# Updated Transport Assessment

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| **Ref** | JTP18_095 |
| **Site Name** | Land South of Kelvedon Road, Tiptree |
| **Date** | November 2020 |

**Quality Assurance**

Site name: Land South of Kelvedon Road, Tiptree

Client name: Marden Homes

Type of report: Updated Transport Assessment

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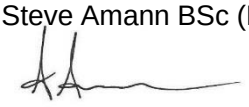
Signed 

Date November 2020

Reviewed by: Fiona Hunter BSc(Hons)

Signed: 

Date: November 2020

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**Appendices**

# 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 also the advice provided in CD 123. In the context of that advice, the potential to provide a mini-roundabout to the site has been assessed as it would have the potential to provide sufficient capacity to accommodate through route traffic for the Grange Road site to the south in the future.

4.8 A mini roundabout access arrangement can be provided within land within the site and the control of the highway authority.

4.9 The roundabout has been the subject of a Stage One Safety Audit which identifies that there are no significant highway safety issues with its design and as such is designed in accordance with current requirements. The safety audit is held in **Appendix 10.**

4.10 The proposed mini-roundabout access arrangement is held in **Appendix 3** and would be suitable to accommodate both the site development traffic and an additional element associated with the Grange Road site and would also accommodate the private access to the land to the north of Kelvedon Road.

4.11 Two 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.

# 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 2025, 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 | 2025 Total Flows | 0.20 | 0.3 | 0.20 | 0.3 |
| PM | 2025 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 2025 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 | 2025 Base | 0.53 | 1.2 | 0.35 | 0.6 | 0.90 | 7.9 |
| PM | 2025 Base | 0.81 | 4.3 | 0.67 | 2.2 | 0.57 | 1.4 |
| AM | 2025 Total Flows | 0.54 | 1.3 | 0.38 | 0.7 | 0.92 | 9.4 |
| PM | 2025 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 | 2025 Base | 0.61 | 1.7 | 0.64 | 1.9 | 0.78 | 3.6 |
| PM | 2025 Base | 0.84 | 5.3 | 0.52 | 1.2 | 0.79 | 3.9 |
| AM | 2025 Total Flows | 0.63 | 1.9 | 0.65 | 2.0 | 0.79 | 3.9 |
| PM | 2025 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 2025 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 | 2025 Total Flows | 0.11 | 0.2 | 0.28 | 0.4 | 0.11 | 0.1 | 0.18 | 0.2 |
| PM | 2025 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 2025 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 | 2025 Total Flows | 0.01 | 0.0 | 0.37 | 0.6 |
| PM | 2025 Total Flows | 0.01 | 0.0 | 0.09 | 0.1 |

6.1 The PICADY analysis indicates that in the 2025 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 Roundabout Junction Assessment

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

**Table 6.6 Site Access Arcady Summary**

| | | Kelvedon Rd E | | Site Access | | Kelvedon Rd W | |
|---|---|---|---|---|---|---|---|
| | | RFC | Q | RFC | Q | RFC | Q |
| AM | 2025 Total Flows | 0.69 | 2.4 | 0.13 | 0.2 | 0.36 | 0.6 |
| PM | 2025 Total Flows | 0.33 | 0.5 | 0.04 | 0.0 | 0.83 | 5.2 |

6.4 The Junctions 9 Arcady assessment illustrated in **Table 6.6** identifies that the junction will operate within the operational capacity of the junction for the design year 2025 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 ARCADY 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.

## Residential Travel Planning

6.10 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.

6.11 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.

6.12 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.)

6.13 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.

6.14 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 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.

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

7.7 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

7.8 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.

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

7.10 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

1

2

Coronation Cottages

Tower End

Ponys Farm

100

95

103

68

67.9m

El Sub Sta

El Sub Sta

Pond

Pond

The Gables

Track

Stourton

Baynards Primary School

Colt Farm

B 1023

The Paddock

Revelors Farm

Gwy

N

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

Diagram to 611.1

4m

Water Tower

Golden Warren

1

2

Coronation Cottages

Tower End

Tactile Paved Drop Kerb Crossing Point

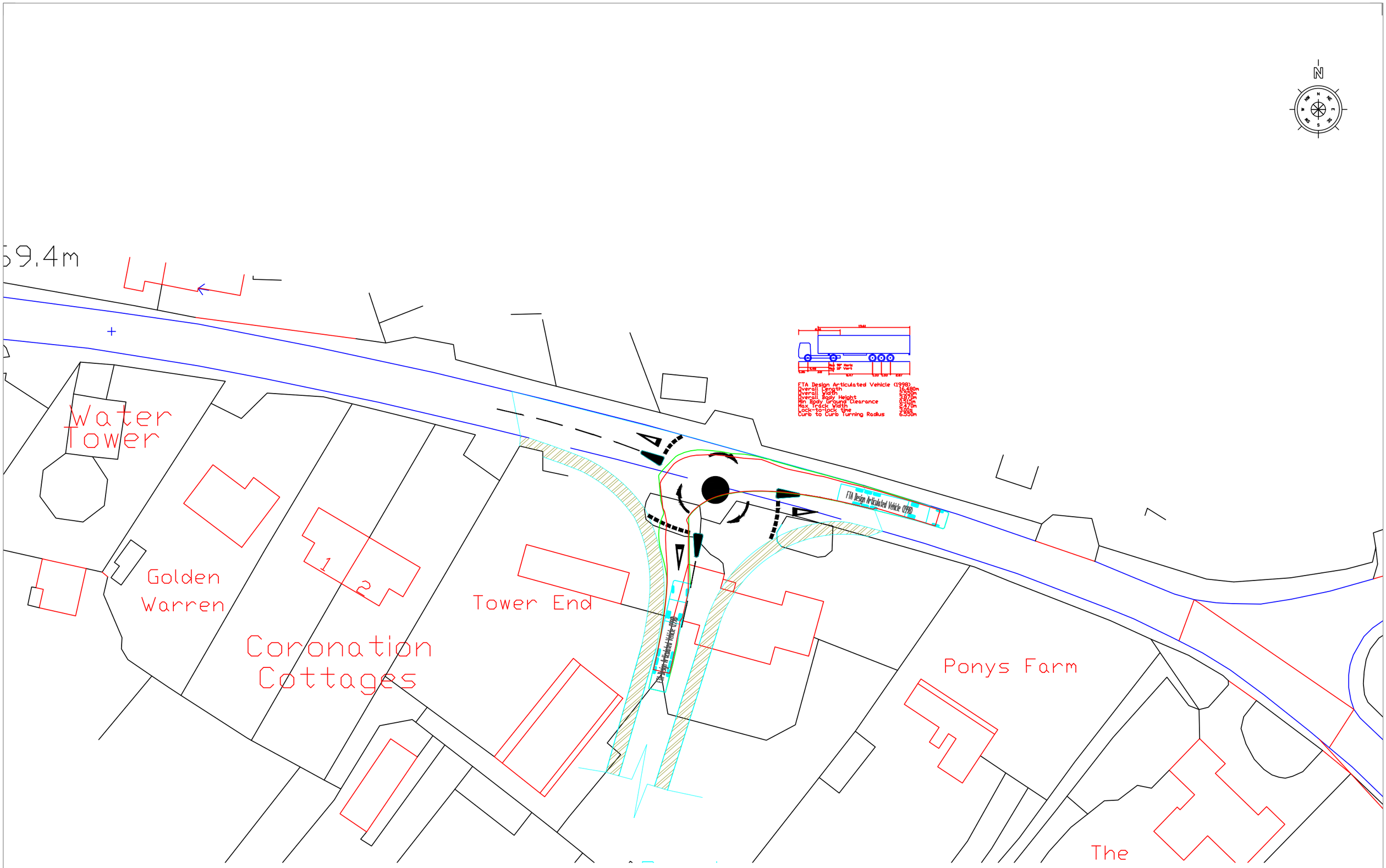
Ponys Farm

Proposed 5.5m Carriageway

2.0m Footway Provision

The

| | | | | |
|---|---|---|---|---|
| client: Marden Homes | title: Proposed Mini-Roundabout Access | date: 01/10/2018 | scale @ A3 1:500 | Journey transport planning |
| project: Kelvedon Road Tiptree | status: Planning (not for construction) | drawn | Revision | |
| discipline Transport Planning | project no. JTP 07718 | chk'd SAA | dwg no. DR2 | |




| | | | | |
|---|---|---|---|---|
| client: Marden Homes | title: Articulated HGV Swept Path 3 of 3 | date: 01/10/2018 | scale @ A3 1:500 | Journey transport planning |
| project: Kelvedon Road Tiptree | status: Planning (not for construction) | drawn | Revision | |
| discipline Transport Planning | project no. JTP 07718 | chk'd SAA | dwg no. DR4 | |

N

69.4m

Water Tower

Golden Warren

1

2

Coronation Cottages

Tower End

Pond

Ponys Farm

The Gables

FTA Design Articulated Vehicle (1998)

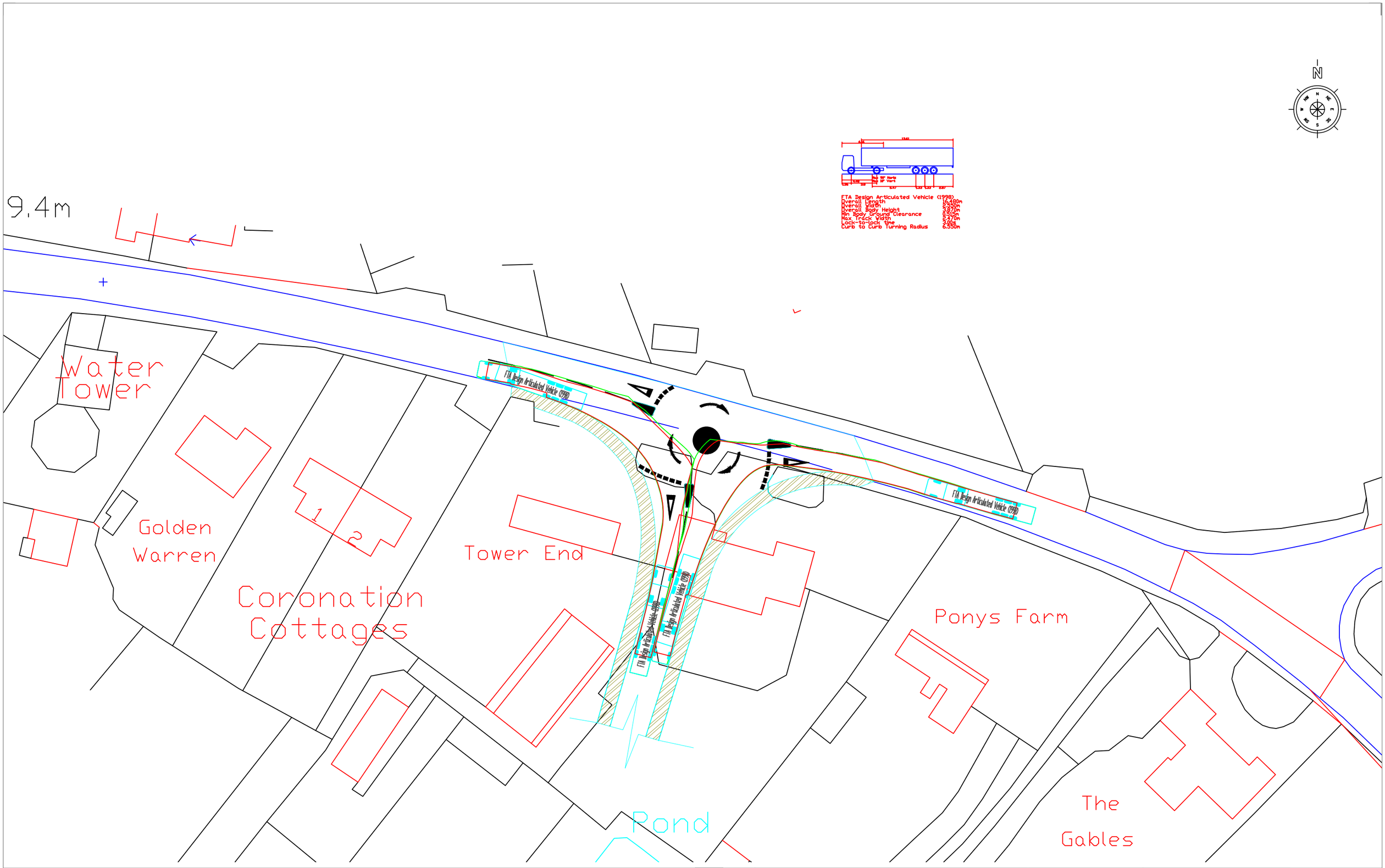
FTA Design Articulated Vehicle (1998)

FTA Design Articulated Vehicle (1998)

| | |
|---|---|
| Overall Length | 16.480m |
| Overall Width | 2.550m |
| Overall Body Height | 3.870m |
| Min Body Ground Clearance | 0.515m |
| Max Track Width | 2.470m |
| Lock-to-lock time | 7.40s |
| Kerb to Kerb Turning Radius | 6.550m |

| | | | | | |
|---|---|---|---|---|---|
| client: | Marden Homes | title: | Articulated HGV Swept Path 2 of 3 | 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. DR3 |

Journey transport planning




| | | | | |
|---|---|---|---|---|
| client: Marden Homes | title: Articulated HGV Swept Path 1 of 3 | date: 01/10/2018 | scale @ A3 1:500 | Journey transport planning |
| project: Kelvedon Road Tiptree | status: Planning (not for construction) | drawn | Revision | |
| discipline Transport Planning | project no. **JTP 07718** | chk'd SAA | dwg no. **DR3** | |

# Appendix 4

# Illustrative Development Layout

Golden Warren

Coronation Cottages

Track

The Gables

Stourton

Colt Farm

Path (um)

OAK ROAD

67.9m

104

103

100

1500
0m 5m 15m 30m

AS PROPOSED LAYOUT PLAN

KELVEDON ROAD
PROPOSED SITE LAYOUT
TIPTREE
COLCHESTER
CO5 OLX
MARDEN HOMES LTD.
23.10.20 1:500@A1 Project#1432
300.00
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<br>SANDCROFT<br>TELFORD<br>SUTTON HILL<br>Edge of Town<br>Residential Zone | SEMI-DETACHED/TERRACED | | SHROPSHIRE |
| | Total Number of dwellings: | 54 | | |
| | *Survey date: THURSDAY* | *24/10/13* | | *Survey Type: MANUAL* |
| 29 | SH-03-A-06<br>ELLESMERE ROAD<br>SHREWSBURY<br><br>Edge of Town<br>Residential Zone | BUNGALOWS | | SHROPSHIRE |
| | Total Number of dwellings: | 16 | | |
| | *Survey date: THURSDAY* | *22/05/14* | | *Survey Type: MANUAL* |
| 30 | ST-03-A-07<br>BEACONSIDE<br>STAFFORD<br>MARSTON GATE<br>Edge of Town<br>Residential Zone | DETACHED & SEMI-DETACHED | | STAFFORDSHIRE |
| | Total Number of dwellings: | 248 | | |
| | *Survey date: WEDNESDAY* | *22/11/17* | | *Survey Type: MANUAL* |
| 31 | WS-03-A-04<br>HILLS FARM LANE<br>HORSHAM<br>BROADBRIDGE HEATH<br>Edge of Town<br>Residential Zone | MIXED HOUSES | | WEST SUSSEX |
| | Total Number of dwellings: | 151 | | |
| | *Survey date: THURSDAY* | *11/12/14* | | *Survey Type: MANUAL* |
| 32 | WS-03-A-06<br>ELLIS ROAD<br>WEST HORSHAM<br>S BROADBRIDGE HEATH<br>Edge of Town<br>Residential Zone | MIXED HOUSES | | WEST SUSSEX |
| | 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<br>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 |

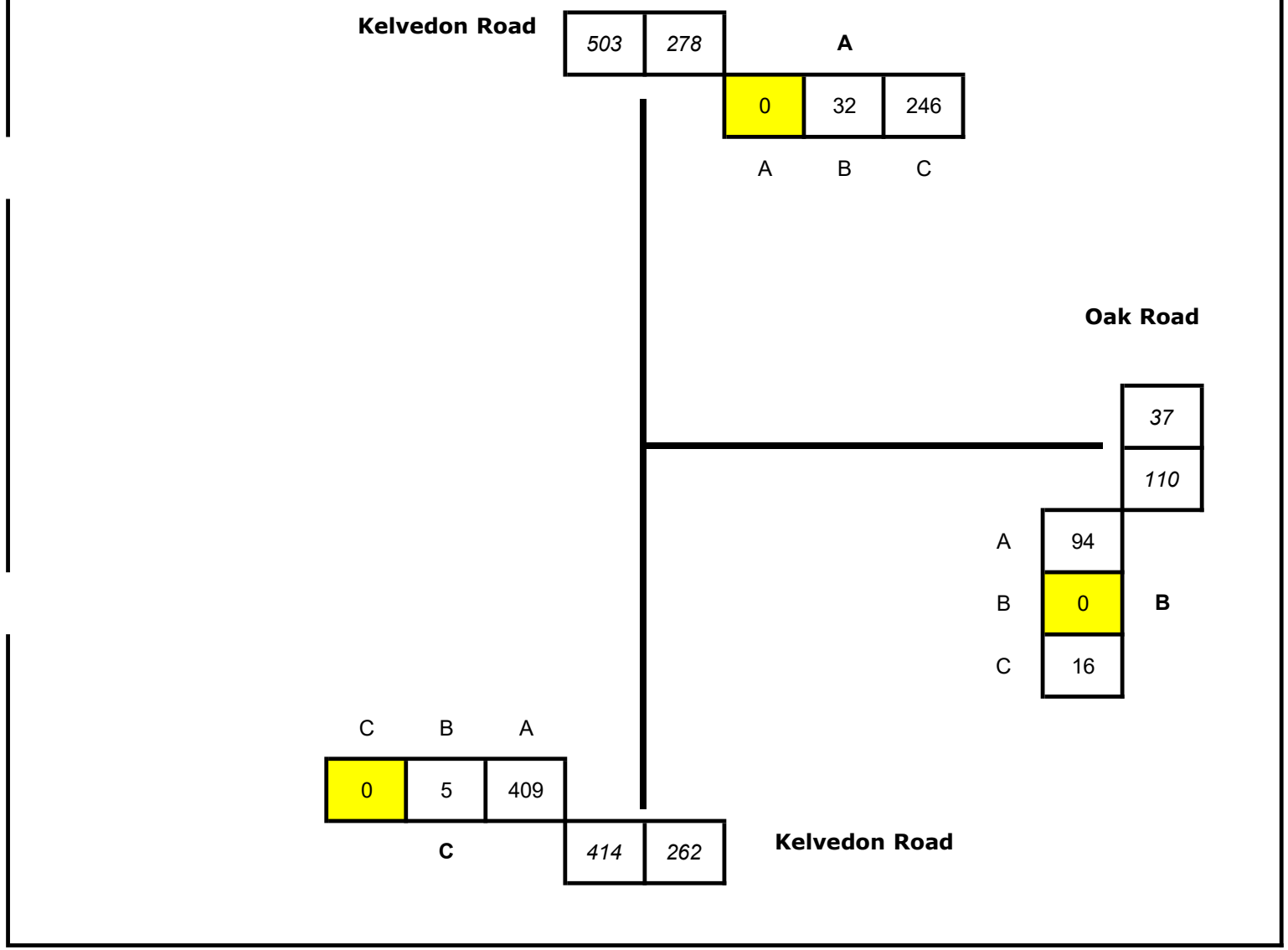
| | |
|---|---|
| South Cambridgeshire | 3 |
| Southend-on-Sea | 7 |
| St Albans | 2 |
| St Edmundsbury | 7 |
| Stevenage | 2 |
| Suffolk Coastal | 5 |
| Tendring | 68 |
| Three Rivers | 1 |
| Thurrock | 14 |
| Uttlesford | 21 |
| Welwyn Hatfield | 1 |
| | 1,642 |

# Appendix 7

## Traffic Data

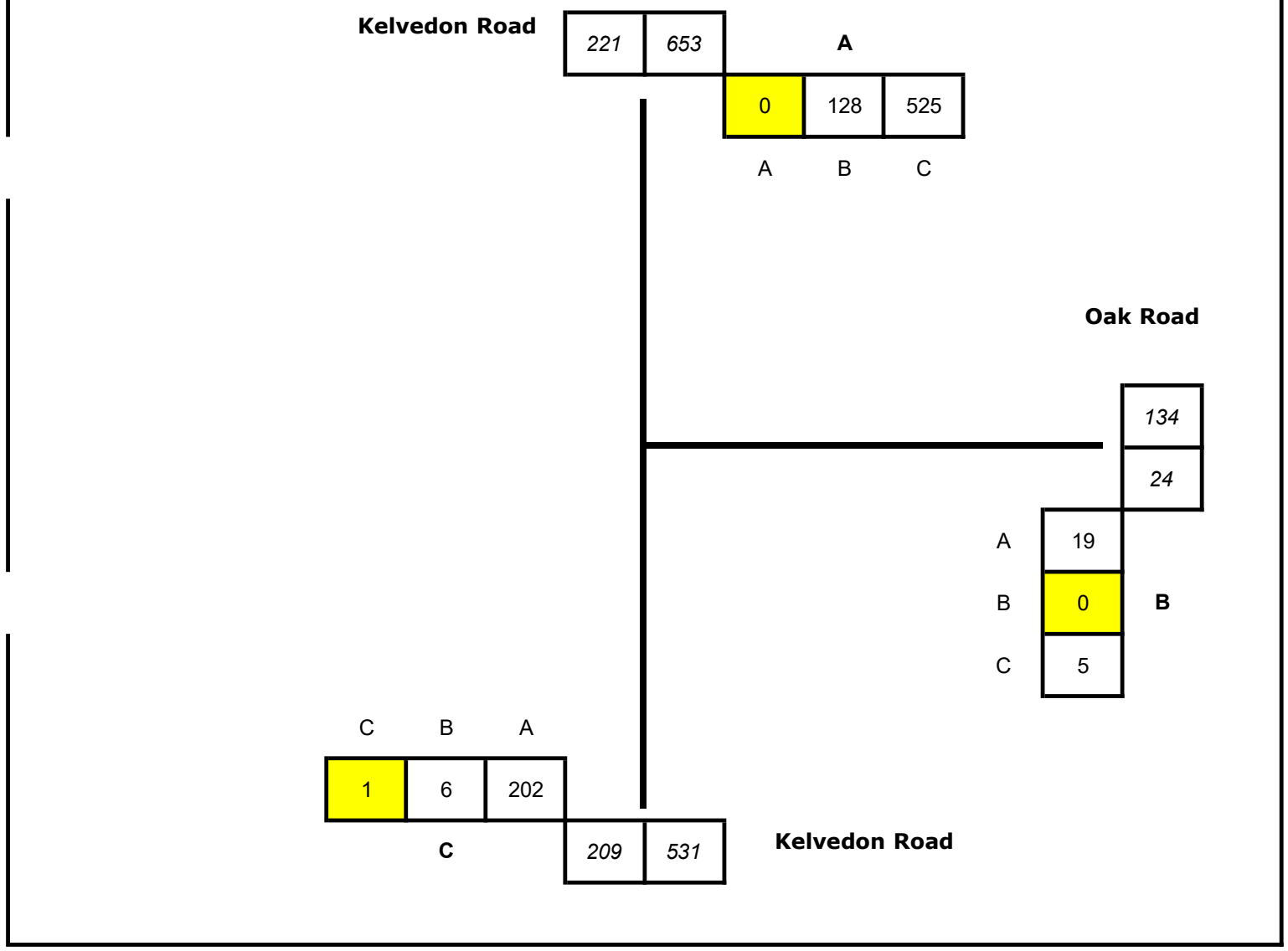
| Advanced Transport Research | Job Number & Name: | 20319 Tiptree, Essex |
|---|---|---|
| Site 1 - Kelvedon Road/ Oak Road | Client: | Journey TP |
| Flow Diagram | Date: | Thursday 24 Jan 2019 |

