Updated Transport Assessment

Ref	JTP18_095
Site Name	Land South of Kelvedon Road, Tiptree
Date	March 2021

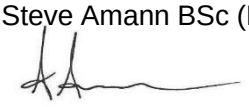
Quality Assurance

Site name: Land South of Kelvedon Road, Tiptree

Client name: Marden Homes

Type of report: Updated Transport Assessment

Prepared by: Steve Amann BSc (Hons) MSc (Engr)

Signed 

Date March 2021

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1 Introduction

Background

1.1 Journey Transport Planning has been commissioned by Marden Homes to undertake a Transport Assessment in support of proposals for residential development on land to the south of Kelvedon Road Tiptree.

1.2 The proposal site is comprised of an area of land across 5.16 hectares occupied by a range of uses and is illustrated in **Appendix 1.**

1.3 This report provides a detailed assessment of the proposed location for the outlined development in respect to its suitability as a sustainable location in transport terms for the purpose of residential development and in terms of the adequacy of the local highway and transport network infrastructure to support such a proposal.

1.4 Specifically, this report provides a technical appraisal of how appropriate access can be achieved for a sustainable residential development on land to the south of Kelvedon Road Tiptree, Essex and sets out a detailed deliverable access strategy encompassing public transport, cycle, pedestrian and vehicular access. It demonstrates the level of access that will be required and provides an analysis of the likely trip distribution and assignment for the development generated traffic and the potential impact on the routes and junctions in terms of vehicular impact, public transport capacity and available cycle and pedestrian infrastructure.

1.5 This assessment is informed by the requirements of Colchester Borough Council and Essex County Council.

1.6 Fundamentally, the purpose of this assessment is to demonstrate that the development of 130 homes is deliverable in the context of both the existing transport infrastructure and moreover any impacts associated with additional traffic generated by the proposal can be accommodated on the transport network and will not have a deleterious impact on the operation of that network.

Brief

1.7 The following matters have been considered in this appraisal:

- Section 2 considers the way in which the proposals accord with and support the objectives of local, regional and national policy with respect to transport and movements.
- Section 3 considers the existing site conditions and reviews the accessibility of the site by road, public transport, on foot and by bicycle, including an assessment of

highway safety, to illustrate that the site is easily accessible by a range of alternative transport modes.

- Section 4 outlines the development aspirations for the site and access proposals.
- Section 5 sets out the methodology for the calculation of traffic generation, trip distribution and assignment from the allocation site.
- Section 6 considers the potential traffic impact of an allocation utilising industry standard capacity assessment methodology and software as appropriate.
- Section 7 sets out a summary and conclusion to the Assessment.

2 Policy Context

2.1 The proposed development is subject to both national and local planning policy guidance with respect to transportation and its impact upon the local environment and surrounding infrastructure. A number of policies are directly pertinent to this site and are set out below.

2.2 Relevant policy guidance relating to new development, transport and land use planning is set out at the national and local level in the following documents:

- The National Planning Policy Framework;
- The Essex 2011 Local Transport Plan;
- Essex County Council's Development Management Policies 2011;
- Colchester Borough Council Core Strategy (adopted 2008, amended 2014);
- Colchester Borough Council Site Allocations DPD (adopted 2010); and
- Colchester Borough Council Development Policies DPD (adopted 2010, amended 2014)

2.3 These documents set the context in which the site's proposals have been assessed.

The National Planning Policy Framework (NPPF)

2.4 The National Planning Policy Framework sets out the Government's planning policies for England and how these should be applied. The NPPF is a material consideration in planning decisions.

2.5 The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Promoting Sustainable Transport

2.6 The NPPF in promoting sustainable transport considers in paragraph 108 that for sites to be allocated for development in plans, or specific applications for development, it should be ensured that:

(a) *appropriate opportunities to promote sustainable transport modes can be – or have been – taken up, given the type of development and its location;*

(b) *safe and suitable access to the site can be achieved for all users; and*

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

2.7 The NPPF goes on to re-iterate in paragraph 109 that ***Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.***

2.8 The NPPF sets out in the context of applications for development in paragraph 110 that they should:

(a) *give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;*

(b) *address the needs of people with disabilities and reduced mobility in relation to all modes of transport;*

(c) *create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;*

(d) *allow for the efficient delivery of goods, and access by service and emergency vehicles; and*

(e) *be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.*

2.9 The chapter concludes in paragraph 111 that … *All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed.*

Essex Local Transport Plan 2011

2.10 The 2011 Essex Local Transport Plan sets out the County Council's aims and objectives for transport and infrastructure for the next ten-year period and provides the policy framework to achieve the objectives.

2.11 Policy 2 Integrated Development sets out the County's position in relation to integrated planning and states that:

Transport and land-use planning will be used together to secure new development at the most appropriate and sustainable locations by: working closely with district planning authorities to enable a better balance of new homes, jobs and services; locating new developments in areas which are accessible to key services by sustainable forms of transport; ensuring new developments provide for sustainable transport and effective travel planning; requiring new developments to provide appropriate transport infrastructure in line with the Council's current development management policies; and making the most effective use of all available funding sources by co-ordinating the delivery of ECC and development funded works.

Development Management Policies 2011

2.12 The aims and objectives of LTP policy are supported by the policies set out in the Development Management Policies 2011 which provides specific requirements in terms of transport access and new development in relation to the County Council's functional route hierarchy.

2.13 The site is bordered by Kelvedon Road to the north which is classified as a Secondary Distributor Road in the hierarchy.

2.14 The proposals take full regard of and accord with the policies set out as they apply to the road and access options for the site.

Colchester Local Plan

2.15 The Colchester Borough Local Plan is contained with the following documents:

- Colchester Borough Council Core Strategy (adopted 2008, amended 2014)
- Colchester Borough Council Site Allocations DPD (adopted 2010)
- Colchester Borough Council Development Policies DPD (adopted 2010, amended 2014)

2.16 Whilst these documents represent the currently adopted Local Plan for development in the Borough; this plan is currently being replaced to ensure its compliance with National Planning Policy.

2.17 The Colchester Borough Council CBC Local Plan 2017-2033 Publication Draft, remains as the 'emerging' Local plan for Colchester.

2.18 In consideration of the above, the following Local Plan policies have relevance to the site and the proposals.

2.19 Policy SG5: – Centre Hierarchy identifies Tiptree as a District Centre with a good range of supporting facilities and amenities.

2.20 Policy SS14: identifies the proposal site as being suitable to support residential development, open space and community infrastructure.

2.21 Policy DM21: Sustainable Access to Development, sets out the requirement for developments to consider all forms of access placing emphasis on sustainable means and also sets out that: "*Development will only be allowed where there is physical and environmental capacity to accommodate the type and amount of traffic generated in a safe manner. Developments that generate significant amounts of movement will require a Transport Statement or Transport Assessment in line with the thresholds set in the latest Essex County Council development management policies relating to highways.*"

2.22 Policy DM 21 also sets out that significant residential developments will be required to provided residential travel packs in accordance with Essex County Council guidance.

2.23 Policy DM22: Parking sets out that the amount of car parking to be provided in association with new residential development will be assessed using the most recent local Parking Guidance.

2.24 This appraisal and the proposals for the site fully take into consideration the policies set out in the adopted and emerging Local Plan for Colchester.

3 Existing Conditions

Site Location

3.1 The proposal site is located in Tiptree, directly to the south of Kelvedon Road B1023 which runs north west to south east past the site. The location of the site in relation to the local area is shown in **Appendix 1**.

Highway Access to Development Area

3.2 The routes in the vicinity of the area of land being considered for development and links to the local area road network have been examined in detail.

3.3 Kelvedon Road runs north west to south east to the north of the site and links Tiptree centre to the east with Kelvedon and the A12 to the west.

3.4 Kelvedon Road is a single carriageway road with an effective running width of 6.0 metres. It is subject to the 30mph speed limit as it passes to the north of the site. The road has the benefit of street lighting and continuous footway provision to both sides as it passes the site.

Public Transport Accessibility: Rail Services

3.5 Kelvedon operates the closest mainline rail station to the development site and is around 3 miles from the site.

3.6 Currently, there is a very frequent service during peak periods from Kelvedon to either Colchester or London Liverpool Street. During the rest of the day the service operates on a reasonably frequent basis with trains to London every 15 minutes or so.

3.7 There is a dedicated car park (around 280 Spaces) at the station. The station also has the benefit of sheltered cycle stands for cycle parking.

Public Transport Accessibility: Bus Services

3.8 The provision of bus based public transport in the area has been assessed in terms of access to routes, frequencies of services and levels of reliability. The quality of the bus infrastructure in the area has also been assessed in respect of the provision and quality of shelters, information and seating.

3.9 Bus accessibility is measured by reference to the number and frequency of services available within easy walking distance of the proposal site. Easy walking distance is considered to be up to 400 metres in the case of accessing bus based public transport. This equates to a five minute walk time assuming a walk speed of 80 metres per minute.

3.10 The whole of the site is within 400m of bus stops on Kelvedon Road near to Oak Road and East Road. From these stops, numbers 91 provides a service between Tollesbury and Witham on a two hourly basis. In addition, stops on Maldon Road B1022 to the east within 500m of

the site provide access to the 75 service which operates between Maldon and Colchester on a half hourly basis.

3.11 **Table 3.1** summarises the bus services available from the stops in the vicinity of the site.

Table 3.1 Bus Service Summary

Bus Number	Route	Frequency
91	Witham to Tollesbury	Mon-Sat 2 hourly freq
75	Maldon- Colchester	Mon-Sat Hal hourly Sunday 2 hourly

3.12 With a regular bus services available between Maldon and Colchester with potential connections to destinations further afield, the proposal site is well provided for by public transport.

3.13 The routes and timetables are held in **Appendix 2.**

Walking and Cycling Assessment

3.14 This Assessment has considered the accessibility and integration of the site to local amenities and facilities on foot and by bicycle.

Cycling

3.15 Cycling has the potential to substitute for short car trips, especially those less than 5km. Cycle access to the site has been considered in detail and for the purposes of cycle accessibility, a cycle time of 20 minutes, which equates to 5km at an average speed of 15kph, has been assumed.

3.16 The 5km catchment area within an acceptable cycling distance of the site includes Tiptree and Kelvedon covers the full range of local facilities and amenities including:

- Supermarket;
- Hotel;
- Employment Areas;
- Churches;
- Nursery Primary and Secondary Educational facilities;
- Pubs and Restaurants;
- Banks and Financial Services;
- Post Offices;
- Country Park;
- Doctors / Dental Surgeries;
- Chemists;
- Village Halls; and
- Mainline rail station

3.17 The site is therefore within reasonable cycling distance of a good range of local amenities and employment opportunities and as such, is considered to have very good levels of accessibility and integration opportunities in line with the aims and objectives of the National Planning Policy Framework.

3.18 There is no specific cycle infrastructure in the vicinity of the site.

Walking

3.19 With respect to pedestrian access, a walk time of ten minutes is generally considered the maximum acceptable to directly access any local facility or amenity and equates to a distance of 800 metres at an average speed of 5kph.

3.20 Whilst there are limited facilities and amenities within the 800 metre pedestrian catchment area from the centre of the site, The National Planning Policy Framework identifies walking as the most important mode of travel at the local level which offers the greatest opportunity to replace short car trips of less than 2km. The site is within acceptable walking distance of:

- Primary Schools
- Local Shops
- Post Office
- Chemist
- General Store
- Doctors

3.21 The provision of pedestrian routes through the proposal site will also enable further direct pedestrian connection between the site and the surrounding built up area, thus integrating the development into the existing community.

3.22 The site is therefore considered to be within reasonable walking distance of a good range of local amenities and as such, is considered to have very good levels of accessibility and integration opportunities in line with policy requirements.

Highway Safety Assessment

3.23 A highway safety assessment has been undertaken for the highway network surrounding the site, based upon Essex County Council Personal Injury Accident (PIA) data obtained for the three-year period October 2017 to October 2020.

3.24 A total of two personal injury accidents were recorded over the three-year period both of which were classed as serious.

3.25 The recorded accidents were recorded to the west of the site on Kelvedon Road one at the junction of Kelvedon Road and Vine road and the other further west on Kelvedon Road near the junction with Primrose Lane.

3.26 The accident data reviewed above identifies the absence of any specific accident pattern with no identified clusters in the vicinity of the site.

3.27 It is considered that in view of the foregoing review there are no prevailing highway safety concerns in relation to site and the surrounding area, and moreover residential development on the site and the resulting increase in traffic would not have a significantly detrimental impact on that safety record.

4 Development Access

Highway Access

4.1 Access to the site has been considered in the context of the aims and objectives of policies set out in the Essex Development Management Policies 2011 which provides specific policy requirements in terms of transport access and new development in relation to the County Council's functional route hierarchy.

4.2 The site is bordered by Kelvedon Road to the north which is classified as a Secondary Distributor in the hierarchy.

4.3 The proposals take full regard of and accord with the policies set out as they apply to the road and access options for the site.

4.4 The access requirements for the site have been also considered in the context of the guidance set out in the latest iteration of the Essex Design Guide 2018. in accordance with the guidance a Type E Minor Access Road would provide a suitable and appropriate level of access to the site to accommodate the development aspirations for the site.

4.5 An Access road with a 5.5m carriageway and two 2.0m footways in accordance with the Type E specification will be provided through the site to accommodate the needs of cyclists, pedestrians and other vehicles and will be designed to achieve a 20mph environment.

4.6 The layout of the development will accord with the Road Type criteria set out in the residential road layout guidance as produced by Essex County Council.

4.7 Access would be taken directly from Kelvedon Road to the north of the site. The access form has been considered in the context of the level of development proposed and the existing traffic levels and in the light of discussions held with Essex County Council with respect to the level access required for the site.

4.8 Essex County Council have accepted that the proposed development can be appropriately accessed via a simple priority junction arrangement designed in accordance with current standards of geometry and visibility.

4.9 It was accepted by Essex County Council, as highway Authority that the proposal does not need to take into account the possibility of a future link road as this was not embodied in either the local or neighbourhood plan and as such is not a committed infrastructure project that needs to be accommodated.

4.10 A simple priority junction arrangement in accordance with current design standards can be provided within land within the site and the control of the highway authority.

4.11 The proposed access arrangement is held in **Appendix 3** and would be suitable to accommodate the development site traffic.

4.12 Three units are proposed to take access directly via Kelvedon Road via a single private drive arrangement, consistent with the arrangements for existing houses on Kelvedon Road, this

arrangement is proposed in accordance with current standards of visibility and design. Whilst it proposes a direct access onto a secondary distributor road, the development proposals as whole effectively reduce the number of access points along the road and as such the proposed arrangement is considered acceptable and in accordance with current policy.

5 Traffic Generation

Proposed Development

5.1 The proposals for the site comprise a sustainable development of 130 dwellings with associated infrastructure, open space, parking and access.

5.2 An illustrative development layout is held in **Appendix 4.**

5.3 In order to forecast the likely travel demand associated with the proposed development allocation for the site, a detailed interrogation of the TRICS Version 7 trip generation database has been undertaken.

5.4 The TRICS database contains a wide range of information relating to travel patterns and behaviours associated with various development types and locations and it provides a robust and accepted basis for assessing the likely impact in terms of travel demand associated with new development.

5.5 For the purposes of this appraisal, information from the TRICS database has been disaggregated by development type, mode and location in order to provide a development trip generation profile that corresponds closely with the characteristics of the proposal site.

5.6 The information supplied from the database provides an estimate of the likely number of vehicular trips to and from the development area. This information in turn informs the infrastructure requirements of the development in terms of highway capacity, public transport capacity, cycle movements and pedestrian movements.

Residential Trip Rates

5.7 Appropriate vehicular residential trip rates have been obtained from the TRICS database and full details of the TRICS Version 7 residential trip rate data are held in **Appendix 5**.

5.8 The trip rates for private housing have been extracted from the database for the AM (08:00-09:00) and PM (17:00-18:00) peak hours and the forecast unrestrained vehicular trip rate generation associated with the proposed residential site is summarised in **Table 5.1.** The TRICS data assumes a standalone residential development without the benefit of travel planning or improvements to public transport and sustainable modes of travel.

Table 5.1 Residential Trip Rates

Land Use	AM 08:00-09:00		PM17:00-18:00	
	Arrival Rates	Departure Rates	Arrival Rates	Departure Rates
Private Housing	0.140	0.384	0.338	0.156

5.9 The residential trip rate data has been applied to the ultimate development capacity of the site to provide a robust estimate of the likely vehicular trips that could be associated with a

residential development on the site. For the purposes of this assessment the impact of a development of up to 130 units has been assessed. **Table 5.2** summarises the vehicular trip generation based on the likely tenure and type of residential units envisaged.

Table 5.2 Vehicular Trip Generation 130 Dwellings

Land Use	AM 08:00-09:00		PM17:00-18:00	
	Arrivals	Departures	Arrivals	Departures
130 Dwellings	18	50	44	20

5.10 **Table 5.2** indicates that a development of 130 residential units as proposed could generate up to 68 vehicular trips in the AM peak and 64 vehicular trips in the PM peak.

Trip Distribution

5.11 The forecast development traffic has been assigned on the network in accordance with local highway network in accordance with the Census Travel to Work Origin and Destination data for the resident population of Tiptree who drive to work. The Census data is held in **Appendix 6.**

5.12 The Google Maps satellite navigation route finder application was used to verify the distribution of vehicle trips on the local highway network.

5.13 Table 5.3 provides a summary of the Development Traffic Trip Distribution and is applied to the network traffic flow diagrams in **Appendix 8**.

Table 5.3 Vehicular Trip Distribution

Link	AM 08:00-09:00		PM17:00-18:00	
	Arrivals	Departures	Arrivals	Departures
Kelvedon Road North/West	62%	62%	62%	62%
London Road East	62%	62%	62%	62%
Kelvedon Road South/East	38%	38%	38%	38%
B1022 South	38%	38%	38%	38%

6 Traffic Impact

Background Traffic Flows

6.1 Existing traffic data has been obtained via manually classified junction turning count (MCC) undertaken by Advanced Transport Research (ATR) on Tuesday 24th January 2019 at the following junctions:

- Maypole Road/Colchester Road/Oak Road Priority Junction
- Kelvedon Road/Maypole Road/Church Road/Maldon Road Mini Roundabout
- Vine Road/Townsend Road/Kelvedon Road Crossroads
- Kelvedon Road/Oak Road

6.2 The full set of observed traffic data, comprising manually classified turning counts is contained in **Appendix 7.**

6.3 It was identified that on the day of the survey Vine Road was closed by road works which would have resulted in traffic diverting via Maldon Road/Maypole Road. In view of this the traffic surveyed for the Colchester United FC/Grange Road was added to the ins and outs for Vine Road. This will inevitably result in an element of double counting across the network and at the junction and as such provides a robust basis for the assessment.

6.4 For the purposes of this assessment the observed AM and PM network peak hour periods of 08:00 to 09:00 and 17:00 to 18:00 have been used, as determined from the surveys undertaken on site. The observed peak hour network traffic flows are illustrated by the network diagrams contained in **Appendix 8.**

Assessment Year and Background Traffic Growth

6.5 An assessment of the impact of the proposed development upon the local highway network in the vicinity of the site comprising the study area has been undertaken. An assessment year of 2026, reflecting the planning timescale, has been applied to the assessment of the local highway network adjacent to the site. The use NTEM Tempro traffic growth factors used incorporate an element of growth to represent consented development schemes and as such provide a robust forecast for the assessment.

Committed Development

6.6 The traffic associated with the ongoing development site at Grange Road has been included in this assessment with the flow information taken directly from the associated Transport Assessment undertaken by Ardent Consulting Engineers in support of the development. The committed development traffic is shown in the network flow diagrams in **Appendix 8.**

Assessment of Traffic Impact

6.7 The traffic impact of the proposals has been examined in terms of the total additional external vehicle trips forecast from the development based on the distribution methodology set out in Section 5 above.

6.8 Principally, this section considers the immediate highway network, the number of additional trips in the AM and PM peak periods (the critical periods for network assessment), the ability of the existing network to accommodate additional traffic, the potential mitigation that may be required and an assessment of the deliverability of that mitigation.

6.9 Detailed assessments of the capacity of the following junctions has been undertaken for AM and PM peak periods with and without development scenarios utilising the Junctions 9 ARCADY/PICADY software.

- Maypole Road/Colchester Road/Oak Road Priority Junction
- Kelvedon Road/Maypole Road/Church Road/Maldon Road Mini Roundabout
- Vine Road/Townsend Road/Kelvedon Road Crossroads
- Kelvedon Road/Oak Road Priority Junction
- Kelvedon Road Site Access Roundabout

6.10 The Junctions 9 capacity assessments set out the maximum Ratio of Flow to Capacity (RFC) and Maximum Queue (vehicles) for each arm of the junction. Generally, where the RFC of an arm is greater than 1.0 then the arm is said to be operating at over its theoretical capacity and would be expected to suffer levels of queuing and delay. An arm with an RFC of between 0.85 and 1.0 is considered to be approaching its practical capacity and some queuing and delay may be expected to occur.

Maypole Road/Colchester Road/Oak Road Priority Junction

6.11 A detailed assessment of the impact of the potential development upon the priority junction has been undertaken and is considered in **Table 6.1** below.

Table 6.1 Maypole Road/Colchester Road/Oak Road PICADY Junction Summary

		Maypole Road		Oak Road	
		RFC	Q	RFC	Q
AM	2026 Total Flows	0.20	0.3	0.20	0.3
PM	2026 Total Flows	0.04	0.0	0.32	0.5

6.12 The full Junctions 9 PICADY outputs for the junction are contained in **Appendix 9.**

6.13 The PICADY analysis indicates that in the 2026 forecast year with the development, the junction will operate within capacity during all time periods.

Kelvedon Road/Maypole Road/Church Road/Maldon Road Mini Roundabout

6.14 A detailed assessment of the operation of the Kelvedon Road/Maypole Road/Church Road/Maldon Road double Mini Roundabout junction has been undertaken and is considered in **Table 6.2** below.

