APPENDIX 6-1

BAT SURVEY REPORT

Bat Survey Report

Knocknacarra District Centre LRD

DOCUMENT DETAILS

Client:	**Glenveagh Living Ltd.**
Project Title:	**Knocknacarra District Centre LRD**
Project Number:	**210206**
Document Title:	**Bat Survey Report**
Document File Name:	**BR F – 2022.12.16 – 210206**
Prepared By:	**MKO Tuam Road Galway Ireland H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
01	Final	16/12/2022	NC	AJ

Table of Contents

TABLE OF PLATES

TABLE OF TABLES

TABLE OF FIGURES

1. INTRODUCTION

MKO was commissioned to undertake a bat survey with regards to a proposed largescale residential development (LRD) at Knocknacarra, Co. Galway.

MKO undertook two dusks and one dawn bat activity surveys in 2021, within the site of the Proposed Development (Grid Reference: M 26884 25143). The main objective of the surveys was to gather information on roosting, commuting, and foraging bats using the site and to identify any important features for bats. Two full spectrum bat detectors, Song Meter Mini (Wildlife Acoustics, Maynard, MA, USA), were deployed for two weeks to record bat activity at two fixed locations. After two weeks, the detectors were then moved to alternative locations within the site where they stayed for further two weeks.

The bat survey and assessment were informed by a desk study and with reference to the following guidelines:

- *Bat Surveys for Professional Ecologists – Good Practice Guidelines (3rd edn.) (Collins, 2016)*
- *Bat Roosts in Trees (Andrews, 2018)*
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2006a)*
- *Guidelines for the Treatment of Bats during the Construction of National Road Schemes (NRA, 2006b)*
- *British Bat Calls: A Guide to Species Identification (Russ, 2012)*
- *Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 134. (Marnell, Kelleher & Mullen, 2022)*
- *Guidance Note 08/18: Bats and Artificial Lighting in the UK (ILP, 2018)*

1.1 Policy and Legislation

All Irish bats are protected under European legislation, namely the Habitats Directive (92/43/EEC). All Irish species are listed under Annex IV of the Directive, requiring strict protection for individuals, their breeding sites and resting places. The lesser horseshoe bat (*Rhinolophus hipposideros)* is further listed under Annex II of the Directive, requiring the designation of conservation areas for the species. Under this Directive, Ireland is obliged to maintain the favourable conservation status of Annex-listed species. This Directive has been transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011).

In addition, Irish species are further protected by national legislation (Wildlife Acts 1976-2022). Under this legislation, it is an offence to intentionally disturb, injure or kill a bat or disturb its roost. Any work at a roost site must be carried out with the agreement of the National Parks and Wildlife Service (NPWS) and a derogation licence must be granted before works commence.

1.2 Statement of Authority

The bat surveys were undertaken by MKO ecologists Keith Costello (BSc.), Ellen Tusk (BSc.) and Kevin McElduff (B.Sc.). Donal Folan, who was a student participating in an internship program in MKO at the time the surveys were carried out, also accompanied the surveyors. All staff have relevant academic qualifications to complete the surveys and assessments that they were required to do. This report was prepared by Neil Campbell (B.Sc., M.Sc.) and was reviewed by Aoife Joyce (BSc., MSc.,). Neil has 2 years' experience and Aoife has over 3 years' experience in ecological assessment.