*Select Period* **0800 Hourly Total**



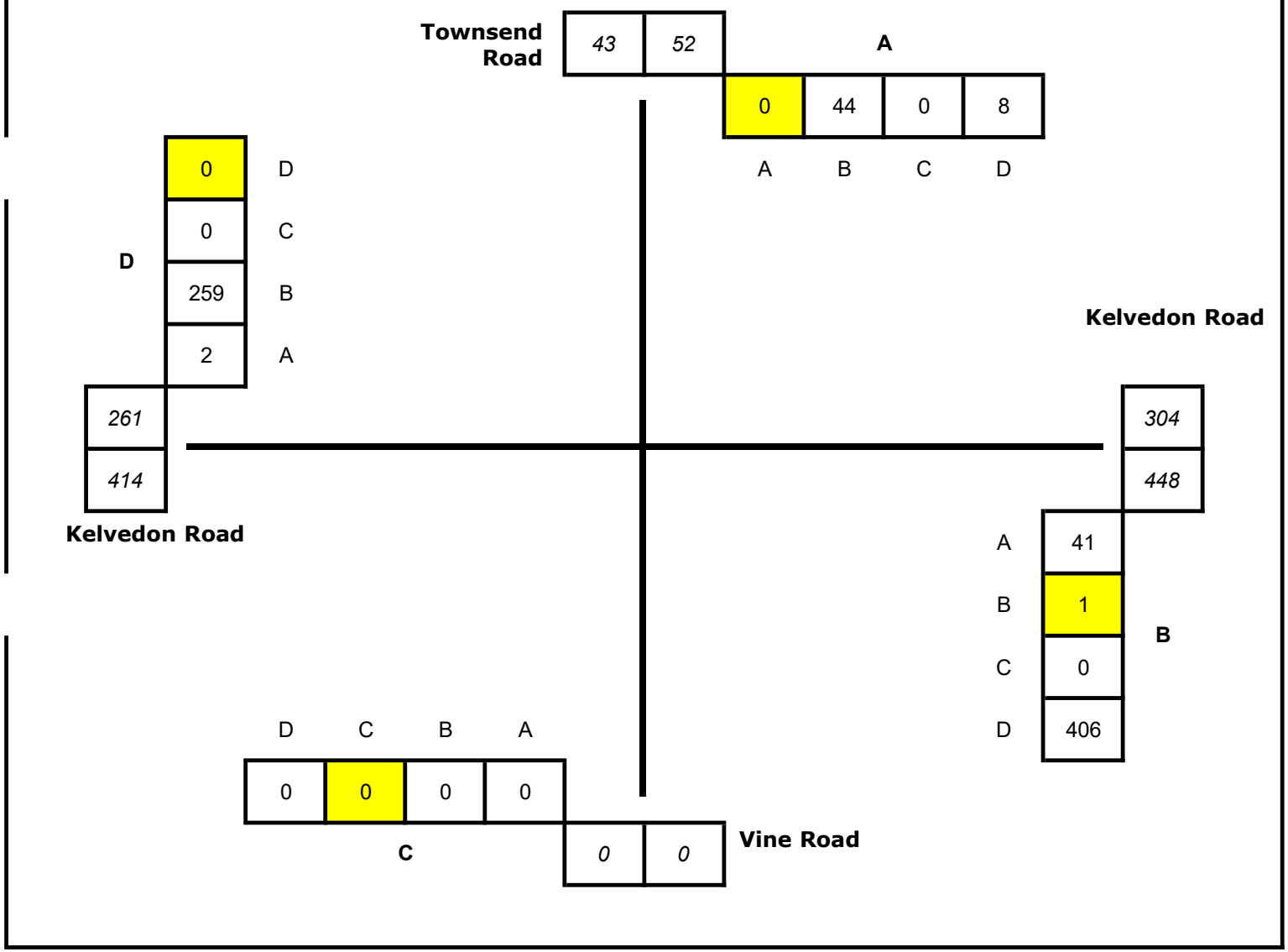
| | | |
|---|---|---|
| **Advanced Transport Research** | *Job Number & Name:* | **20319 Tiptree, Essex** |
| **Site 1 - Kelvedon Road/ Oak Road** | *Client:* | **Journey TP** |
| **Flow Diagram** | *Date:* | **Thursday 24 Jan 2019** |

*Select Period* **1700 Hourly Total**



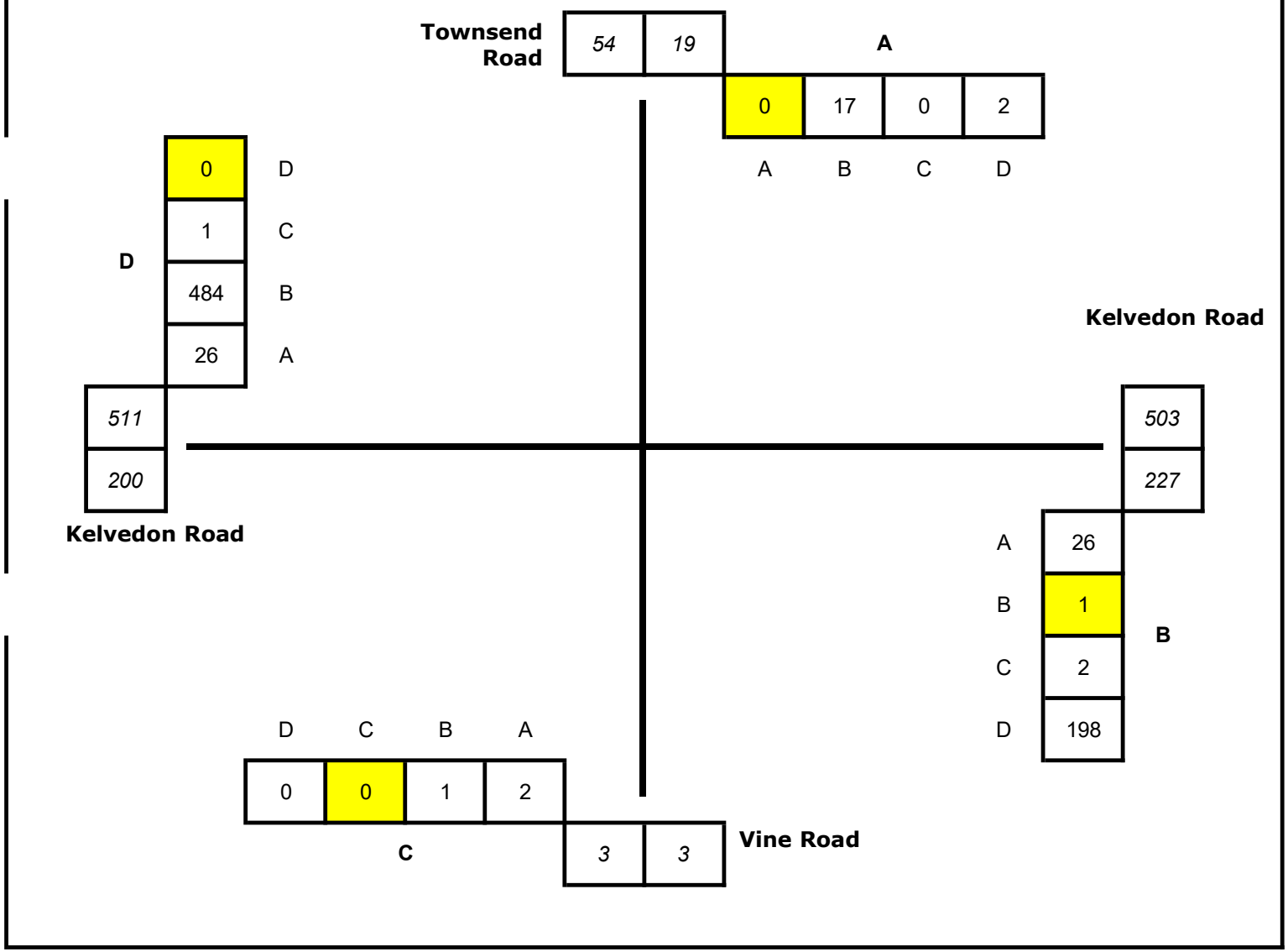
| Advanced Transport Research | Job Number & Name: | 20319 Tiptree, Essex |
|---|---|---|
| Site 2 - Kelvedon Road/ Vine Road/Townsend Road | Client: | Journey TP |
| Flow Diagram | Date: | Thursday 24 Jan 2019 |

*Select Period* **0800 Hourly Total**



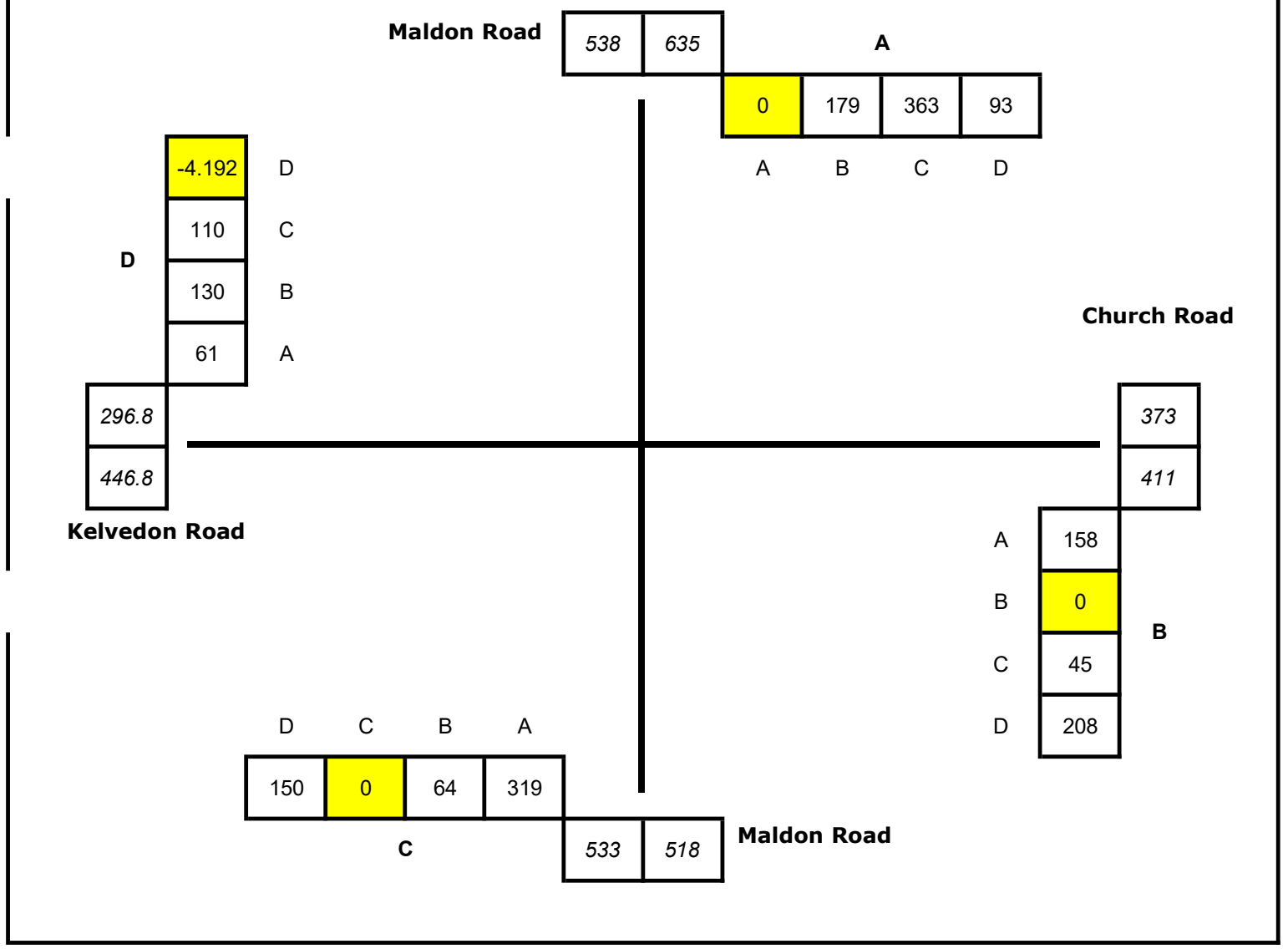
| | | |
|---|---|---|
| **Advanced Transport Research** | *Job Number & Name:* | **20319 Tiptree, Essex** |
| **Site 2 - Kelvedon Road/ Vine Road/Townsend Road** | *Client:* | **Journey TP** |
| **Flow Diagram** | *Date:* | **Thursday 24 Jan 2019** |

*Select Period* **1700 Hourly Total**

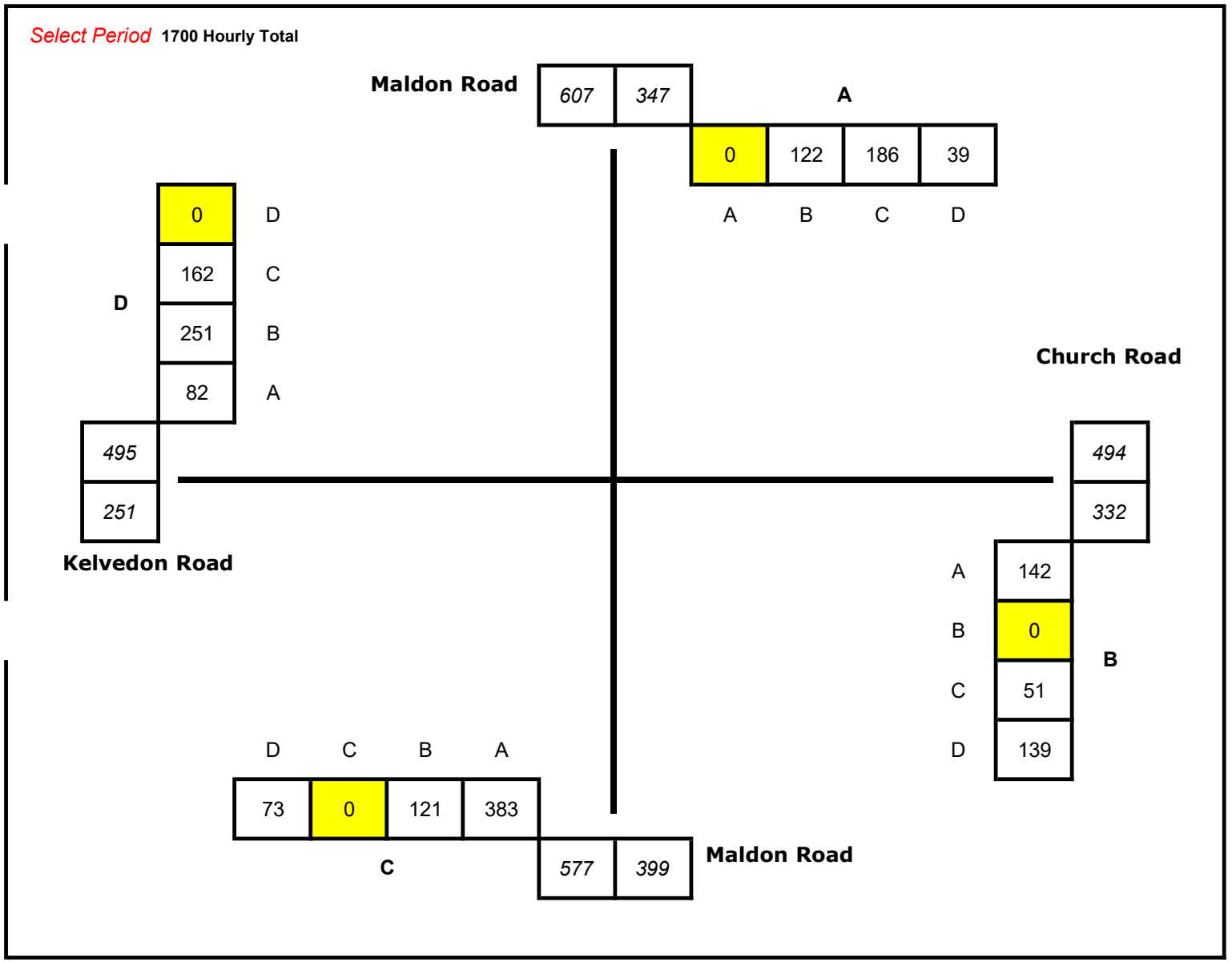


| Advanced Transport Research | Job Number & Name: | 20319 Tiptree, Essex |
|---|---|---|
| Site 3 - Maldon Road/ Kelvedon Road | Client: | Journey TP |
| Flow Diagram | Date: | Thursday 24 Jan 2019 |

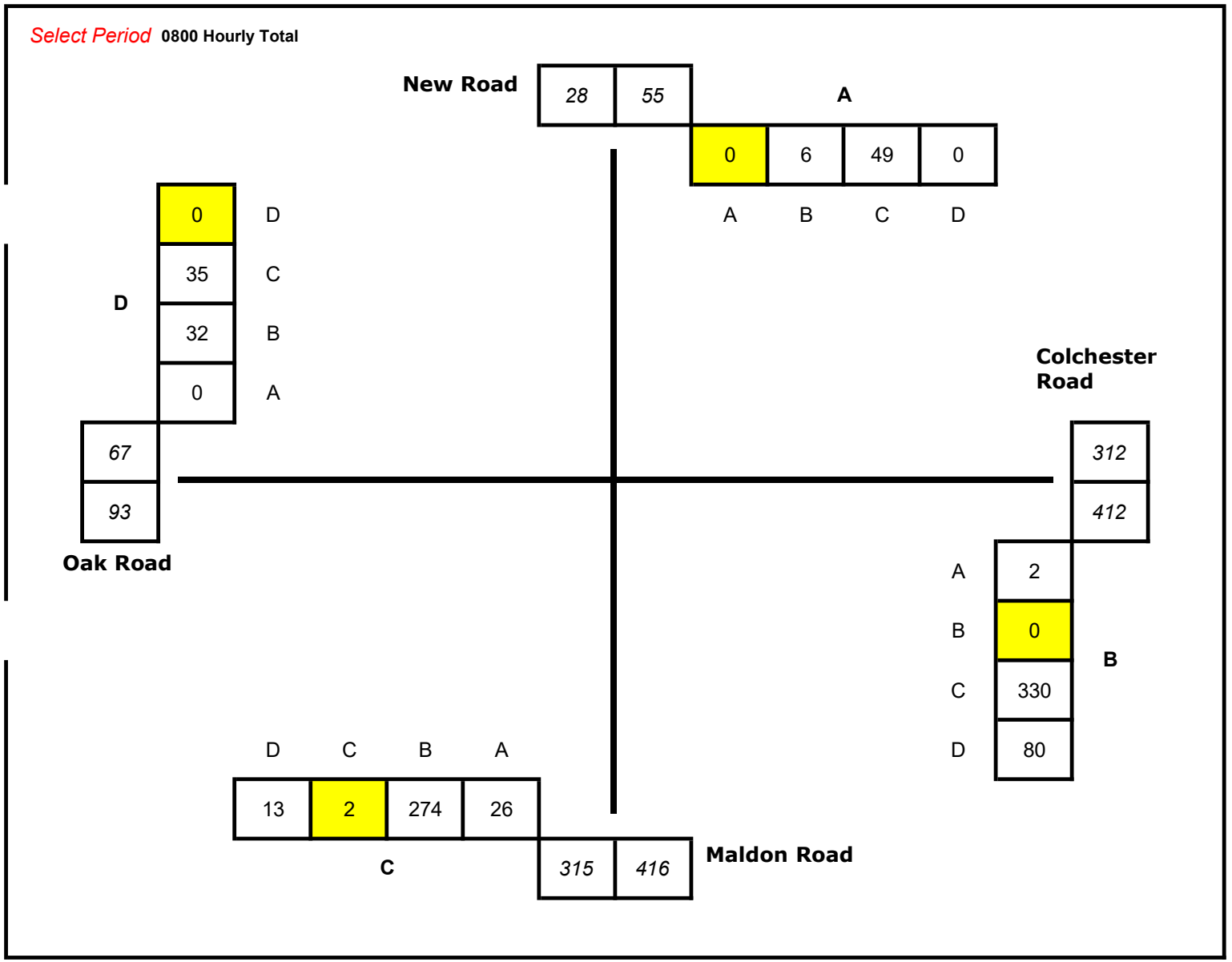
*Select Period* **0800 Hourly Total**



| 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 |

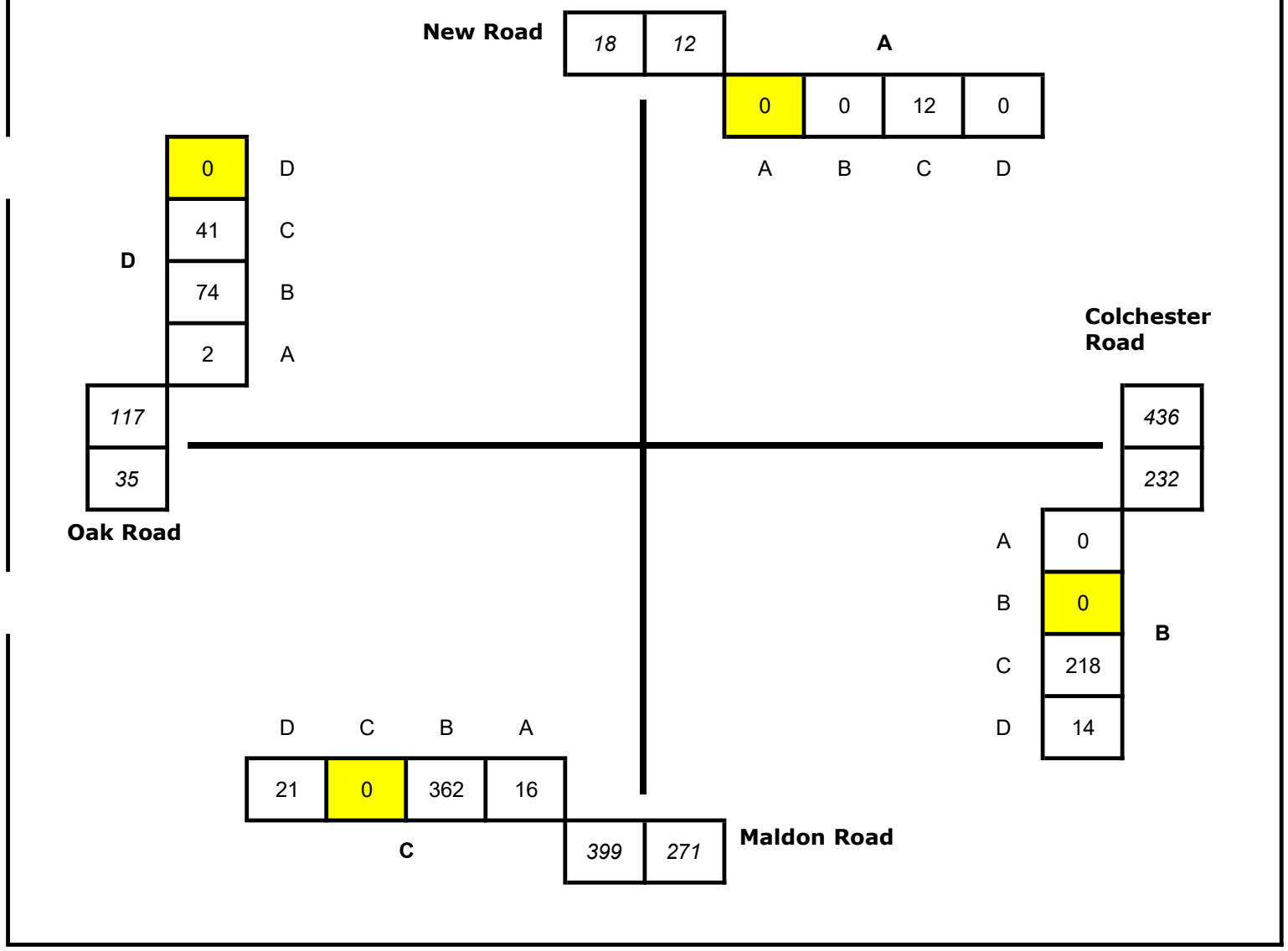


| Advanced Transport Research | Job Number & Name: | 20319 Tiptree, Essex |
|---|---|---|
| Site 4 - Colchester Road/ Oak Road/ Maldon Road | Client: | Journey TP |
| Flow Diagram | Date: | Thursday 24 Jan 2019 |