6.15 The roundabout was modelled as 2 separate 3 arm mini roundabouts in accordance with current guidance and are referred to as the north and south roundabouts respectively.

Table 6.2 North Roundabout Mini Roundabout

		Roundabout Link		Kelvedon Road		Maypole Road	
		RFC	Q	RFC	Q	RFC	Q
AM	2026 Base	0.53	1.2	0.35	0.6	0.90	7.9
PM	2026 Base	0.81	4.3	0.67	2.2	0.57	1.4
AM	2026 Total Flows	0.54	1.3	0.38	0.7	0.92	9.4
PM	2026 Total Flows	0.84	5.4	0.69	2.3	0.58	1.5

Table 6.3 South Roundabout Mini Roundabout

		Roundabout Link		Church Road		Maldon Road	
		RFC	Q	RFC	Q	RFC	Q
AM	2026 Base	0.61	1.7	0.64	1.9	0.78	3.6
PM	2026 Base	0.84	5.3	0.52	1.2	0.79	3.9
AM	2026 Total Flows	0.63	1.9	0.65	2.0	0.79	3.9
PM	2026 Total Flows	0.84	5.5	0.52	1.2	0.81	4.4

6.16 The Junctions 9 North Roundabout PICADY assessment illustrated in **Table 6.2** identifies that the junction will operate in excess of capacity with an RFC of 0.9 and queueing up to 8 vehicles identified on Maypole Road in the AM peak in the 2026 base case without the development, this is identified to increase by just 0.2 with the development with an increase in queuing of 1 vehicle. It is considered that this increase will not be perceptible when considered against the daily fluctuations at the junction and as such is not considered to be material of significant in the context of highway capacity and traffic impact.

6.17 The Junctions 9 South Roundabout PICADY assessment illustrated in **Table 6.3** identifies that the junction will operate within capacity in the design year with and without the development.

6.18 The full Junctions 9 PICADY outputs for the junction are contained in **Appendix 9**.

Vine Road/Townsend Road/Kelvedon Road Crossroads

6.19 A detailed assessment of the operation of the Vine Road/Townsend Road/Kelvedon Road junction has been undertaken and is considered in **Table 6.4** below.

Table 6.4 Vine Road/Townsend Road/Kelvedon Road Crossroads PICADY Summary

		Kelvedon Road		Vine Road		Kelvedon Road West		Townsend Road	
		RFC	Q	RFC	Q	RFC	Q	RFC	Q
AM	2026 Total Flows	0.11	0.2	0.28	0.4	0.11	0.1	0.18	0.2
PM	2026 Total Flows	0.16	0.2	0.30	0.5	0.09	0.1	0.07	0.1

6.20 The Junctions 9 PICADY assessment illustrated in **Table 6.4** identifies that the junction will operate comfortably within the operational capacity of the junction for the design year 2026 with the site development flows in both the AM and PM peak with no significant queuing or delay predicted.

6.21 The full Junctions 9 PICADY outputs for the junction are contained in **Appendix 9**.

Kelvedon Road/Oak Road Junction Assessment

6.22 A detailed assessment of the impact of the potential development upon the priority junction has been undertaken and is considered in **Table 6.5** below.

Table 6.5 Maypole Road/Colchester Road/Oak Road PICADY Junction Summary

		Kelvedon Road		Oak Road	
		RFC	Q	RFC	Q
AM	2026 Total Flows	0.01	0.0	0.37	0.6
PM	2026 Total Flows	0.01	0.0	0.09	0.1

6.1 The PICADY analysis indicates that in the 2026 forecast year with the development, the junction will operate within capacity during all time periods.

6.2 The full Junctions 9 PICADY outputs for the junction are contained in **Appendix 9.**

Site Access Priority Junction Assessment

6.3 A detailed assessment of the operation of the Site Access priority junction has been undertaken and is considered in **Table 6.6** below.

Table 6.6 Site Access PICADY Summary

		Kelvedon Rd		Site Access	
		RFC	Q	RFC	Q
AM	2026 Total Flows	0.03	0.0	0.15	0.2
PM	2026 Total Flows	0.05	0.1	0.05	0.1

6.4 The Junctions 9 PICADY assessment illustrated in **Table 6.6** identifies that the junction will operate within the operational capacity of the junction for the design year 2026 with the site development flows in both the AM and PM peak with no significant queuing or delay predicted.

6.5 The full Junctions 9 PICCADY outputs for the junction are contained in **Appendix 9**.

6.6 In summary, the detailed network capacity analysis identifies that additional vehicular trips that the proposed development would generate would not have a significant or material impact in terms of either highway capacity or safety and moreover can be accommodated within the capacity of the existing network.

Vehicle Parking

6.7 Car parking for the proposal is proposed in accordance with the minimum standards set out in the Essex Planning Officers Association Standards for Parking as appropriate for residential developments. Cycle parking is also be provided in accordance with current standards.

6.8 Car parking is provided in accordance with the following schedule:

• 1 space per 1 bed units	9 one bed units	9 spaces
• 2 spaces per 2 bed plus units	121 units	242 spaces
• 0.25 visitor spaces per house	130 units	33 spaces
• Total		284 Spaces

Servicing

6.9 The proposed access and internal layout will be designed in accordance with current Essex County Council standards to accommodate the delivery and servicing requirements of a range of vehicles including emergency vehicles and refuse vehicles.

Pedestrian Access

6.10 The development proposes to provide the opportunity for a pedestrian connection with the adjoining development site to the south with the provision of a pedestrian footpath as adjacent to that boundary to enable a connection to be made in the future.

6.11 Following discussions with the Highway Authority it was agreed that the potential to improve pedestrian connections along Kelvedon Road to the south east. Due to the limited land available in the control of either the landowner or the client along the south western side of Kelvedon Road, the development would promote a crossing point of Kelvedon Road to access the existing footway to the north east side of Kelvedon which would also provide a useful link to the primary school.

Residential Travel Planning

6.12 The provision of travel plans, travel plan groups and travel plan co-ordination services will be fundamental to ensuring that the development promotes sustainable alternatives to sole occupancy car use not only in its implementation but throughout the life of the proposals.

6.13 This approach will help the development manage its own travel demand at source rather than relying on outside agencies to deal with the travel consequences of the development. Additionally, travel planning will also seek to reduce, over time, through the setting of targets for modal shift, the numbers of vehicle movements associated with the proposals. This will mean that in time there will be reductions in the number of sole occupancy trips associated with the development on the network as the development becomes established.

6.14 Taking the baseline trip generation as a starting point at the occupation of various phases of the development, achievable targets for traffic reduction will be set and monitored throughout the early stages of the development. A variety of schemes and measures to reduce sole occupancy trips will be put into action and the effectiveness of these schemes will be monitored against the set targets. The following list provides examples of the various travel plan measures applicable to residential uses which can be promoted for this development:

- Site pedestrian and cycle permeability;
- Sustainable modal hierarchy;
- Car sharing database;
- Taxi buddy schemes;
- Residents Travel Plan Packs giving information on the alternatives available;
- Discounted public transport travel vouchers;
- Promotion of cycle routes to the development;
- Regular promotion including e-mail, posters and flyers to maintain or increase the level of participation;
- Improvements to the cycle infrastructure; and
- Providing for home-working (Broadband access/home office rooms etc.)

6.15 The travel plan measures set out above have the ability to effect a reduction in vehicular movements associated with the proposals and will over time ensure the sustainability of the development. The measures will be promoted as a part of any proposals coming forward and are an integral part of the planning process and as such, will be deliverable as a part of those proposals. In consideration of the target modal shift potential, discounts on trip rates for the development will be appropriate.

6.16 As a part of the proposals, a Residential Travel Information Pack will be provided for each new dwelling.

7 Summary

Summary

7.1 This report provides an assessment of the likely transport impacts arising from the erection of up to 130 dwellings and with associated parking, public open space, landscaping, sustainable drainage system (SUDs) and vehicular access points from Kelvedon Road.

7.2 The assessment considers impact of the proposed development and its corresponding trip generation on the transport infrastructure.

7.3 The assessment demonstrates that the site is a suitable location for sustainable development and has the benefit of being accessible to a full range of key services and amenities to support the development and also is in accordance with the sustainability framework.

7.4 Residential Travel Packs are proposed as a part of the proposals and will assist in managing the traffic impact of the development.

7.5 The development incorporates proposals to enhance pedestrian connections between the site and the surrounding area through a commitment to provide a crossing point on Kelvedon Road and also to promote a connection to the adjacent residential development.

7.6 A comprehensive trip generation analysis has been undertaken in order to understand the impacts, in terms of transport and traffic that the proposals will engender.

7.7 The assessment identifies that the proposals will not have a significant or material impact on the operation of the local highway network.

7.8 The capacity assessment demonstrates that the proposal site can be delivered without having a detrimental impact on the local transport infrastructure in the vicinity of the site and can be accommodated for the purposes of capacity and safety.

Conclusion

7.9 The assessment clearly demonstrates that the proposed development of 130 dwellings on land to the south of Kelvedon Road, Tiptree will not have a material or significant impact on the operation of the local road network.

7.10 The assessment also demonstrates that the proposed development is suitably located to access key services, facilities and amenities by means other than private vehicles.

7.11 In consideration of the above, there are no substantive transport or access reasons why the proposals as submitted should not receive planning permission.

Appendix 1

Site Location

KELVEDON ROAD

Water Tower

Tower House

Golden Warren

Coronation Cottages

1

2

Tower End

Ponys Farm

El Sub Sta

El Sub Sta

Pond

Pond

The Gables

Track

100

95

103

68

67.9m

Stourton

Baynards Primary School

Colt Farm

B 1023

The Paddock

Revelors Farm

Gwy

N

Patrick Stroud Designs Ltd, 10 Hurstwood Avenue, Brentwood, Essex CM15 9HT T: 01277 260130 M 07955 687623 E: patrickjstroud@btinternet.com	Client : **MARDEN.HOMES** Project : **LAND.AT.KELVEDON.ROAD,** **TIPTREE** Drawing : **LOCATION.PLAN**	Scale : **1:1250@A3** 0 25 50 Status : **PLANNING** Rev : Dwg No : **2017-116-01**

C:\Users\Pat\Documents\New Projects\2017.116 - Tiptree\2017.115 - Site Plans

Appendix 2

Public Transport Data

Hedingham 91 Witham-Tollesbury

Mondays to Fridays (from 27 August 2017)

service no.	91	91	91	91	91	91	91	91	91	91	91
notes											
Witham, Morrisons	-	-	-	0840	0955	1125	1345	1603	1633	1755	-
Witham, Rail Station Stop 2	-	0700	0753	0842	0958	1128	1348	1606	1635	1758	1905
Witham, The George	-	0702	0755	0845	1000	1130	1350	1608	1638	1800	1908
Kelvedon, The Railway Tavern	0646	0711	0804	0852	1009	1139	1359	1617	1645	1809	1916
Feering, Gore Pit Corner	0647	0714	0807	0854	1012	1142	1402	1620	1647	1812	1917
Inworth, The Prince of Wales	0650	0717	0810	0857	1015	1145	1405	1623	1650	1815	1920
Tiptree, Windmill Green	0653	0720	0814	0859	1018	1148	1408	1626	1651	1818	1923
Tiptree, The Centre	0654	0722	|	0900	1020	1150	1410	1628s	|	1820	1924
Tolleshunt Knights, Top Road	0659	0729	|	0904	1027	1157	1417	1635	|	1827	1929
Tolleshunt D'Arcy, The Red Lion	0703	0733	|	0908	1031	1201	1421	1639	|	1831	1933
Tollesbury, The Square	0708	0738	|	0913	1036	1206	1426	1644	|	1836	1938
Tiptree, The New Times	-	-	0817	-	-	-	-	-	1654	-	-
Tiptree, The Centre	-	-	0820	-	-	-	-	-	1656	-	-

Hedingham 91 Witham-Tollesbury

Saturdays (from 27 August 2017)

service no.	91	91	91	91	91	91
notes						
Witham, Morrisons	-	0820	0950	1200	1430	1733
Witham, Rail Station Stop 2	-	0822	0952	1202	1432	1735
Witham, The George	-	0825	0955	1205	1435	1738
Kelvedon, The Railway Tavern	0712	0832	1002	1212	1442	1745
Feering, Gore Pit Corner	0714	0834	1004	1214	1444	1747
Inworth, The Prince of Wales	0717	0837	1007	1217	1447	1750
Tiptree, Windmill Green	0719	0839	1009	1219	1449	1752
Tiptree, The Centre	0720	0840	1010	1220	1450	1753
Tolleshunt Knights, Top Road	0724	0844	1014	1224	1454	1757
Tolleshunt D'Arcy, The Red Lion	0728	0848	1018	1228	1458	1801
Tollesbury, The Square	0733	0853	1023	1233	1503	1806

Hedingham 91 Tollesbury-Witham

Mondays to Fridays (from 27 August 2017)

service no.	91	91	91	91	91	91	91	91	91	91
notes										
Tollesbury, The Square	-	0710	-	0910	1040	1300	1518	1710	1825	1940
Tolleshunt D'Arcy, The Red Lion	-	0715	-	0915	1045	1305	1523	1715	1828	1943
Tolleshunt Knights, Top Road	-	0719	-	0919	1049	1309	1527	1719	1830	1945
Tiptree, The Centre	0634	0726	0821	0926	1056	1316	1534	1726	1835	1950
Tiptree, Windmill Green	0635	0727	0823	0927	1057	1317	1535	1727	1837	1952
Inworth, The Prince of Wales	0640	0732	0824	0932	1102	1322	1540	1732	1839	1954
Feering, Gore Pit Corner	0643	0735	0826	0935	1105	1325	1543	1735	1841	1956
Kelvedon, The Railway Tavern	0646	0738	0827	0938	1108	1328	1546	1738	1843	1958
Witham, The George	0655	0747	0835	0947	1117	1337	1555	1747	1851	-
Witham, Rail Station	0658	0750	0837	0950	1120	1340	1558	1750	1853	-
Witham, Morrisons	-	-	0838	0953	1123	1343	1601	1753	-	-

Hedingham 91 Tollesbury-Witham

Saturdays (from 27 August 2017)

service no.	91	91	91	91	91	91	91
notes							
Tollesbury, The Square	0737	0907	1107	1337	1552	-	1810
Tolleshunt D'Arcy, The Red Lion	0740	0910	1110	1340	1555	-	1813
Tolleshunt Knights, Top Road	0742	0912	1112	1342	1557	-	1815
Tiptree, The Centre	0747	0917	1117	1347	1602	1701	1822
Tiptree, Windmill Green	0749	0919	1119	1349	1604	1703	1824
Inworth, The Prince of Wales	0751	0921	1121	1351	1606	1705	1826
Feering, Gore Pit Corner	0753	0923	1123	1353	1608	1707	1828
Kelvedon, The Railway Tavern	0755	0925	1125	1355	1610	1709	-
Witham, The George	0803	0933	1133	1403	1618	1717	-
Witham, Rail Station	0805	0935	1135	1405	1620	1719	-
Witham, Morrisons	0806	0936	1136	1406	1621	1720	-

Appendix 3

Proposed Access Arrangement

N

2.4x70m visibility in accordance with TD 9 for a 50kph design speed

.4m

2.0m Footways

6.0m Radii

2.4x70m visibility in accordance with TD 9 for a 50kph design speed

Water Tower

Golden Warren

1

2

Coronation Cottages

Tower End

Proposed 5.5m Carriageway

Pond

Ponys Farm

The Gables

client: Marden Homes		title: Access and Visibility		date: 01/10/2018	scale @ A3 1:500
project: Kelvedon Road Tiptree		status: Planning (not for construction)		drawn	Revision
discipline Transport Planning		project no. JTP 07718		chk'd SAA	dwg no. DR1

Appendix 4

Illustrative Development Layout

Open Space = 5718.5sqm
(11.64% of total site area)

Track

Golden Warren

Coronation Cottages

Coal Yard

Highlands

The Gables

Stourton

Colt Farm

Path (um)

OAK ROAD

67.9m

AS PROPOSED LAYOUT PLAN

1:500
0m 5m 15m 30m

KELVEDON ROAD
PROPOSED SITE LAYOUT
TIPTREE
COLCHESTER
CO5 OLX
MARDEN HOMES LTD.
10.03.21 1:500@A1 Project#1432

251.06

www.daparchitecture.co.uk

Appendix 5

TRICS Data

Calculation Reference: AUDIT-757101-181004-1022

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	2 days
	HC	HAMPSHIRE	1 days
	KC	KENT	2 days
	SC	SURREY	1 days
	WS	WEST SUSSEX	2 days
03	SOUTH WEST		
	DV	DEVON	2 days
04	EAST ANGLIA		
	NF	NORFOLK	2 days
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	2 days
	ST	STAFFORDSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	1 days
	NY	NORTH YORKSHIRE	6 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
09	NORTH		
	DH	DURHAM	1 days
10	WALES		
	PS	POWYS	1 days
11	SCOTLAND		
	AG	ANGUS	1 days
	FA	FALKIRK	1 days
	HI	HIGHLAND	1 days
	PK	PERTH & KINROSS	1 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 7 to 805 (units:)
Range Selected by User: 5 to 4334 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 19/04/18

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

Selected survey days:

Monday	6 days
Tuesday	7 days
Wednesday	8 days
Thursday	7 days
Friday	4 days

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

Selected survey types:

Manual count	32 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	16
Edge of Town	16

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

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

Secondary Filtering selection:

Use Class:

C3	32 days

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

Population within 1 mile:

1,000 or Less	1 days
1,001 to 5,000	5 days
5,001 to 10,000	8 days
10,001 to 15,000	11 days
15,001 to 20,000	7 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	7 days
25,001 to 50,000	5 days
50,001 to 75,000	6 days
75,001 to 100,000	12 days
100,001 to 125,000	2 days

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

Car ownership within 5 miles:

0.6 to 1.0	8 days
1.1 to 1.5	24 days

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

Travel Plan:

Yes	4 days
No	28 days

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

PTAL Rating:

No PTAL Present	32 days

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

LIST OF SITES relevant to selection parameters

1 AG-03-A-01 BUNGALOWS/DET. ANGUS
KEPTIE ROAD
ARBROATH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 7
Survey date: TUESDAY *22/05/12* *Survey Type: MANUAL*

2 CH-03-A-08 DETACHED CHESHIRE
WHITCHURCH ROAD
CHESTER
BOUGHTON HEATH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 11
Survey date: TUESDAY *22/05/12* *Survey Type: MANUAL*

3 CH-03-A-09 TERRACED HOUSES CHESHIRE
GREYSTOKE ROAD
MACCLESFIELD
HURDSFIELD
Edge of Town
Residential Zone
Total Number of dwellings: 24
Survey date: MONDAY *24/11/14* *Survey Type: MANUAL*

4 DH-03-A-01 SEMI DETACHED DURHAM
GREENFIELDS ROAD
BISHOP AUCKLAND

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 50
Survey date: TUESDAY *28/03/17* *Survey Type: MANUAL*

5 DV-03-A-02 HOUSES & BUNGALOWS DEVON
MILLHEAD ROAD
HONITON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 116
Survey date: FRIDAY *25/09/15* *Survey Type: MANUAL*

6 DV-03-A-03 TERRACED & SEMI DETACHED DEVON
LOWER BRAND LANE
HONITON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 70
Survey date: MONDAY *28/09/15* *Survey Type: MANUAL*

7 ES-03-A-02 PRIVATE HOUSING EAST SUSSEX
SOUTH COAST ROAD
PEACEHAVEN

Edge of Town
Residential Zone
Total Number of dwellings: 37
Survey date: FRIDAY *18/11/11* *Survey Type: MANUAL*

8 ES-03-A-04 MIXED HOUSES & FLATS EAST SUSSEX
NEW LYDD ROAD
CAMBER

Edge of Town
Residential Zone
Total Number of dwellings: 134
Survey date: FRIDAY *15/07/16* *Survey Type: MANUAL*

9 FA-03-A-01 SEMI-DETACHED/TERRACED FALKIRK
MANDELA AVENUE
FALKIRK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 37
Survey date: THURSDAY *30/05/13* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

10 HC-03-A-19 HOUSES & FLATS HAMPSHIRE
CANADA WAY
LIPHOOK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 62
Survey date: MONDAY *27/11/17* *Survey Type: MANUAL*

11 HI-03-A-14 SEMI-DETACHED & TERRACED HIGHLAND
KING BRUDE ROAD
INVERNESS
SCORGUIE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 40
Survey date: WEDNESDAY *23/03/16* *Survey Type: MANUAL*

12 KC-03-A-03 MIXED HOUSES & FLATS KENT
HYTHE ROAD
ASHFORD
WILLESBOROUGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 51
Survey date: THURSDAY *14/07/16* *Survey Type: MANUAL*

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

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

14 LN-03-A-03 SEMI DETACHED LINCOLNSHIRE
ROOKERY LANE
LINCOLN
BOULTHAM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 22
Survey date: TUESDAY *18/09/12* *Survey Type: MANUAL*

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

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

16 NF-03-A-01 SEMI DET. & BUNGALOWS NORFOLK
YARMOUTH ROAD
CAISTER-ON-SEA

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 27
Survey date: TUESDAY *16/10/12* *Survey Type: MANUAL*

17 NF-03-A-03 DETACHED HOUSES NORFOLK
HALING WAY
THETFORD

Edge of Town
Residential Zone
Total Number of dwellings: 10
Survey date: WEDNESDAY *16/09/15* *Survey Type: MANUAL*

18 NY-03-A-06 BUNGALOWS & SEMI DET. NORTH YORKSHIRE
HORSEFAIR
BOROUGHBRIDGE

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 115
Survey date: FRIDAY *14/10/11* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

19 NY-03-A-07 DETACHED & SEMI DET. NORTH YORKSHIRE
CRAVEN WAY
BOROUGHBRIDGE

Edge of Town
No Sub Category
Total Number of dwellings: 23
Survey date: TUESDAY *18/10/11* *Survey Type: MANUAL*

20 NY-03-A-09 MIXED HOUSING NORTH YORKSHIRE
GRAMMAR SCHOOL LANE
NORTHALLERTON

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 52
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

21 NY-03-A-10 HOUSES AND FLATS NORTH YORKSHIRE
BOROUGHBRIDGE ROAD
RIPON

Edge of Town
No Sub Category
Total Number of dwellings: 71
Survey date: TUESDAY *17/09/13* *Survey Type: MANUAL*

22 NY-03-A-11 PRIVATE HOUSING NORTH YORKSHIRE
HORSEFAIR
BOROUGHBRIDGE

Edge of Town
Residential Zone
Total Number of dwellings: 23
Survey date: WEDNESDAY *18/09/13* *Survey Type: MANUAL*

23 NY-03-A-13 TERRACED HOUSES NORTH YORKSHIRE
CATTERICK ROAD
CATTERICK GARRISON
OLD HOSPITAL COMPOUND
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 10
Survey date: WEDNESDAY *10/05/17* *Survey Type: MANUAL*

24 PK-03-A-01 DETAC. & BUNGALOWS PERTH & KINROSS
TULLYLUMB TERRACE
PERTH
GORNHILL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 36
Survey date: WEDNESDAY *11/05/11* *Survey Type: MANUAL*

25 PS-03-A-02 DETACHED/SEMI-DETACHED POWYS
GUNROG ROAD
WELSHPOOL

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 28
Survey date: MONDAY *11/05/15* *Survey Type: MANUAL*

26 SC-03-A-04 DETACHED & TERRACED SURREY
HIGH ROAD
BYFLEET

Edge of Town
Residential Zone
Total Number of dwellings: 71
Survey date: THURSDAY *23/01/14* *Survey Type: MANUAL*

27 SF-03-A-05 DETACHED HOUSES SUFFOLK
VALE LANE
BURY ST EDMUNDS

Edge of Town
Residential Zone
Total Number of dwellings: 18
Survey date: WEDNESDAY *09/09/15* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

28	SH-03-A-05	SEMI-DETACHED/TERRACED	SHROPSHIRE
	SANDCROFT		
	TELFORD		
	SUTTON HILL		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	54	
	Survey date: THURSDAY	*24/10/13*	*Survey Type: MANUAL*
29	SH-03-A-06	BUNGALOWS	SHROPSHIRE
	ELLESMERE ROAD		
	SHREWSBURY		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	16	
	Survey date: THURSDAY	*22/05/14*	*Survey Type: MANUAL*
30	ST-03-A-07	DETACHED & SEMI-DETACHED	STAFFORDSHIRE
	BEACONSIDE		
	STAFFORD		
	MARSTON GATE		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	248	
	Survey date: WEDNESDAY	*22/11/17*	*Survey Type: MANUAL*
31	WS-03-A-04	MIXED HOUSES	WEST SUSSEX
	HILLS FARM LANE		
	HORSHAM		
	BROADBRIDGE HEATH		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	151	
	Survey date: THURSDAY	*11/12/14*	*Survey Type: MANUAL*
32	WS-03-A-06	MIXED HOUSES	WEST SUSSEX
	ELLIS ROAD		
	WEST HORSHAM		
	S BROADBRIDGE HEATH		
	Edge of Town		
	Residential Zone		
	Total Number of dwellings:	805	
	Survey date: THURSDAY	*02/03/17*	*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.