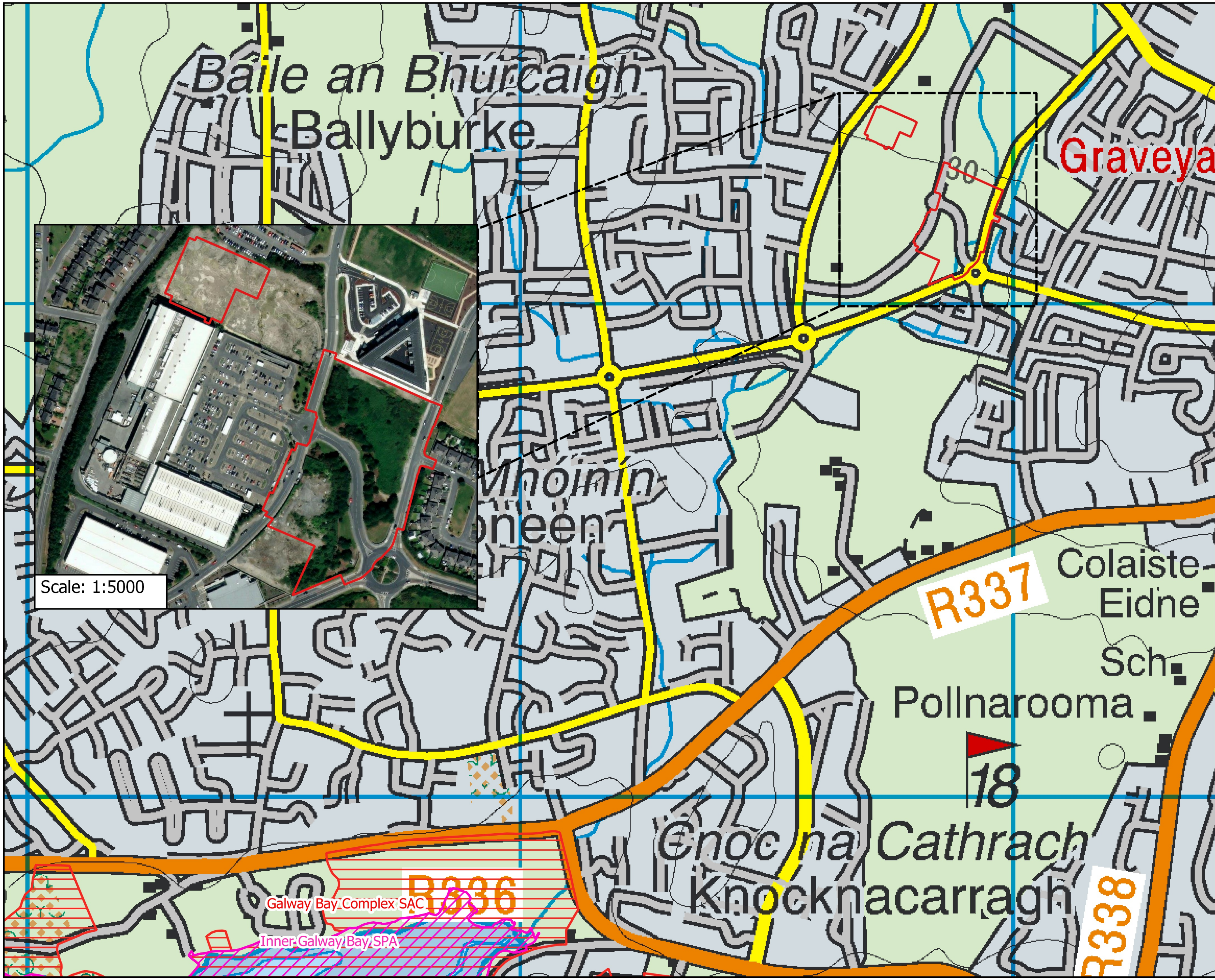
2. CHARACTERISTICS OF PROPOSED DEVELOPMENT

The subject site is bounded by Gaelscoil Mhic Amhlaigh to the north and the Western Distributor Road to the south. Gateway Retail Park is located approximately 200m to the west of the site. At the eastern boundary of the site there are existing low-density residential housing units. (Grid Reference: M 26903 25141).

A site location map is presented in Figure 2-1.

The Proposed Development will consist of the following:

1. *Provision of 227 no. residential apartments in 7 no. blocks comprising the following:*
    - *Block A1: 14 no. 1 bed apartments & 24 no. 2 bed apartments in a block ranging between 3-5 storeys in height;*
    - *Block A2: 25 no. 1 bed apartments & 15 no. 2 bed apartments in a block ranging between 1-5 storeys in height;*
    - *Block B1: 3 no. 1 bed apartments, 18 no. 2 bed apartments & 3 no. 3 bed apartments in a block ranging between 3-4 storeys in height;*
    - *Block B2: 13 no. 1 bed apartments & 21 no. 2 bed apartments in a block ranging between 4-5 storeys in height.*
    - *Block B3: 5 no. 1 bed apartments, 22 no. 2 bed apartments & 1 no. 3 bed apartment in a block ranging between 3-5 storeys in height;*
    - *Block B4: 11 no. 1 bed apartments & 26 no. 2 bed apartments in a block ranging between 3-5 storeys in height;*
    - *Block B5: 13 no. 1 bed apartments & 13 no. 2 bed apartments in a block ranging between 3-5 storeys in height.*
2. *Provision of 1,009.7 sq.m of ground floor commercial units as follows:*
    - *Unit A101: 411.7 sq.m;*
    - *Unit A102: 138.2 sq.m;*
    - *Unit B201: 99.7 sq.m;*
    - *Unit B202: 133.9 sq.m;*
    - *Unit B301 3: 226.2 sq.m.*
3. *Provision of a Community Facility (117.8 sq.m);*
4. *Provision of Tenant Amenity Facilities (99.4 sq.m);*
5. *Provision of a Childcare Facility (561.3 sq.m) including an external secure play area;*
6. *Provision of 49 no. surface car parking spaces including EV charging spaces;*
7. *Provision of bicycle parking comprising 114 no. short stay and 436 no. long stay spaces;*
8. *Provision of realigned road between Gort na Bró and Gateway Retail Park Road;*
9. *Change of use of existing underground void to 181 bay underground car park;*
10. *Provision of shared communal and private open spaces, bin storage, public lighting, site landscaping, services, signage, substation, and all associated site development works required to accommodate the Proposed Development.*



Map Legend

- Site Boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

N

Drawing Title	Site Location
Project Title	Knocknacarra District Centre LRD
Drawn By: AvdGM	Checked By: RW
Project No.: 210206	Drawing No.: Fig 2-1
Scale: 1:10000	Date: 14.12.2022

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: www.mkoireland.ie

3. METHODS

3.1 Desktop Study

A desktop review of published material was undertaken to inform all subsequent field studies and assessments. The aim of the desktop review was to identify the presence of species of interest within the Proposed Development site and surrounding region.