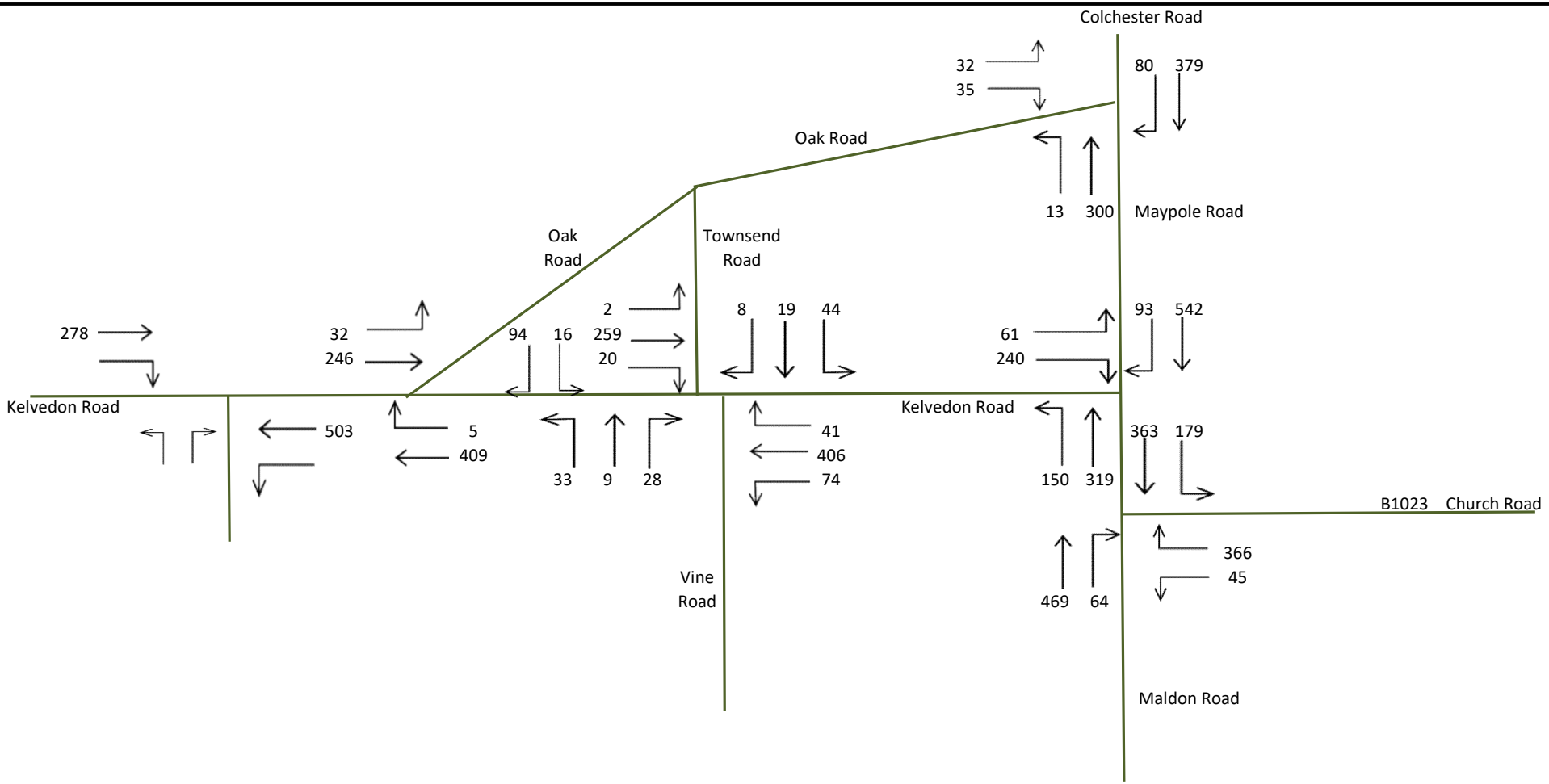
| Advanced Transport Research | Job Number & Name: | 20319 Tiptree, Essex |
|---|---|---|
| Site 4 - Colchester Road/ Oak Road/ Maldon Road | Client: | Journey TP |
| Flow Diagram | Date: | Thursday 24 Jan 2019 |

*Select Period* **1700 Hourly Total**

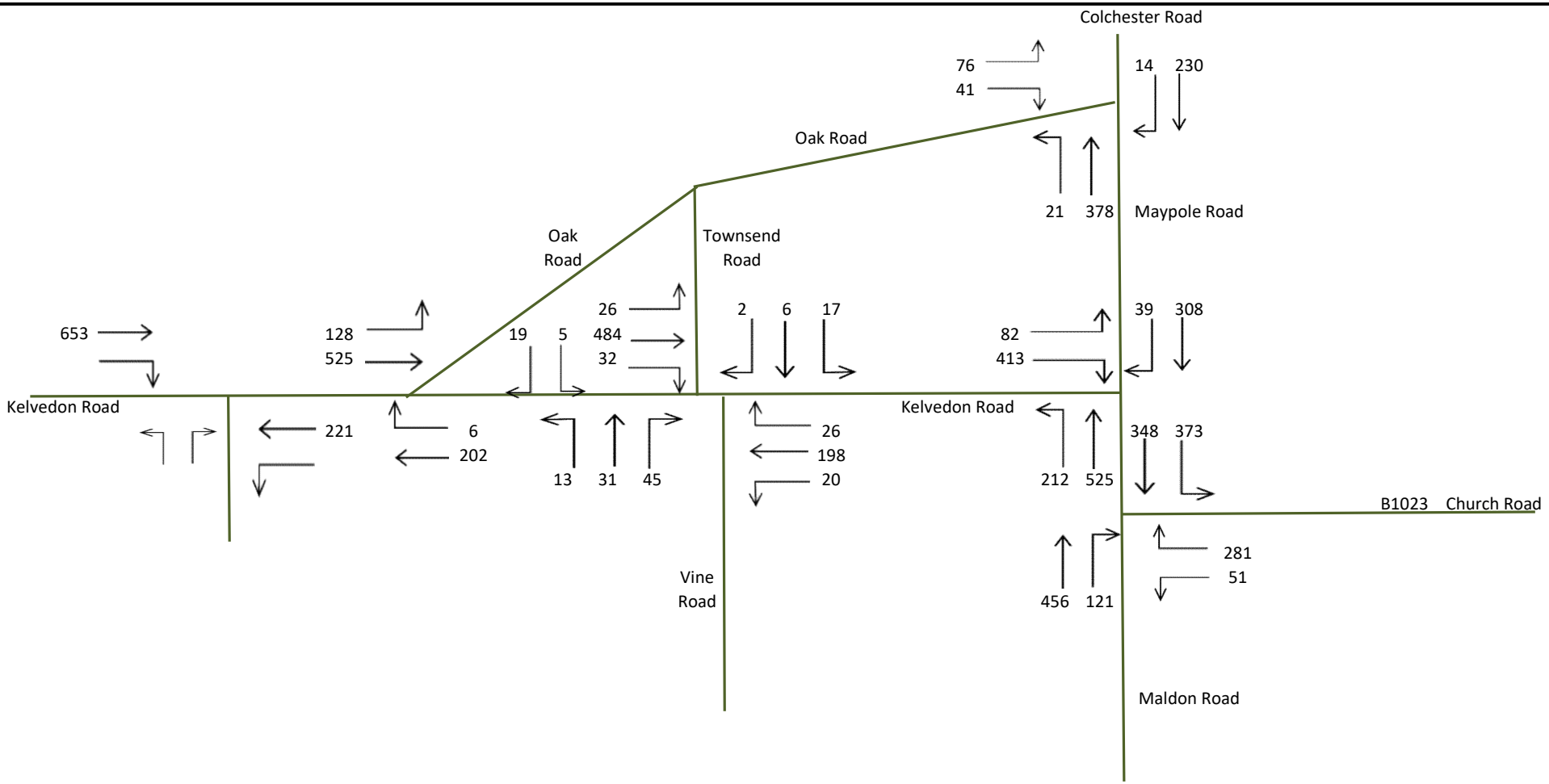


# Appendix 8

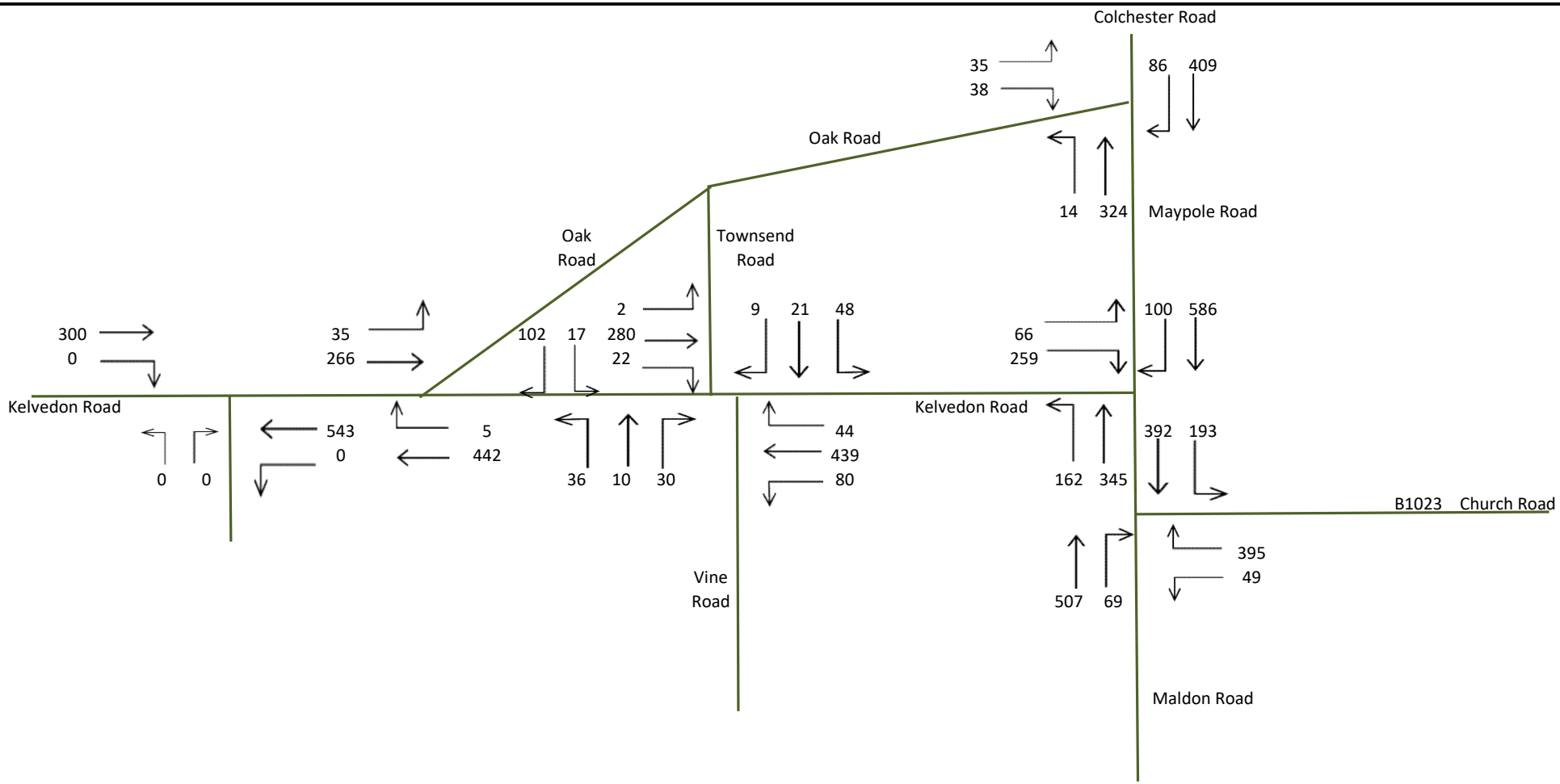
# Network Flows




| | | | | |
|---|---|---|---|---|
| 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 | |



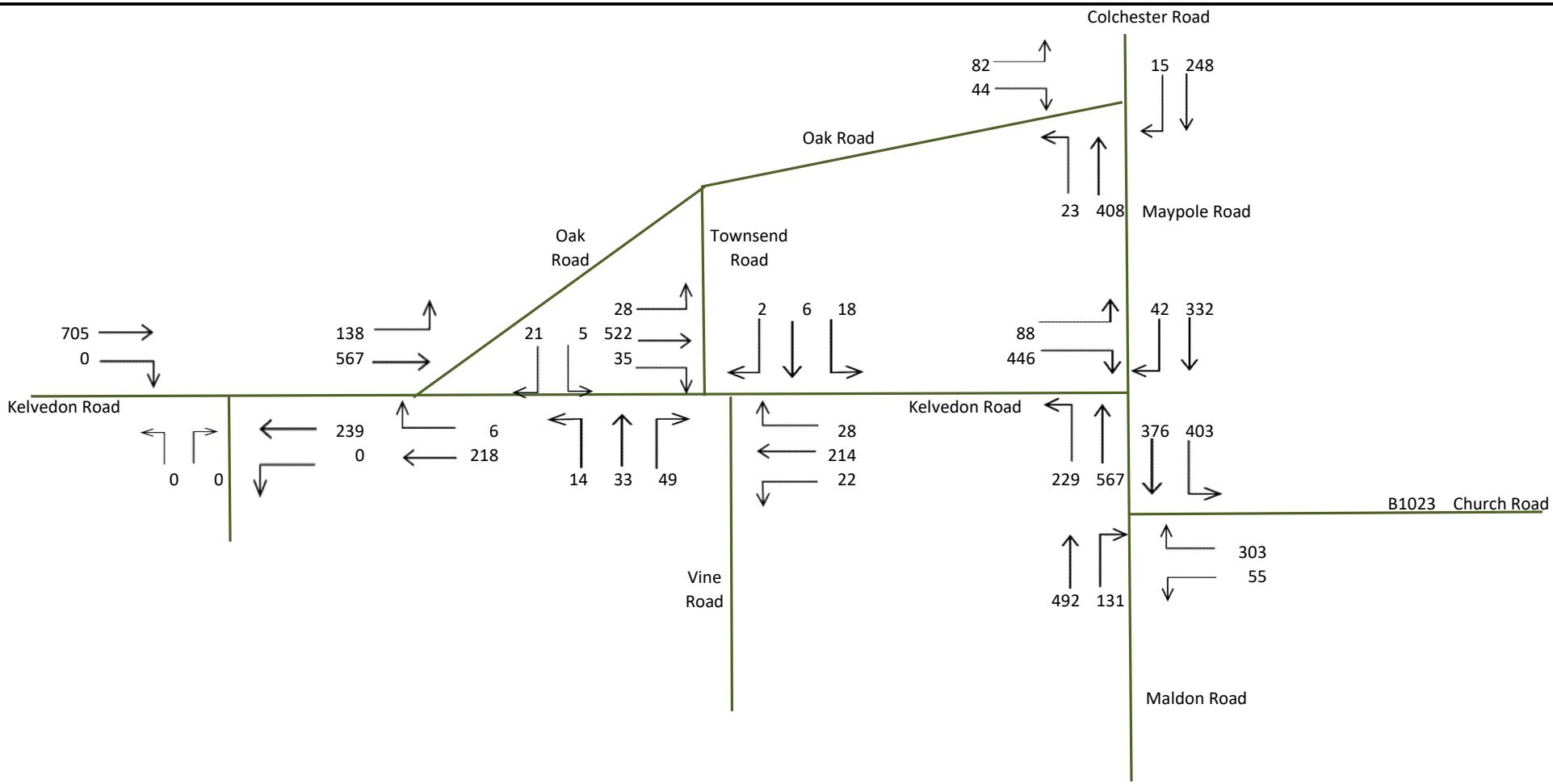

| | | | | |
|---|---|---|---|---|
| Drawing Title | **PM Peak 17:00-18:00 2019 Surveyed Flows** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 2 | |




| Level | Area | Local Growth Figure | |
|---|---|---|---|
| E02004525 | | Colchester 020 | 1.080 |

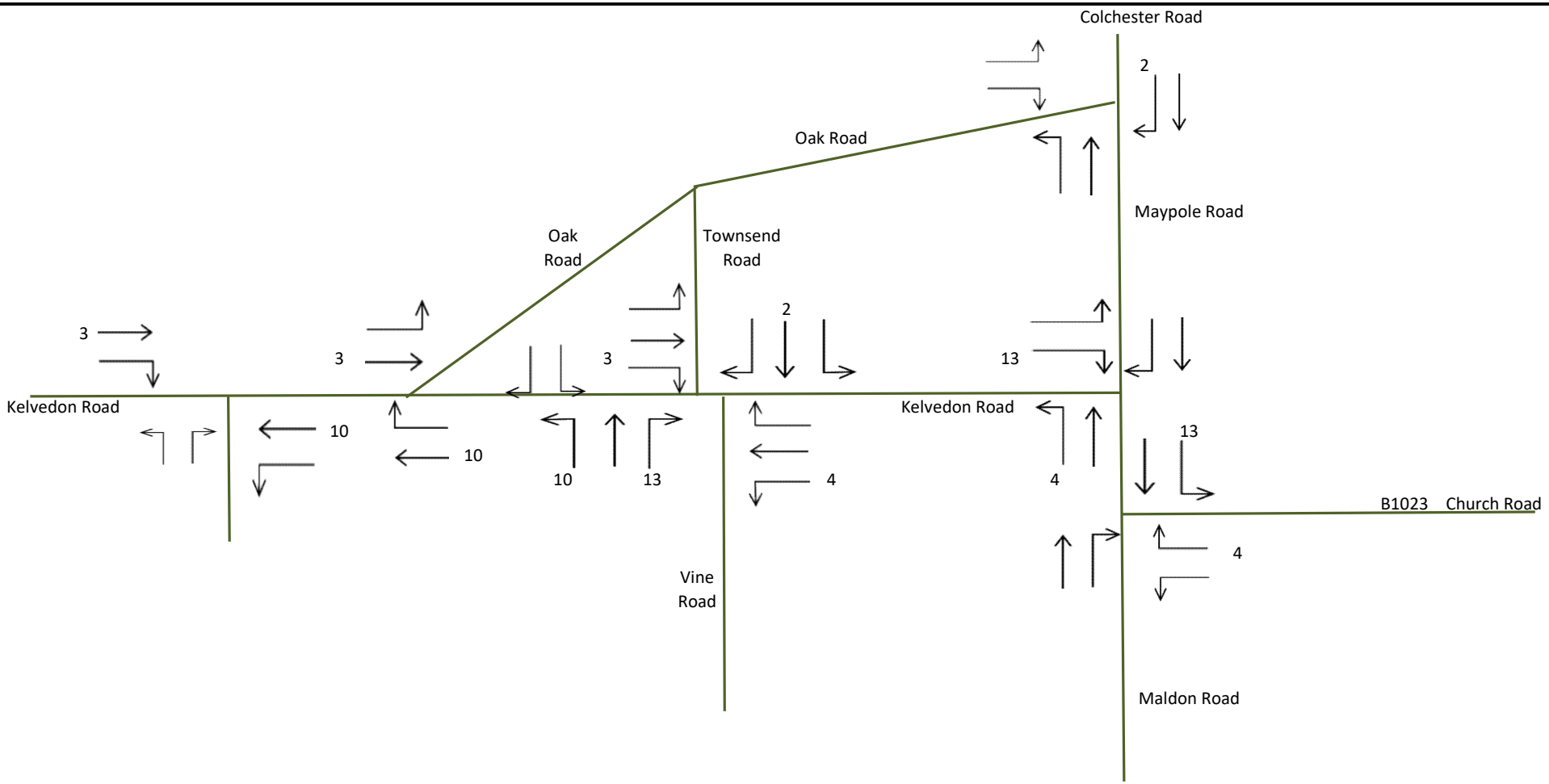
| | | | |
|---|---|---|---|
| Drawing Title | **AM Peak 08:00-09:00 2025 Forecast Flows** | Drawn | SAA |
| | | Date | 02/01/2019 |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 3 |