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	32	98	0.083	32	98	0.291	32	98	0.374
08:00 - 09:00	32	98	0.140	32	98	0.384	32	98	0.524
09:00 - 10:00	32	98	0.148	32	98	0.164	32	98	0.312
10:00 - 11:00	32	98	0.130	32	98	0.159	32	98	0.289
11:00 - 12:00	32	98	0.133	32	98	0.153	32	98	0.286
12:00 - 13:00	32	98	0.160	32	98	0.154	32	98	0.314
13:00 - 14:00	32	98	0.160	32	98	0.155	32	98	0.315
14:00 - 15:00	32	98	0.163	32	98	0.187	32	98	0.350
15:00 - 16:00	32	98	0.257	32	98	0.175	32	98	0.432
16:00 - 17:00	32	98	0.275	32	98	0.171	32	98	0.446
17:00 - 18:00	32	98	0.338	32	98	0.156	32	98	0.494
18:00 - 19:00	32	98	0.278	32	98	0.173	32	98	0.451
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.265			2.322			4.587

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

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

Parameter summary

Trip rate parameter range selected:	7 - 805 (units:)
Survey date date range:	01/01/10 - 19/04/18
Number of weekdays (Monday-Friday):	32
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	2
Surveys manually removed from selection:	0

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

Appendix 6

Census Information

WU03EW - Location of usual residence and place of work by method of travel to work (MSOA level)

population	All usual residents aged 16 and over in employment the week before the census
units	Persons
date	2011
method of travel to work	Driving a car or van

place of work : 2011 census merged local authority district	usual residence E02004525 : Colchester 020
Babergh	25
Basildon	47
Bedford	1
Braintree	332
Breckland	1
Brentwood	23
Broxbourne	1
Cambridge	3
Castle Point	3
Chelmsford	214
Colchester	472
East Hertfordshire	4
Epping Forest	8
Forest Heath	1
Harlow	12
Hertsmere	2
Ipswich	21
Maldon	330
Mid Suffolk	5
Norwich	1
Rochford	5

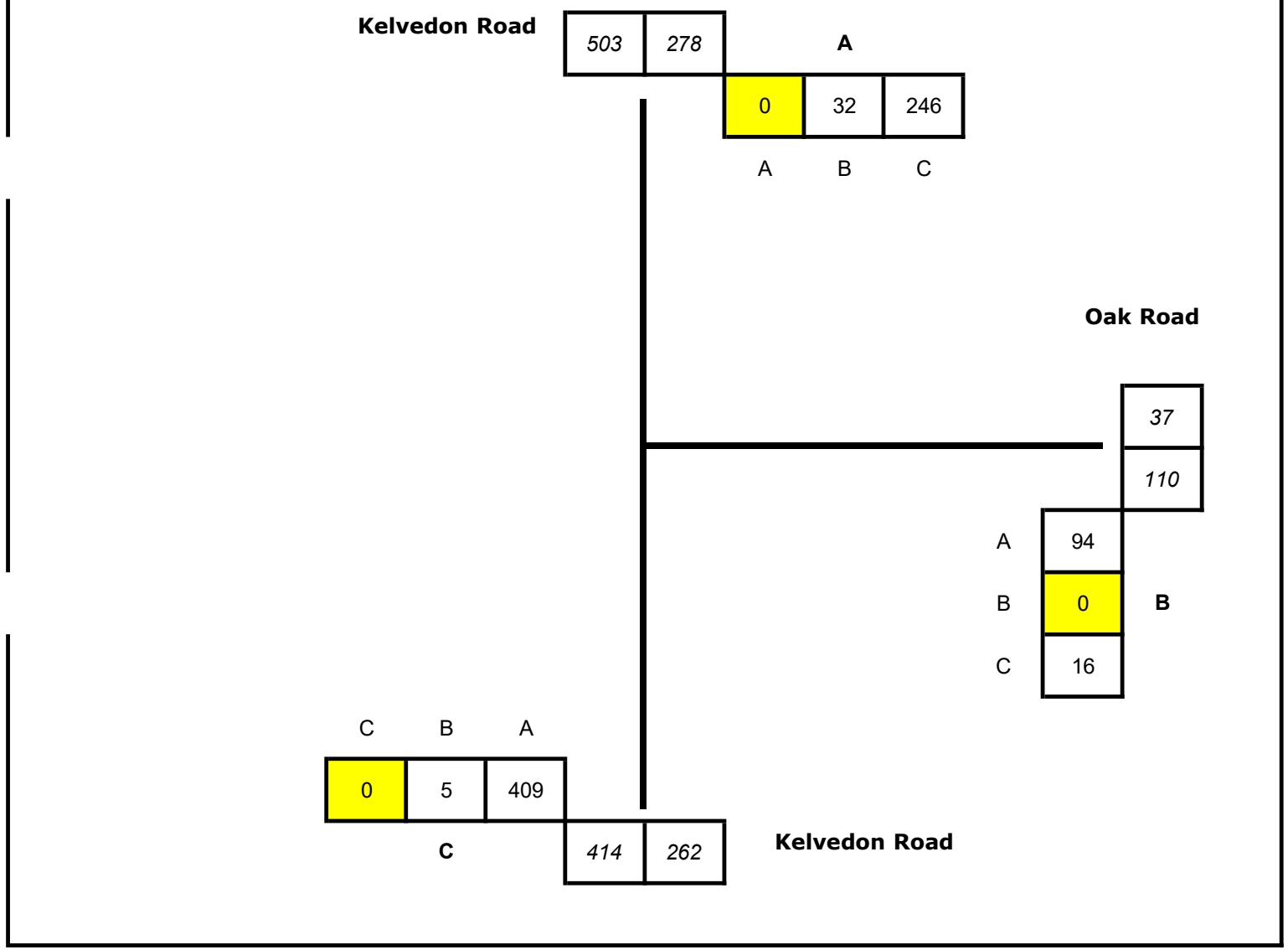
South Cambridgeshire	3
Southend-on-Sea	7
St Albans	2
St Edmundsbury	7
Stevenage	2
Suffolk Coastal	5
Tendring	68
Three Rivers	1
Thurrock	14
Uttlesford	21
Welwyn Hatfield	1
	1,642

Appendix 7

Traffic Data

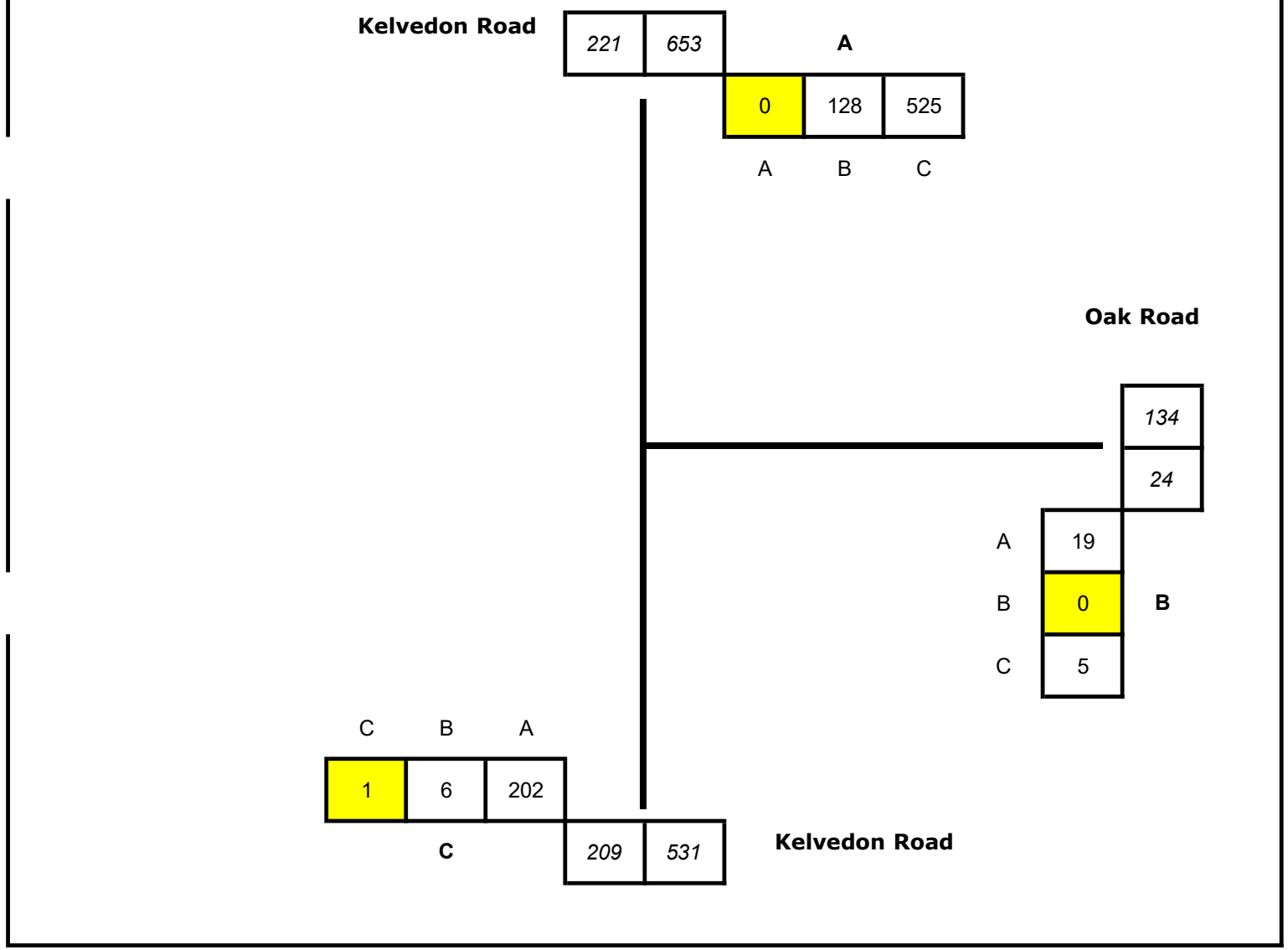
Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 1 - Kelvedon Road/ Oak Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019

Select Period **0800 Hourly Total**



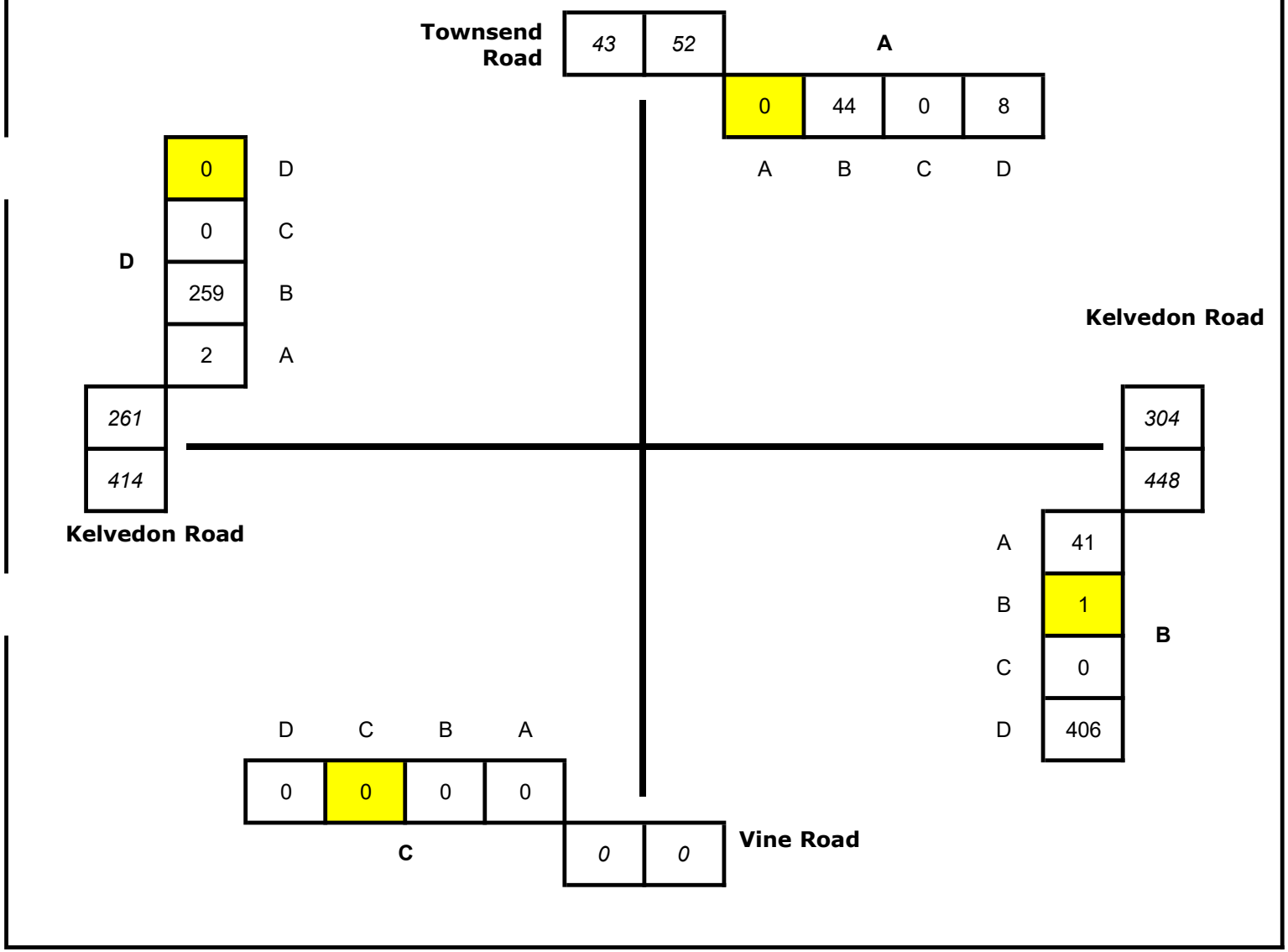
Advanced Transport Research	*Job Number & Name:*	**20319 Tiptree, Essex**
Site 1 - Kelvedon Road/ Oak Road	*Client:*	**Journey TP**
Flow Diagram	*Date:*	**Thursday 24 Jan 2019**

Select Period **1700 Hourly Total**

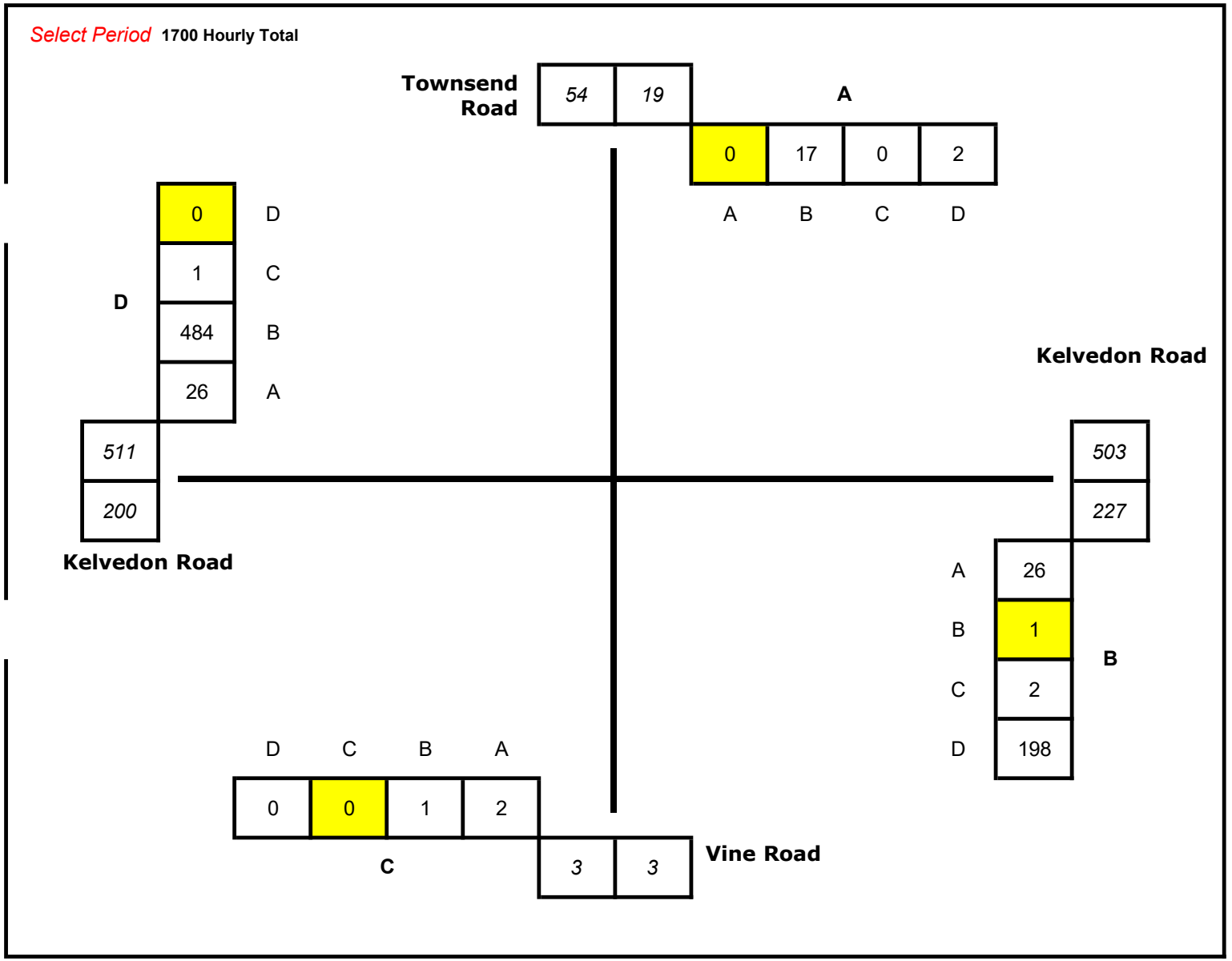


Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 2 - Kelvedon Road/ Vine Road/Townsend Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019