The following list describes the sources of data consulted:

- *Review of online web-mappers: National Parks and Wildlife Service (NPWS) mapping.*
- *Review of NPWS Article 17 Report.*
- *Review of the publicly available National Biodiversity Data Centre web-mapper.*
- *Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads which overlap with the study area.*
- *Review of N6 Galway City Transport Project; Ecological information presented in the Route Selection Report: Chapter 4: http://www.n6galwaycity.ie.*
- *Review of N6 Galway City Ring Road Environmental Impact Assessment Report (2018)*

3.1.1 National Bat Database of Ireland

The National Bat Database of Ireland holds records of bat observations received and maintained by Bat Conservation Ireland. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The database was searched on 18/10/2022 for bat presence and roost records within 10km of the Proposed Development site.

In addition, information on species' range and distribution, available in the 2019 Article 17 Reports (NPWS, 2019), was reviewed in relation to the location of the development. The NPWS monitors the conservation status of European protected habitats and species and reports their findings to the European Commission every 6 years in the form of an Article 17 Report. The most recent report for the Republic of Ireland was submitted in 2019.

3.1.2 Designated Sites

The potential for the Proposed Development to impact on sites that are designated for bats was considered in the main Biodiversity Chapter.

Special Areas of Conservation (SACs) are designated under EU Habitats Directive. The potential for effects on European Sites is fully considered in the AA Screening Report that accompanies this report. The European Sites that are within the Zone of Likely Impact, with bats identified as Qualifying Interests, are listed in the Appropriate Assessment Screening Report (AASR) and are not repeated in this document.

Natural Heritage Areas (NHAs) are designated under the Wildlife (Amendment) Act 2000 and their management and protection is provided for by this legislation and planning policy. The potential for effects on these designated sites is fully considered in the Biodiversity Chapter.

Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, the potential for effects on these designated sites is fully considered in the Biodiversity Chapter.

3.1.3 Galway City Transport Project (2015) and Galway City Ring Road EIAR (2018)

The "Route Selection Report: Chapter 4" of the N6 Galway City Transport Project Environmental Impact Statement, the N6 Galway City Ring Road Environmental Impact Assessment Report (2018) were consulted as part of the desk study for the purposes of the bat assessment. Details of consultation, specifically related to bats, are provided in Section 4.1 below.

3.2 Ecological Appraisal (Bats)

A walkover survey of the Study Area was carried out during daylight hours on the 27th July and 24th of August 2021. The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn.) (Collins, 2016). Table 4.1 of the 2016 BCT Guidelines identifies a grading protocol for assessing structures, trees and commuting/foraging habitat for bats. The protocol is divided into four Suitability Categories: *High, Moderate, Low* and *Negligible*.

3.3 Bat Surveys

3.3.1 Roost Assessment

A search for roosts was undertaken within the boundary of the Proposed Development. The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. The site was visited on multiple occasions in July and August 2021. All structures and trees were assessed for their potential to support roosting bats. Any potential roost sites were subject to a roost assessment. This comprised a detailed inspection of the exterior and interior (if accessible) to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises.

Trees within the site were also assessed from ground level, with the aid of binoculars. Any potential tree roosts were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (i.e., PRFs) identified by Andrews (2018).