Journey transport planning

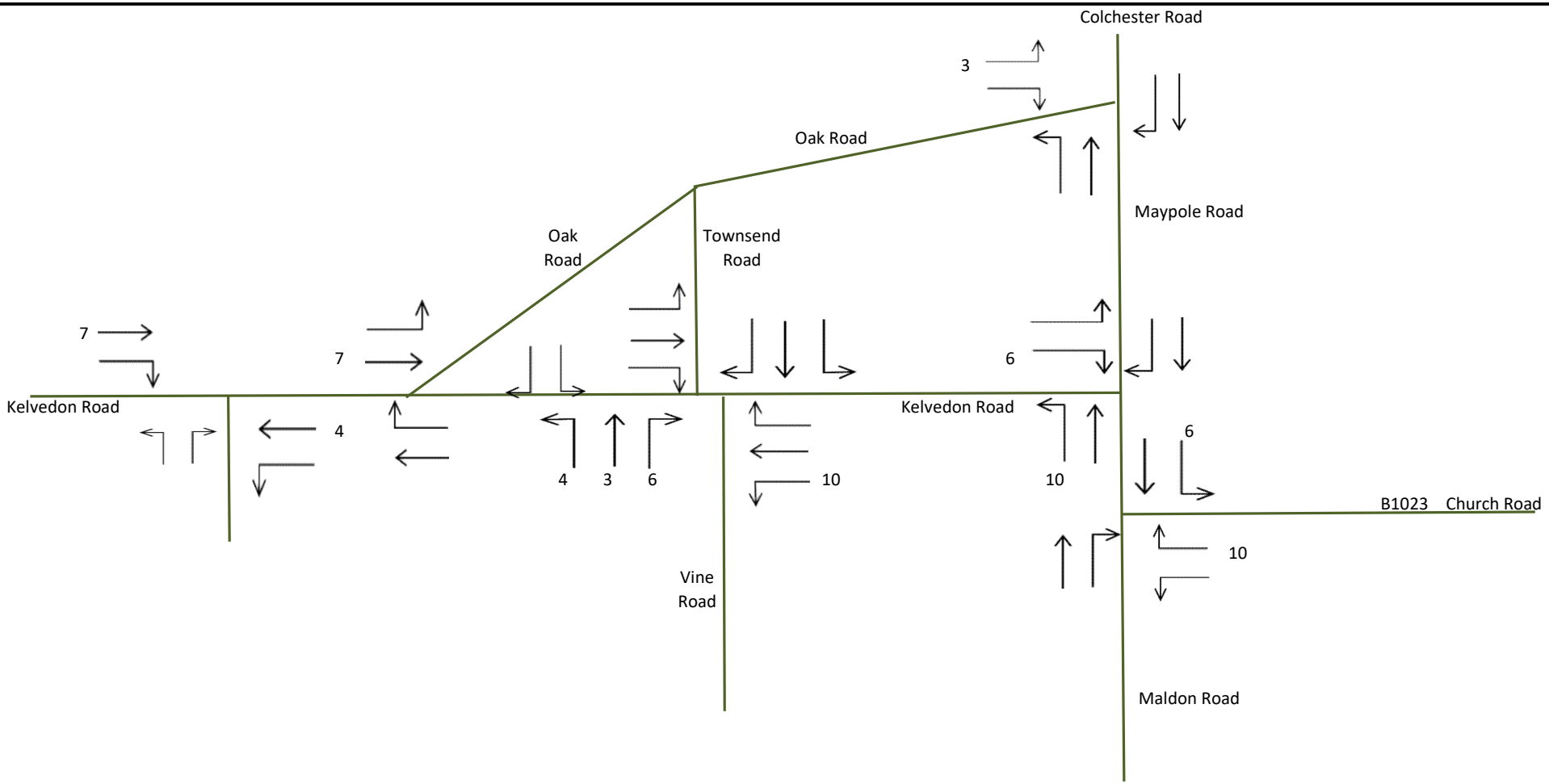



| Level | Area | Local Growth Figure |
|---|---|---|
| E02004525 | Colchester 020 | 1.079 |

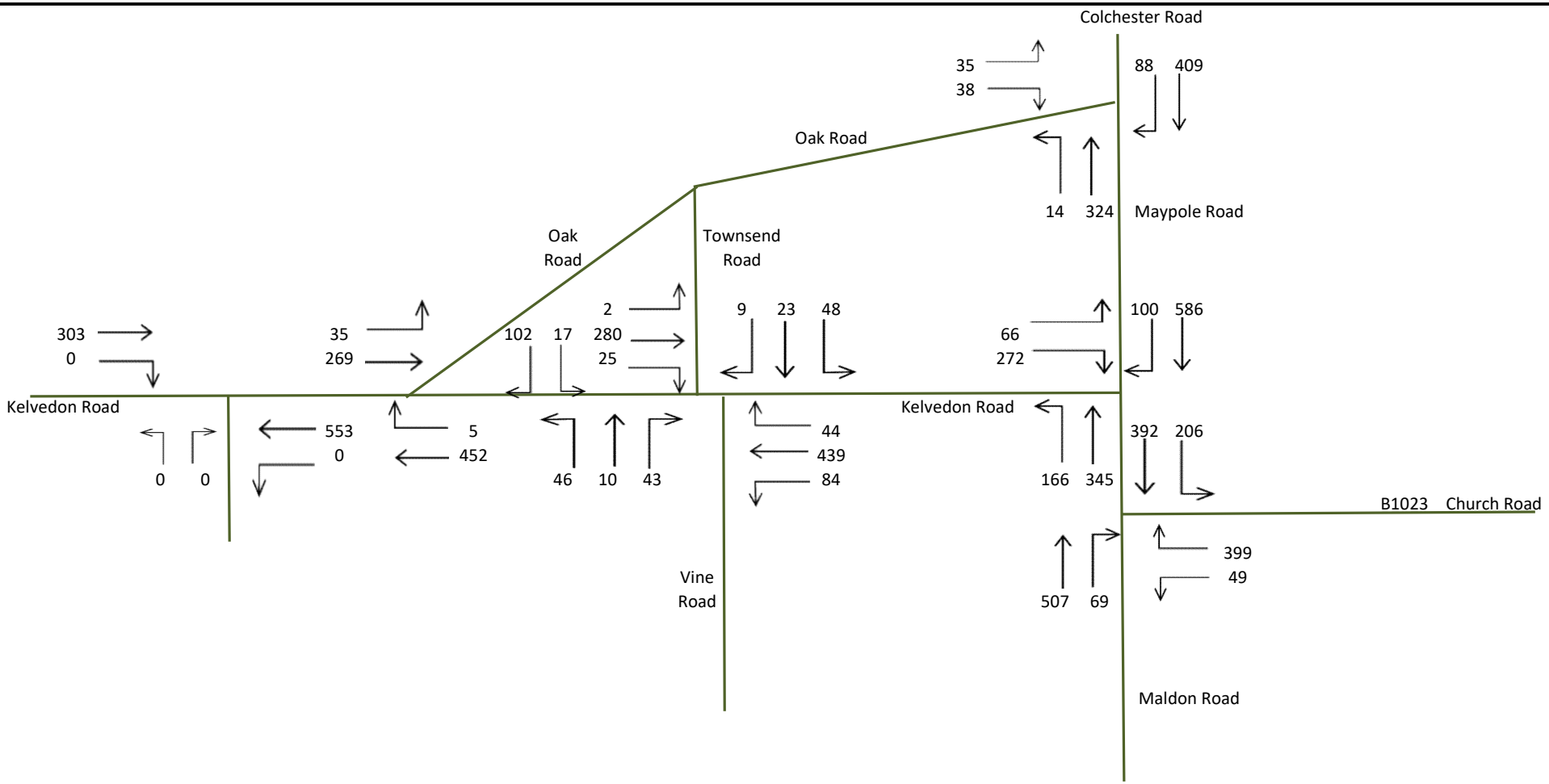
| | | | | |
|---|---|---|---|---|
| Drawing Title | **PM Peak 17:00-18:00 2025 Forecast Flows** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figur 4 | |



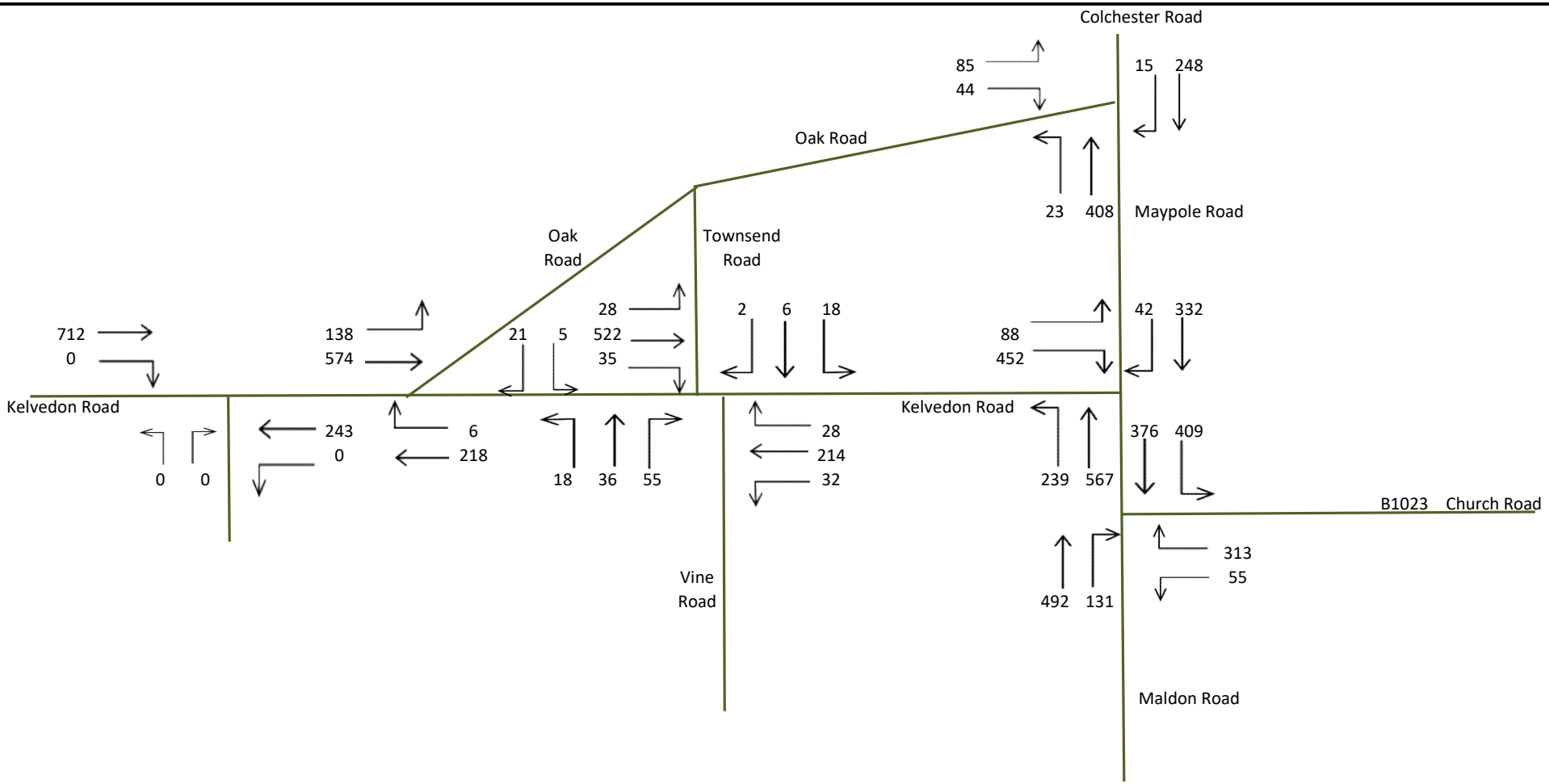

| | | | | |
|---|---|---|---|---|
| Drawing Title | **AM Peak 08:00-09:00 Committed Development** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 5 | |



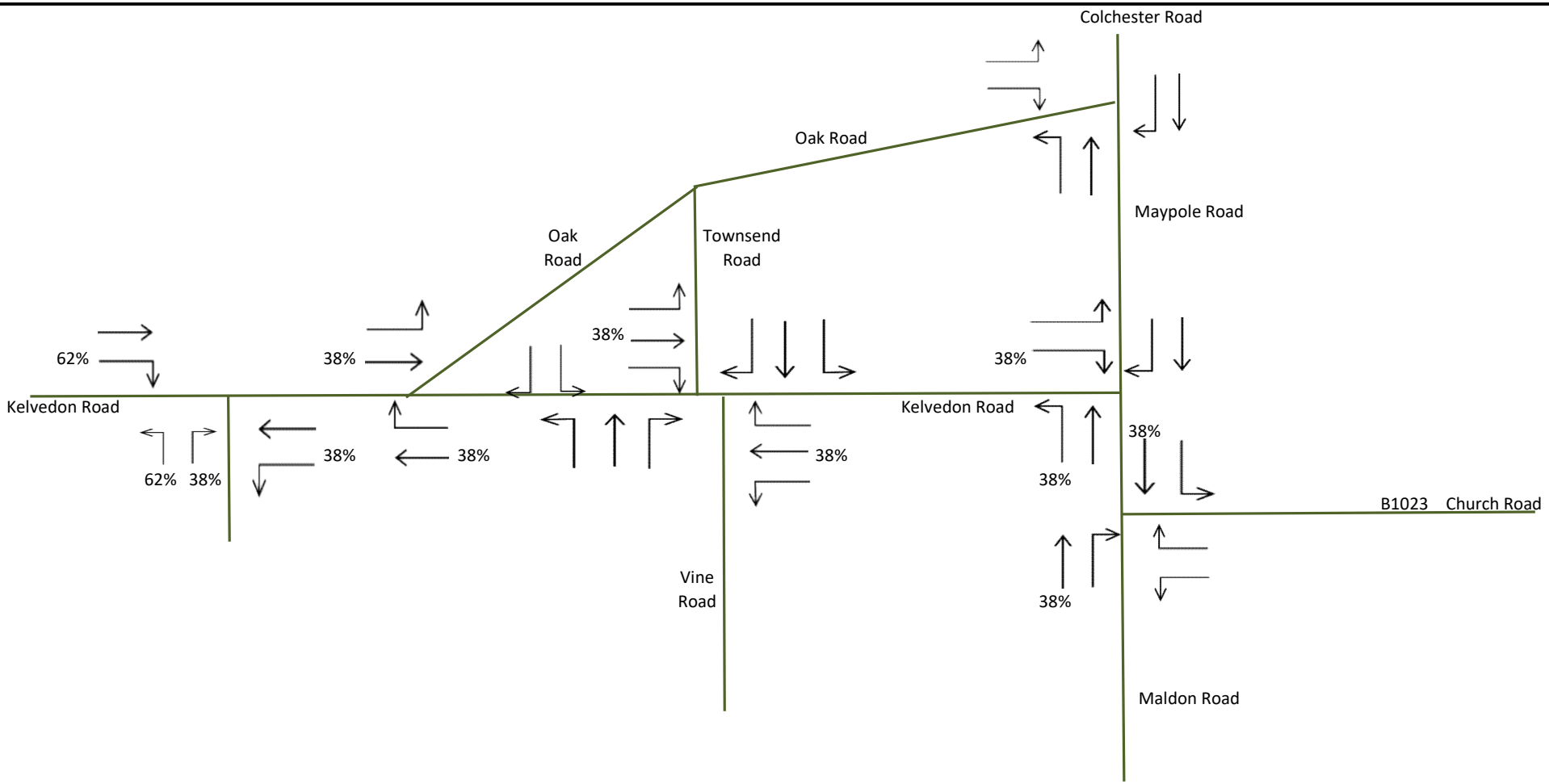

| | | | | |
|---|---|---|---|---|
| Drawing Title | **PM Peak 17:00-18:00 Committed Development** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 6 | |



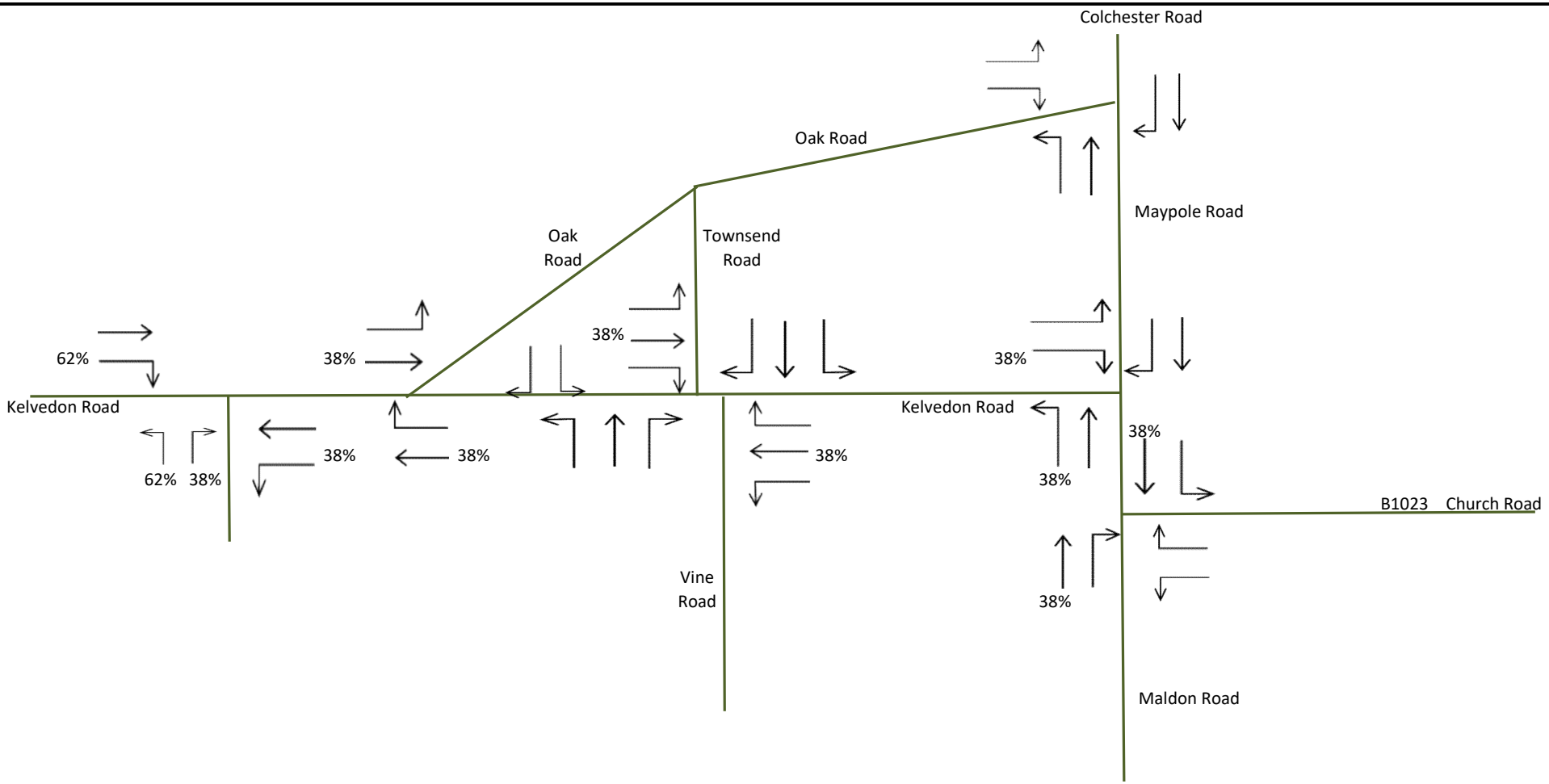

| | | | | |
|---|---|---|---|---|
| Drawing Title | **AM Peak 08:00-09:00 2025 Base Flows** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 7 | |



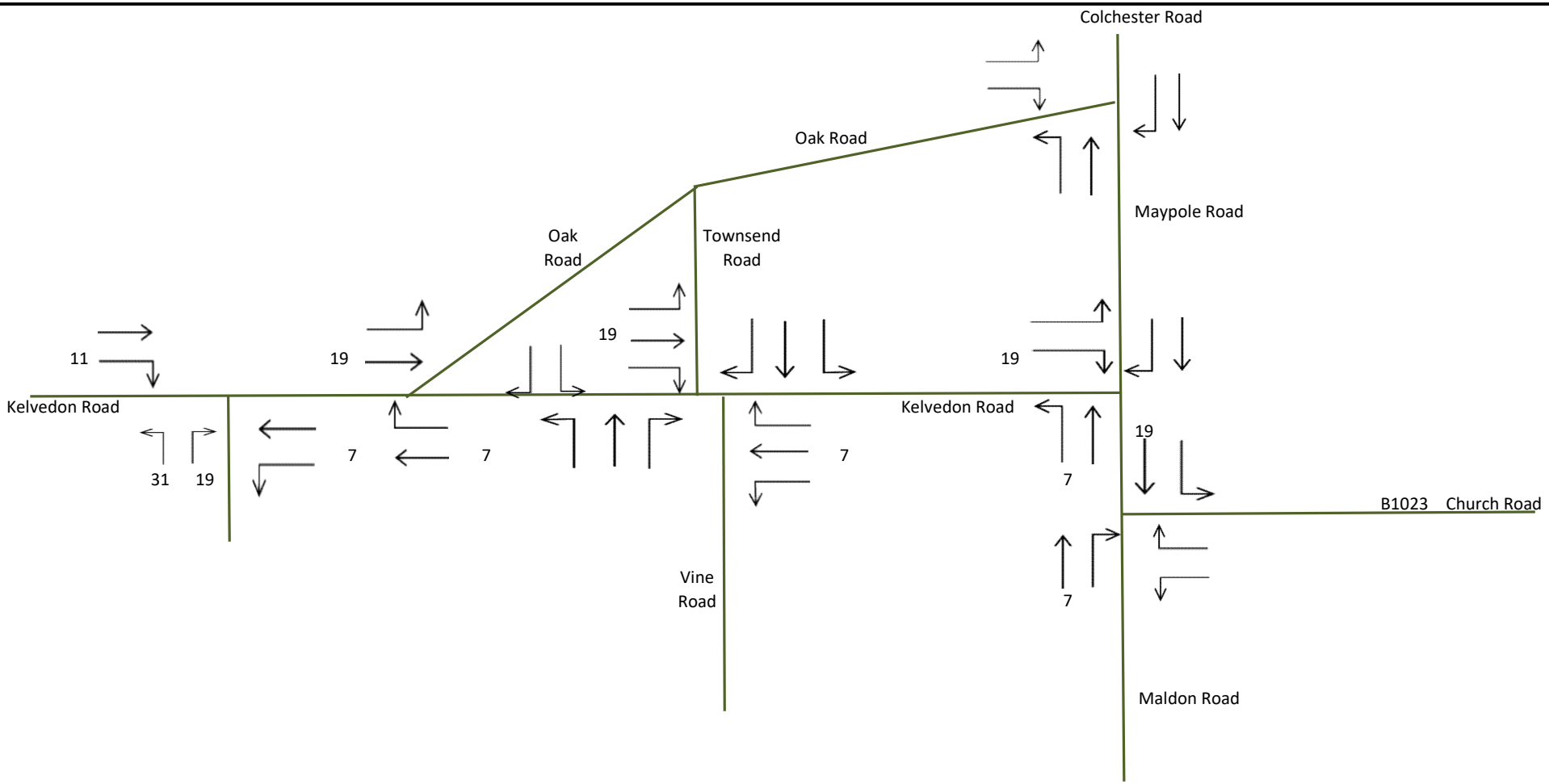

| | | | | |
|---|---|---|---|---|
| Drawing Title | **PM Peak 17:00-18:00 2025 Base Flows** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 8 | |




| | | | | |
|---|---|---|---|---|
| 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 | |