Select Period **0800 Hourly Total**

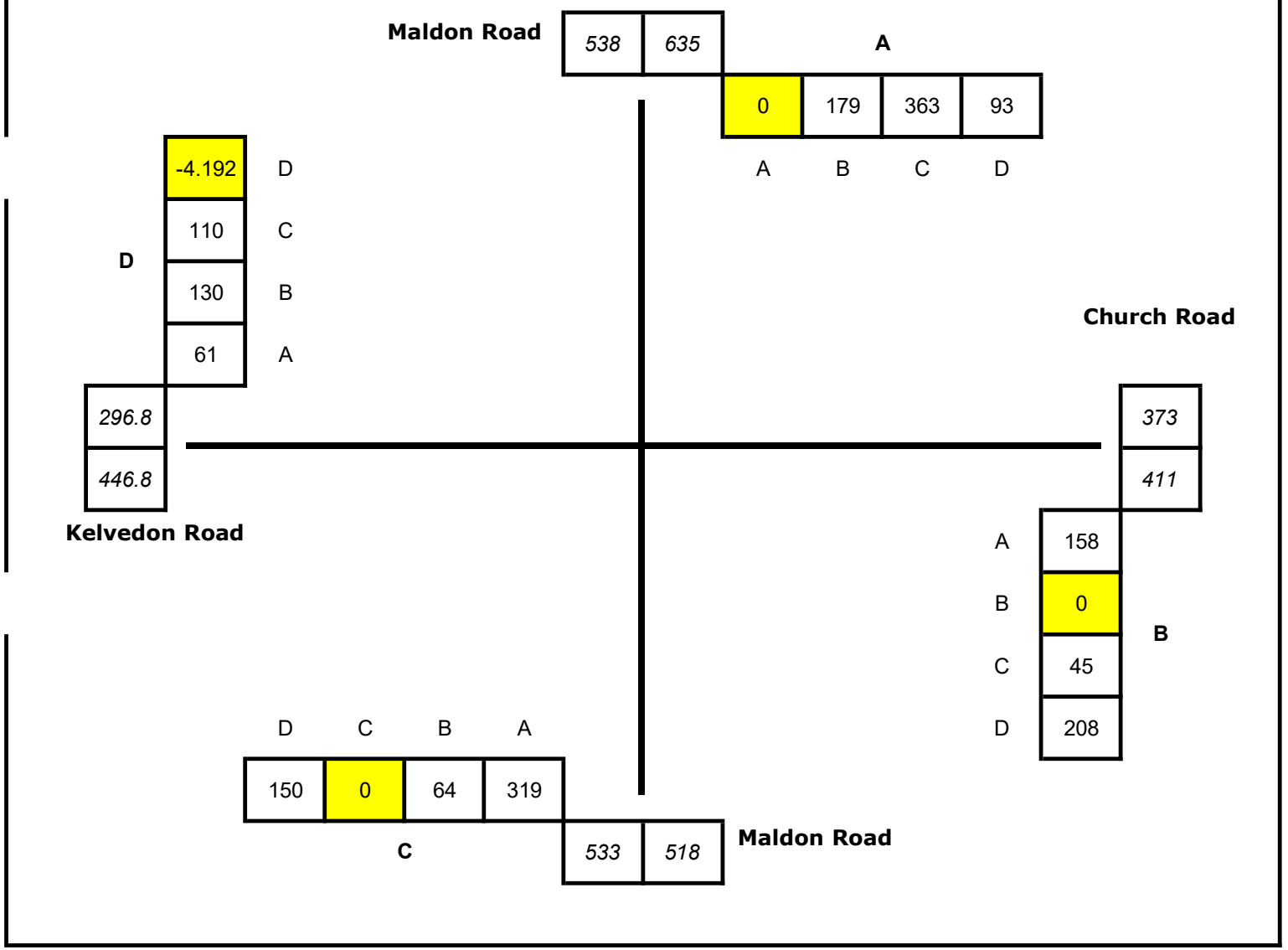


Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 2 - Kelvedon Road/ Vine Road/Townsend Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019



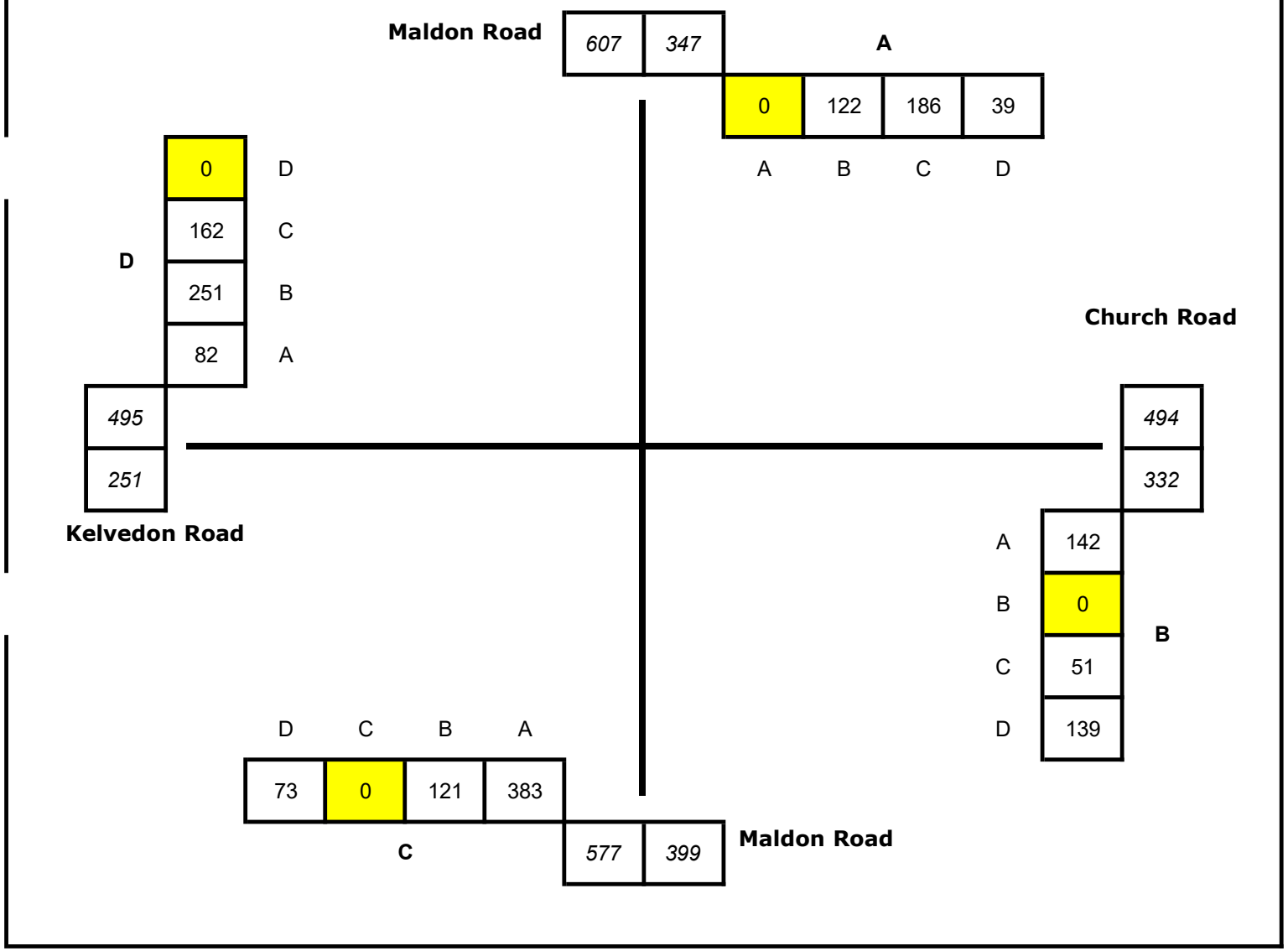
Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 3 - Maldon Road/ Kelvedon Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019

Select Period **0800 Hourly Total**

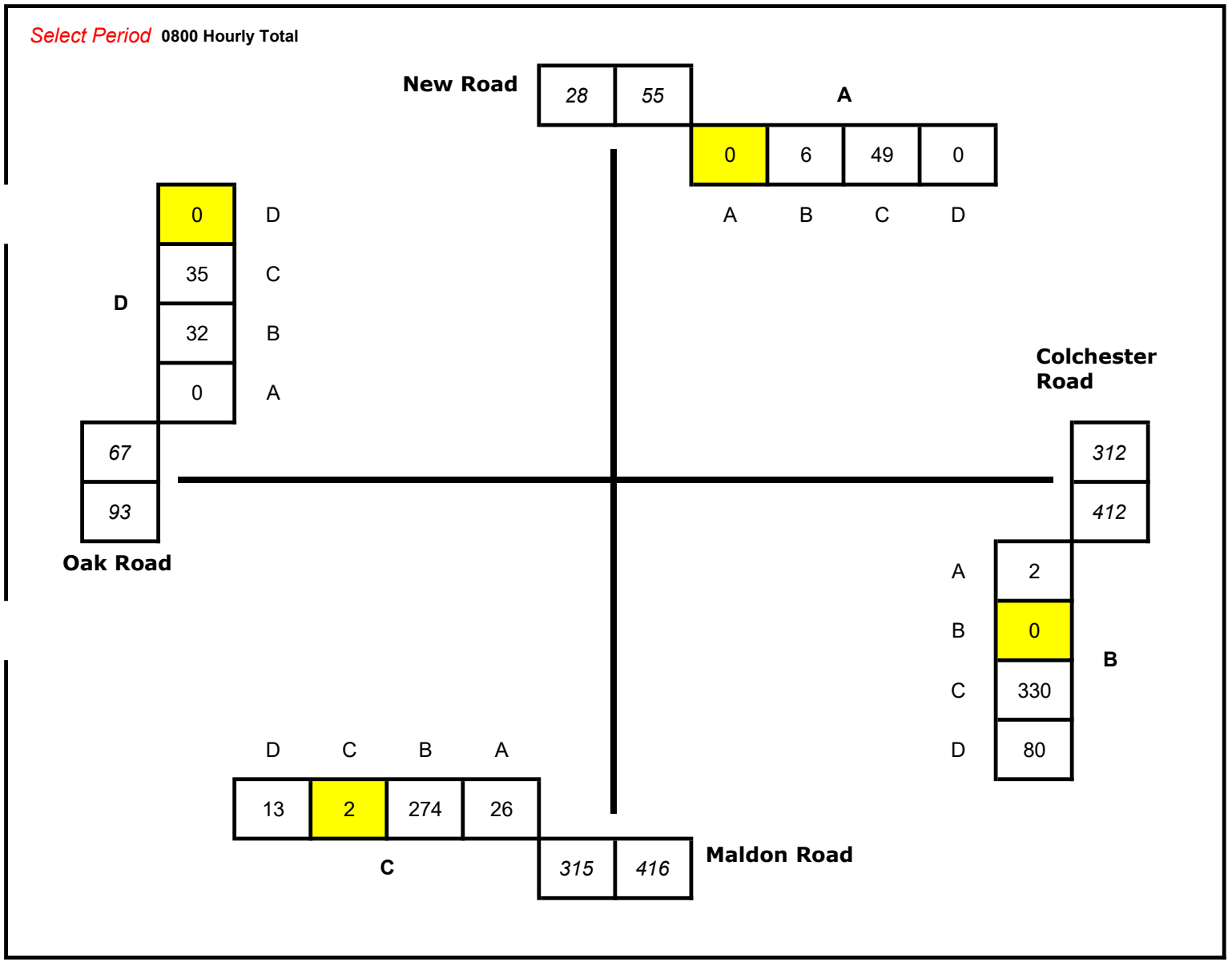


Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 3 - Maldon Road/ Kelvedon Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019

Select Period **1700 Hourly Total**

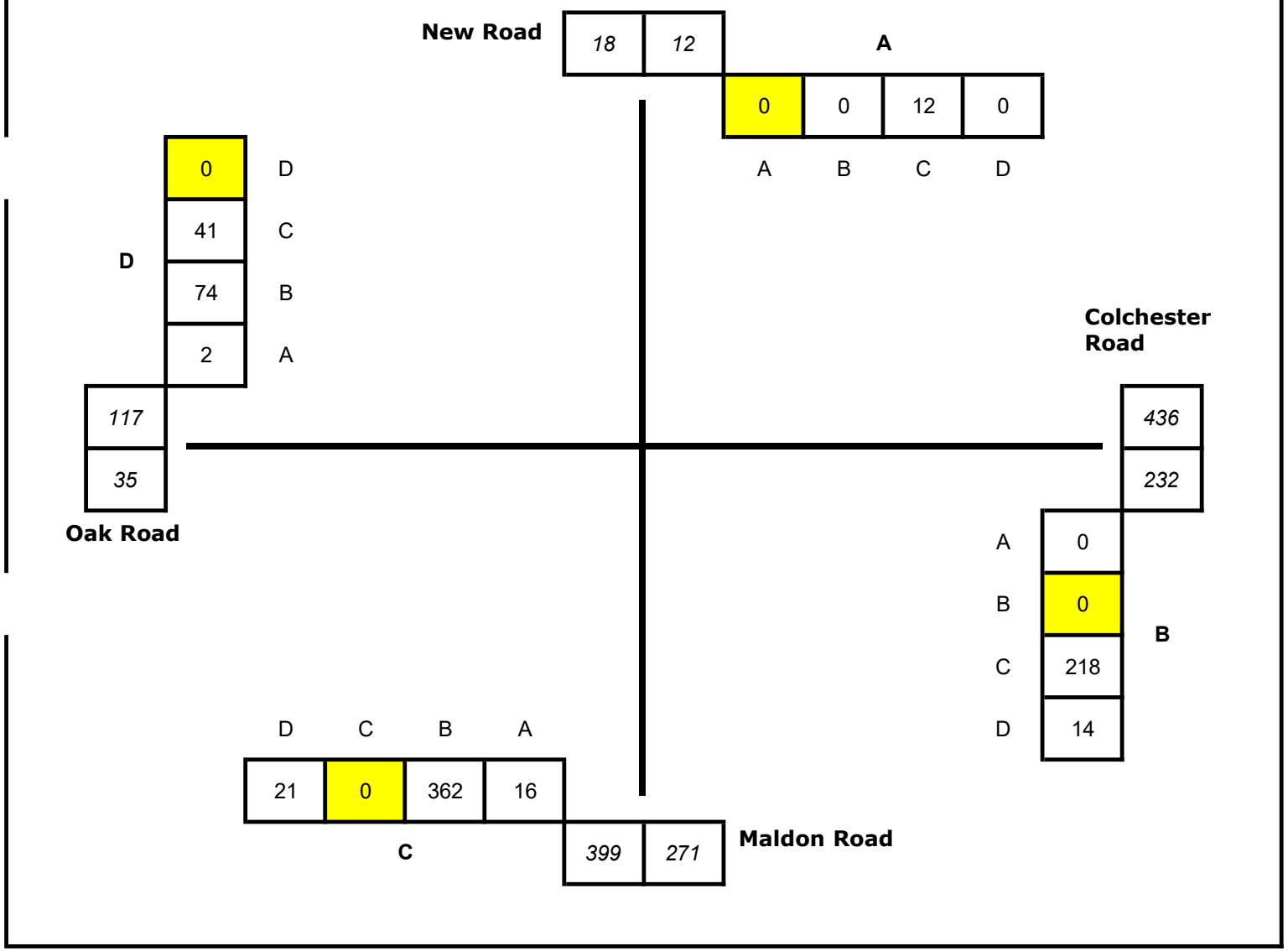


Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 4 - Colchester Road/ Oak Road/ Maldon Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019



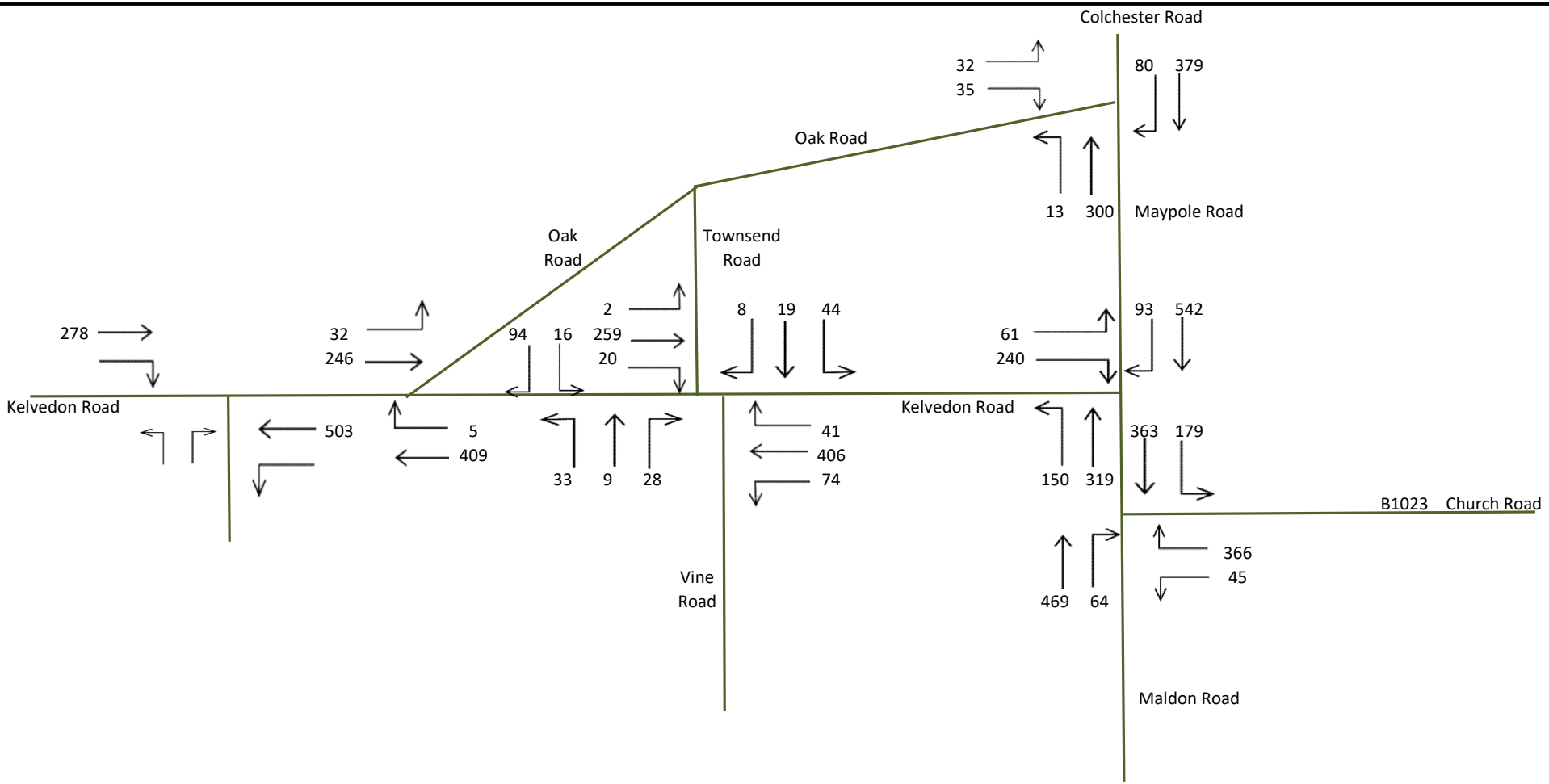
Advanced Transport Research	Job Number & Name:	20319 Tiptree, Essex
Site 4 - Colchester Road/ Oak Road/ Maldon Road	Client:	Journey TP
Flow Diagram	Date:	Thursday 24 Jan 2019