3.3.2 Dusk and Dawn Activity Surveys

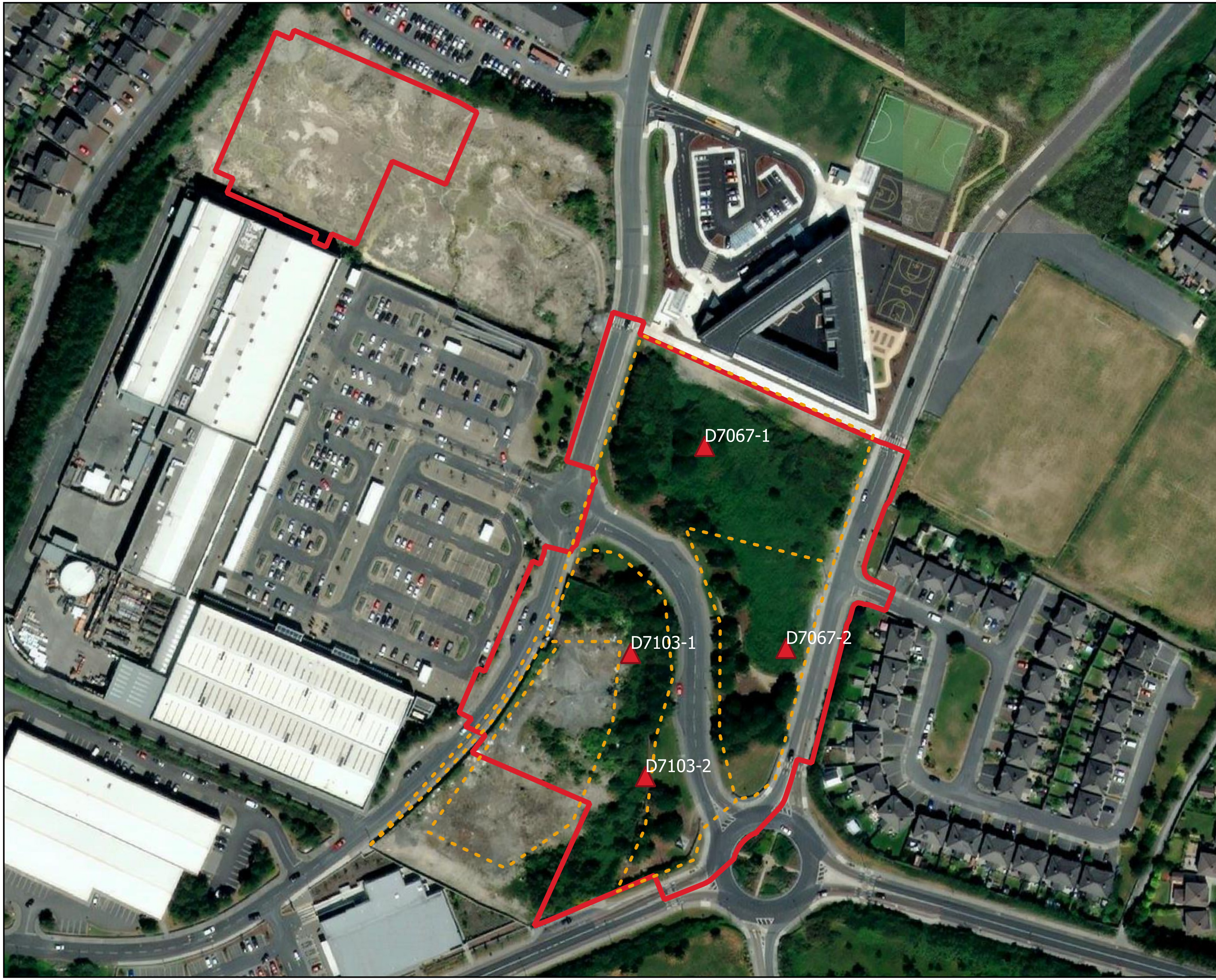
Three dusk and one dawn surveys were carried out in July/ August 2021 (Table 3-1). The aim of the surveys was to identify if there were bats present at the proposed site, what bat species were present and to gather any information on bat foraging and commuting behaviour. The activity surveys included walked transects across the extent of the proposed site during the dusk and dawn surveys. Figure 3-1 shows the route travelled during the manual surveys.

The dusk surveys commenced 30 minutes before sunset and were completed for 2 hours after sunset. The dawn surveys commenced two hours before sunrise and was completed at sunrise. Conditions were suitable for all bat surveys completed at the site (Table 3-1).

Table 3-1 Bat Activity Survey Effort 2021

Date	Surveyor	Type	Sunrise/Sunset	Weather
27th July 2021	Keith Costello and Donal Folan	Dusk	21:40	17°C, Dry, Light breeze, cloud cover approx. 40%

Date	Surveyor	Type	Sunrise/Sunset	Weather
10th August 2021	Keith Costello and Ellen Tuck	Dawn	06:07	12°C, Dry, Light breeze, cloud cover approx. 60%
24th August 2021	Keith Costello and Kevin McElduff	Dusk	20:45	23°C, Dry, Light Breeze, cloud cover approx. 10%



Map Legend

Static Detector Locations

Manual Transect Route

Site Boundary

N

Drawing Title: 2021 Survey Effort	
Project Title: Knocknacarra District Centre LRD	
Drawn By: NC	Checked By: AJ
Project No.: 210206	Drawing No.: Fig 3-1
Scale: 1:2000	Date: 14/12/2022

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: www.mkoireland.ie

3.3.3 Static Detector Surveys

Full spectrum bat detectors, Song Meter Mini (Wildlife Acoustics, Maynard, MA, USA), were deployed during static surveys to record bat activity at four fixed locations over a 4-week period in 2021. The four locations of static detectors were selected to represent the range of habitats present within the site, including favourable bat habitats. Settings used were those recommended by the manufacturer for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates.

The survey was designed to utilise two static detectors to monitor bat activity. Two full spectrum bat detectors, Song Meter SM4 detectors were deployed on site on the 27th of July 2021. The detectors were moved to alternative locations within the site on the 10th of August 2021, to sample a range of habitats, before being collected on the 25th of August 2021. Static detector locations can be found in Figure 3-1.

Analysis of Static Detector Results

Echolocation signal characteristics (including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra) were compared to published signal characteristics for local bat species (Russ, 1999). Myotis species (potentially *M. daubentonii, M. mystacinus, M. nattereri*) were considered as a single group, due to the difficulty in distinguishing them based on echolocation parameters alone (Russ, 1999). The echolocation of *P. pygmaeus* and *P. pipistrellus* are distinguished by having distinct frequencies (peak frequency of maximum energy in search flight) of ~55 kHz and ~46 kHz respectively (Jones & van Parijs, 1993).