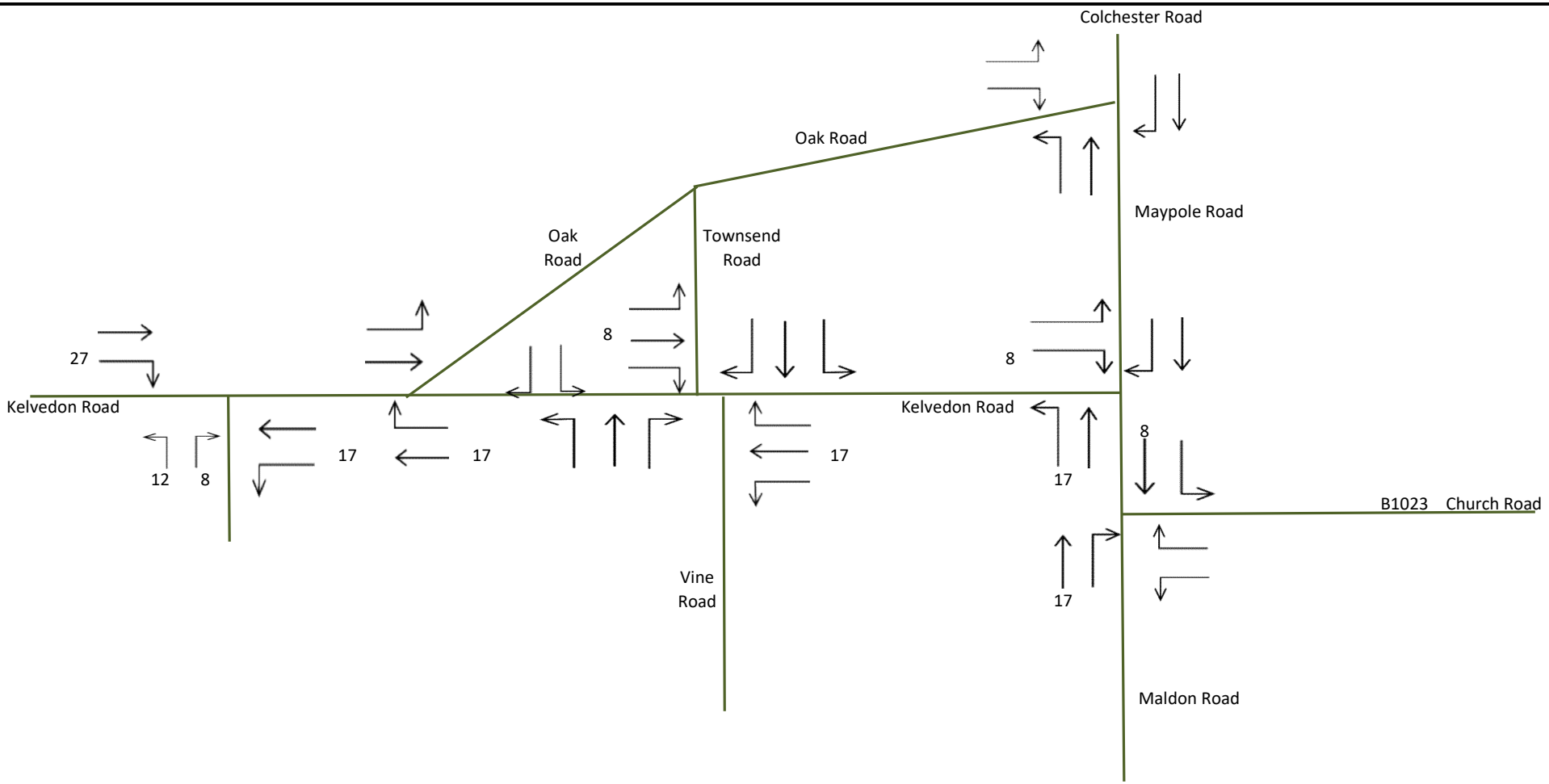

| | | | | |
|---|---|---|---|---|
| Drawing Title | **PM Peak 17:00-18:00 Residential Trip Distribution** | Drawn | SAA | Journey transport planning |
| | | Date | 02/01/2019 | |
| Project Title | Land to the South of Kelvedon Road, Tiptree | Ref | Figure 10 | |




| | |
|---|---|
| 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 |

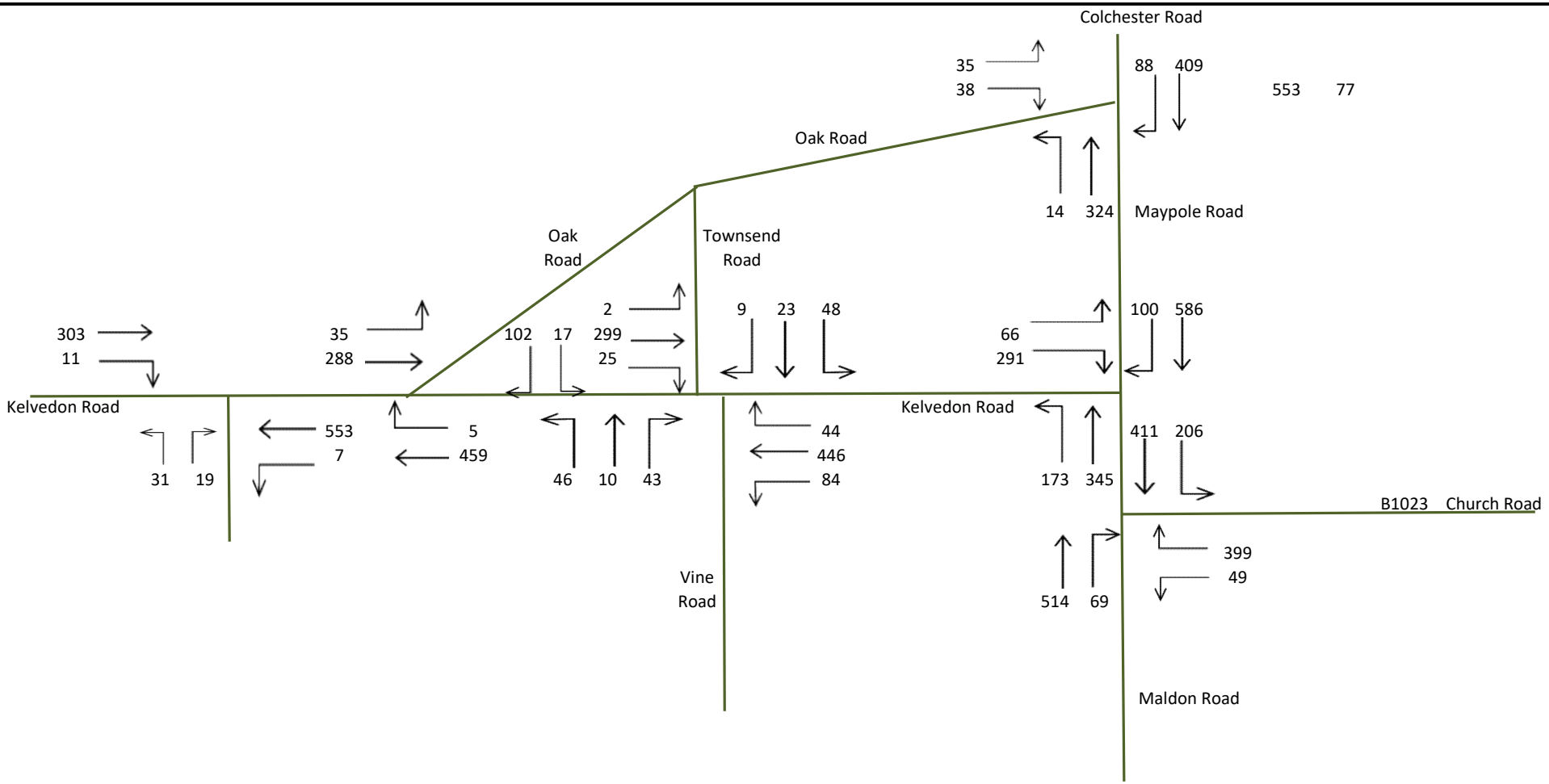
Journey transport planning



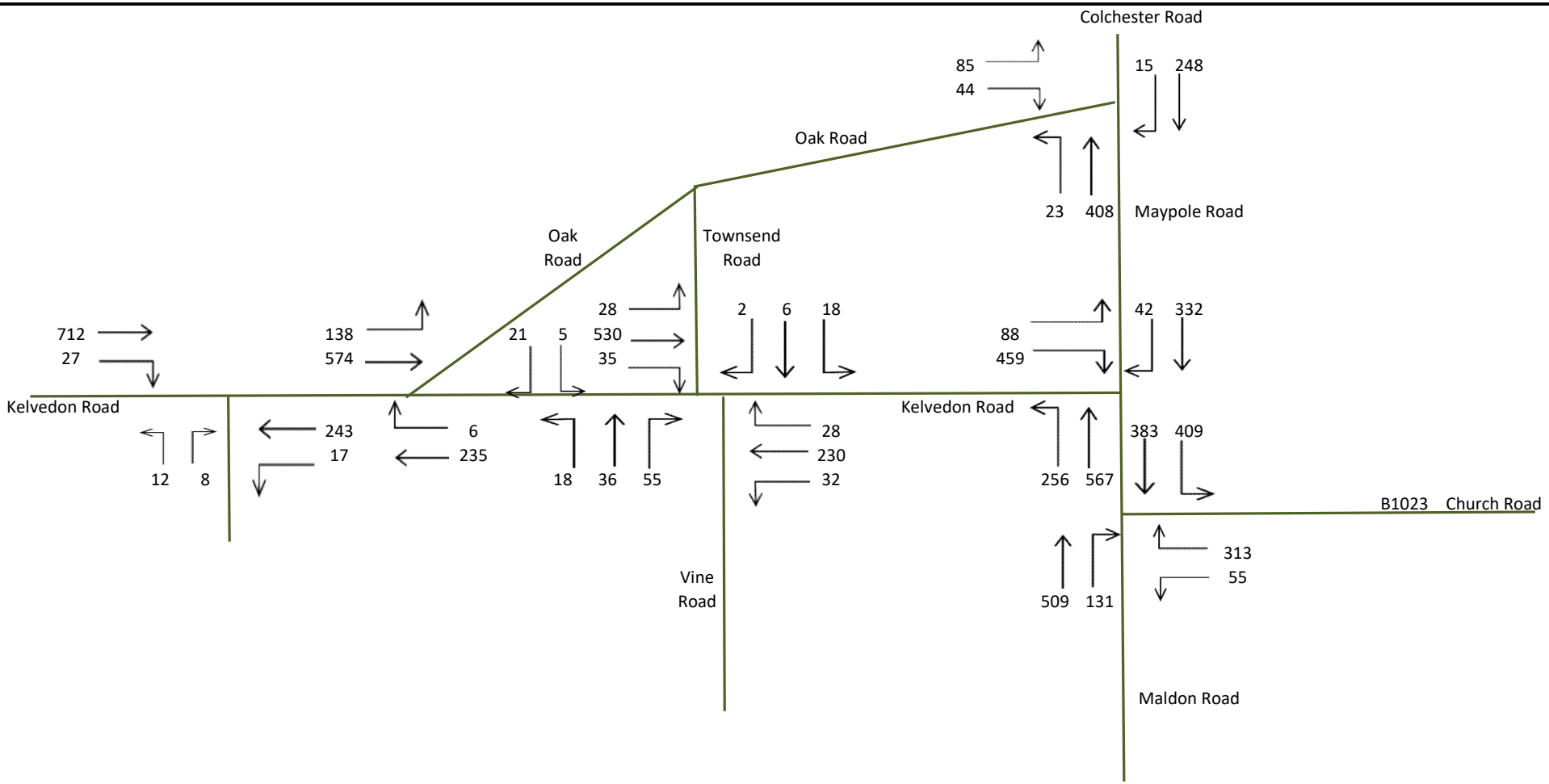

| | |
|---|---|
| Arrivals | 44 |
| Departures | 20 |

| | | | |
|---|---|---|---|
| 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 |

Journey transport planning




| | | | | |
|---|---|---|---|---|
| Drawing Title | **AM Peak 08:00-09:00 2025 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 2025 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

## ARCADY 9 - Roundabout Module



**Filename:** Site Access.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:** 05/11/2020 17:21:25

---



### 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 |
| | 2025 Total Development | | | | | | | | | | | |
| Arm 1 | D1 | 2.4 | 14.30 | 0.69 | B | 28 % | D2 | 0.5 | 6.64 | 0.32 | A | 7 % |
| Arm 2 | | 0.2 | 11.05 | 0.13 | B | [Arm 1] | | 0.0 | 6.61 | 0.04 | A | [Arm 3] |
| Arm 3 | | 0.6 | 6.37 | 0.36 | A | | | 5.2 | 23.90 | 0.83 | C | |

*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. 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 | 2025 Total Development | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D2 | 2025 Total 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 |

# 2025 Total Development, AM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Mini-roundabout | | Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 94% of the total flow for the roundabout for one or more time segments] |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | untitled | Mini-roundabout | | 1, 2, 3 | 11.43 | B |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 28 | Arm 1 |

## Arms

### Arms

| Arm | Name | Description |
|---|---|---|
| 1 | Kelvedon Road South East | |
| 2 | Site Access | |
| 3 | Kelvedon Road North West | |

### 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 | 4.70 | 1.0 | 12.00 | 7.00 | 0.0 | |
| 2 | 3.00 | 3.00 | 5.20 | 2.0 | 11.00 | 7.00 | 0.0 | |
| 3 | 3.00 | 3.00 | 4.50 | 2.0 | 18.00 | 16.00 | 0.0 | |

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

| Arm | Final slope | Final intercept (PCU/hr) |
|---|---|---|
| 1 | 0.600 | 900 |
| 2 | 0.609 | 784 |
| 3 | 0.648 | 981 |

*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 | 2025 Total 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 | ✓ | 560 | 100.000 |
| 2 | | ONE HOUR | ✓ | 50 | 100.000 |
| 3 | | ONE HOUR | ✓ | 314 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 7 | 553 |
| | 2 | 19 | 0 | 31 |
| | 3 | 303 | 11 | 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 | 0.69 | 14.30 | 2.4 | B | 514 | 771 |
| 2 | 0.13 | 11.05 | 0.2 | B | 46 | 69 |
| 3 | 0.36 | 6.37 | 0.6 | A | 288 | 432 |

### 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 | 422 | 105 | 8 | 895 | 0.471 | 418 | 241 | 0.0 | 1.0 | 8.231 | A |
| 2 | 38 | 9 | 413 | 533 | 0.071 | 37 | 13 | 0.0 | 0.1 | 7.989 | A |
| 3 | 236 | 59 | 14 | 972 | 0.243 | 235 | 436 | 0.0 | 0.4 | 5.365 | 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 | 503 | 126 | 10 | 894 | 0.563 | 502 | 289 | 1.0 | 1.4 | 10.047 | B |
| 2 | 45 | 11 | 495 | 482 | 0.093 | 45 | 16 | 0.1 | 0.1 | 9.052 | A |
| 3 | 282 | 71 | 17 | 970 | 0.291 | 282 | 523 | 0.4 | 0.4 | 5.753 | A |

### 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 | 617 | 154 | 12 | 893 | 0.691 | 613 | 354 | 1.4 | 2.3 | 13.942 | B |
| 2 | 55 | 14 | 605 | 415 | 0.133 | 55 | 20 | 0.1 | 0.2 | 10.973 | B |
| 3 | 346 | 86 | 21 | 967 | 0.357 | 345 | 639 | 0.4 | 0.6 | 6.355 | A |

### 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 | 617 | 154 | 12 | 893 | 0.691 | 616 | 355 | 2.3 | 2.4 | 14.296 | B |
| 2 | 55 | 14 | 609 | 413 | 0.133 | 55 | 20 | 0.2 | 0.2 | 11.053 | B |
| 3 | 346 | 86 | 21 | 967 | 0.357 | 346 | 643 | 0.6 | 0.6 | 6.368 | A |

### 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 | 503 | 126 | 10 | 894 | 0.563 | 507 | 290 | 2.4 | 1.5 | 10.332 | B |
| 2 | 45 | 11 | 501 | 479 | 0.094 | 45 | 16 | 0.2 | 0.1 | 9.135 | A |
| 3 | 282 | 71 | 17 | 970 | 0.291 | 283 | 529 | 0.6 | 0.5 | 5.771 | A |

### 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 | 422 | 105 | 8 | 895 | 0.471 | 423 | 243 | 1.5 | 1.0 | 8.429 | A |
| 2 | 38 | 9 | 418 | 529 | 0.071 | 38 | 14 | 0.1 | 0.1 | 8.059 | A |
| 3 | 236 | 59 | 14 | 972 | 0.243 | 237 | 442 | 0.5 | 0.4 | 5.393 | A |

# 2025 Total Development, PM

### Data Errors and Warnings

| Severity | Area | Item | Description |
|---|---|---|---|
| Warning | Mini-roundabout | | Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 98% of the total flow for the roundabout for one or more time segments] |

## Junction Network

### Junctions

| Junction | Name | Junction type | Use circulating lanes | Arm order | Junction Delay (s) | Junction LOS |
|---|---|---|---|---|---|---|
| 1 | untitled | Mini-roundabout | | 1, 2, 3 | 19.16 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 7 | 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 |
|---|---|---|---|---|---|---|---|
| D2 | 2025 Total 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 | ✓ | 260 | 100.000 |
| 2 | | ONE HOUR | ✓ | 20 | 100.000 |
| 3 | | ONE HOUR | ✓ | 739 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 17 | 243 |
| | 2 | 8 | 0 | 12 |
| | 3 | 712 | 27 | 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 | 0.32 | 6.64 | 0.5 | A | 239 | 358 |
| 2 | 0.04 | 6.61 | 0.0 | A | 18 | 28 |
| 3 | 0.83 | 23.90 | 5.2 | C | 678 | 1017 |

## 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 | 196 | 49 | 20 | 888 | 0.220 | 195 | 537 | 0.0 | 0.3 | 5.699 | A |
| 2 | 15 | 4 | 182 | 673 | 0.022 | 15 | 33 | 0.0 | 0.0 | 6.015 | A |
| 3 | 556 | 139 | 6 | 977 | 0.569 | 551 | 191 | 0.0 | 1.4 | 9.170 | 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 | 234 | 58 | 24 | 886 | 0.264 | 233 | 644 | 0.3 | 0.4 | 6.069 | A |
| 2 | 18 | 4 | 218 | 651 | 0.028 | 18 | 39 | 0.0 | 0.0 | 6.254 | A |
| 3 | 664 | 166 | 7 | 976 | 0.680 | 661 | 229 | 1.4 | 2.3 | 12.422 | 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 | 286 | 72 | 29 | 882 | 0.324 | 286 | 783 | 0.4 | 0.5 | 6.631 | A |
| 2 | 22 | 6 | 267 | 621 | 0.035 | 22 | 48 | 0.0 | 0.0 | 6.607 | A |
| 3 | 814 | 203 | 9 | 975 | 0.834 | 803 | 280 | 2.3 | 4.9 | 21.760 | 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 | 286 | 72 | 30 | 882 | 0.324 | 286 | 792 | 0.5 | 0.5 | 6.643 | A |
| 2 | 22 | 6 | 268 | 621 | 0.035 | 22 | 48 | 0.0 | 0.0 | 6.610 | A |
| 3 | 814 | 203 | 9 | 975 | 0.834 | 812 | 281 | 4.9 | 5.2 | 23.897 | 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 | 234 | 58 | 25 | 885 | 0.264 | 234 | 658 | 0.5 | 0.4 | 6.089 | A |
| 2 | 18 | 4 | 219 | 651 | 0.028 | 18 | 40 | 0.0 | 0.0 | 6.261 | A |
| 3 | 664 | 166 | 7 | 976 | 0.680 | 675 | 230 | 5.2 | 2.4 | 13.589 | 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 | 196 | 49 | 20 | 888 | 0.220 | 196 | 546 | 0.4 | 0.3 | 5.729 | A |
| 2 | 15 | 4 | 183 | 672 | 0.022 | 15 | 33 | 0.0 | 0.0 | 6.024 | A |
| 3 | 556 | 139 | 6 | 977 | 0.569 | 560 | 192 | 2.4 | 1.5 | 9.583 | A |

# Junctions 9

## PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462


For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk



**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:** 05/11/2020 17:17:21



### 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 |
| | 2025 With Development | | | | | | | | | | | |
| Stream B-AC | D1 | 0.3 | 12.45 | 0.20 | B | 78 % | D2 | 0.5 | 12.95 | 0.32 | B | 69 % |
| Stream C-AB | | 0.3 | 8.31 | 0.20 | A | [Stream B-AC] | | 0.0 | 8.52 | 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 | 2025 With Development | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D2 | 2025 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 |

# 2025 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 | | 1.93 | A |

### Junction Network Options

| Driving side | Lighting | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|
| Left | Normal/unknown | 78 | 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 | 2025 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 | ✓ | 338 | 100.000 |
| B | | ONE HOUR | ✓ | 73 | 100.000 |
| C | | ONE HOUR | ✓ | 497 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | A | B | C |
| From | A | 0 | 14 | 324 |
| | B | 38 | 0 | 35 |
| | C | 409 | 88 | 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 | 0.20 | 12.45 | 0.3 | B | 67 | 100 |
| C-AB | 0.20 | 8.31 | 0.3 | A | 93 | 140 |
| C-A | | | | | 363 | 544 |
| A-B | | | | | 13 | 19 |
| A-C | | | | | 297 | 446 |

### 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 | 55 | 14 | 451 | 0.122 | 54 | 0.0 | 0.2 | 9.969 | A |
| C-AB | 72 | 18 | 565 | 0.128 | 72 | 0.0 | 0.2 | 8.018 | A |
| C-A | 302 | 75 | | | 302 | | | | |
| A-B | 11 | 3 | | | 11 | | | | |
| A-C | 244 | 61 | | | 244 | | | | |