Select Period **1700 Hourly Total**

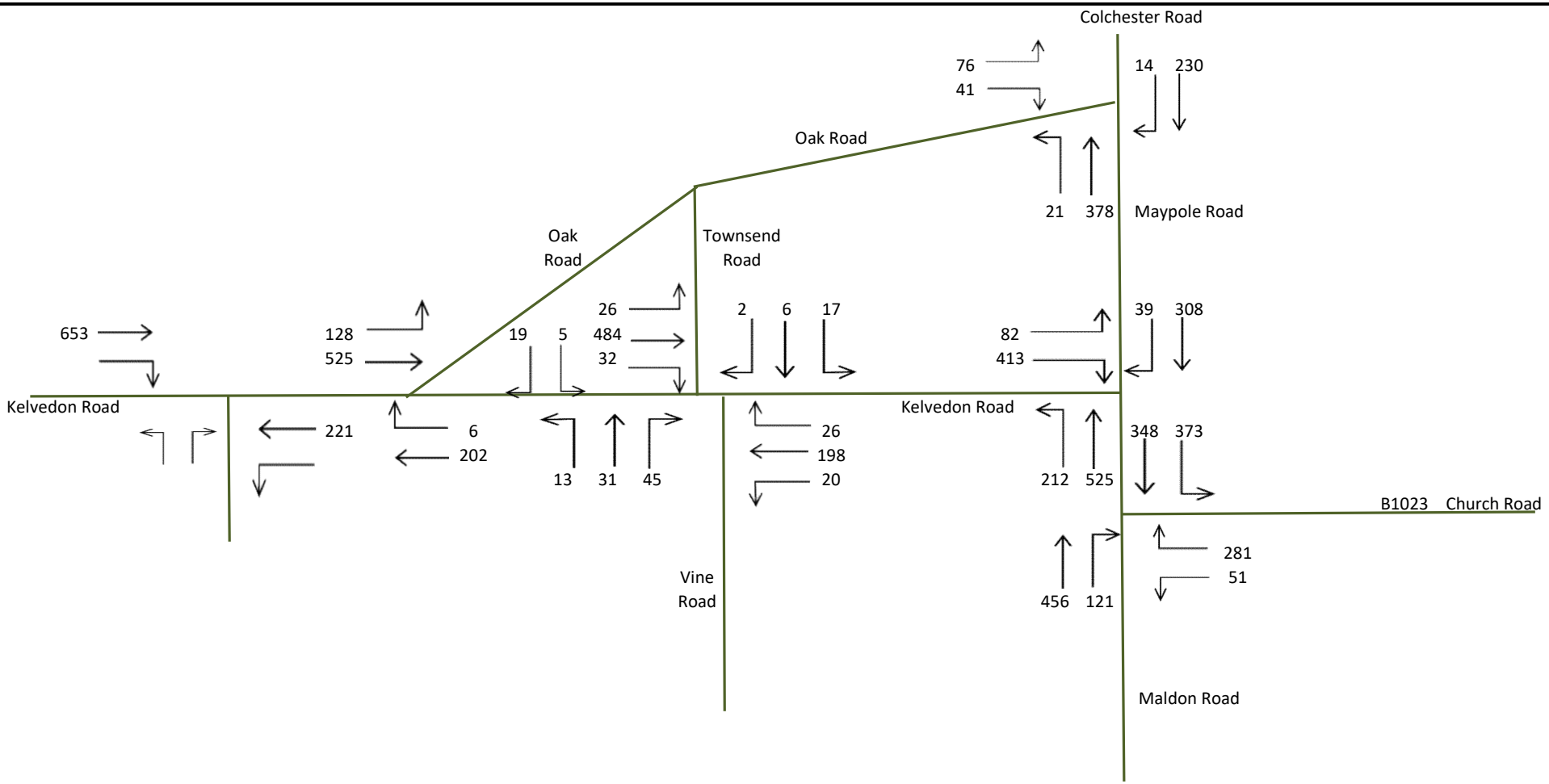


Appendix 8

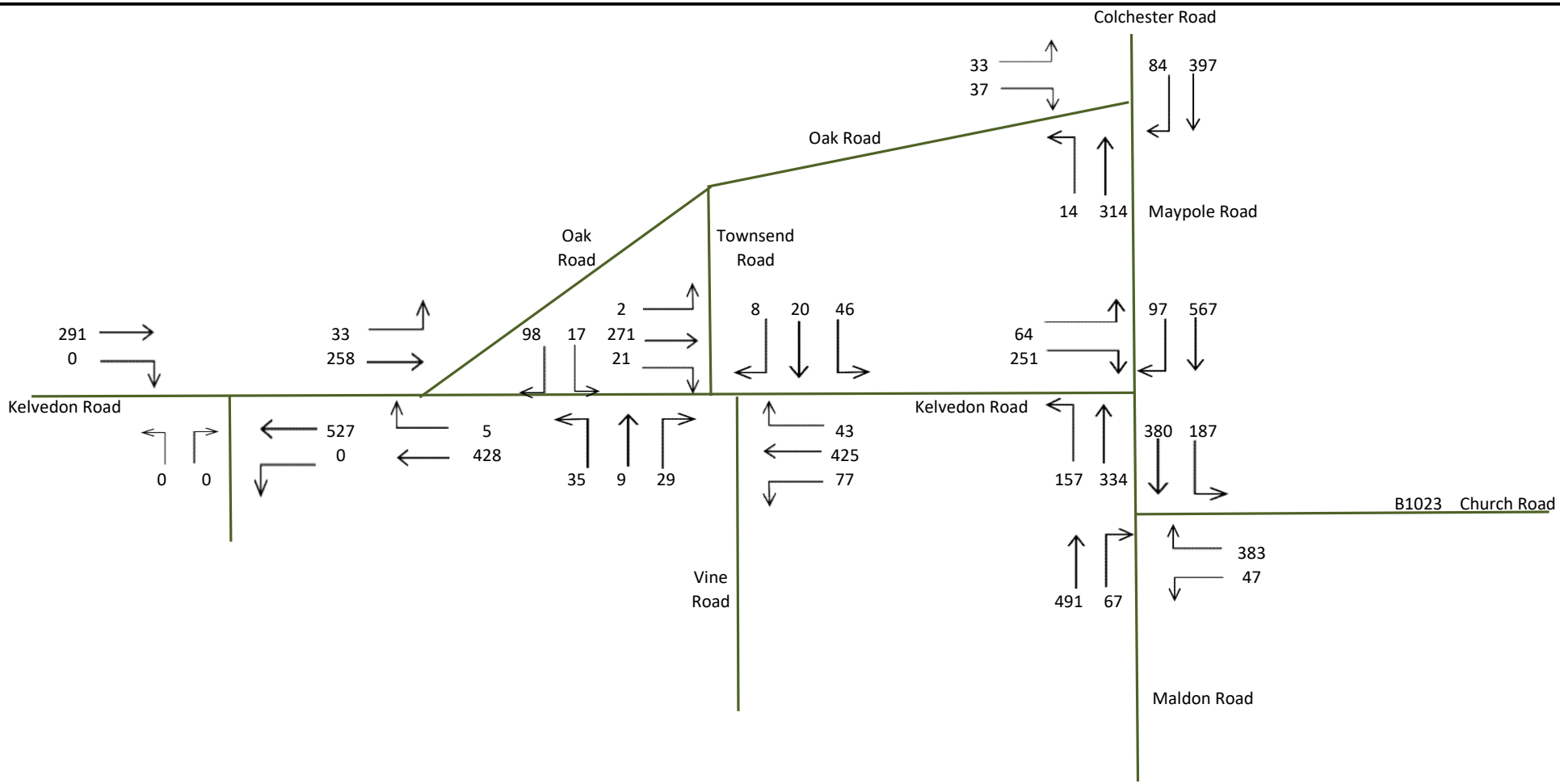
Network Flows



Drawing Title	**AM Peak 08:00-09:00 2019 Surveyed Flows**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 1	



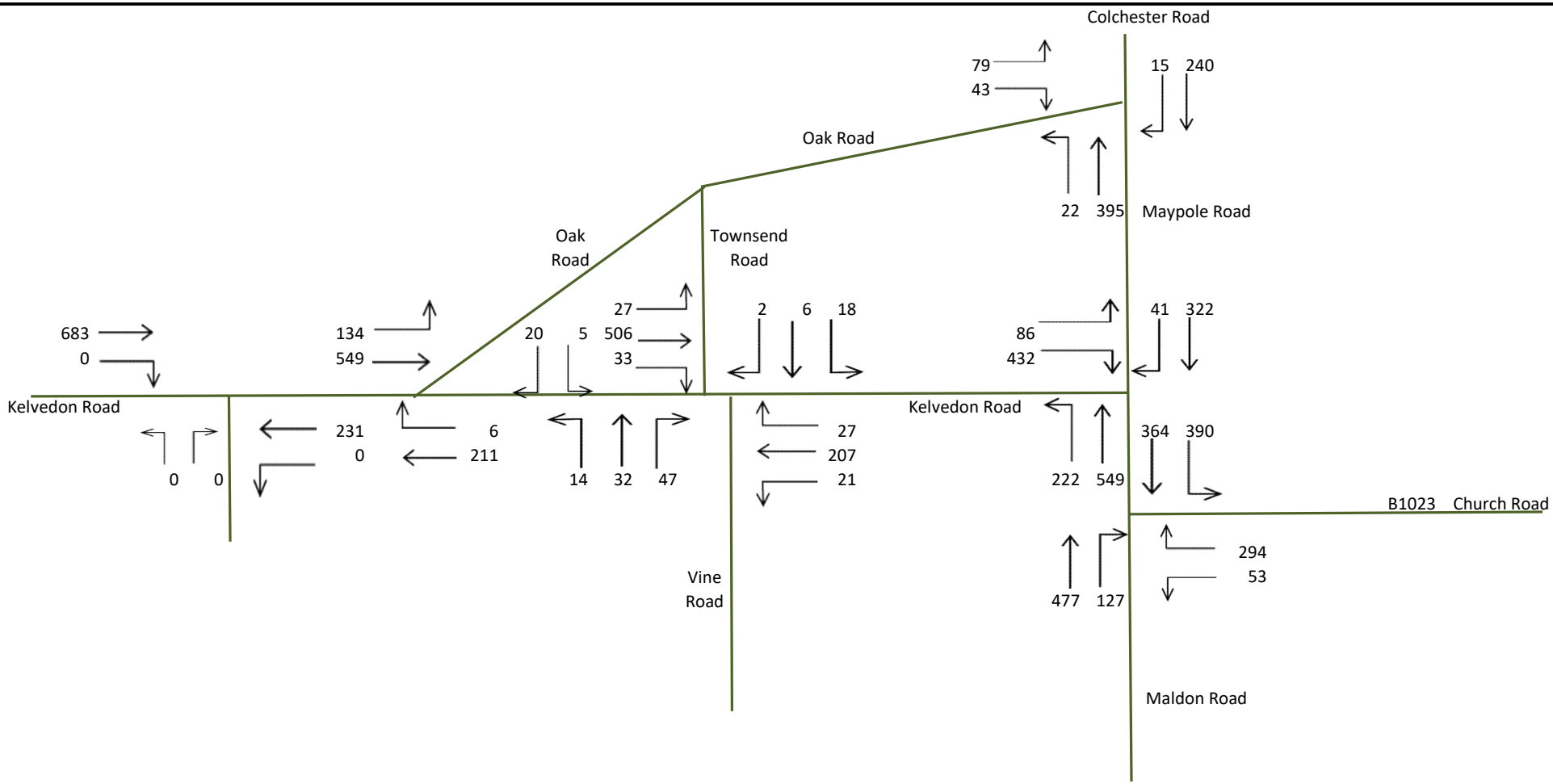
Drawing Title	**PM Peak 17:00-18:00 2019 Surveyed Flows**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 2	



Level Area
E02004525 Colchester 020 1.047

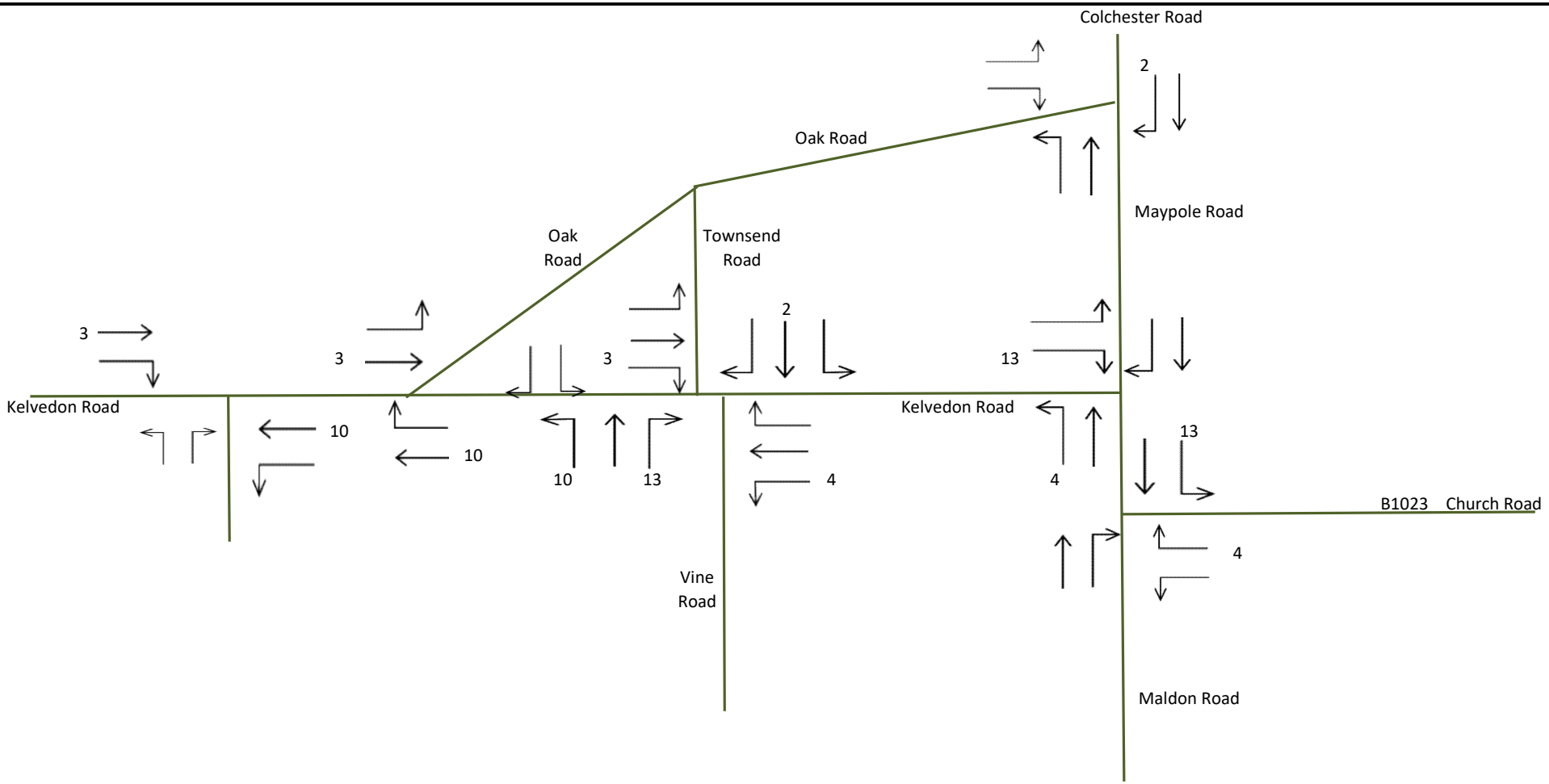
Drawing Title	**AM Peak 08:00-09:00 2026 Forecast Flows**	Drawn	SAA
		Date	02/01/2019
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 3

Journey transport planning

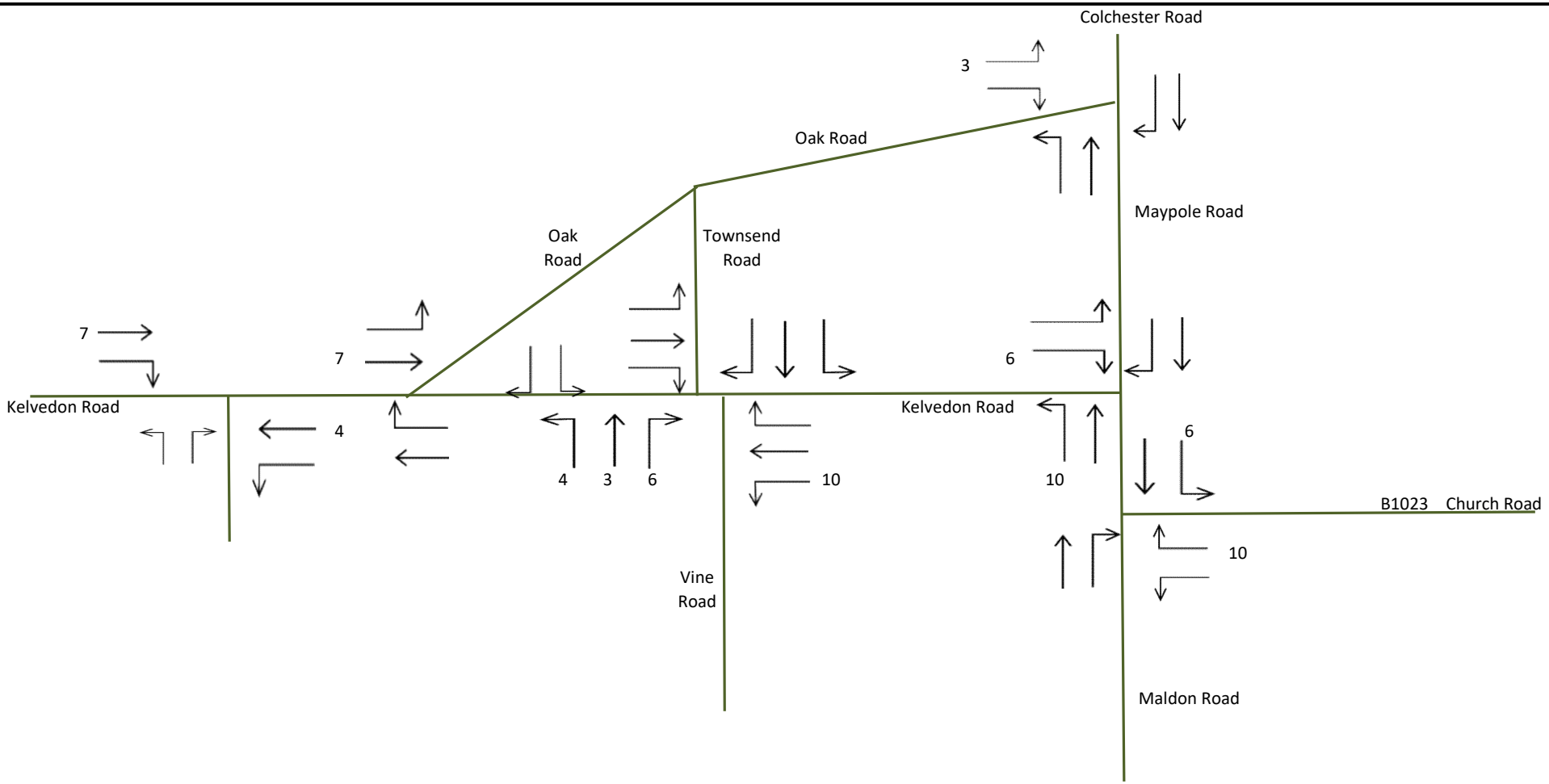


Level	Area	Local Growth Figure
E02004525	Colchester 020	1.05

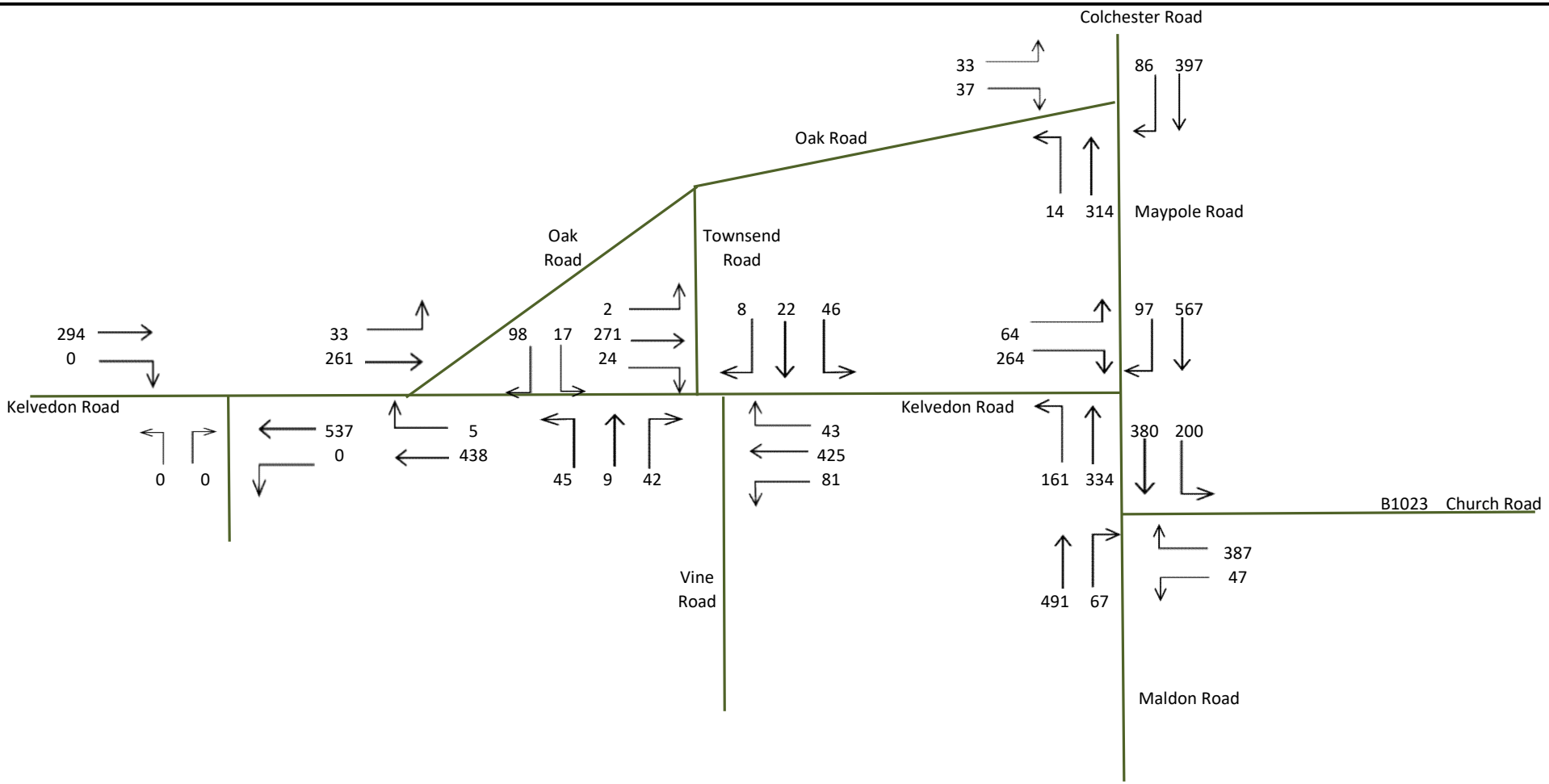
Drawing Title	**PM Peak 17:00-18:00 2026 Forecast Flows**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figur 4	



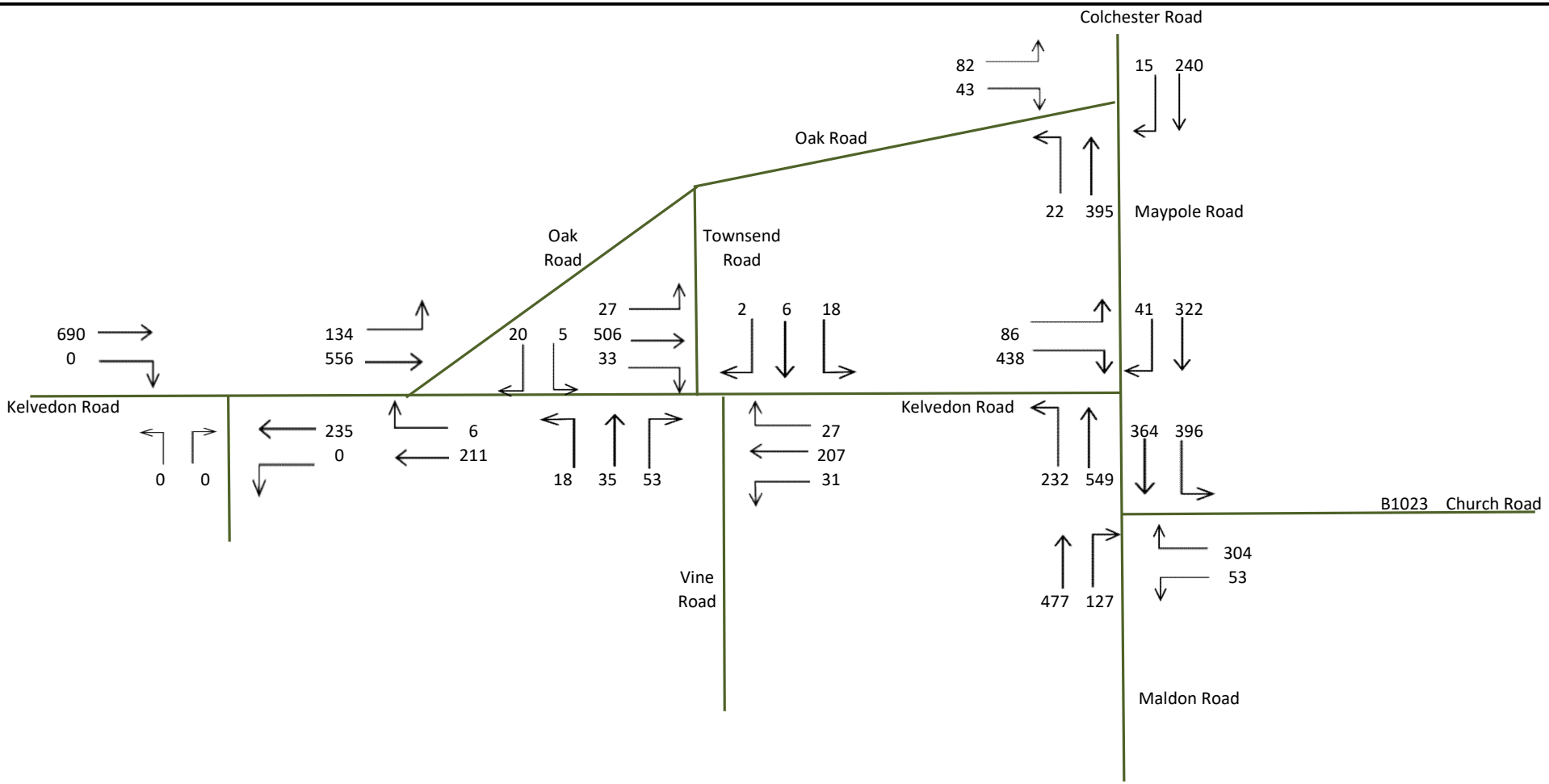
Drawing Title	**AM Peak 08:00-09:00 Committed Development**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 5	