Plate 3-1 below shows a typical sonogram of echolocation pulses for Common pipistrelle recorded with a SM4BAT bioacoustic static bat recording device. The recorded file is illustrated using Wildlife Acoustics Kaleidoscope software.

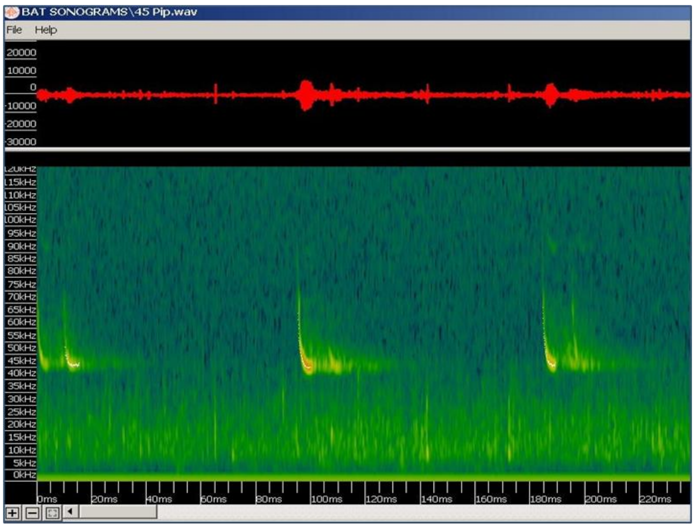


Plate 3-1 Sonogram of Echolocation Pulses of Common pipistrelle (Peak Frequency 45kHz)

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2016). For the purposes of this survey, a bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15 seconds length.

3.4 Survey Limitations

Survey design and effort was created in accordance with the most current best practice guidelines for surveying bats (Collins, 2016).

The information provided in this report accurately and comprehensively describes the baseline environment; provides an accurate prediction of the likely effects of the Proposed Development; prescribes mitigation as necessary; and describes the predicted residual impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines.

July and August are within the optimal survey period for bat activity surveys, (Collins, 2016). Weather conditions were suitable for carrying out all surveys.

No significant limitations in the scope, scale or context of the assessment have been identified. Overall, a comprehensive assessment has been achieved.

4. RESULTS

4.1 Desktop Study

4.1.1 National Bat Database of Ireland

National Biodiversity Data Centre

A review of the National Bat Database of Ireland was made on the 18th of October 2022 yielded results of bats within a 10km radius of the development site. The search yielded seven bat species within 10km. Table 4-1 lists the bat species recorded within the hectad which pertains to the current study area (M22).

Table 4-1 NBDC Bat Records

Hectad	Species	Date	Database	Status
M22	Brown long-eared bat *Plecotus auritus*	21/05/2007	National Bat Database of Ireland	HD Annex IV, WA
M22	Daubenton's bat *Myotis daubentonii*	19/08/2014	National Bat Database of Ireland	HD Annex IV, WA
M22	Lesser horseshoe bat *Rhinolophus hipposideros*	30/01/2015	National Bat Database of Ireland	HD Annex II & IV, WA
M22	Leisler's bat *Nyctalus leisleri*	21/05/2016	National Bat Database of Ireland	HD Annex IV, WA
M22	Natterer's bat *Myotis nattereri*	15/08/2005	National Bat Database of Ireland	HD Annex IV, WA
M22	Common pipistrelle *Pipistrellus pipistrellus*	21/05/2016	National Bat Database of Ireland	HD Annex IV, WA
M22	Soprano pipistrelle *Pipistrellus pygmaeus*	21/05/2016	National Bat Database of Ireland	HD Annex IV, WA

4.1.2 Designated Sites

The following Designated Sites have been identified as having Lesser horseshoe bat as a Qualifying Interest within 15km of the Proposed Development.

Lough Corrib SAC (000297)

The SAC site boundary is located 2.5km from the Proposed Development. The Lesser horseshoe bat roost for which the SAC has been designated (roost id. 217 in NPWS database) is located approximately 33.5km to the north-west of the site of Proposed Development. This is significantly outside the foraging range (2.5km) of Lesser Horseshoe bat (NPWS, 2013). There is no potential for significant effect on the Lesser horseshoe bat population or the QI habitats either in the form of disturbance, loss or deterioration of habitat quality.

Ross Lake And Woods SAC (001312)

The SAC site boundary is located 12km from the Proposed Development. The Lesser horseshoe bat roost for which the SAC has been designated (roost id. 212 in NPWS database) is located approximately 15.4km to the north-west of the site of Proposed Development. This is significantly outside the foraging range (2.5km) of Lesser Horseshoe bat (NPWS, 2013). There is no potential for significant effect on the Lesser horseshoe bat population or the QI habitats either in the form of disturbance, loss or deterioration of habitat quality for which the SAC has been designated.

East Burren Complex SAC (001926)

The SAC site boundary is located 13.86km from the Proposed Development. The Lesser horseshoe bat roosts for which the SAC has been designated, is located approximately 28.5km to the south of the site of Proposed Development. This is significantly outside the foraging range (2.5km) of Lesser horseshoe bat (NPWS, 2013). There is no potential for significant effect on the Lesser horseshoe bat population or the QI habitats either in the form of disturbance, loss or deterioration of habitat quality.