### 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 | 66 | 16 | 429 | 0.153 | 65 | 0.2 | 0.2 | 10.881 | B |
| C-AB | 90 | 22 | 574 | 0.156 | 90 | 0.2 | 0.2 | 8.167 | A |
| C-A | 357 | 89 | | | 357 | | | | |
| A-B | 13 | 3 | | | 13 | | | | |
| A-C | 291 | 73 | | | 291 | | | | |

### 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 | 80 | 20 | 398 | 0.202 | 80 | 0.2 | 0.3 | 12.425 | B |
| C-AB | 117 | 29 | 594 | 0.197 | 117 | 0.2 | 0.3 | 8.297 | A |
| C-A | 430 | 108 | | | 430 | | | | |
| A-B | 15 | 4 | | | 15 | | | | |
| A-C | 357 | 89 | | | 357 | | | | |

### 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 | 80 | 20 | 398 | 0.202 | 80 | 0.3 | 0.3 | 12.453 | B |
| C-AB | 117 | 29 | 594 | 0.197 | 117 | 0.3 | 0.3 | 8.310 | A |
| C-A | 430 | 108 | | | 430 | | | | |
| A-B | 15 | 4 | | | 15 | | | | |
| A-C | 357 | 89 | | | 357 | | | | |

### 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 | 66 | 16 | 429 | 0.153 | 66 | 0.3 | 0.2 | 10.916 | B |
| C-AB | 90 | 22 | 574 | 0.156 | 90 | 0.3 | 0.2 | 8.186 | A |
| C-A | 357 | 89 | | | 357 | | | | |
| A-B | 13 | 3 | | | 13 | | | | |
| A-C | 291 | 73 | | | 291 | | | | |

### 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 | 55 | 14 | 451 | 0.122 | 55 | 0.2 | 0.2 | 10.013 | B |
| C-AB | 72 | 18 | 565 | 0.128 | 73 | 0.2 | 0.2 | 8.048 | A |
| C-A | 302 | 75 | | | 302 | | | | |
| A-B | 11 | 3 | | | 11 | | | | |
| A-C | 244 | 61 | | | 244 | | | | |

# 2025 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 | | 2.19 | A |

### Junction Network Options

| Driving side | Lighting | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|
| Left | Normal/unknown | 69 | 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 | 2025 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 | ✓ | 431 | 100.000 |
| B | | ONE HOUR | ✓ | 129 | 100.000 |
| C | | ONE HOUR | ✓ | 263 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | A | B | C |
| From | A | 0 | 23 | 408 |
| | B | 44 | 0 | 85 |
| | C | 248 | 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 | 0.32 | 12.95 | 0.5 | B | 118 | 178 |
| C-AB | 0.04 | 8.52 | 0.0 | A | 14 | 21 |
| C-A | | | | | 227 | 341 |
| A-B | | | | | 21 | 32 |
| A-C | | | | | 374 | 562 |

## 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 | 97 | 24 | 491 | 0.198 | 96 | 0.0 | 0.3 | 9.993 | A |
| C-AB | 11 | 3 | 508 | 0.023 | 11 | 0.0 | 0.0 | 7.974 | A |
| C-A | 187 | 47 | | | 187 | | | | |
| A-B | 17 | 4 | | | 17 | | | | |
| A-C | 307 | 77 | | | 307 | | | | |

### 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 | 116 | 29 | 473 | 0.245 | 116 | 0.3 | 0.4 | 11.069 | B |
| C-AB | 14 | 3 | 496 | 0.028 | 14 | 0.0 | 0.0 | 8.204 | A |
| C-A | 223 | 56 | | | 223 | | | | |
| A-B | 21 | 5 | | | 21 | | | | |
| A-C | 367 | 92 | | | 367 | | | | |

### 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 | 142 | 36 | 448 | 0.317 | 141 | 0.4 | 0.5 | 12.902 | B |
| C-AB | 17 | 4 | 481 | 0.035 | 17 | 0.0 | 0.0 | 8.524 | A |
| C-A | 273 | 68 | | | 273 | | | | |
| A-B | 25 | 6 | | | 25 | | | | |
| A-C | 449 | 112 | | | 449 | | | | |

### 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 | 142 | 36 | 448 | 0.317 | 142 | 0.5 | 0.5 | 12.951 | B |
| C-AB | 17 | 4 | 481 | 0.035 | 17 | 0.0 | 0.0 | 8.524 | A |
| C-A | 273 | 68 | | | 273 | | | | |
| A-B | 25 | 6 | | | 25 | | | | |
| A-C | 449 | 112 | | | 449 | | | | |

### 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 | 116 | 29 | 473 | 0.245 | 117 | 0.5 | 0.4 | 11.126 | B |
| C-AB | 14 | 3 | 496 | 0.028 | 14 | 0.0 | 0.0 | 8.206 | A |
| C-A | 223 | 56 | | | 223 | | | | |
| A-B | 21 | 5 | | | 21 | | | | |
| A-C | 367 | 92 | | | 367 | | | | |

### 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 | 97 | 24 | 491 | 0.198 | 97 | 0.4 | 0.3 | 10.066 | B |
| C-AB | 11 | 3 | 508 | 0.023 | 11 | 0.0 | 0.0 | 7.981 | A |
| C-A | 187 | 47 | | | 187 | | | | |
| A-B | 17 | 4 | | | 17 | | | | |
| A-C | 307 | 77 | | | 307 | | | | |

# Junctions 9

## PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462


For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk



**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:** 05/11/2020 17:13:28



## 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 |
| | 2025 With Development | | | | | | | | | | | |
| Stream B-AC | D1 | 0.6 | 17.42 | 0.37 | C | 42 % | D2 | 0.1 | 13.84 | 0.09 | B | 77 % |
| Stream C-AB | | 0.0 | 7.24 | 0.01 | A | [Stream B-AC] | | 0.0 | 9.02 | 0.02 | 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 | 2025 With Development | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D2 | 2025 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 |

# 2025 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 | | 2.33 | A |

### Junction Network Options

| Driving side | Lighting | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|
| Left | Normal/unknown | 42 | 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 | 2025 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 | ✓ | 323 | 100.000 |
| B | | ONE HOUR | ✓ | 119 | 100.000 |
| C | | ONE HOUR | ✓ | 464 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | A | B | C |
| From | A | 0 | 35 | 288 |
| | B | 102 | 0 | 17 |
| | C | 459 | 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 | 0.37 | 17.42 | 0.6 | C | 109 | 164 |
| C-AB | 0.01 | 7.24 | 0.0 | A | 5 | 7 |
| C-A | | | | | 421 | 632 |
| A-B | | | | | 32 | 48 |
| A-C | | | | | 264 | 396 |

### 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 | 90 | 22 | 404 | 0.222 | 88 | 0.0 | 0.3 | 12.488 | B |
| C-AB | 4 | 0.95 | 576 | 0.007 | 4 | 0.0 | 0.0 | 6.920 | A |
| C-A | 346 | 86 | | | 346 | | | | |
| A-B | 26 | 7 | | | 26 | | | | |
| A-C | 217 | 54 | | | 217 | | | | |

### 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 | 107 | 27 | 385 | 0.278 | 107 | 0.3 | 0.4 | 14.198 | B |
| C-AB | 5 | 1 | 566 | 0.008 | 5 | 0.0 | 0.0 | 7.053 | A |
| C-A | 413 | 103 | | | 413 | | | | |
| A-B | 31 | 8 | | | 31 | | | | |
| A-C | 259 | 65 | | | 259 | | | | |

### 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 | 131 | 33 | 358 | 0.366 | 130 | 0.4 | 0.6 | 17.300 | C |
| C-AB | 6 | 1 | 553 | 0.010 | 6 | 0.0 | 0.0 | 7.238 | A |
| C-A | 505 | 126 | | | 505 | | | | |
| A-B | 39 | 10 | | | 39 | | | | |
| A-C | 317 | 79 | | | 317 | | | | |

### 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 | 131 | 33 | 358 | 0.366 | 131 | 0.6 | 0.6 | 17.416 | C |
| C-AB | 6 | 1 | 553 | 0.010 | 6 | 0.0 | 0.0 | 7.238 | A |
| C-A | 505 | 126 | | | 505 | | | | |
| A-B | 39 | 10 | | | 39 | | | | |
| A-C | 317 | 79 | | | 317 | | | | |

### 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 | 107 | 27 | 385 | 0.278 | 108 | 0.6 | 0.4 | 14.325 | B |
| C-AB | 5 | 1 | 566 | 0.008 | 5 | 0.0 | 0.0 | 7.056 | A |
| C-A | 413 | 103 | | | 413 | | | | |
| A-B | 31 | 8 | | | 31 | | | | |
| A-C | 259 | 65 | | | 259 | | | | |

### 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 | 90 | 22 | 404 | 0.222 | 90 | 0.4 | 0.3 | 12.621 | B |
| C-AB | 4 | 0.95 | 576 | 0.007 | 4 | 0.0 | 0.0 | 6.923 | A |
| C-A | 346 | 86 | | | 346 | | | | |
| A-B | 26 | 7 | | | 26 | | | | |
| A-C | 217 | 54 | | | 217 | | | | |

# 2025 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 | | 0.42 | A |

### Junction Network Options

| Driving side | Lighting | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|
| Left | Normal/unknown | 77 | 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 | 2025 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 | ✓ | 712 | 100.000 |
| B | | ONE HOUR | ✓ | 26 | 100.000 |
| C | | ONE HOUR | ✓ | 241 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | A | B | C |
| From | A | 0 | 138 | 574 |
| | B | 21 | 0 | 5 |
| | C | 235 | 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 | 13.84 | 0.1 | B | 24 | 36 |
| C-AB | 0.02 | 9.02 | 0.0 | A | 6 | 8 |
| C-A | | | | | 216 | 323 |
| A-B | | | | | 127 | 190 |
| A-C | | | | | 527 | 790 |

## 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 | 20 | 5 | 376 | 0.052 | 19 | 0.0 | 0.1 | 11.087 | B |
| C-AB | 5 | 1 | 503 | 0.009 | 4 | 0.0 | 0.0 | 7.942 | A |
| C-A | 177 | 44 | | | 177 | | | | |
| A-B | 104 | 26 | | | 104 | | | | |
| A-C | 432 | 108 | | | 432 | | | | |

### 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 | 23 | 6 | 350 | 0.067 | 23 | 0.1 | 0.1 | 12.100 | B |
| C-AB | 5 | 1 | 479 | 0.011 | 5 | 0.0 | 0.0 | 8.365 | A |
| C-A | 211 | 53 | | | 211 | | | | |
| A-B | 124 | 31 | | | 124 | | | | |
| A-C | 516 | 129 | | | 516 | | | | |

### 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 | 29 | 7 | 315 | 0.091 | 29 | 0.1 | 0.1 | 13.833 | B |
| C-AB | 7 | 2 | 446 | 0.015 | 7 | 0.0 | 0.0 | 9.021 | A |
| C-A | 259 | 65 | | | 259 | | | | |
| A-B | 152 | 38 | | | 152 | | | | |
| A-C | 632 | 158 | | | 632 | | | | |

### 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 | 29 | 7 | 315 | 0.091 | 29 | 0.1 | 0.1 | 13.844 | B |
| C-AB | 7 | 2 | 446 | 0.015 | 7 | 0.0 | 0.0 | 9.022 | A |
| C-A | 259 | 65 | | | 259 | | | | |
| A-B | 152 | 38 | | | 152 | | | | |
| A-C | 632 | 158 | | | 632 | | | | |

### 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 | 23 | 6 | 350 | 0.067 | 23 | 0.1 | 0.1 | 12.114 | B |
| C-AB | 5 | 1 | 479 | 0.011 | 5 | 0.0 | 0.0 | 8.366 | A |
| C-A | 211 | 53 | | | 211 | | | | |
| A-B | 124 | 31 | | | 124 | | | | |
| A-C | 516 | 129 | | | 516 | | | | |

### 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 | 20 | 5 | 376 | 0.052 | 20 | 0.1 | 0.1 | 11.105 | B |
| C-AB | 5 | 1 | 503 | 0.009 | 5 | 0.0 | 0.0 | 7.943 | A |
| C-A | 177 | 44 | | | 177 | | | | |
| A-B | 104 | 26 | | | 104 | | | | |
| A-C | 432 | 108 | | | 432 | | | | |

# Junctions 9

## ARCADY 9 - Roundabout Module



**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:** 05/11/2020 17:08:45



### 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 |
| | 2025 Base | | | | | | | | | | | |
| Arm 1 | D1 | 1.7 | 9.50 | 0.61 | A | 8 % | D2 | 5.3 | 22.94 | 0.84 | C | 7 % |
| Arm 2 | | 1.9 | 14.17 | 0.64 | B | [Arm 3] | | 1.2 | 10.48 | 0.52 | B | [Arm 1] |
| Arm 3 | | 3.7 | 22.12 | 0.78 | C | | | 3.9 | 21.43 | 0.79 | C | |
| | 2025 with development | | | | | | | | | | | |
| Arm 1 | D3 | 1.9 | 10.00 | 0.63 | A | 7 % | D4 | 5.5 | 23.94 | 0.84 | C | 6 % |
| Arm 2 | | 2.0 | 14.83 | 0.65 | B | [Arm 3] | | 1.2 | 10.60 | 0.52 | B | [Arm 1] |
| Arm 3 | | 3.9 | 23.08 | 0.79 | C | | | 4.4 | 23.73 | 0.81 | 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 | 2025 Base | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D2 | 2025 Base | PM | ONE HOUR | 16:45 | 18:15 | 15 | ✓ |
| D3 | 2025 with development | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D4 | 2025 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 |

# 2025 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 | 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 | | 8 | 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 | 2025 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 | ✓ | 598 | 100.000 |
| 2 | | ONE HOUR | ✓ | 448 | 100.000 |
| 3 | | ONE HOUR | ✓ | 576 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 206 | 392 |
| | 2 | 399 | 0 | 49 |
| | 3 | 507 | 69 | 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 | 9.50 | 1.7 | A | 549 | 823 |
| 2 | 0.64 | 14.17 | 1.9 | B | 411 | 617 |
| 3 | 0.78 | 22.12 | 3.7 | C | 529 | 793 |

### 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 | 450 | 113 | 51 | 1090 | 0.413 | 447 | 676 | 0.0 | 0.8 | 6.139 | A |
| 2 | 337 | 84 | 293 | 855 | 0.394 | 334 | 205 | 0.0 | 0.7 | 7.567 | A |
| 3 | 434 | 108 | 298 | 897 | 0.484 | 430 | 330 | 0.0 | 1.0 | 8.410 | 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 | 134 | 62 | 1084 | 0.496 | 536 | 811 | 0.8 | 1.1 | 7.217 | A |
| 2 | 403 | 101 | 352 | 820 | 0.491 | 401 | 247 | 0.7 | 1.0 | 9.429 | A |
| 3 | 518 | 129 | 358 | 860 | 0.602 | 515 | 396 | 1.0 | 1.6 | 11.399 | 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 | 658 | 165 | 75 | 1076 | 0.612 | 656 | 988 | 1.1 | 1.7 | 9.379 | A |
| 2 | 493 | 123 | 430 | 773 | 0.638 | 490 | 301 | 1.0 | 1.9 | 13.827 | B |
| 3 | 634 | 159 | 436 | 812 | 0.781 | 626 | 484 | 1.6 | 3.6 | 20.481 | 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 | 658 | 165 | 76 | 1075 | 0.612 | 658 | 997 | 1.7 | 1.7 | 9.497 | A |
| 2 | 493 | 123 | 432 | 772 | 0.639 | 493 | 303 | 1.9 | 1.9 | 14.171 | B |
| 3 | 634 | 159 | 439 | 811 | 0.782 | 633 | 485 | 3.6 | 3.7 | 22.124 | 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 | 134 | 63 | 1083 | 0.496 | 540 | 824 | 1.7 | 1.1 | 7.324 | A |
| 2 | 403 | 101 | 354 | 819 | 0.492 | 406 | 249 | 1.9 | 1.1 | 9.673 | A |
| 3 | 518 | 129 | 362 | 858 | 0.604 | 526 | 398 | 3.7 | 1.7 | 12.205 | 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 | 450 | 113 | 52 | 1090 | 0.413 | 451 | 686 | 1.1 | 0.8 | 6.216 | A |
| 2 | 337 | 84 | 296 | 853 | 0.395 | 339 | 208 | 1.1 | 0.7 | 7.717 | A |
| 3 | 434 | 108 | 302 | 894 | 0.485 | 436 | 333 | 1.7 | 1.1 | 8.699 | A |

# 2025 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 | 19.83 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 7 | 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 | 2025 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 | ✓ | 785 | 100.000 |
| 2 | | ONE HOUR | ✓ | 368 | 100.000 |
| 3 | | ONE HOUR | ✓ | 623 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 409 | 376 |
| | 2 | 313 | 0 | 55 |
| | 3 | 492 | 131 | 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 | 0.84 | 22.94 | 5.3 | C | 720 | 1080 |
| 2 | 0.52 | 10.48 | 1.2 | B | 338 | 507 |
| 3 | 0.79 | 21.43 | 3.9 | C | 572 | 858 |

## 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 | 591 | 148 | 98 | 1061 | 0.557 | 586 | 601 | 0.0 | 1.4 | 8.232 | A |
| 2 | 277 | 69 | 280 | 863 | 0.321 | 275 | 403 | 0.0 | 0.5 | 6.717 | A |
| 3 | 469 | 117 | 234 | 935 | 0.501 | 465 | 322 | 0.0 | 1.1 | 8.340 | 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 | 706 | 176 | 117 | 1049 | 0.673 | 702 | 721 | 1.4 | 2.2 | 11.303 | B |
| 2 | 331 | 83 | 336 | 829 | 0.399 | 330 | 483 | 0.5 | 0.7 | 7.921 | A |
| 3 | 560 | 140 | 281 | 907 | 0.617 | 558 | 386 | 1.1 | 1.7 | 11.245 | 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 | 864 | 216 | 143 | 1034 | 0.836 | 853 | 878 | 2.2 | 4.9 | 20.762 | C |
| 2 | 405 | 101 | 409 | 786 | 0.516 | 403 | 587 | 0.7 | 1.1 | 10.312 | B |
| 3 | 686 | 171 | 343 | 869 | 0.789 | 678 | 469 | 1.7 | 3.7 | 19.906 | 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 | 864 | 216 | 144 | 1033 | 0.837 | 863 | 886 | 4.9 | 5.3 | 22.941 | C |
| 2 | 405 | 101 | 413 | 783 | 0.518 | 405 | 594 | 1.1 | 1.2 | 10.475 | B |
| 3 | 686 | 171 | 345 | 868 | 0.790 | 685 | 474 | 3.7 | 3.9 | 21.426 | 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 | 706 | 176 | 120 | 1048 | 0.673 | 717 | 732 | 5.3 | 2.4 | 12.367 | B |
| 2 | 331 | 83 | 344 | 825 | 0.401 | 332 | 493 | 1.2 | 0.7 | 8.072 | A |
| 3 | 560 | 140 | 283 | 906 | 0.618 | 568 | 393 | 3.9 | 1.8 | 12.011 | 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 | 591 | 148 | 99 | 1061 | 0.557 | 595 | 609 | 2.4 | 1.4 | 8.571 | A |
| 2 | 277 | 69 | 285 | 860 | 0.322 | 278 | 409 | 0.7 | 0.5 | 6.816 | A |
| 3 | 469 | 117 | 236 | 934 | 0.502 | 472 | 326 | 1.8 | 1.1 | 8.620 | A |

# 2025 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 | 15.94 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 7 | 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 | 2025 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 | ✓ | 617 | 100.000 |
| 2 | | ONE HOUR | ✓ | 448 | 100.000 |
| 3 | | ONE HOUR | ✓ | 583 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 206 | 411 |
| | 2 | 399 | 0 | 49 |
| | 3 | 514 | 69 | 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 | 0.63 | 10.00 | 1.9 | A | 566 | 849 |
| 2 | 0.65 | 14.83 | 2.0 | B | 411 | 617 |
| 3 | 0.79 | 23.08 | 3.9 | C | 535 | 802 |

## 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 | 465 | 116 | 51 | 1090 | 0.426 | 461 | 681 | 0.0 | 0.8 | 6.266 | A |
| 2 | 337 | 84 | 307 | 847 | 0.398 | 334 | 205 | 0.0 | 0.7 | 7.690 | A |
| 3 | 439 | 110 | 298 | 897 | 0.490 | 435 | 344 | 0.0 | 1.0 | 8.501 | 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 | 555 | 139 | 62 | 1084 | 0.512 | 553 | 817 | 0.8 | 1.1 | 7.447 | A |
| 2 | 403 | 101 | 369 | 810 | 0.497 | 401 | 246 | 0.7 | 1.1 | 9.661 | A |
| 3 | 524 | 131 | 357 | 860 | 0.609 | 522 | 413 | 1.0 | 1.7 | 11.602 | 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 | 679 | 170 | 75 | 1076 | 0.632 | 677 | 995 | 1.1 | 1.8 | 9.852 | A |
| 2 | 493 | 123 | 451 | 761 | 0.648 | 490 | 301 | 1.1 | 1.9 | 14.431 | B |
| 3 | 642 | 160 | 436 | 812 | 0.790 | 634 | 504 | 1.7 | 3.7 | 21.208 | 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 | 679 | 170 | 76 | 1075 | 0.632 | 679 | 1004 | 1.8 | 1.9 | 9.997 | A |
| 2 | 493 | 123 | 452 | 760 | 0.649 | 493 | 303 | 1.9 | 2.0 | 14.831 | B |
| 3 | 642 | 160 | 439 | 811 | 0.792 | 641 | 506 | 3.7 | 3.9 | 23.076 | 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 | 555 | 139 | 63 | 1083 | 0.512 | 557 | 831 | 1.9 | 1.2 | 7.575 | A |
| 2 | 403 | 101 | 371 | 808 | 0.498 | 406 | 249 | 2.0 | 1.1 | 9.937 | A |
| 3 | 524 | 131 | 362 | 858 | 0.611 | 533 | 416 | 3.9 | 1.8 | 12.492 | 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 | 465 | 116 | 52 | 1090 | 0.426 | 466 | 691 | 1.2 | 0.8 | 6.364 | A |
| 2 | 337 | 84 | 310 | 845 | 0.399 | 339 | 208 | 1.1 | 0.7 | 7.850 | A |
| 3 | 439 | 110 | 302 | 894 | 0.491 | 442 | 347 | 1.8 | 1.1 | 8.806 | A |