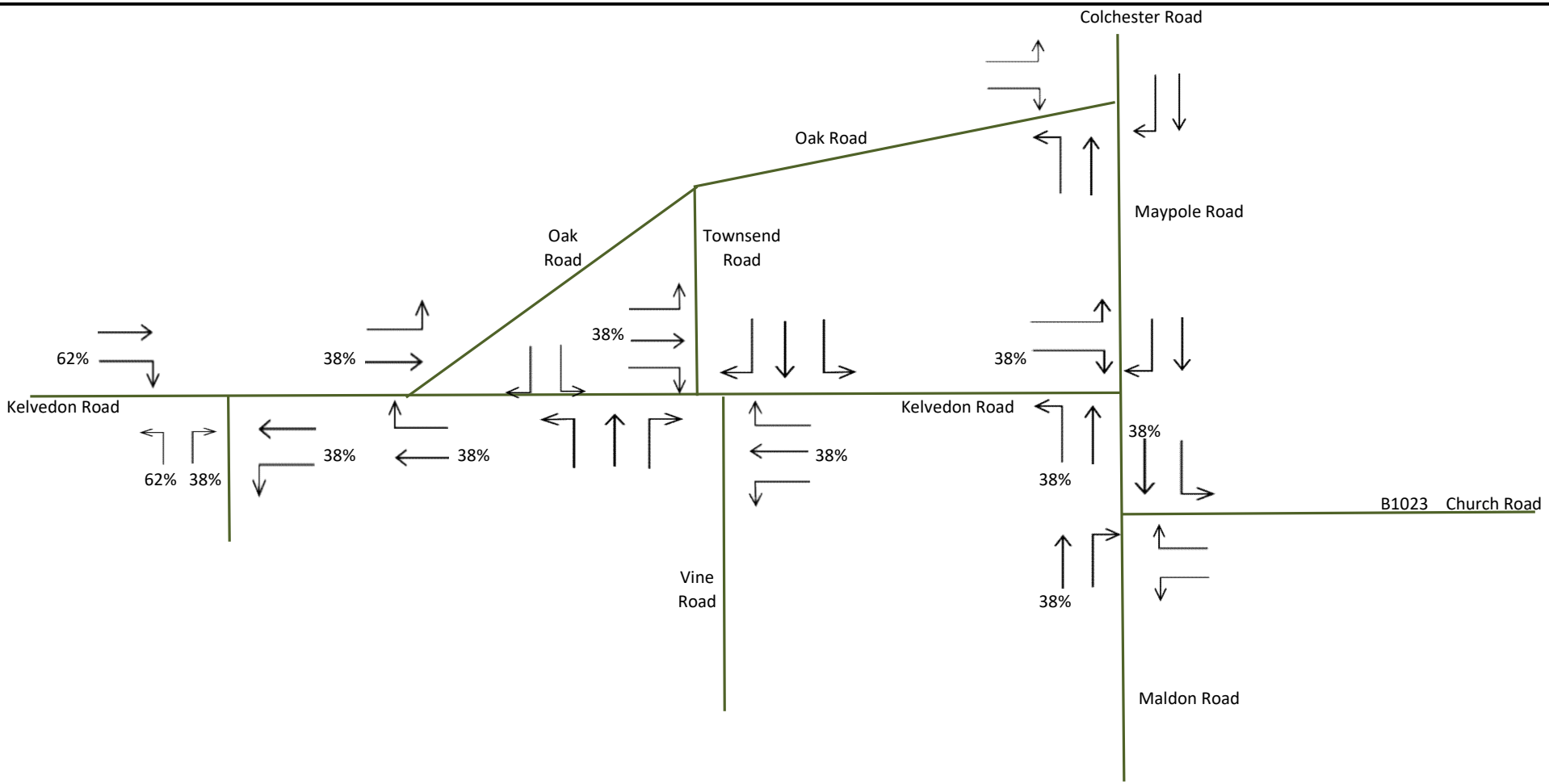
Drawing Title	**PM Peak 17:00-18:00 Committed Development**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 6	



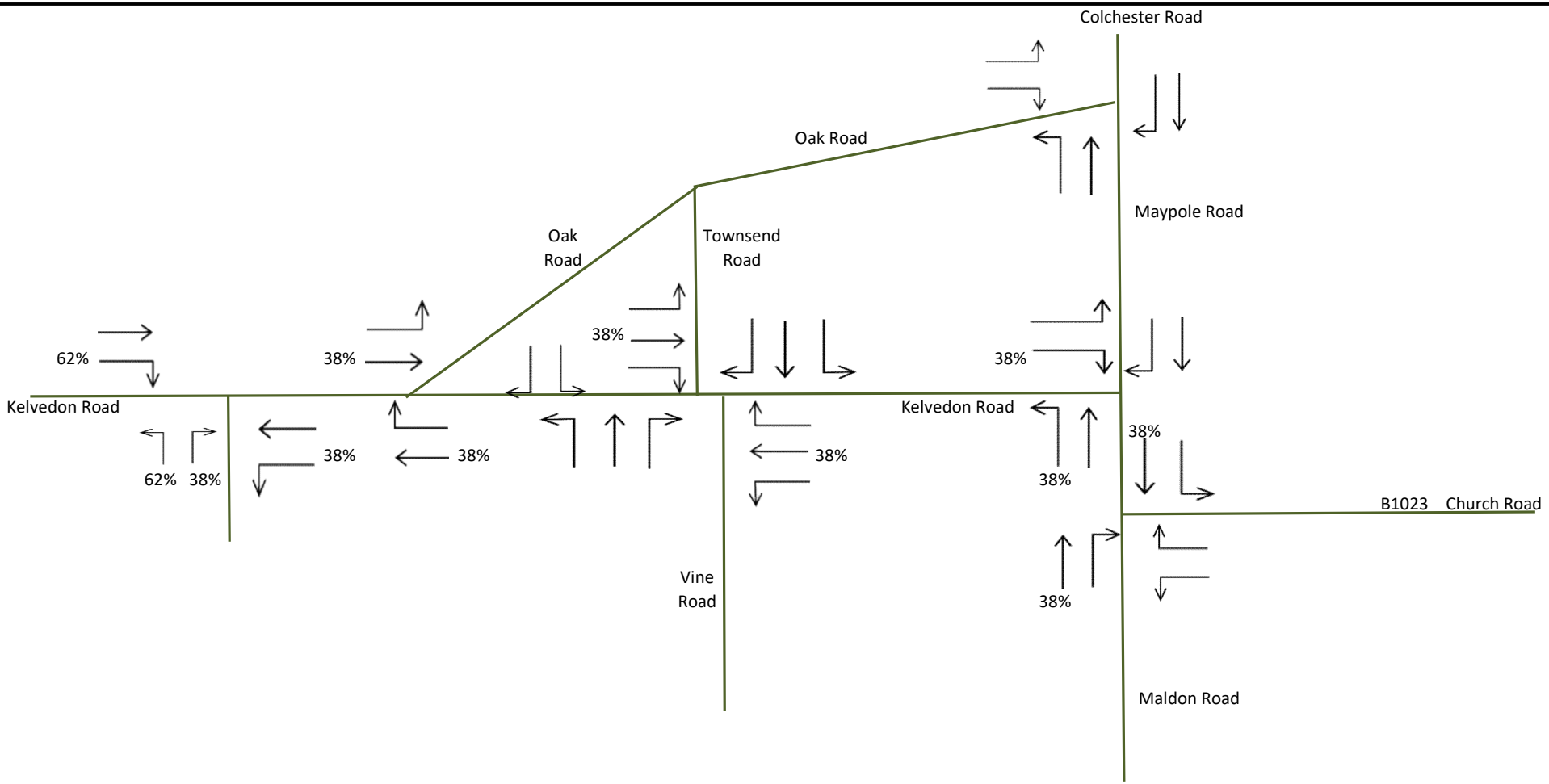
Drawing Title	**AM Peak 08:00-09:00 2026 Base Flows**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 7	



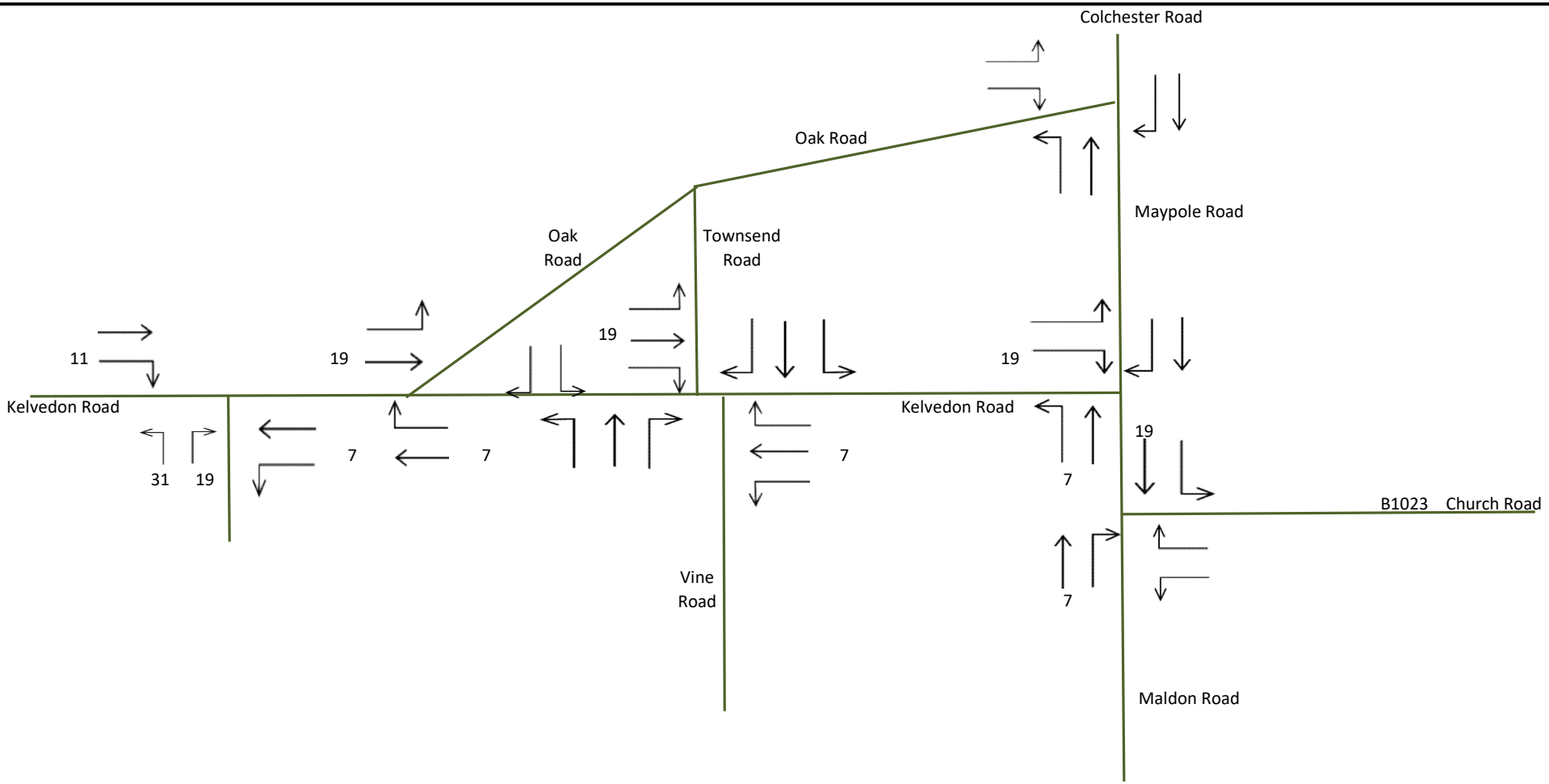
Drawing Title	**PM Peak 17:00-18:00 2026 Base Flows**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 8	



Drawing Title	**AM Peak 08:00-09:00 Residential Trip Distribution**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 9	



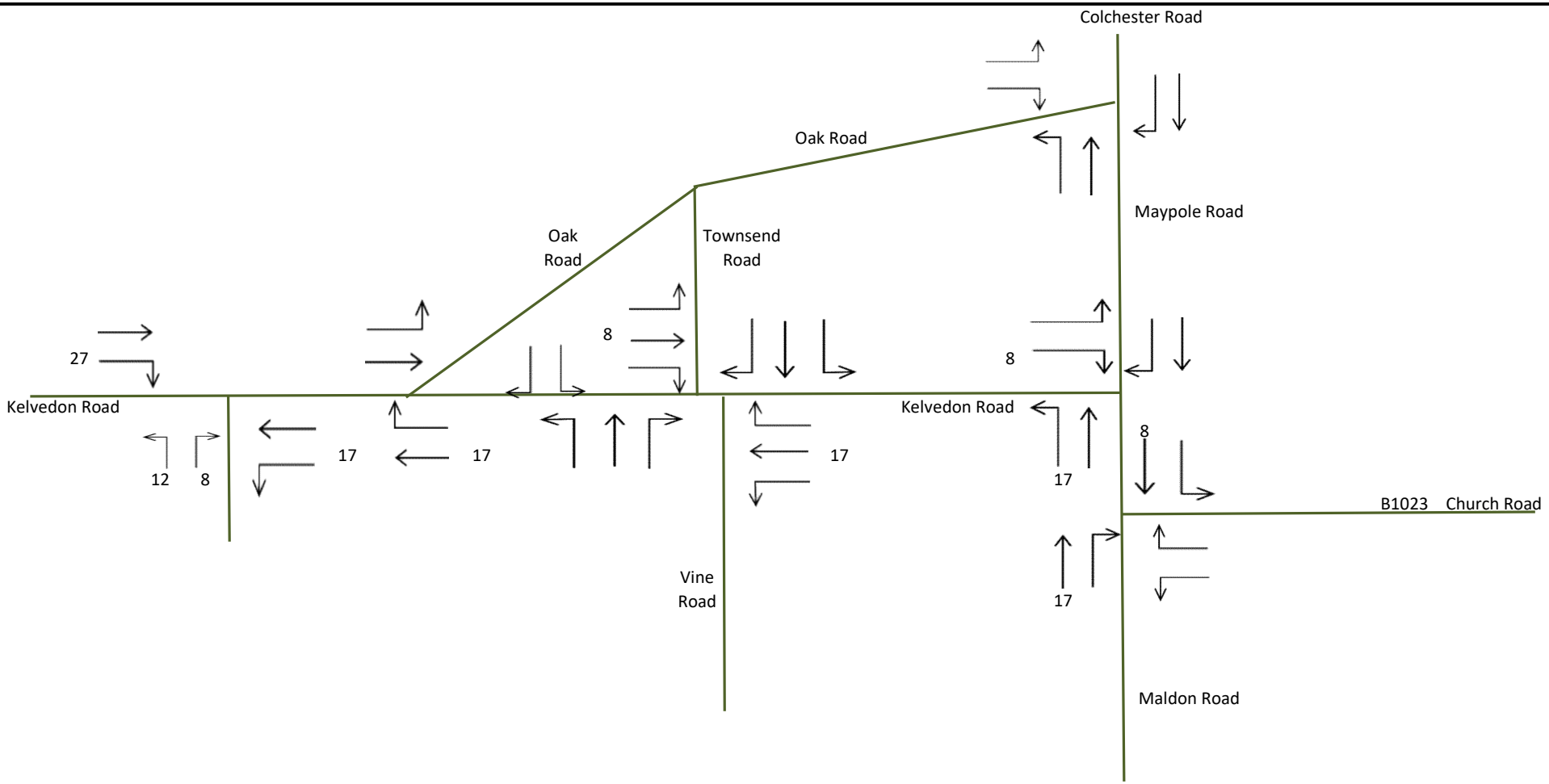
Drawing Title	**PM Peak 17:00-18:00 Residential Trip Distribution**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 10	



Arrivals	18
Departures	50

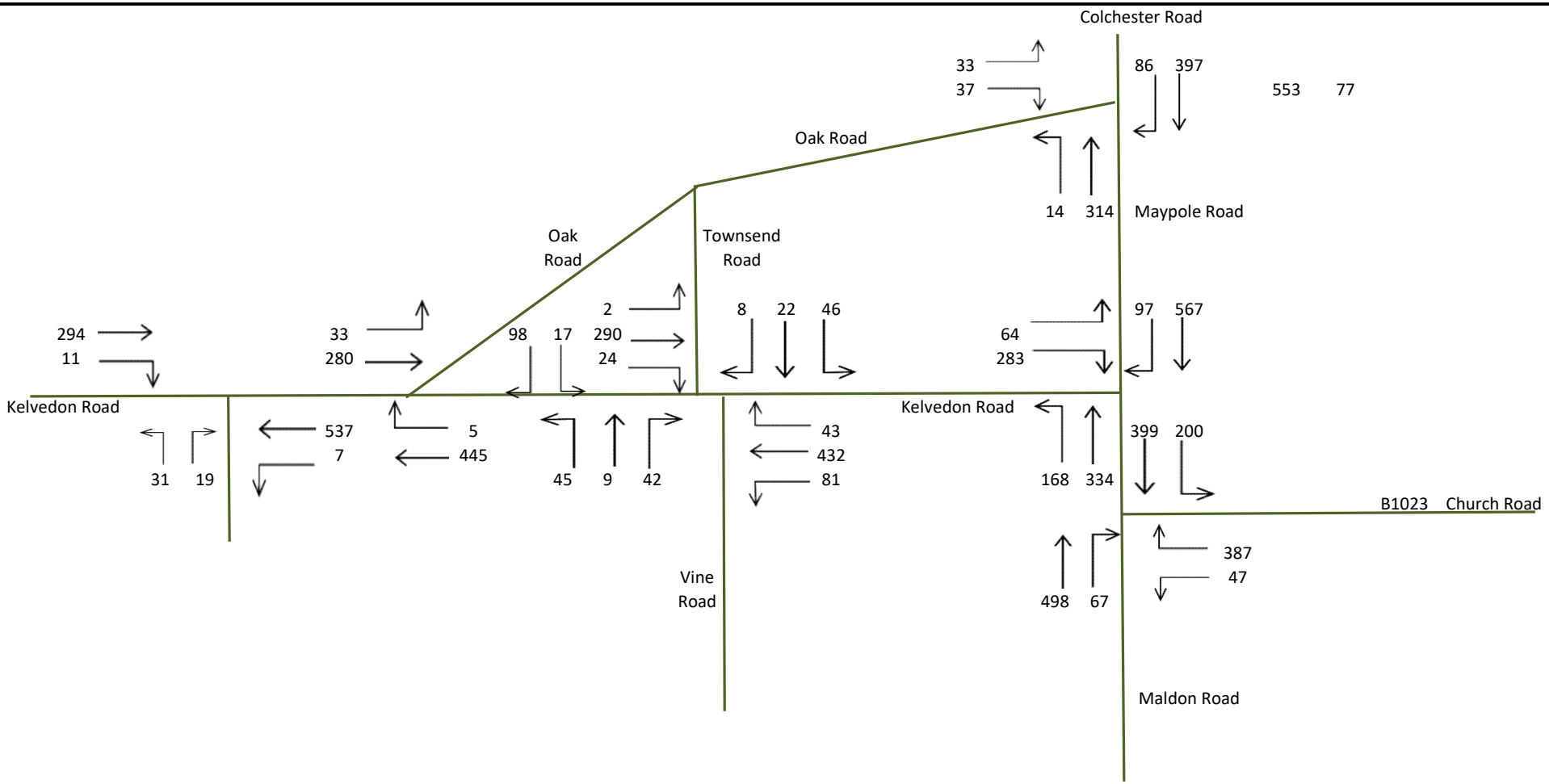
Drawing Title	**AM Peak 08:00-09:00 Residential Trip Generation**	Drawn	SAA
		Date	02/01/2019
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 11