4.1.3 Galway City Transport Project (2015) and Galway City Ring Road EIAR (2018)

Galway City Transport Project (2015)

A review of publicly available information, on studies undertaken as part of the Galway City Transport Project (GCTP), was carried out. As part of this project, detailed bat surveys were undertaken in the area surrounding Galway City and this publicly available information was consulted.

Extensive bat survey work carried out as part of the GCTP included walked transect surveys in Ballymoneen/Rahoon and surrounding areas. Chapter 4 of the Route Selection Report identifies bats and bat roosts throughout Galway city (Table 4-2). Detector surveys recorded Soprano pipistrelle, Common pipistrelle, Leisler's bat and Brown long-eared bat commuting/foraging in the area surrounding Ballymoneen/Rahoon.

Table 4-2 Roosts identified within 2.5km of Proposed Development (2015).

Species	Approx. Distance from Site
Common pipistrelle *(Pipistrellus pipistrellus)*	400m west
Common pipistrelle *(Pipistrellus pipistrellus)*	400m west
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	1.2km north
Brown long-eared bat *(Plecotus auratus)*	1.2km north
Daubenton's bat (*Myotis daubentonii*)	2.2km northwest
Daubenton's bat (*Myotis daubentonii*)	2.2km northwest
Lesser horseshoe bat *(Rhinolophus hipposideros)*	2.2km southwest
Leisler's bat *(Nyctalus leisleri)*	2.3km west
Leisler's bat *(Nyctalus leisleri)*	2.3km west
Whiskered bat *(Myotis mystacinus)*	2.4km southeast
Lesser horseshoe bat *(Rhinolophus hipposideros)*	2.4km southwest
Daubenton's bat (*Myotis daubentonii*)	2.5km east
Daubenton's bat (*Myotis daubentonii*)	2.5km east

Galway City Ring Road EIAR (2018)

The N6 Environmental Impact Assessment Report for the Galway City Ring Road (GCRR) was consulted for roost records near the Proposed Development site (Table 4-3).

Table 4-3 Roosts identified within 2.5km of Proposed Development (2018).

Roost ID	Species	Approx. Distance from Site	Details
PBR141	Common pipistrelle *Pipistrellus pipistrellus*	400m northwest	Female roosting in two modern buildings in a housing estate at Ballymoneen
PBR147	Common pipistrelle *Pipistrellus pipistrellus*	400m northwest	Female roosting in two modern buildings in a housing estate at Ballymoneen
PBR165	Common pipistrelle *Pipistrellus pipistrellus*	400m northwest	N/A
PBR49	Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared bat (*Plecotus auritus*)	1.2km north	Building. Roost for small numbers of Soprano pipistrelle and Brown long-eared bats (likely to be a transition/occasional roost)
PBR237	Soprano pipistrelle *Pipistrellus pygmaeus*	1.2km north	Unoccupied farm building or house
PBR267	Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared bat (*Plecotus auritus*)	1.4km northwest	Building. Roost for small numbers of Soprano pipistrelle and Brown long-eared bats (likely to be a transition/occasional roost)
PBR173	Brown Long-eared bat (*Plecotus auritus*)	1.8km northwest	Building. Possible maternity roost for Brown long-eared bats, small roost
PBR143	Daubenton's bat (*Myotis daubentonii*)	2.1km northeast	Building. Galway City Centre
PBR144	Daubenton's bat (*Myotis daubentonii*)	2.1km northeast	Building. Galway City Centre
PBR116	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	2.2km southeast	N/A
PBR146	Leisler's bat (*Nycatlus leisleri*)	2.3km west	Building. Day roost for Leisler's bats.
PBR139	Leisler's bat (*Nycatalus leisleri*)	2.3km west	Building. Day roost for Leisler's bats.
PBR256	Brown Long-eared bat (*Plecotus auritus*)	2.3km northwest	Building. Brown long-eared maternity roost.
PBR177	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	2.3km northwest	Building. Roost for small numbers of Soprano pipistrelle bats (likely to be a transition/occasional roost)
PBR255	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	2.3km northwest	Building. Roost for small numbers of Soprano pipistrelle bats (likely to be a transition/occasional roost)
PBR124	Lesser horseshoe bat (*Rhinolophus hipposideros*)	2.4km southeast	Night roost in vicinity of Bearna woods
PBR140	Whiskered bat (*Myotis mystacinus*)	2.4km southeast	Roosting in modern dwelling house in residential estate by the Sports Centre, near Bearna Woods
PBR151	Whiskered bat (*Myotis mystacinus*)	2.4km southeast	Roosting in modern dwelling house in residential estate by the Sports Centre, near Bearna Woods
PBR210	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	2.5km northwest	Building. Night roost for Lesser Horseshoe bat (*Rhinolophus hipposideros*)
PBR130	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	2.5km northwest	N/A
PBR73	Natterer's Bat (*Myotis nattereri*)	2.5km north	Church. Historical record of Natterer's roost
PBR150	Daubenton's bat (*Myotis daubentonii*)	2.5km east	Bridge. Galway City Centre
PBR152	Daubenton's bat (*Myotis daubentonii*)	2.5km east	Bridge. Galway City Centre