# 2025 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 | 21.14 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 6 | 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 | 2025 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 | ✓ | 792 | 100.000 |
| 2 | | ONE HOUR | ✓ | 368 | 100.000 |
| 3 | | ONE HOUR | ✓ | 640 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 409 | 383 |
| | 2 | 313 | 0 | 55 |
| | 3 | 509 | 131 | 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 | 0.84 | 23.94 | 5.5 | C | 727 | 1090 |
| 2 | 0.52 | 10.60 | 1.2 | B | 338 | 507 |
| 3 | 0.81 | 23.73 | 4.4 | C | 587 | 881 |

## 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 | 596 | 149 | 98 | 1061 | 0.562 | 591 | 613 | 0.0 | 1.4 | 8.319 | A |
| 2 | 277 | 69 | 286 | 859 | 0.322 | 275 | 403 | 0.0 | 0.5 | 6.753 | A |
| 3 | 482 | 120 | 234 | 936 | 0.515 | 477 | 327 | 0.0 | 1.1 | 8.559 | 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 | 712 | 178 | 117 | 1049 | 0.679 | 709 | 736 | 1.4 | 2.2 | 11.501 | B |
| 2 | 331 | 83 | 343 | 825 | 0.401 | 330 | 483 | 0.5 | 0.7 | 7.981 | A |
| 3 | 575 | 144 | 281 | 907 | 0.634 | 573 | 392 | 1.1 | 1.8 | 11.737 | 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 | 872 | 218 | 142 | 1034 | 0.844 | 860 | 896 | 2.2 | 5.2 | 21.480 | C |
| 2 | 405 | 101 | 416 | 781 | 0.519 | 403 | 587 | 0.7 | 1.2 | 10.429 | B |
| 3 | 705 | 176 | 343 | 869 | 0.811 | 695 | 476 | 1.8 | 4.2 | 21.677 | 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 | 872 | 218 | 144 | 1033 | 0.844 | 871 | 904 | 5.2 | 5.5 | 23.937 | C |
| 2 | 405 | 101 | 421 | 778 | 0.521 | 405 | 594 | 1.2 | 1.2 | 10.603 | B |
| 3 | 705 | 176 | 345 | 868 | 0.812 | 704 | 482 | 4.2 | 4.4 | 23.727 | 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 | 712 | 178 | 120 | 1048 | 0.680 | 724 | 748 | 5.5 | 2.4 | 12.678 | B |
| 2 | 331 | 83 | 350 | 821 | 0.403 | 333 | 494 | 1.2 | 0.8 | 8.140 | A |
| 3 | 575 | 144 | 283 | 906 | 0.635 | 585 | 400 | 4.4 | 2.0 | 12.706 | 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 | 596 | 149 | 99 | 1060 | 0.562 | 600 | 622 | 2.4 | 1.4 | 8.676 | A |
| 2 | 277 | 69 | 290 | 857 | 0.323 | 278 | 409 | 0.8 | 0.5 | 6.854 | A |
| 3 | 482 | 120 | 236 | 934 | 0.516 | 485 | 332 | 2.0 | 1.2 | 8.881 | A |

# 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:** 05/11/2020 16:59:36



### 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 |
| | 2025 Base | | | | | | | | | | | |
| Arm 1 | D1 | 1.2 | 8.05 | 0.53 | A | -3 % | D2 | 4.5 | 18.96 | 0.81 | C | 11 % |
| Arm 2 | | 0.6 | 5.93 | 0.36 | A | | | 2.2 | 13.92 | 0.68 | B | |
| Arm 3 | | 8.4 | 42.84 | 0.90 | E | [Arm 3] | | 1.5 | 12.92 | 0.57 | B | [Arm 1] |
| | 2025 with development | | | | | | | | | | | |
| Arm 1 | D3 | 1.3 | 8.18 | 0.54 | A | -4 % | D4 | 5.4 | 22.05 | 0.84 | C | 8 % |
| Arm 2 | | 0.7 | 6.12 | 0.38 | A | | | 2.3 | 14.30 | 0.69 | B | |
| Arm 3 | | 9.4 | 47.97 | 0.92 | E | [Arm 3] | | 1.5 | 13.11 | 0.58 | 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 | 2025 Base | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D2 | 2025 Base | PM | ONE HOUR | 16:45 | 18:15 | 15 | ✓ |
| D3 | 2025 with development | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D4 | 2025 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 |

# 2025 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 | 23.13 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | -3 | 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 | 2025 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 | ✓ | 511 | 100.000 |
| 2 | | ONE HOUR | ✓ | 338 | 100.000 |
| 3 | | ONE HOUR | ✓ | 686 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 166 | 345 |
| | 2 | 272 | 0 | 66 |
| | 3 | 586 | 100 | 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 | 0.53 | 8.05 | 1.2 | A | 469 | 703 |
| 2 | 0.36 | 5.93 | 0.6 | A | 310 | 465 |
| 3 | 0.90 | 42.84 | 8.4 | E | 629 | 944 |

### 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 | 385 | 96 | 74 | 1076 | 0.358 | 382 | 640 | 0.0 | 0.6 | 5.690 | A |
| 2 | 254 | 64 | 258 | 1121 | 0.227 | 253 | 199 | 0.0 | 0.3 | 4.557 | A |
| 3 | 516 | 129 | 204 | 893 | 0.578 | 511 | 308 | 0.0 | 1.5 | 10.209 | B |

#### 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 | 459 | 115 | 89 | 1067 | 0.431 | 459 | 767 | 0.6 | 0.8 | 6.501 | A |
| 2 | 304 | 76 | 310 | 1087 | 0.280 | 303 | 238 | 0.3 | 0.4 | 5.053 | A |
| 3 | 617 | 154 | 244 | 869 | 0.710 | 612 | 369 | 1.5 | 2.6 | 15.182 | C |

### 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 | 563 | 141 | 107 | 1055 | 0.533 | 561 | 928 | 0.8 | 1.2 | 7.980 | A |
| 2 | 372 | 93 | 379 | 1041 | 0.358 | 371 | 290 | 0.4 | 0.6 | 5.909 | A |
| 3 | 755 | 189 | 299 | 836 | 0.903 | 736 | 451 | 2.6 | 7.4 | 34.306 | 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 | 563 | 141 | 110 | 1054 | 0.534 | 563 | 941 | 1.2 | 1.2 | 8.053 | A |
| 2 | 372 | 93 | 380 | 1040 | 0.358 | 372 | 292 | 0.6 | 0.6 | 5.927 | A |
| 3 | 755 | 189 | 299 | 836 | 0.904 | 751 | 452 | 7.4 | 8.4 | 42.836 | 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 | 459 | 115 | 93 | 1064 | 0.432 | 461 | 791 | 1.2 | 0.8 | 6.580 | A |
| 2 | 304 | 76 | 311 | 1086 | 0.280 | 305 | 243 | 0.6 | 0.4 | 5.073 | A |
| 3 | 617 | 154 | 245 | 868 | 0.710 | 639 | 371 | 8.4 | 2.9 | 18.701 | 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 | 385 | 96 | 76 | 1075 | 0.358 | 386 | 651 | 0.8 | 0.6 | 5.751 | A |
| 2 | 254 | 64 | 260 | 1119 | 0.227 | 255 | 201 | 0.4 | 0.3 | 4.583 | A |
| 3 | 516 | 129 | 205 | 892 | 0.579 | 522 | 310 | 2.9 | 1.6 | 10.837 | B |

# 2025 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 | 16.06 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 11 | 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 | 2025 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 | ✓ | 806 | 100.000 |
| 2 | | ONE HOUR | ✓ | 540 | 100.000 |
| 3 | | ONE HOUR | ✓ | 374 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 239 | 567 |
| | 2 | 452 | 0 | 88 |
| | 3 | 332 | 42 | 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 | 18.96 | 4.5 | C | 740 | 1109 |
| 2 | 0.68 | 13.92 | 2.2 | B | 496 | 743 |
| 3 | 0.57 | 12.92 | 1.5 | B | 343 | 515 |

## 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 | 607 | 152 | 31 | 1103 | 0.550 | 602 | 586 | 0.0 | 1.3 | 7.822 | A |
| 2 | 407 | 102 | 423 | 1011 | 0.402 | 404 | 210 | 0.0 | 0.7 | 6.485 | A |
| 3 | 282 | 70 | 338 | 813 | 0.346 | 279 | 489 | 0.0 | 0.6 | 7.389 | 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 | 725 | 181 | 38 | 1099 | 0.659 | 722 | 703 | 1.3 | 2.1 | 10.413 | B |
| 2 | 485 | 121 | 508 | 955 | 0.508 | 484 | 252 | 0.7 | 1.1 | 8.375 | A |
| 3 | 336 | 84 | 405 | 773 | 0.435 | 335 | 586 | 0.6 | 0.8 | 9.024 | 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 | 887 | 222 | 46 | 1094 | 0.811 | 878 | 858 | 2.1 | 4.3 | 17.689 | C |
| 2 | 595 | 149 | 618 | 882 | 0.674 | 590 | 306 | 1.1 | 2.2 | 13.386 | B |
| 3 | 412 | 103 | 494 | 720 | 0.572 | 409 | 714 | 0.8 | 1.4 | 12.656 | 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 | 887 | 222 | 46 | 1093 | 0.812 | 887 | 863 | 4.3 | 4.5 | 18.958 | C |
| 2 | 595 | 149 | 624 | 878 | 0.677 | 594 | 309 | 2.2 | 2.2 | 13.924 | B |
| 3 | 412 | 103 | 497 | 718 | 0.574 | 412 | 721 | 1.4 | 1.5 | 12.920 | 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 | 725 | 181 | 38 | 1099 | 0.660 | 734 | 710 | 4.5 | 2.2 | 11.112 | B |
| 2 | 485 | 121 | 516 | 950 | 0.511 | 490 | 256 | 2.2 | 1.2 | 8.691 | A |
| 3 | 336 | 84 | 410 | 770 | 0.437 | 339 | 596 | 1.5 | 0.9 | 9.228 | 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 | 607 | 152 | 32 | 1102 | 0.550 | 610 | 593 | 2.2 | 1.4 | 8.096 | A |
| 2 | 407 | 102 | 429 | 1007 | 0.404 | 408 | 213 | 1.2 | 0.8 | 6.627 | A |
| 3 | 282 | 70 | 342 | 811 | 0.347 | 283 | 496 | 0.9 | 0.6 | 7.514 | A |

# 2025 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 | 25.20 | D |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | -4 | 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 | 2025 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 | ✓ | 518 | 100.000 |
| 2 | | ONE HOUR | ✓ | 357 | 100.000 |
| 3 | | ONE HOUR | ✓ | 686 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 173 | 345 |
| | 2 | 291 | 0 | 66 |
| | 3 | 586 | 100 | 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 | 0.54 | 8.18 | 1.3 | A | 475 | 713 |
| 2 | 0.38 | 6.12 | 0.7 | A | 328 | 491 |
| 3 | 0.92 | 47.97 | 9.4 | E | 629 | 944 |

## 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 | 390 | 97 | 74 | 1076 | 0.362 | 388 | 654 | 0.0 | 0.6 | 5.731 | A |
| 2 | 269 | 67 | 258 | 1121 | 0.240 | 267 | 204 | 0.0 | 0.3 | 4.631 | A |
| 3 | 516 | 129 | 218 | 884 | 0.584 | 510 | 308 | 0.0 | 1.5 | 10.431 | B |

### 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 | 466 | 116 | 89 | 1067 | 0.437 | 465 | 784 | 0.6 | 0.8 | 6.569 | A |
| 2 | 321 | 80 | 310 | 1087 | 0.295 | 320 | 244 | 0.3 | 0.5 | 5.164 | A |
| 3 | 617 | 154 | 261 | 859 | 0.718 | 612 | 369 | 1.5 | 2.6 | 15.765 | C |

### 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 | 570 | 143 | 107 | 1056 | 0.540 | 569 | 946 | 0.8 | 1.3 | 8.100 | A |
| 2 | 393 | 98 | 379 | 1041 | 0.378 | 392 | 297 | 0.5 | 0.7 | 6.098 | A |
| 3 | 755 | 189 | 320 | 824 | 0.917 | 734 | 451 | 2.6 | 8.1 | 37.171 | E |

### 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 | 570 | 143 | 109 | 1054 | 0.541 | 570 | 961 | 1.3 | 1.3 | 8.179 | A |
| 2 | 393 | 98 | 380 | 1040 | 0.378 | 393 | 300 | 0.7 | 0.7 | 6.119 | A |
| 3 | 755 | 189 | 320 | 823 | 0.917 | 750 | 452 | 8.1 | 9.4 | 47.975 | 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 | 466 | 116 | 94 | 1064 | 0.438 | 467 | 811 | 1.3 | 0.9 | 6.654 | A |
| 2 | 321 | 80 | 311 | 1086 | 0.296 | 322 | 250 | 0.7 | 0.5 | 5.190 | A |
| 3 | 617 | 154 | 262 | 858 | 0.719 | 642 | 371 | 9.4 | 3.0 | 20.207 | 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 | 390 | 97 | 76 | 1075 | 0.363 | 391 | 665 | 0.9 | 0.6 | 5.797 | A |
| 2 | 269 | 67 | 260 | 1119 | 0.240 | 269 | 207 | 0.5 | 0.3 | 4.659 | A |
| 3 | 516 | 129 | 219 | 884 | 0.585 | 522 | 310 | 3.0 | 1.6 | 11.120 | B |

# 2025 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 | 17.73 | C |

### Junction Network Options

| Driving side | Lighting | Road surface | In London | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|---|---|
| Left | Normal/unknown | Normal/unknown | | 8 | 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 | 2025 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 | ✓ | 834 | 100.000 |
| 2 | | ONE HOUR | ✓ | 547 | 100.000 |
| 3 | | ONE HOUR | ✓ | 374 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| From | 1 | 0 | 267 | 567 |
| | 2 | 459 | 0 | 88 |
| | 3 | 332 | 42 | 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 | 0.84 | 22.05 | 5.4 | C | 765 | 1148 |
| 2 | 0.69 | 14.30 | 2.3 | B | 502 | 753 |
| 3 | 0.58 | 13.11 | 1.5 | B | 343 | 515 |

## 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 | 628 | 157 | 31 | 1103 | 0.569 | 622 | 591 | 0.0 | 1.4 | 8.148 | A |
| 2 | 412 | 103 | 423 | 1011 | 0.407 | 409 | 231 | 0.0 | 0.7 | 6.541 | A |
| 3 | 282 | 70 | 343 | 810 | 0.348 | 279 | 489 | 0.0 | 0.6 | 7.434 | 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 | 750 | 187 | 38 | 1099 | 0.682 | 746 | 709 | 1.4 | 2.3 | 11.122 | B |
| 2 | 492 | 123 | 507 | 955 | 0.515 | 490 | 277 | 0.7 | 1.1 | 8.483 | A |
| 3 | 336 | 84 | 411 | 769 | 0.437 | 335 | 586 | 0.6 | 0.8 | 9.100 | 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 | 918 | 230 | 46 | 1094 | 0.840 | 907 | 865 | 2.3 | 5.1 | 20.085 | C |
| 2 | 602 | 151 | 617 | 883 | 0.682 | 598 | 336 | 1.1 | 2.3 | 13.684 | B |
| 3 | 412 | 103 | 502 | 715 | 0.576 | 409 | 713 | 0.8 | 1.4 | 12.836 | 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 | 918 | 230 | 46 | 1093 | 0.840 | 917 | 871 | 5.1 | 5.4 | 22.054 | C |
| 2 | 602 | 151 | 623 | 878 | 0.686 | 602 | 340 | 2.3 | 2.3 | 14.295 | B |
| 3 | 412 | 103 | 505 | 713 | 0.577 | 412 | 720 | 1.4 | 1.5 | 13.114 | 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 | 750 | 187 | 38 | 1099 | 0.682 | 761 | 717 | 5.4 | 2.5 | 12.126 | B |
| 2 | 492 | 123 | 518 | 949 | 0.518 | 496 | 282 | 2.3 | 1.2 | 8.842 | A |
| 3 | 336 | 84 | 416 | 766 | 0.439 | 339 | 598 | 1.5 | 0.9 | 9.312 | 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 | 628 | 157 | 32 | 1102 | 0.570 | 632 | 598 | 2.5 | 1.5 | 8.482 | A |
| 2 | 412 | 103 | 430 | 1007 | 0.409 | 414 | 234 | 1.2 | 0.8 | 6.693 | A |
| 3 | 282 | 70 | 347 | 808 | 0.349 | 283 | 496 | 0.9 | 0.6 | 7.560 | A |

# 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:** 05/11/2020 16:41:32



### 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 |
| | 2025 With Development | | | | | | | | | | | |
| Stream B-ACD | D1 | 0.4 | 14.94 | 0.29 | B | 49 % [Stream B-ACD] | D2 | 0.5 | 13.87 | 0.30 | B | 62 % [Stream B-ACD] |
| Stream AB-CD | | 0.2 | 7.52 | 0.11 | A | | | 0.2 | 9.37 | 0.16 | A | |
| Stream D-ABC | | 0.3 | 10.63 | 0.19 | B | | | 0.1 | 10.24 | 0.07 | B | |
| Stream CD-AB | | 0.2 | 8.76 | 0.12 | A | | | 0.1 | 7.27 | 0.09 | 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 | 2025 With Development | AM | ONE HOUR | 07:45 | 09:15 | 15 | ✓ |
| D2 | 2025 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 |

# 2025 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 | | 1.60 | A |

### Junction Network Options

| Driving side | Lighting | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|
| Left | Normal/unknown | 49 | 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 | 2025 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 | ✓ | 574 | 100.000 |
| B | | ONE HOUR | ✓ | 99 | 100.000 |
| C | | ONE HOUR | ✓ | 326 | 100.000 |
| D | | ONE HOUR | ✓ | 80 | 100.000 |

# Origin-Destination Data

### Demand (PCU/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| From | A | 0 | 84 | 446 | 44 |
| | B | 43 | 0 | 46 | 10 |
| | C | 299 | 25 | 0 | 2 |
| | D | 48 | 23 | 9 | 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 | 14.94 | 0.4 | B | 91 | 136 |
| A-B | | | | | 77 | 116 |
| A-C | | | | | 409 | 614 |
| A-D | | | | | 40 | 61 |
| AB-CD | 0.11 | 7.52 | 0.2 | A | 55 | 82 |
| AB-C | | | | | 446 | 669 |
| D-ABC | 0.19 | 10.63 | 0.3 | B | 73 | 110 |
| C-D | | | | | 2 | 3 |
| C-A | | | | | 274 | 412 |
| C-B | | | | | 23 | 34 |
| CD-AB | 0.12 | 8.76 | 0.2 | A | 48 | 72 |
| CD-A | | | | | 315 | 472 |

## 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 | 75 | 19 | 434 | 0.172 | 74 | 0.0 | 0.2 | 10.950 | B |
| A-B | 63 | 16 | | | 63 | | | | |
| A-C | 336 | 84 | | | 336 | | | | |
| A-D | 33 | 8 | | | 33 | | | | |
| AB-CD | 43 | 11 | 580 | 0.074 | 43 | 0.0 | 0.1 | 7.361 | A |
| AB-C | 367 | 92 | | | 367 | | | | |
| D-ABC | 60 | 15 | 494 | 0.122 | 60 | 0.0 | 0.2 | 9.107 | A |
| C-D | 2 | 0.38 | | | 2 | | | | |
| C-A | 225 | 56 | | | 225 | | | | |
| C-B | 19 | 5 | | | 19 | | | | |
| CD-AB | 38 | 9 | 528 | 0.071 | 37 | 0.0 | 0.1 | 8.065 | A |
| CD-A | 259 | 65 | | | 259 | | | | |

### 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 | 89 | 22 | 409 | 0.217 | 89 | 0.2 | 0.3 | 12.338 | B |
| A-B | 76 | 19 | | | 76 | | | | |
| A-C | 401 | 100 | | | 401 | | | | |
| A-D | 40 | 10 | | | 40 | | | | |
| AB-CD | 53 | 13 | 584 | 0.091 | 53 | 0.1 | 0.1 | 7.452 | A |
| AB-C | 438 | 109 | | | 438 | | | | |
| D-ABC | 72 | 18 | 480 | 0.150 | 72 | 0.2 | 0.2 | 9.694 | A |
| C-D | 2 | 0.45 | | | 2 | | | | |
| C-A | 269 | 67 | | | 269 | | | | |
| C-B | 22 | 6 | | | 22 | | | | |
| CD-AB | 46 | 12 | 519 | 0.089 | 46 | 0.1 | 0.1 | 8.368 | A |
| CD-A | 309 | 77 | | | 309 | | | | |

### 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 | 109 | 27 | 374 | 0.291 | 108 | 0.3 | 0.4 | 14.877 | B |
| A-B | 92 | 23 | | | 92 | | | | |
| A-C | 491 | 123 | | | 491 | | | | |
| A-D | 48 | 12 | | | 48 | | | | |
| AB-CD | 68 | 17 | 595 | 0.114 | 68 | 0.1 | 0.2 | 7.520 | A |
| AB-C | 533 | 133 | | | 533 | | | | |
| D-ABC | 88 | 22 | 461 | 0.191 | 88 | 0.2 | 0.3 | 10.615 | B |
| C-D | 2 | 0.55 | | | 2 | | | | |
| C-A | 329 | 82 | | | 329 | | | | |
| C-B | 28 | 7 | | | 28 | | | | |
| CD-AB | 59 | 15 | 511 | 0.115 | 59 | 0.1 | 0.2 | 8.754 | A |
| CD-A | 376 | 94 | | | 376 | | | | |

### 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 | 109 | 27 | 374 | 0.291 | 109 | 0.4 | 0.4 | 14.942 | B |
| A-B | 92 | 23 | | | 92 | | | | |
| A-C | 491 | 123 | | | 491 | | | | |
| A-D | 48 | 12 | | | 48 | | | | |
| AB-CD | 68 | 17 | 595 | 0.115 | 68 | 0.2 | 0.2 | 7.525 | A |
| AB-C | 533 | 133 | | | 533 | | | | |
| D-ABC | 88 | 22 | 461 | 0.191 | 88 | 0.3 | 0.3 | 10.630 | B |
| C-D | 2 | 0.55 | | | 2 | | | | |
| C-A | 329 | 82 | | | 329 | | | | |
| C-B | 28 | 7 | | | 28 | | | | |
| CD-AB | 59 | 15 | 511 | 0.116 | 59 | 0.2 | 0.2 | 8.762 | A |
| CD-A | 376 | 94 | | | 376 | | | | |