Journey transport planning

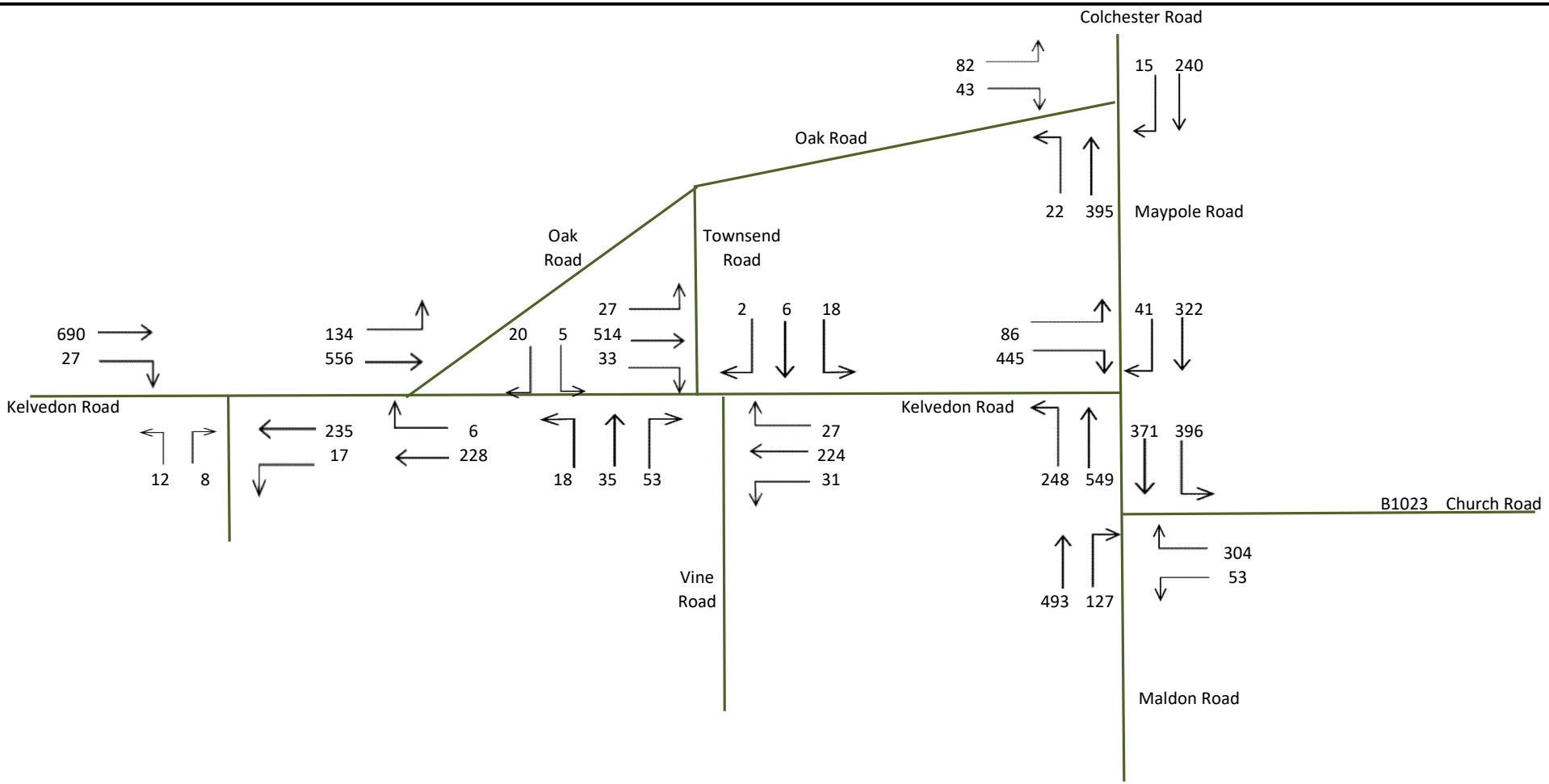


Arrivals	44
Departures	20

Drawing Title	**PM Peak 17:00-18:00 Residential Trip Generation**	Drawn	SAA
		Date	02/01/2019
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 12



Drawing Title	**AM Peak 08:00-09:00 2026 Total Trips**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 13	



Drawing Title	**PM Peak 17:00-18:00 2026 Total Trips**	Drawn	SAA	Journey transport planning
		Date	02/01/2019	
Project Title	Land to the South of Kelvedon Road, Tiptree	Ref	Figure 14	

Appendix 9

Junctions 9 Output

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462

Filename: Townsend Stagger.j9
Path: C:\Users\PC\OneDrive\Journey\Projects\004 Xero or Paid\2018\18_099 Kelvedon Road Tiptree Phase 2\05 Calculations
Report generation date: 26/03/2021 16:14:26

»2026 With Development, AM
»2026 With Development, PM

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2026 With Development											
Stream B-ACD	D1	0.4	14.46	0.28	B	54 % [Stream B-ACD]	D2	0.4	13.55	0.29	B	65 % [Stream B-ACD]
Stream AB-CD		0.2	7.52	0.11	A			0.2	9.35	0.15	A	
Stream D-ABC		0.2	10.35	0.18	B			0.1	10.21	0.07	B	
Stream CD-AB		0.1	8.69	0.11	A			0.1	7.25	0.08	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	28/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	STEVE-PC\Steve
Description	

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 With Development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Kelvedon Rd Townsend Rd Stagger	Left-Right Stagger	Two-way		1.55	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	54	Stream B-ACD

Arms

Arms

Arm	Name	Description	Arm type
A	Kelvedon Road E		Major
B	Grange Road		Minor
C	Kelvedon Road W		Major
D	Townsend Road		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	6.00			50.0	✓	1.00
C	6.00			55.0	✓	1.00

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)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	10	10
D	One lane	2.20	10	10

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
AB-D	603	-	-	-	-	-	0.234	0.234	0.234	-	-
B-A	486	0.088	0.224	0.224	-	-	0.141	0.320	-	0.141	0.320
B-CD	630	0.097	0.244	0.244	-	-	-	-	-	-	-
CD-B	606	0.235	0.235	0.235	-	-	-	-	-	-	-
D-AB	580	-	-	-	-	-	0.225	0.225	0.089	-	-
D-C	447	-	0.129	0.294	0.129	0.294	0.206	0.206	0.081	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	556	100.000
B		ONE HOUR	✓	96	100.000
C		ONE HOUR	✓	316	100.000
D		ONE HOUR	✓	76	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	81	432	43
	B	42	0	45	9
	C	290	24	0	2
	D	46	22	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	10	10	10
	B	10	0	10	10
	C	10	10	0	10
	D	10	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.28	14.46	0.4	B	88	132
A-B					74	111
A-C					396	595
A-D					39	59
AB-CD	0.11	7.52	0.2	A	52	79
AB-C					433	649
D-ABC	0.18	10.35	0.2	B	70	105
C-D					2	3
C-A					266	399
C-B					22	33
CD-AB	0.11	8.69	0.1	A	45	68
CD-A					305	458

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	72	18	438	0.165	71	0.0	0.2	10.783	B
A-B	61	15			61				
A-C	325	81			325				
A-D	32	8			32				
AB-CD	41	10	580	0.071	41	0.0	0.1	7.344	A
AB-C	356	89			356				
D-ABC	57	14	498	0.115	57	0.0	0.1	8.966	A
C-D	2	0.38			2				
C-A	218	55			218				
C-B	18	5			18				
CD-AB	36	9	529	0.068	36	0.0	0.1	8.014	A
CD-A	251	63			251				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	86	22	414	0.209	86	0.2	0.3	12.077	B
A-B	73	18			73				
A-C	388	97			388				
A-D	39	10			39				
AB-CD	51	13	583	0.087	51	0.1	0.1	7.437	A
AB-C	425	106			425				
D-ABC	68	17	485	0.141	68	0.1	0.2	9.504	A
C-D	2	0.45			2				
C-A	261	65			261				
C-B	22	5			22				
CD-AB	44	11	520	0.085	44	0.1	0.1	8.309	A
CD-A	299	75			299				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	106	26	380	0.278	105	0.3	0.4	14.405	B
A-B	89	22			89				
A-C	476	119			476				
A-D	47	12			47				
AB-CD	65	16	592	0.110	65	0.1	0.2	7.511	A
AB-C	517	129			517				
D-ABC	84	21	466	0.179	83	0.2	0.2	10.339	B
C-D	2	0.55			2				
C-A	319	80			319				
C-B	26	7			26				
CD-AB	56	14	512	0.109	56	0.1	0.1	8.687	A
CD-A	364	91			364				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	106	26	379	0.279	106	0.4	0.4	14.459	B
A-B	89	22			89				
A-C	476	119			476				
A-D	47	12			47				
AB-CD	65	16	592	0.110	65	0.2	0.2	7.516	A
AB-C	517	129			517				
D-ABC	84	21	466	0.179	84	0.2	0.2	10.352	B
C-D	2	0.55			2				
C-A	319	80			319				
C-B	26	7			26				
CD-AB	56	14	512	0.110	56	0.1	0.1	8.694	A
CD-A	365	91			365				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	86	22	413	0.209	87	0.4	0.3	12.140	B
A-B	73	18			73				
A-C	388	97			388				
A-D	39	10			39				
AB-CD	51	13	583	0.087	51	0.2	0.1	7.442	A
AB-C	425	106			425				
D-ABC	68	17	485	0.141	69	0.2	0.2	9.520	A
C-D	2	0.45			2				
C-A	261	65			261				
C-B	22	5			22				
CD-AB	44	11	521	0.085	44	0.1	0.1	8.318	A
CD-A	299	75			299				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	72	18	438	0.165	73	0.3	0.2	10.857	B
A-B	61	15			61				
A-C	325	81			325				
A-D	32	8			32				
AB-CD	42	10	580	0.072	42	0.1	0.1	7.358	A
AB-C	357	89			357				
D-ABC	57	14	498	0.115	57	0.2	0.1	8.994	A
C-D	2	0.38			2				
C-A	218	55			218				
C-B	18	5			18				
CD-AB	36	9	530	0.068	36	0.1	0.1	8.028	A
CD-A	252	63			252				

2026 With Development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Kelvedon Rd Townsend Rd Stagger	Left-Right Stagger	Two-way		1.39	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	65	Stream B-ACD

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	282	100.000
B		ONE HOUR	✓	106	100.000
C		ONE HOUR	✓	590	100.000
D		ONE HOUR	✓	26	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	31	224	27
	B	53	0	18	35
	C	530	33	0	27
	D	18	6	2	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	0	10	10	10
	B	10	0	10	10
	C	10	10	0	10
	D	10	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-ACD	0.29	13.55	0.4	B	97	146
A-B					28	43
A-C					206	308
A-D					25	37
AB-CD	0.15	9.35	0.2	A	61	92
AB-C					218	327
D-ABC	0.07	10.21	0.1	B	24	36
C-D					25	37
C-A					486	730
C-B					30	45
CD-AB	0.08	7.25	0.1	A	39	58
CD-A					500	750

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	80	20	455	0.175	79	0.0	0.2	10.493	B
A-B	23	6			23				
A-C	169	42			169				
A-D	20	5			20				
AB-CD	48	12	520	0.093	48	0.0	0.1	8.377	A
AB-C	180	45			180				
D-ABC	20	5	465	0.042	19	0.0	0.0	8.889	A
C-D	20	5			20				
C-A	399	100			399				
C-B	25	6			25				
CD-AB	31	8	584	0.053	31	0.0	0.1	7.146	A
CD-A	411	103			411				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	95	24	436	0.218	95	0.2	0.3	11.598	B
A-B	28	7			28				
A-C	201	50			201				
A-D	24	6			24				
AB-CD	59	15	510	0.116	59	0.1	0.2	8.785	A
AB-C	214	53			214				
D-ABC	23	6	445	0.053	23	0.0	0.1	9.400	A
C-D	24	6			24				
C-A	476	119			476				
C-B	30	7			30				
CD-AB	38	9	587	0.064	38	0.1	0.1	7.209	A
CD-A	490	123			490				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	117	29	409	0.285	116	0.3	0.4	13.501	B
A-B	34	9			34				
A-C	247	62			247				
A-D	30	7			30				
AB-CD	75	19	499	0.151	75	0.2	0.2	9.340	A
AB-C	259	65			259				
D-ABC	29	7	416	0.069	29	0.1	0.1	10.207	B
C-D	30	7			30				
C-A	584	146			584				
C-B	36	9			36				
CD-AB	48	12	594	0.081	48	0.1	0.1	7.249	A
CD-A	598	150			598				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	117	29	409	0.285	117	0.4	0.4	13.548	B
A-B	34	9			34				
A-C	247	62			247				
A-D	30	7			30				
AB-CD	75	19	499	0.151	75	0.2	0.2	9.352	A
AB-C	259	65			259				
D-ABC	29	7	416	0.069	29	0.1	0.1	10.212	B
C-D	30	7			30				
C-A	584	146			584				
C-B	36	9			36				
CD-AB	48	12	594	0.081	48	0.1	0.1	7.250	A
CD-A	598	150			598				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	95	24	436	0.219	96	0.4	0.3	11.654	B
A-B	28	7			28				
A-C	201	50			201				
A-D	24	6			24				
AB-CD	60	15	510	0.117	60	0.2	0.2	8.804	A
AB-C	214	54			214				
D-ABC	23	6	444	0.053	23	0.1	0.1	9.408	A
C-D	24	6			24				
C-A	476	119			476				
C-B	30	7			30				
CD-AB	38	9	587	0.064	38	0.1	0.1	7.212	A
CD-A	490	123			490				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-ACD	80	20	455	0.175	80	0.3	0.2	10.565	B
A-B	23	6			23				
A-C	169	42			169				
A-D	20	5			20				
AB-CD	49	12	520	0.094	49	0.2	0.1	8.404	A
AB-C	180	45			180				
D-ABC	20	5	465	0.042	20	0.1	0.0	8.901	A
C-D	20	5			20				
C-A	399	100			399				
C-B	25	6			25				
CD-AB	31	8	584	0.053	31	0.1	0.1	7.154	A
CD-A	411	103			411				

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

Filename: Double Mini North.j9
Path: C:\Users\PC\OneDrive\Journey\Projects\004 Xero or Paid\2018\18_099 Kelvedon Road Tiptree Phase 2\05 Calculations
Report generation date: 26/03/2021 16:08:01

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2026 Base											
Arm 1	D1	1.2	7.75	0.52	A	0 %	D2	3.9	16.75	0.79	C	15 %
Arm 2		0.6	5.76	0.34	A			2.0	12.58	0.65	B	
Arm 3		6.4	33.76	0.87	D	[Arm 3]		1.3	12.08	0.55	B	[Arm 1]
	2026 with development											
Arm 1	D3	1.2	7.86	0.52	A	-1 %	D4	4.2	18.07	0.80	C	13 %
Arm 2		0.6	5.94	0.36	A			2.1	12.89	0.66	B	
Arm 3		7.1	37.24	0.88	E	[Arm 3]		1.4	12.69	0.57	B	[Arm 1]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	STEVE-PC\Steve
Description	

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

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9	5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2026 with development	AM	ONE HOUR	07:45	09:15	15	✓
D4	2026 with development	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	18.93	C

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		0	Arm 3

Arms

Arms

Arm	Name	Description
1	Link	
2	Kelvedon Road	
3	Maypole Road	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	3.00	3.00	4.50	6.0	5.00	3.00	0.0	
2	3.00	3.00	6.00	18.0	6.00	3.00	0.0	
3	3.00	3.00	3.30	1.0	8.00	3.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.622	1122
2	0.664	1292
3	0.596	1014

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Base	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	495	100.000
2		ONE HOUR	✓	328	100.000
3		ONE HOUR	✓	664	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	161	334
	2	264	0	64
	3	567	97	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.52	7.75	1.2	A	454	681
2	0.34	5.76	0.6	A	301	451
3	0.87	33.76	6.4	D	609	914

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	373	93	72	1077	0.346	370	620	0.0	0.6	5.584	A
2	247	62	250	1126	0.219	246	193	0.0	0.3	4.489	A
3	500	125	198	896	0.558	494	298	0.0	1.4	9.726	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	445	111	87	1068	0.417	444	744	0.6	0.8	6.337	A
2	295	74	300	1093	0.270	294	231	0.3	0.4	4.955	A
3	597	149	237	873	0.684	593	357	1.4	2.3	13.964	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	545	136	105	1057	0.516	544	902	0.8	1.2	7.687	A
2	361	90	367	1049	0.344	360	281	0.4	0.6	5.746	A
3	731	183	290	841	0.869	717	437	2.3	5.9	28.843	D

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	545	136	106	1056	0.516	545	913	1.2	1.2	7.747	A
2	361	90	368	1048	0.345	361	284	0.6	0.6	5.763	A
3	731	183	291	841	0.869	729	438	5.9	6.4	33.763	D

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	445	111	90	1067	0.417	446	761	1.2	0.8	6.400	A
2	295	74	301	1092	0.270	296	235	0.6	0.4	4.973	A
3	597	149	238	873	0.684	613	359	6.4	2.5	16.070	C

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	373	93	74	1076	0.346	373	630	0.8	0.6	5.642	A
2	247	62	252	1125	0.220	247	195	0.4	0.3	4.515	A
3	500	125	199	896	0.558	504	300	2.5	1.4	10.225	B

2026 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	14.42	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		15	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	781	100.000
2		ONE HOUR	✓	524	100.000
3		ONE HOUR	✓	363	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	232	549
	2	438	0	86
	3	322	41	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.79	16.75	3.9	C	717	1075
2	0.65	12.58	2.0	B	481	721
3	0.55	12.08	1.3	B	333	500

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	588	147	31	1103	0.533	583	568	0.0	1.2	7.545	A
2	394	99	410	1020	0.387	392	204	0.0	0.7	6.273	A
3	273	68	327	819	0.334	271	474	0.0	0.5	7.192	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	702	176	37	1099	0.639	699	681	1.2	1.9	9.835	A
2	471	118	492	966	0.488	470	245	0.7	1.0	7.960	A
3	326	82	393	780	0.418	325	569	0.5	0.8	8.685	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	860	215	45	1094	0.786	852	832	1.9	3.7	15.896	C
2	577	144	599	894	0.645	573	298	1.0	1.9	12.201	B
3	400	100	479	729	0.548	398	693	0.8	1.3	11.883	B

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	860	215	45	1094	0.786	859	837	3.7	3.9	16.753	C
2	577	144	604	891	0.647	577	300	1.9	2.0	12.576	B
3	400	100	482	727	0.550	400	699	1.3	1.3	12.084	B

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	702	176	37	1099	0.639	710	688	3.9	2.0	10.351	B
2	471	118	499	961	0.490	475	248	2.0	1.1	8.200	A
3	326	82	397	778	0.420	328	577	1.3	0.8	8.851	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	588	147	31	1103	0.533	591	574	2.0	1.3	7.777	A
2	394	99	415	1016	0.388	396	207	1.1	0.7	6.396	A
3	273	68	331	817	0.334	274	480	0.8	0.6	7.308	A

2026 with development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	20.32	C

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		-1	Arm 3

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2026 with development	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	502	100.000
2		ONE HOUR	✓	347	100.000
3		ONE HOUR	✓	664	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	168	334
	2	283	0	64
	3	567	97	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.52	7.86	1.2	A	461	691
2	0.36	5.94	0.6	A	318	478
3	0.88	37.24	7.1	E	609	914

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	378	94	72	1077	0.351	376	634	0.0	0.6	5.626	A
2	261	65	250	1126	0.232	260	198	0.0	0.3	4.564	A
3	500	125	212	888	0.563	494	298	0.0	1.4	9.928	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	451	113	87	1068	0.422	450	760	0.6	0.8	6.401	A
2	312	78	300	1093	0.285	312	237	0.3	0.4	5.063	A
3	597	149	254	863	0.692	593	357	1.4	2.4	14.460	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	553	138	104	1057	0.523	551	922	0.8	1.2	7.800	A
2	382	96	367	1049	0.364	381	289	0.4	0.6	5.926	A
3	731	183	311	829	0.882	715	437	2.4	6.4	31.057	D

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	553	138	106	1056	0.523	553	933	1.2	1.2	7.865	A
2	382	96	368	1048	0.365	382	291	0.6	0.6	5.944	A
3	731	183	312	829	0.882	728	438	6.4	7.1	37.238	E

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	451	113	90	1066	0.423	453	780	1.2	0.8	6.469	A
2	312	78	301	1092	0.286	313	241	0.6	0.4	5.085	A
3	597	149	255	862	0.692	615	359	7.1	2.6	17.025	C

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	378	94	74	1076	0.351	379	644	0.8	0.6	5.685	A
2	261	65	252	1125	0.232	262	200	0.4	0.3	4.588	A
3	500	125	213	887	0.564	504	300	2.6	1.5	10.470	B

2026 with development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	15.27	C

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		13	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2026 with development	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	797	100.000
2		ONE HOUR	✓	531	100.000
3		ONE HOUR	✓	373	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	248	549
	2	445	0	86
	3	332	41	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.80	18.07	4.2	C	731	1097
2	0.66	12.89	2.1	B	487	731
3	0.57	12.69	1.4	B	342	513

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	600	150	31	1103	0.544	595	581	0.0	1.3	7.716	A
2	400	100	410	1020	0.392	397	216	0.0	0.7	6.326	A
3	281	70	333	816	0.344	279	474	0.0	0.6	7.336	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	716	179	37	1099	0.652	714	696	1.3	2.0	10.188	B
2	477	119	492	966	0.494	476	259	0.7	1.1	8.058	A
3	335	84	399	777	0.432	334	569	0.6	0.8	8.932	A

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	878	219	45	1094	0.802	869	850	2.0	4.1	16.975	C
2	585	146	599	895	0.653	581	315	1.1	2.0	12.470	B
3	411	103	487	724	0.567	408	693	0.8	1.4	12.446	B

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	878	219	45	1094	0.802	877	855	4.1	4.2	18.072	C
2	585	146	604	891	0.656	584	318	2.0	2.1	12.888	B
3	411	103	490	722	0.568	411	699	1.4	1.4	12.686	B

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	716	179	37	1099	0.652	725	704	4.2	2.1	10.811	B
2	477	119	499	961	0.497	481	263	2.1	1.1	8.321	A
3	335	84	403	774	0.433	338	577	1.4	0.9	9.119	A

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	600	150	31	1103	0.544	603	587	2.1	1.3	7.972	A
2	400	100	415	1016	0.393	401	219	1.1	0.7	6.453	A
3	281	70	336	814	0.345	282	480	0.9	0.6	7.457	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462