Roost ID	Species	Approx. Distance from Site	Details
PBR178	Lesser horseshoe bat (*Rhinolophus hipposideros*) Brown long-eared bat (*Plecotus auritus*)	2.5km northwest	Building. Lesser horseshoe bat roost. Juvenile bats present late in the maternity season but not proven to be a maternity roost.
PBR222	Soprano pipistrelle *Pipistrellus pygmaeus*	2.4km southwest	Occupied dwelling in Bearna woods

4.1.4 Conclusion of Desktop Study

The desktop study has provided information about the existing bat activity in grid square M22, within which the Proposed Development is located. The GCTP and GCRR have provided information about the existing bat activity and roost locations within Galway city.

Bat records within 2.5km and 10km of the Proposed Development revealed that the wider area has been studied for bats and that a number of bat roost for a variety of species have been recorded. This suggests that the area offers potential for foraging and commuting bat species.

4.2 Bat Habitat Appraisal

A walkover survey, assessing bat habitat suitability, was conducted on the 27th of July 2021. Habitats recorded at the site are listed in Table 4-4. Further details on habitats present within the site can be found in the main Biodiversity Chapter.

Table 4-4 Habitats recorded within and adjacent to the Proposed Development.

Habitat	Fossitt (2000) Code
Spoil and Bare Ground	ED2
Recolonising Bare Ground	ED3
Buildings and Artificial Surfaces	BL3
Scattered Trees and Parkland	WD5
Amenity Grassland	GA2
Scrub	WS1
Ornamental/ non-native shrub	WS3
Hedgerows	WL1

The Proposed Development area is bisected by a public access road. This road and associated footpaths are classified as **Buildings and Artificial Surfaces (BL3)**. Areas of concrete block and stone wall façade along the boundaries of the site are also classified as *Buildings and Artificial Surfaces*. The Proposed Development area, south of the road, is dominated by **Spoil and bare ground (ED2)** and **Recolonising Bare Ground (ED3),** with areas of **Scrub (WS1)** and **Scattered trees and Parkland (WD5)** acting as a natural barrier to the road to the North and East.

The northern portion of the Proposed Development site is dominated by **Scrub (WS1)** habitat characterised by bindweed (*Calystegia sepium*), willowherb (*Epibolium spp.*), immature willows (Salix spp.), gorse (*Ulex europeaus*), bramble (*Rubus fruticosus agg.*), ragwort (Senecio jacobaea), dandelion (Taraxacum spp.), and butterfly bush (*Buddleja davidii*) among other common and widespread species (Plate 4-1).

Habitats bordering the public access road and within the north-western boundary are classified as **Scattered trees and parkland (WD5)** characterised by maple (*Acer platanoides*), sycamore (*Acer pseudoplatanus*), beech (*Fagus sylvatica*), birch (*Betula spp.*), ash (*Fraxinus excelsior*), and willow as well as areas of **Amenity grassland (GA2)** (Plates 4-2 and 4-3).

The southern portion of the Proposed Development site is dominated by artificial habitats classified as a mosaic of **Spoil and bare ground (ED2)** and **Recolonising bare ground (ED3)** (Plate 4-4). Large areas of the southern portion of the Proposed Development site area classified as a mosaic of **Scrub (WS1)** and **Ornamental/ non-native shrub (WS3)** dominated by himalayan knotweed (*Persicaria wallichii*) and butterfly bush.

A short immature **Hedgerow (WL1)** is present within the southeastern boundary of the Proposed Development site. A short, planted line of **Ornamental/ non-native shrub (WS3)** is present along the western boundary of the Proposed Development site bordering the existing car park west of the Proposed Development.

With regard to foraging and commuting bats, areas of spoil and bare ground, recolonising bare ground, buildings and artificial surfaces, ornamental shrubs and amenity grassland and were considered *Low* suitability, i.e., habitat that could be used by small numbers of commuting or foraging bats (Collins, 2016). Hedgerows, scrub and scattered trees forming boundary habitats provide some connectivity to the surrounding landscape. As such, they were assessed as having *Moderate* suitability i.e., Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens (Collins, 2016).

Plate 4-1 Area of scrub on the north section of the development.

Plate 4-2 Scattered Trees and Parkland (WD5) adjacent to public access road Buildings and Artificial Surfaces (BL3).

Plate 4-3 View of Amenity grassland (GA2) with Scattered Trees and Parkland (WD5) in background and Buildings and Artificial Surfaces (BL3) in right middle.

Plate 4-4 View of Spoil and bare ground (ED2) in the south section of the development area.

4.3 Bat Surveys

4.3.1 Roost Assessment

A daytime walkover survey and inspection of the site was conducted on the 27th July 2021. Following the search for roosts, no structures were identified on site. The site was also checked for potential tree roosts. Trees within the site consisted of a mixture of immature and semi mature, sycamore, beech, birch, ash and willow. No trees within the Proposed Development site were identified as having any potential roost features (PRF's). As such, the Proposed Development site was considered to have *Negligible* suitability for roosting bats.