### 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 | 89 | 22 | 409 | 0.218 | 90 | 0.4 | 0.3 | 12.412 | B |
| A-B | 76 | 19 | | | 76 | | | | |
| A-C | 401 | 100 | | | 401 | | | | |
| A-D | 40 | 10 | | | 40 | | | | |
| AB-CD | 53 | 13 | 585 | 0.091 | 53 | 0.2 | 0.1 | 7.460 | A |
| AB-C | 438 | 110 | | | 438 | | | | |
| D-ABC | 72 | 18 | 480 | 0.150 | 72 | 0.3 | 0.2 | 9.716 | A |
| C-D | 2 | 0.45 | | | 2 | | | | |
| C-A | 269 | 67 | | | 269 | | | | |
| C-B | 22 | 6 | | | 22 | | | | |
| CD-AB | 46 | 12 | 519 | 0.089 | 46 | 0.2 | 0.1 | 8.379 | A |
| CD-A | 309 | 77 | | | 309 | | | | |

### 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 | 75 | 19 | 434 | 0.172 | 75 | 0.3 | 0.2 | 11.031 | B |
| A-B | 63 | 16 | | | 63 | | | | |
| A-C | 336 | 84 | | | 336 | | | | |
| A-D | 33 | 8 | | | 33 | | | | |
| AB-CD | 43 | 11 | 581 | 0.075 | 43 | 0.1 | 0.1 | 7.375 | A |
| AB-C | 368 | 92 | | | 368 | | | | |
| D-ABC | 60 | 15 | 494 | 0.122 | 60 | 0.2 | 0.2 | 9.141 | A |
| C-D | 2 | 0.38 | | | 2 | | | | |
| C-A | 225 | 56 | | | 225 | | | | |
| C-B | 19 | 5 | | | 19 | | | | |
| CD-AB | 38 | 9 | 528 | 0.072 | 38 | 0.1 | 0.1 | 8.080 | A |
| CD-A | 260 | 65 | | | 260 | | | | |

# 2025 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 | | 1.43 | A |

### Junction Network Options

| Driving side | Lighting | Network residual capacity (%) | First arm reaching threshold |
|---|---|---|---|
| Left | Normal/unknown | 62 | 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 | 2025 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 | ✓ | 290 | 100.000 |
| B | | ONE HOUR | ✓ | 109 | 100.000 |
| C | | ONE HOUR | ✓ | 593 | 100.000 |
| D | | ONE HOUR | ✓ | 26 | 100.000 |

## Origin-Destination Data

### Demand (PCU/hr)

| | | To | | | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| From | A | 0 | 32 | 230 | 28 |
| | B | 55 | 0 | 18 | 36 |
| | C | 530 | 35 | 0 | 28 |
| | 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 | 0.30 | 13.87 | 0.5 | B | 100 | 150 |
| A-B | | | | | 29 | 44 |
| A-C | | | | | 211 | 317 |
| A-D | | | | | 26 | 39 |
| AB-CD | 0.16 | 9.37 | 0.2 | A | 63 | 95 |
| AB-C | | | | | 223 | 334 |
| D-ABC | 0.07 | 10.24 | 0.1 | B | 24 | 36 |
| C-D | | | | | 26 | 39 |
| C-A | | | | | 486 | 730 |
| C-B | | | | | 32 | 48 |
| CD-AB | 0.09 | 7.27 | 0.1 | A | 41 | 61 |
| CD-A | | | | | 499 | 749 |

## 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 | 82 | 21 | 453 | 0.181 | 81 | 0.0 | 0.2 | 10.626 | B |
| A-B | 24 | 6 | | | 24 | | | | |
| A-C | 173 | 43 | | | 173 | | | | |
| A-D | 21 | 5 | | | 21 | | | | |
| AB-CD | 50 | 12 | 521 | 0.096 | 50 | 0.0 | 0.1 | 8.397 | A |
| AB-C | 184 | 46 | | | 184 | | | | |
| D-ABC | 20 | 5 | 464 | 0.042 | 19 | 0.0 | 0.0 | 8.900 | A |
| C-D | 21 | 5 | | | 21 | | | | |
| C-A | 399 | 100 | | | 399 | | | | |
| C-B | 26 | 7 | | | 26 | | | | |
| CD-AB | 32 | 8 | 584 | 0.056 | 32 | 0.0 | 0.1 | 7.168 | 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 | 98 | 24 | 433 | 0.226 | 98 | 0.2 | 0.3 | 11.793 | B |
| A-B | 29 | 7 | | | 29 | | | | |
| A-C | 207 | 52 | | | 207 | | | | |
| A-D | 25 | 6 | | | 25 | | | | |
| AB-CD | 61 | 15 | 511 | 0.120 | 61 | 0.1 | 0.2 | 8.805 | A |
| AB-C | 219 | 55 | | | 219 | | | | |
| D-ABC | 23 | 6 | 444 | 0.053 | 23 | 0.0 | 0.1 | 9.416 | A |
| C-D | 25 | 6 | | | 25 | | | | |
| C-A | 476 | 119 | | | 476 | | | | |
| C-B | 31 | 8 | | | 31 | | | | |
| CD-AB | 40 | 10 | 587 | 0.068 | 40 | 0.1 | 0.1 | 7.232 | A |
| CD-A | 490 | 122 | | | 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 | 120 | 30 | 405 | 0.296 | 119 | 0.3 | 0.5 | 13.818 | B |
| A-B | 35 | 9 | | | 35 | | | | |
| A-C | 253 | 63 | | | 253 | | | | |
| A-D | 31 | 8 | | | 31 | | | | |
| AB-CD | 78 | 20 | 501 | 0.156 | 78 | 0.2 | 0.2 | 9.361 | A |
| AB-C | 265 | 66 | | | 265 | | | | |
| D-ABC | 29 | 7 | 415 | 0.069 | 29 | 0.1 | 0.1 | 10.231 | B |
| C-D | 31 | 8 | | | 31 | | | | |
| C-A | 584 | 146 | | | 584 | | | | |
| C-B | 39 | 10 | | | 39 | | | | |
| CD-AB | 51 | 13 | 595 | 0.085 | 50 | 0.1 | 0.1 | 7.272 | A |
| CD-A | 598 | 149 | | | 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 | 120 | 30 | 405 | 0.296 | 120 | 0.5 | 0.5 | 13.875 | B |
| A-B | 35 | 9 | | | 35 | | | | |
| A-C | 253 | 63 | | | 253 | | | | |
| A-D | 31 | 8 | | | 31 | | | | |
| AB-CD | 78 | 20 | 501 | 0.156 | 78 | 0.2 | 0.2 | 9.373 | A |
| AB-C | 265 | 66 | | | 265 | | | | |
| D-ABC | 29 | 7 | 415 | 0.069 | 29 | 0.1 | 0.1 | 10.236 | B |
| C-D | 31 | 8 | | | 31 | | | | |
| C-A | 584 | 146 | | | 584 | | | | |
| C-B | 39 | 10 | | | 39 | | | | |
| CD-AB | 51 | 13 | 595 | 0.085 | 51 | 0.1 | 0.1 | 7.273 | A |
| CD-A | 598 | 149 | | | 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 | 98 | 24 | 433 | 0.226 | 99 | 0.5 | 0.3 | 11.853 | B |
| A-B | 29 | 7 | | | 29 | | | | |
| A-C | 207 | 52 | | | 207 | | | | |
| A-D | 25 | 6 | | | 25 | | | | |
| AB-CD | 62 | 15 | 511 | 0.121 | 62 | 0.2 | 0.2 | 8.825 | A |
| AB-C | 219 | 55 | | | 219 | | | | |
| D-ABC | 23 | 6 | 444 | 0.053 | 23 | 0.1 | 0.1 | 9.424 | A |
| C-D | 25 | 6 | | | 25 | | | | |
| C-A | 476 | 119 | | | 476 | | | | |
| C-B | 31 | 8 | | | 31 | | | | |
| CD-AB | 40 | 10 | 587 | 0.068 | 40 | 0.1 | 0.1 | 7.238 | A |
| CD-A | 490 | 122 | | | 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 | 82 | 21 | 453 | 0.181 | 82 | 0.3 | 0.2 | 10.703 | B |
| A-B | 24 | 6 | | | 24 | | | | |
| A-C | 173 | 43 | | | 173 | | | | |
| A-D | 21 | 5 | | | 21 | | | | |
| AB-CD | 50 | 13 | 521 | 0.097 | 51 | 0.2 | 0.1 | 8.423 | A |
| AB-C | 185 | 46 | | | 185 | | | | |
| D-ABC | 20 | 5 | 464 | 0.042 | 20 | 0.1 | 0.0 | 8.910 | A |
| C-D | 21 | 5 | | | 21 | | | | |
| C-A | 399 | 100 | | | 399 | | | | |
| C-B | 26 | 7 | | | 26 | | | | |
| CD-AB | 33 | 8 | 584 | 0.056 | 33 | 0.1 | 0.1 | 7.176 | A |
| CD-A | 411 | 103 | | | 411 | | | | |

# Appendix 10

## Stage One Safety Audit

# KELVEDON ROAD
# TIPTREE
# ESSEX

## PROPOSED 3-ARM MINI-ROUNDABOUT FOR A RESIDENTIAL DEVELOPMENT

## STAGE 1 ROAD SAFETY AUDIT

**November 2019**

**Client: JourneyTransport Planning**

# KELVEDON ROAD
# TIPTREE
# ESSEX

# PROPOSED 3-ARM MINI ROUNDABOUT FOR A RESIDENTIAL DEVELOPMENT

# Stage 1 Road Safety Audit

## November 2019

### Notice

This report was produced by *JB Road Safety Consultancy Limited* for *Journey Transport Planning,* for the specific purpose of documenting the Stage 1 Road Safety Audit process undertaken in accordance with GG119.

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| Revision Status: Final | Prepared By: | Checked By: | Approved By: | Date Approved: |
|---|---|---|---|---|
| Audit Team | John Bowman | Beth Newiss |  | 02.11.19 |
| Designers Response | Steve Amann | | | |
| Authorities Response | | | | |
| Audit Response | | | | |

# Contents



## DISTRIBUTION RECORD

| Issued to | Document Number | Issue Number |
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| Steve Amann Journey Transport Planning | 3 | 2 |

## 1.0 Introduction

1.1 This report results from a Stage 1 Road Safety Audit (RSA) carried out on the proposed 3-arm mini roundabout for a residential development of up to 150 dwellings on Kelvedon road in Tiptree, Essex.

1.2 The proposals include:

- The provision of a 3-arm mini roundabout on Kelvedon Road;
- The provision of a 5.5m wide carriageway on the southern arm of the mini roundabout into the development;
- The provision of indented dropped kerbs and tactile paving on the new southern access road;
- The provision of 2.0m wide footway, either side of the new access road into the development, and
- Associated road markings and signage.

1.3 The Stage 1 RSA was carried out at the request of Steve Amann, on behalf of the Design Organisation Journey Transport Planning, based at Unit BIC 112, The MedBIC, Alan Cherry Drive, Chelmsford in Essex.

1.4 The Audit Brief and Audit Team were approved by Steve Amann, on behalf of the Design Organisation Journey Transport Planning, on the 10th October 2019.

1.5 The Road Safety Audit Brief was supplied by Steve Amann, (e-mail: steve amann <steve.amann@journeytp.co.uk>, of Journey Transport Planning.

1.6 The Audit was carried out on Tuesday 22nd October 2019, between 09.50hrs and 10:40hrs. The Audit Team, which is independent of the project design team, has had no involvement with the project.

The Audit Team membership was as follows:

| | |
|---|---|
| John Bowman | MCIHT MSoRSA<br>JB Road Safety Consultancy Ltd |
| Beth Newiss | MCIHT MSoRSA<br>Road Safety Consultant |

1.7 The report has been prepared in accordance with General Principles and Scheme Governance General Information, GG 119, Road Safety Audit, of the Design Manual for Roads and Bridges. (Formerly HD19/15 Road Safety Audits).

1.8 The Audit consisted of a study of the drawings and documents provided by the Design Organisation, and given in *Appendix A* to this report.

1.9 No details of any Departures of Standard have been provided to the Audit Team by the Design Organisation.

1.10 The site visit was carried out by the Audit Team, together, when the weather was dry and sunny but the road surface was damp. Traffic conditions on Kelvedon Road were constant, including HGV's and LGV's, buses and cars. No pedestrians or pedal cyclists were seen.

1.11 Collision data, obtained from Essex County Council by the Design Team has been provided to the Audit Team covering Kelvedon Road in the vicinity of the proposed scheme. This shows that there have been no recorded personal injury collisions in the vicinity of the scheme.

1.12 The recommendations in this report are aimed at addressing the road safety problems; however, there may be other alternative acceptable ways to overcome a specific problem, when other practical issues are considered. The recommendations contained herein do not absolve the Designer of his/her responsibilities.

1.13 The Overseeing Organisation response to the RSA should be formally recorded and reported to the Designer and the RSA Team so that a record of the Audit process is contained in the *As Built* design pack to be provided and retained by the Overseeing Organisation on final completion.

1.14 All problems identified in this Road Safety Audit Report are indicated on a location plan in *Appendix B* to this report.

1.15 The Audit Brief supplied by the Design Organisation dated 10th October 2019 to the Audit Team outlined the requirements of the scheme to be audited.

# 2 Items Raised During This Stage 1 Road Safety Audit

## 2.1 Local Alignment

### 2.1.1 PROBLEM

**Locations**: **A** and **B** – The eastbound and westbound approaches to the proposed roundabout (Drawing: DR2 Rev 0).

**Summary**: Reduced vehicle pedestrian inter-visibility at the proposed roundabout, could increase the potential risk of rear end shunt collisions occurring.

The scheme drawing indicates that the vehicle / pedestrian inter-visibility splay of 43.0m is to be maintained on the approaches to the roundabout. The proposed stopping sight distances for both eastbound and westbound approaches to the roundabout cross land adjacent to the carriageway.

Concern arises that any existing or proposed vegetation impacting upon the forward visibility on approach to the roundabout could lead to a potential increased risk of rear end shunt collisions occurring, whereby vehicle occupants could sustain personal injury.

**RECOMMENDATION**

It is recommended that at the detailed design stage of the project, details relating to planting and vegetation removal should be provided.

## 2.2 General

### 2.2.1 PROBLEM

**Locations**: **C** and **D** – The eastbound and westbound approaches to the proposed roundabout (Drawing: DR2 Rev 0).

**Summary**: Existing carriageway PSV may not be sufficient to reduce the potential for skidding and enhancing braking capacity on the eastbound and westbound approaches to the proposed roundabout junction resulting in side impact or rear end shunt type collisions.

The scheme proposals indicate that a new roundabout will be constructed on Kelvedon Road approximately 100m to the west of the junction of Kelvedon Road and Oak Road. In operational terms, the introduction of the new roundabout junction and respective give way lines will result in the creation of new braking areas on the eastbound and westbound approaches to the new feature that does not currently exit.

As a result, concern arises that a high skid resistant surface course material may be required on both the eastbound and westbound approaches to the new roundabout junction.

Whilst motorists should always be anticipating the unexpected, sudden or late braking may be required by motorists, particularly those who may be unfamiliar with the area, which could result in potential give way line overshoots and consequent side impact collisions occurring within the circulatory area of the roundabout junction

or rear end shunt collisions occurring between a leading and any following vehicles on the immediate approaches to the give way lines.

**RECOMMENDATION**

It is recommended that at the detailed design stage of the project, a high skid resistant surface course material should be provided on the northbound and southbound approaches to the proposed junction. The length of skid resistant surface course should be based on the actual 85$^{th}$ percentile vehicular approach speeds.

## 2.3 Junctions

No Problems identified in this category at the Stage 1 Road Safety Audit.

## 2.4 Walking, Cycling and Horse Riding

No Problems identified in this category at the Stage 1 Road Safety Audit.

## 2.5 Traffic Signs, Carriageway Markings and Lighting

### 2.5.1 PROBLEM

**Location**: The approaches to the proposed roundabout (Drawing: DR2 Rev 0)

**Summary**: Give Way road markings are proposed on each approach to the mini roundabout. However, no road signs supporting the road markings have been shown. Lack of supporting information could result in late braking resulting in side impact or rear end shunt type collisions.

The scheme proposals indicate that a new roundabout will be constructed on Kelvedon Road approximately 100m to the west of the junction of Kelvedon Road and Oak Road. In operational terms, the introduction of the new roundabout junction and respective give way lines will result in the creation of new braking areas on the eastbound and westbound approaches to the new feature that does not currently exit.

However, no Give Way road signs, specifically on the westbound approach supporting the road markings have been provided. As a result, concern arises that road users wishing to exit from the new development may find that by giving way to traffic from the right, as is the principal for mini-roundabouts, they are faced with a continual flow of road users at peak hours, increasing the risk of them entering the roundabout in the face of oncoming road users increasing the risk of side impact or rear end shunt type collisions on the circulatory area of the roundabout.

**RECOMMENDATION**

It is recommended that at the detailed design stage of the project, Give Way road signs should be provided on the western approach to the roundabout on Kelvedon Road.

# 3 Road Safety Audit Team Statement

We certify that this audit has been undertaken in accordance with the principles of DMRB GG 119.

AUDIT TEAM LEADER:

**Name:** **John Bowman MCIHT MSoRSA**

Position: Director

Organisation: JB Road Safety Consultancy Ltd

Address: 12 Dorset Avenue, Gt Baddow, Chelmsford, Essex, CM2 9TZ

Signed 

Date 4th November 2019

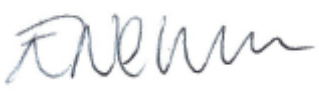
AUDIT TEAM MEMBER:

Name: **Beth Newiss**
**MCIHT MSoRSA**

Position: Road Safety Consultant

Organisation: JB Road Safety Consultancy Ltd

Address: 12 Dorset Avenue, Gt Baddow, Chelmsford, Essex, CM2 9TZ

Signed 

Date 4th November 2019

**Audit Team Leader's Contact Details:**

Direct Telephone: 07775 631650

Email address: javbowman@btinternet.com

# Appendix A

(Details of the Drawings and Documents Supplied by the Client for
This Stage 1 Road Safety Audit)

Drawing Number DR2 Rev 0  Kelvedon Road, Tiptree – Proposed Mini-roundabout Access

Drawing Number DR3 Rev 0  Kelvedon Road, Tiptree – Articulated HGV Swept Path 1 of 3

Drawing Number DR3 Rev 0  Kelvedon road, Tiptree – Articulated HGV Swept Path 2 of 3

Drawing Number DR4 Rev 0  Kelvedon road, Tiptree – Articulated HGV Swept Path 3 of 3

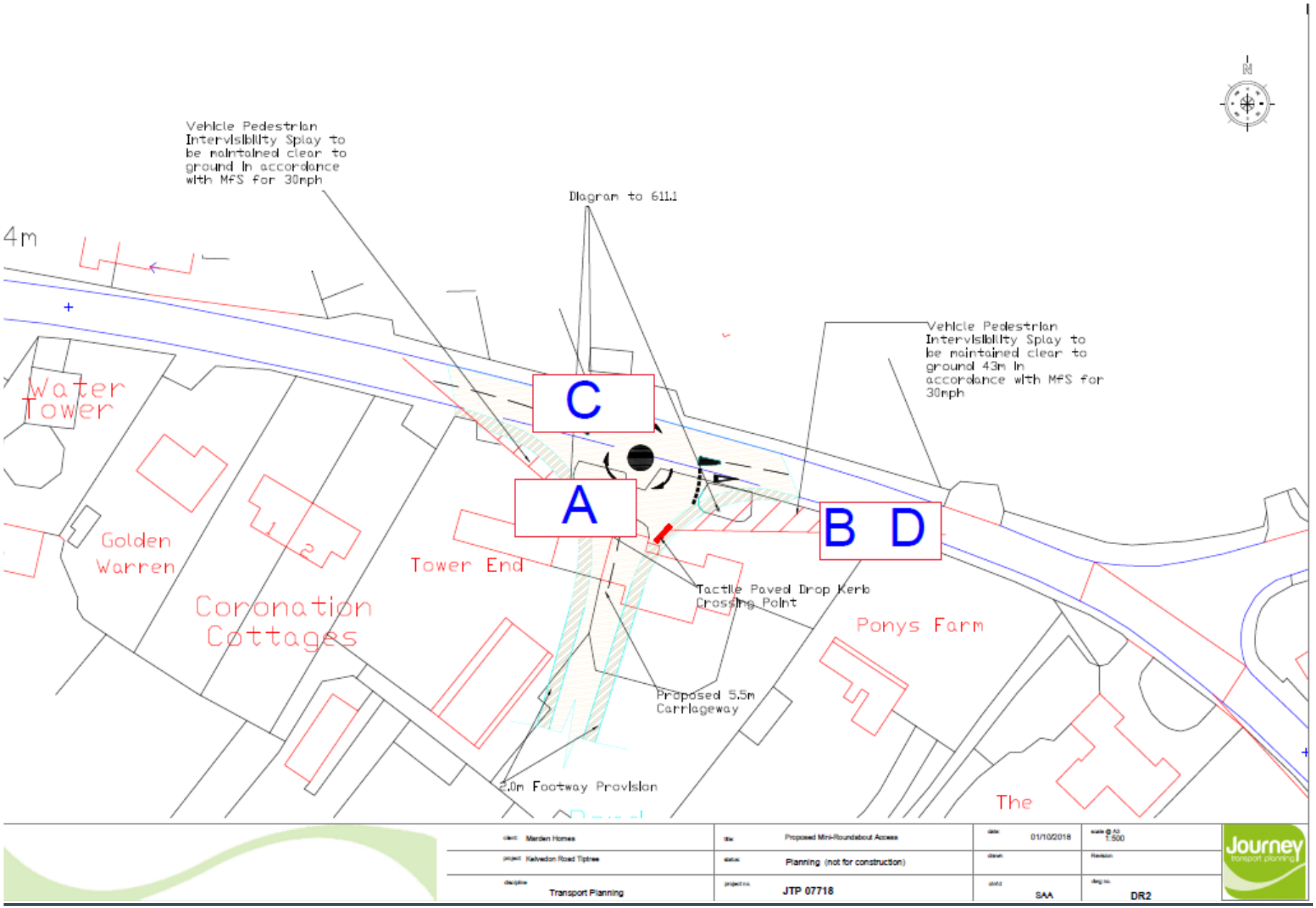
Other Documents

Road Safety Audit Brief – Journey Transport Planning

Transport Assessment – Journey Transport Planning – January 2019

# Appendix B

(Annotated Drawing Showing Locations of Problems Identified in This Stage 1 Road Safety Audit)


Vehicle Pedestrian Intervisibility Splay to be maintained clear to ground in accordance with MfS for 30mph
Diagram to 611.1
4m
Water Tower
C
A
B D
Vehicle Pedestrian Intervisibility Splay to be maintained clear to ground 43m in accordance with MfS for 30mph
Golden Warren
1
2
Tower End
Coronation Cottages
Tactile Paved Drop Kerb Crossing Point
Ponys Farm
Proposed 5.5m Carriageway
2.0m Footway Provision
The
N
client Marden Homes
title Proposed Mini-Roundabout Access
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
check SAA
dwg no. DR2
Journey transport planning

**Audit Team Leader's Contact Details:**

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