Filename: Double Mini South.j9
Path: C:\Users\PC\OneDrive\Journey\Projects\004 Xero or Paid\2018\18_099 Kelvedon Road Tiptree Phase 2\05 Calculations
Report generation date: 26/03/2021 16:03:39

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2026 Base											
Arm 1	D1	1.6	9.04	0.59	A	11 % [Arm 3]	D2	4.4	19.66	0.81	C	10 % [Arm 1]
Arm 2		1.7	13.08	0.61	B			1.1	9.95	0.50	A	
Arm 3		3.2	19.22	0.75	C			3.4	18.77	0.76	C	
	2026 with development											
Arm 1	D3	1.7	9.49	0.61	A	10 % [Arm 3]	D4	4.6	20.41	0.82	C	9 % [Arm 1]
Arm 2		1.8	13.65	0.62	B			1.1	10.07	0.50	B	
Arm 3		3.3	19.95	0.76	C			3.7	20.43	0.78	C	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	29/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	STEVE-PC\Steve
Description	

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

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9	5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Base	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓
D3	2026 with development	AM	ONE HOUR	07:45	09:15	15	✓
D4	2026 with development	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	13.77	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		11	Arm 3

Arms

Arms

Arm	Name	Description
1	Link	
2	Kelvedon Road	
3	Maldon Road	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1	3.00	3.00	4.50	6.0	5.00	3.00	0.0	
2	3.00	3.00	4.00	1.0	6.00	3.00	0.0	
3	3.00	3.00	4.00	3.0	5.00	3.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.622	1122
2	0.599	1031
3	0.608	1078

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 Base	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	580	100.000
2		ONE HOUR	✓	434	100.000
3		ONE HOUR	✓	558	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	200	380
	2	387	0	47
	3	491	67	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.59	9.04	1.6	A	532	798
2	0.61	13.08	1.7	B	398	597
3	0.75	19.22	3.2	C	512	768

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	437	109	50	1091	0.400	434	655	0.0	0.7	5.998	A
2	327	82	284	860	0.380	324	200	0.0	0.7	7.350	A
3	420	105	289	902	0.466	416	319	0.0	0.9	8.093	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	521	130	60	1085	0.481	520	786	0.7	1.0	6.999	A
2	390	98	341	826	0.472	389	239	0.7	1.0	9.027	A
3	502	125	347	867	0.579	500	383	0.9	1.5	10.719	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	639	160	73	1077	0.593	636	959	1.0	1.6	8.944	A
2	478	119	417	781	0.612	475	292	1.0	1.7	12.828	B
3	614	154	424	820	0.749	608	468	1.5	3.0	18.147	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	639	160	74	1076	0.593	639	966	1.6	1.6	9.039	A
2	478	119	418	780	0.613	478	294	1.7	1.7	13.084	B
3	614	154	426	819	0.750	614	470	3.0	3.2	19.220	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	521	130	61	1084	0.481	524	797	1.6	1.0	7.089	A
2	390	98	343	825	0.473	393	242	1.7	1.0	9.223	A
3	502	125	350	865	0.580	508	386	3.2	1.6	11.299	B

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	437	109	51	1091	0.400	438	664	1.0	0.7	6.075	A
2	327	82	287	859	0.380	328	202	1.0	0.7	7.481	A
3	420	105	292	900	0.467	422	322	1.6	1.0	8.336	A

2026 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	17.33	C

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		10	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 Base	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	760	100.000
2		ONE HOUR	✓	357	100.000
3		ONE HOUR	✓	604	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	396	364
	2	304	0	53
	3	477	127	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.81	19.66	4.4	C	697	1046
2	0.50	9.95	1.1	A	328	491
3	0.76	18.77	3.4	C	554	831

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	572	143	95	1063	0.538	567	583	0.0	1.3	7.905	A
2	269	67	272	868	0.310	267	390	0.0	0.5	6.567	A
3	455	114	227	940	0.484	451	311	0.0	1.0	8.036	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	683	171	114	1052	0.650	680	700	1.3	2.0	10.583	B
2	321	80	326	835	0.384	320	468	0.5	0.7	7.674	A
3	543	136	273	912	0.595	541	373	1.0	1.6	10.603	B

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	837	209	138	1036	0.808	828	853	2.0	4.2	18.266	C
2	393	98	397	793	0.496	392	570	0.7	1.1	9.824	A
3	665	166	333	875	0.760	658	455	1.6	3.2	17.754	C

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	837	209	140	1035	0.808	836	859	4.2	4.4	19.656	C
2	393	98	400	791	0.497	393	575	1.1	1.1	9.953	A
3	665	166	335	874	0.761	665	459	3.2	3.4	18.768	C

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	683	171	116	1050	0.650	692	709	4.4	2.1	11.328	B
2	321	80	332	832	0.386	322	476	1.1	0.7	7.794	A
3	543	136	275	911	0.596	550	379	3.4	1.7	11.162	B

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	572	143	96	1062	0.539	575	591	2.1	1.3	8.183	A
2	269	67	276	866	0.311	270	396	0.7	0.5	6.655	A
3	455	114	230	938	0.485	457	316	1.7	1.1	8.275	A

2026 with development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	14.32	B

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		10	Arm 3

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2026 with development	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	599	100.000
2		ONE HOUR	✓	434	100.000
3		ONE HOUR	✓	565	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	200	399
	2	387	0	47
	3	498	67	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.61	9.49	1.7	A	550	824
2	0.62	13.65	1.8	B	398	597
3	0.76	19.95	3.3	C	518	778

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	451	113	50	1091	0.413	448	660	0.0	0.8	6.118	A
2	327	82	298	852	0.384	324	200	0.0	0.7	7.466	A
3	425	106	289	902	0.472	422	333	0.0	1.0	8.178	A

08:00 - 08:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	538	135	60	1085	0.496	537	793	0.8	1.1	7.214	A
2	390	98	358	816	0.478	389	239	0.7	1.0	9.239	A
3	508	127	347	867	0.586	506	400	1.0	1.5	10.897	B

08:15 - 08:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	660	165	73	1077	0.612	657	966	1.1	1.7	9.375	A
2	478	119	438	768	0.622	475	292	1.0	1.7	13.347	B
3	622	156	423	820	0.758	615	489	1.5	3.2	18.736	C

08:30 - 08:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	660	165	74	1076	0.613	659	974	1.7	1.7	9.491	A
2	478	119	439	767	0.623	478	294	1.7	1.8	13.648	B
3	622	156	426	819	0.760	622	491	3.2	3.3	19.948	C

08:45 - 09:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	538	135	61	1084	0.497	541	804	1.7	1.1	7.320	A
2	390	98	360	815	0.479	393	242	1.8	1.0	9.457	A
3	508	127	351	865	0.588	515	403	3.3	1.6	11.536	B

09:00 - 09:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	451	113	51	1091	0.413	452	670	1.1	0.8	6.214	A
2	327	82	301	850	0.384	328	202	1.0	0.7	7.606	A
3	425	106	293	900	0.473	428	337	1.6	1.0	8.432	A

2026 with development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Maypole Rd N Mini roundabout	Mini-roundabout		1, 2, 3	18.30	C

Junction Network Options

Driving side	Lighting	Road surface	In London	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	Normal/unknown		9	Arm 1

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2026 with development	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
1		ONE HOUR	✓	767	100.000
2		ONE HOUR	✓	357	100.000
3		ONE HOUR	✓	620	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		1	2	3
From	1	0	396	371
	2	304	0	53
	3	493	127	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	10	10
	2	10	0	10
	3	10	10	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.82	20.41	4.6	C	704	1056
2	0.50	10.07	1.1	B	328	491
3	0.78	20.43	3.7	C	569	853

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	577	144	95	1063	0.543	572	595	0.0	1.3	7.986	A
2	269	67	277	865	0.311	267	390	0.0	0.5	6.601	A
3	467	117	227	940	0.497	463	316	0.0	1.1	8.229	A

17:00 - 17:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	690	172	114	1052	0.656	687	714	1.3	2.0	10.758	B
2	321	80	332	832	0.386	320	468	0.5	0.7	7.730	A
3	557	139	273	912	0.611	555	380	1.1	1.7	11.013	B

17:15 - 17:30

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	844	211	138	1036	0.815	835	870	2.0	4.4	18.846	C
2	393	98	404	789	0.498	392	569	0.7	1.1	9.932	A
3	683	171	333	875	0.780	675	462	1.7	3.6	19.107	C

17:30 - 17:45

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	844	211	140	1035	0.816	844	877	4.4	4.6	20.406	C
2	393	98	408	786	0.500	393	575	1.1	1.1	10.069	B
3	683	171	335	874	0.781	682	466	3.6	3.7	20.428	C

17:45 - 18:00

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	690	172	116	1050	0.657	699	724	4.6	2.2	11.574	B
2	321	80	338	828	0.388	322	477	1.1	0.7	7.857	A
3	557	139	275	911	0.612	565	386	3.7	1.8	11.703	B

18:00 - 18:15

Arm	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Throughput (exit side) (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
1	577	144	96	1062	0.544	581	603	2.2	1.3	8.280	A
2	269	67	281	862	0.312	270	396	0.7	0.5	6.691	A
3	467	117	230	938	0.498	469	321	1.8	1.1	8.499	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462

Filename: Oak Road Kelvedon Road.j9
Path: C:\Users\PC\OneDrive\Journey\Projects\004 Xero or Paid\2018\18_099 Kelvedon Road Tiptree Phase 2\05 Calculations
Report generation date: 26/03/2021 15:59:08

»2026 With Development, AM
»2026 With Development, PM

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2026 With Development											
Stream B-AC	D1	0.6	16.72	0.35	C	47 %	D2	0.1	13.47	0.09	B	83 %
Stream C-AB		0.0	7.21	0.01	A	[Stream B-AC]		0.0	8.91	0.01	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	28/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	STEVE-PC\Steve
Description	

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 With Development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Maypole Road Oak Road	T-Junction	Two-way		2.23	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	47	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	Kelvedon Road W		Major
B	Oak Road		Minor
C	Kelvedon Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			100.0	✓	1.00

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)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	10	10

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	486	0.088	0.224	0.141	0.320
B-C	630	0.097	0.244	-	-
C-B	632	0.245	0.245	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	313	100.000
B		ONE HOUR	✓	115	100.000
C		ONE HOUR	✓	450	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	33	280
	B	98	0	17
	C	445	5	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.35	16.72	0.6	C	106	158
C-AB	0.01	7.21	0.0	A	5	7
C-A					408	612
A-B					30	45
A-C					257	385

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	87	22	408	0.212	85	0.0	0.3	12.238	B
C-AB	4	0.95	578	0.007	4	0.0	0.0	6.899	A
C-A	335	84			335				
A-B	25	6			25				
A-C	211	53			211				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	103	26	389	0.266	103	0.3	0.4	13.816	B
C-AB	5	1	568	0.008	5	0.0	0.0	7.027	A
C-A	400	100			400				
A-B	30	7			30				
A-C	252	63			252				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	127	32	363	0.349	126	0.4	0.6	16.628	C
C-AB	6	1	555	0.010	6	0.0	0.0	7.206	A
C-A	490	122			490				
A-B	36	9			36				
A-C	308	77			308				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	127	32	363	0.349	127	0.6	0.6	16.725	C
C-AB	6	1	555	0.010	6	0.0	0.0	7.206	A
C-A	490	122			490				
A-B	36	9			36				
A-C	308	77			308				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	103	26	389	0.266	104	0.6	0.4	13.925	B
C-AB	5	1	568	0.008	5	0.0	0.0	7.030	A
C-A	400	100			400				
A-B	30	7			30				
A-C	252	63			252				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	87	22	408	0.212	87	0.4	0.3	12.360	B
C-AB	4	0.95	578	0.007	4	0.0	0.0	6.902	A
C-A	335	84			335				
A-B	25	6			25				
A-C	211	53			211				

2026 With Development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Maypole Road Oak Road	T-Junction	Two-way		0.41	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	83	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	690	100.000
B		ONE HOUR	✓	25	100.000
C		ONE HOUR	✓	234	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	134	556
	B	20	0	5
	C	228	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.09	13.47	0.1	B	23	34
C-AB	0.01	8.91	0.0	A	6	8
C-A					209	314
A-B					123	184
A-C					510	765

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	19	5	381	0.049	19	0.0	0.1	10.910	B
C-AB	5	1	507	0.009	4	0.0	0.0	7.880	A
C-A	172	43			172				
A-B	101	25			101				
A-C	419	105			419				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	6	356	0.063	22	0.1	0.1	11.856	B
C-AB	5	1	483	0.011	5	0.0	0.0	8.283	A
C-A	205	51			205				
A-B	120	30			120				
A-C	500	125			500				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	28	7	322	0.086	27	0.1	0.1	13.450	B
C-AB	7	2	451	0.015	7	0.0	0.0	8.905	A
C-A	251	63			251				
A-B	148	37			148				
A-C	612	153			612				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	28	7	322	0.086	28	0.1	0.1	13.465	B
C-AB	7	2	451	0.015	7	0.0	0.0	8.905	A
C-A	251	63			251				
A-B	148	37			148				
A-C	612	153			612				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	6	356	0.063	23	0.1	0.1	11.869	B
C-AB	5	1	483	0.011	5	0.0	0.0	8.285	A
C-A	205	51			205				
A-B	120	30			120				
A-C	500	125			500				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	19	5	381	0.049	19	0.1	0.1	10.929	B
C-AB	5	1	507	0.009	5	0.0	0.0	7.881	A
C-A	172	43			172				
A-B	101	25			101				
A-C	419	105			419				

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462

Filename: Oak Road Maypole Road.j9
Path: C:\Users\PC\OneDrive\Journey\Projects\004 Xero or Paid\2018\18_099 Kelvedon Road Tiptree Phase 2\05 Calculations
Report generation date: 26/03/2021 15:55:14

»2026 With Development, AM
»2026 With Development, PM

Summary of junction performance

	AM						PM					
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	2026 With Development											
Stream B-AC	D1	0.3	12.20	0.19	B	83 %	D2	0.5	12.61	0.30	B	74 %
Stream C-AB		0.3	8.30	0.19	A	[Stream B-AC]		0.0	8.47	0.04	A	[Stream B-AC]

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	28/01/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	STEVE-PC\Steve
Description	

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

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	Residual capacity criteria type	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75			✓	Delay	0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 With Development, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Maypole Road Oak Road	T-Junction	Two-way		1.90	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	83	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	Maypole Rd S		Major
B	Oak Road		Minor
C	Colchester Road		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	6.00			0.0	✓	1.00

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)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	25	25

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	498	0.091	0.229	0.144	0.328
B-C	640	0.098	0.248	-	-
C-B	574	0.222	0.222	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	328	100.000
B		ONE HOUR	✓	70	100.000
C		ONE HOUR	✓	483	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	14	314
	B	37	0	33
	C	397	86	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.19	12.20	0.3	B	64	96
C-AB	0.19	8.30	0.3	A	90	135
C-A					353	529
A-B					13	19
A-C					288	432

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	53	13	453	0.116	52	0.0	0.1	9.873	A
C-AB	70	18	564	0.125	70	0.0	0.2	8.001	A
C-A	293	73			293				
A-B	11	3			11				
A-C	236	59			236				

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	63	16	431	0.146	63	0.1	0.2	10.736	B
C-AB	87	22	573	0.152	87	0.2	0.2	8.149	A
C-A	347	87			347				
A-B	13	3			13				
A-C	282	71			282				

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	77	19	402	0.192	77	0.2	0.3	12.178	B
C-AB	113	28	591	0.192	113	0.2	0.3	8.284	A
C-A	418	105			418				
A-B	15	4			15				
A-C	346	86			346				

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	77	19	402	0.192	77	0.3	0.3	12.202	B
C-AB	113	28	591	0.192	113	0.3	0.3	8.297	A
C-A	418	105			418				
A-B	15	4			15				
A-C	346	86			346				

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	63	16	431	0.146	63	0.3	0.2	10.766	B
C-AB	87	22	573	0.152	87	0.3	0.2	8.169	A
C-A	347	87			347				
A-B	13	3			13				
A-C	282	71			282				

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	53	13	452	0.116	53	0.2	0.1	9.914	A
C-AB	70	18	564	0.125	71	0.2	0.2	8.030	A
C-A	293	73			293				
A-B	11	3			11				
A-C	236	59			236				

2026 With Development, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Maypole Road Oak Road	T-Junction	Two-way		2.14	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	74	Stream B-AC

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		ONE HOUR	✓	417	100.000
B		ONE HOUR	✓	125	100.000
C		ONE HOUR	✓	255	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	22	395
	B	43	0	82
	C	240	15	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
B-AC	0.30	12.61	0.5	B	115	172
C-AB	0.04	8.47	0.0	A	14	21
C-A					220	330
A-B					20	30
A-C					362	544

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	94	24	494	0.191	93	0.0	0.3	9.861	A
C-AB	11	3	510	0.022	11	0.0	0.0	7.940	A
C-A	181	45			181				
A-B	17	4			17				
A-C	297	74			297				

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	112	28	476	0.236	112	0.3	0.3	10.868	B
C-AB	14	3	499	0.027	14	0.0	0.0	8.162	A
C-A	216	54			216				
A-B	20	5			20				
A-C	355	89			355				

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	138	34	452	0.305	137	0.3	0.5	12.570	B
C-AB	17	4	484	0.035	17	0.0	0.0	8.471	A
C-A	264	66			264				
A-B	24	6			24				
A-C	435	109			435				

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	138	34	452	0.305	138	0.5	0.5	12.612	B
C-AB	17	4	484	0.035	17	0.0	0.0	8.472	A
C-A	264	66			264				
A-B	24	6			24				
A-C	435	109			435				

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	112	28	476	0.236	113	0.5	0.3	10.919	B
C-AB	14	3	499	0.027	14	0.0	0.0	8.164	A
C-A	216	54			216				
A-B	20	5			20				
A-C	355	89			355				

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Junction Arrivals (PCU)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	Start queue (PCU)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	94	24	494	0.191	94	0.3	0.3	9.928	A
C-AB	11	3	510	0.022	11	0.0	0.0	7.946	A
C-A	181	45			181				
A-B	17	4			17				
A-C	297	74			297				

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462

Filename: Priority Site Access J9.j9
Path: C:\Users\PC\OneDrive\Journey\Projects\004 Xero or Paid\2018\18_099 Kelvedon Road Tiptree Phase 2\03 Reports
Report generation date: 26/03/2021 15:47:58

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2026 With Development									
Stream B-AC	D1	0.2	11.71	0.15	B	D2	0.1	9.68	0.05	A
Stream C-AB		0.0	7.60	0.03	A		0.1	7.22	0.05	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

File summary

File Description

Title	
Location	
Site number	
Date	26/03/2021
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DESKTOP-JHIBOST\PC
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2026 With Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	Arm C - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Kelvedon Road Site Access	T-Junction	Two-way		0.75	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled	Kelvedon Road East	Major
B	Site access		Minor
C	Kelvedon Road West		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	5.50			90.0	✓	1.00

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)	Visibility to left (m)	Visibility to right (m)
B	One lane	2.20	15	15

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	451	0.084	0.212	0.133	0.303
B-C	583	0.091	0.231	-	-
C-B	626	0.248	0.248	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2026 With Development	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	544	100.000
B		✓	50	100.000
C		✓	305	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	7	537
	B	19	0	31
	C	294	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	0
	B	0	0	0
	C	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	11.71	0.2	B
C-AB	0.03	7.60	0.0	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	38	415	0.091	37	0.1	9.527	A
C-AB	8	528	0.016	8	0.0	6.925	A
C-A	221			221			
A-B	5			5			
A-C	404			404			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	45	393	0.114	45	0.1	10.338	B
C-AB	10	510	0.020	10	0.0	7.198	A
C-A	264			264			
A-B	6			6			
A-C	483			483			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	55	362	0.152	55	0.2	11.698	B
C-AB	12	486	0.025	12	0.0	7.601	A
C-A	323			323			
A-B	8			8			
A-C	591			591			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	55	362	0.152	55	0.2	11.712	B
C-AB	12	486	0.025	12	0.0	7.601	A
C-A	323			323			
A-B	8			8			
A-C	591			591			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	45	393	0.114	45	0.1	10.355	B
C-AB	10	510	0.020	10	0.0	7.198	A
C-A	264			264			
A-B	6			6			
A-C	483			483			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	38	415	0.091	38	0.1	9.552	A
C-AB	8	528	0.016	8	0.0	6.926	A
C-A	221			221			
A-B	5			5			
A-C	404			404			

2026 With Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Major arm width	Arm C - Major arm geometry	For two-way major roads, please interpret results with caution if the total major carriageway width is less than 6m.

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Kelvedon Road Site Access	T-Junction	Two-way		0.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2026 With Development	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	252	100.000
B		✓	20	100.000
C		✓	321	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	17	235
	B	8	0	12
	C	294	27	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	10	10
	B	10	0	10
	C	10	10	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.05	9.68	0.1	A
C-AB	0.05	7.22	0.1	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	460	0.033	15	0.0	8.888	A
C-AB	21	590	0.035	21	0.0	6.957	A
C-A	221			221			
A-B	13			13			
A-C	177			177			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	448	0.040	18	0.0	9.207	A
C-AB	25	585	0.043	25	0.0	7.070	A
C-A	264			264			
A-B	15			15			
A-C	211			211			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	431	0.051	22	0.1	9.682	A
C-AB	31	580	0.053	31	0.1	7.213	A
C-A	322			322			
A-B	19			19			
A-C	259			259			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	22	431	0.051	22	0.1	9.684	A
C-AB	31	580	0.053	31	0.1	7.216	A
C-A	322			322			
A-B	19			19			
A-C	259			259			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	18	448	0.040	18	0.0	9.209	A
C-AB	25	585	0.043	25	0.1	7.074	A
C-A	264			264			
A-B	15			15			
A-C	211			211			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-AC	15	460	0.033	15	0.0	8.897	A
C-AB	21	590	0.035	21	0.0	6.963	A
C-A	221			221			
A-B	13			13			
A-C	177			177			