4.3.2 Dusk and Dawn Activity Surveys

Numerous foraging and commuting bats were recorded during the dusk and dawn bat activity surveys. In total, 57 bat passes were recorded. Activity was dominated by Soprano pipistrelle (*Pipistrellus pygmaeus*) n=28. This was followed by Common pipistrelle (*Pipistrellus pipistrellus*) n=22. These species are common and widespread across Ireland. In addition, very small numbers of Leisler's bat (*Nyctalus leisleri*) n=6 and *Myotis spp.* n=1 were also recorded. Activity levels were concentrated along the scattered trees that border the road which bisects the site (Figure 4-1 – 4-3). Overall activity within the site during the dusk and dawn activity surveys was low. Plate 4-5 shows total bat species composition and Table 4-5 presents the results per survey. Plate 4-6 shows total bat passes per night.

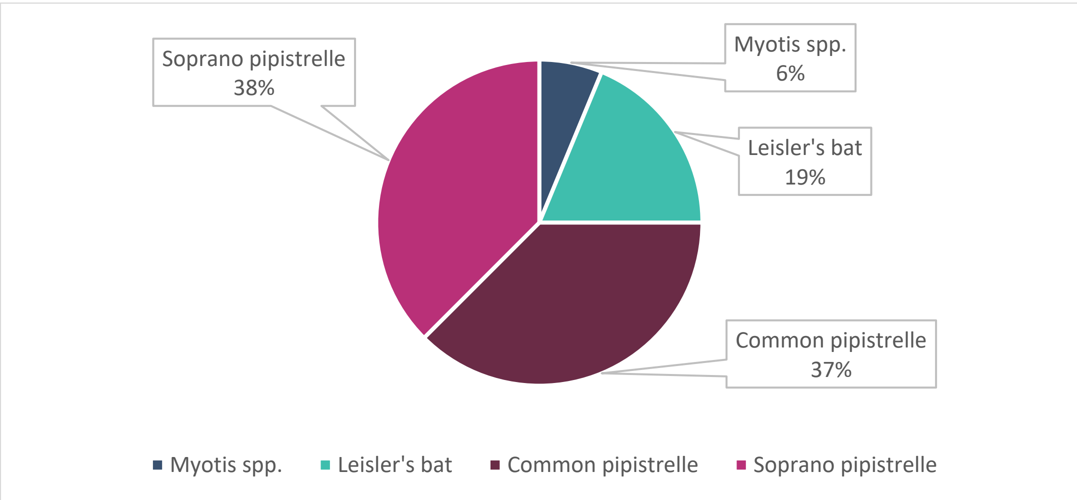


Plate 4-5 Dusk and Dawn Activity Survey Total Bat Species Composition

Table 4-5 Manual Transect Bat Pass Results Per Survey

Species	Dusk 27th July	Dawn 10th August	Dusk 24th August	Total
Myotis spp.	1	-	-	**1**
Leisler's bat	3	2	1	**6**
Common pipistrelle	6	1	15	**22**
Soprano pipistrelle	6	2	20	**28**
Grand Total	**16**	**5**	**36**	**57**

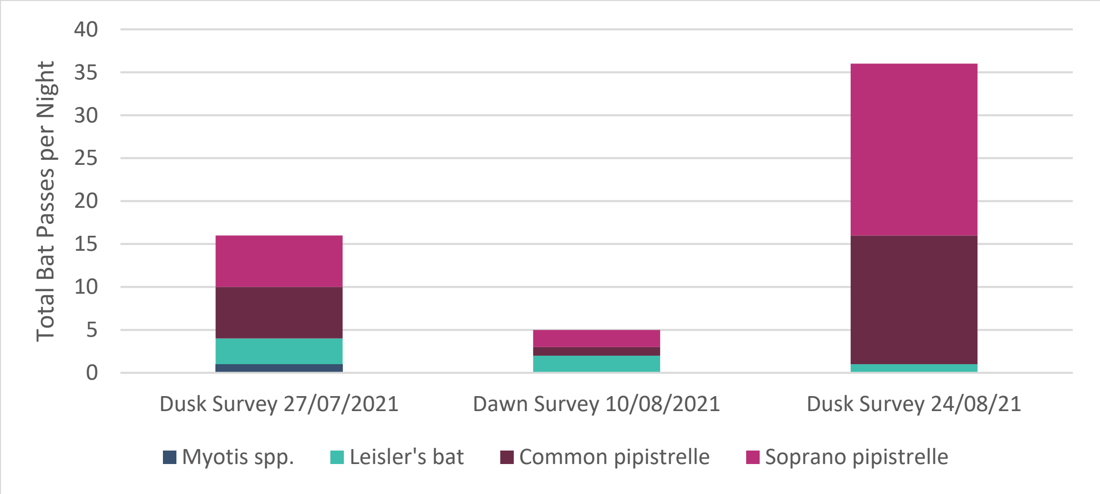
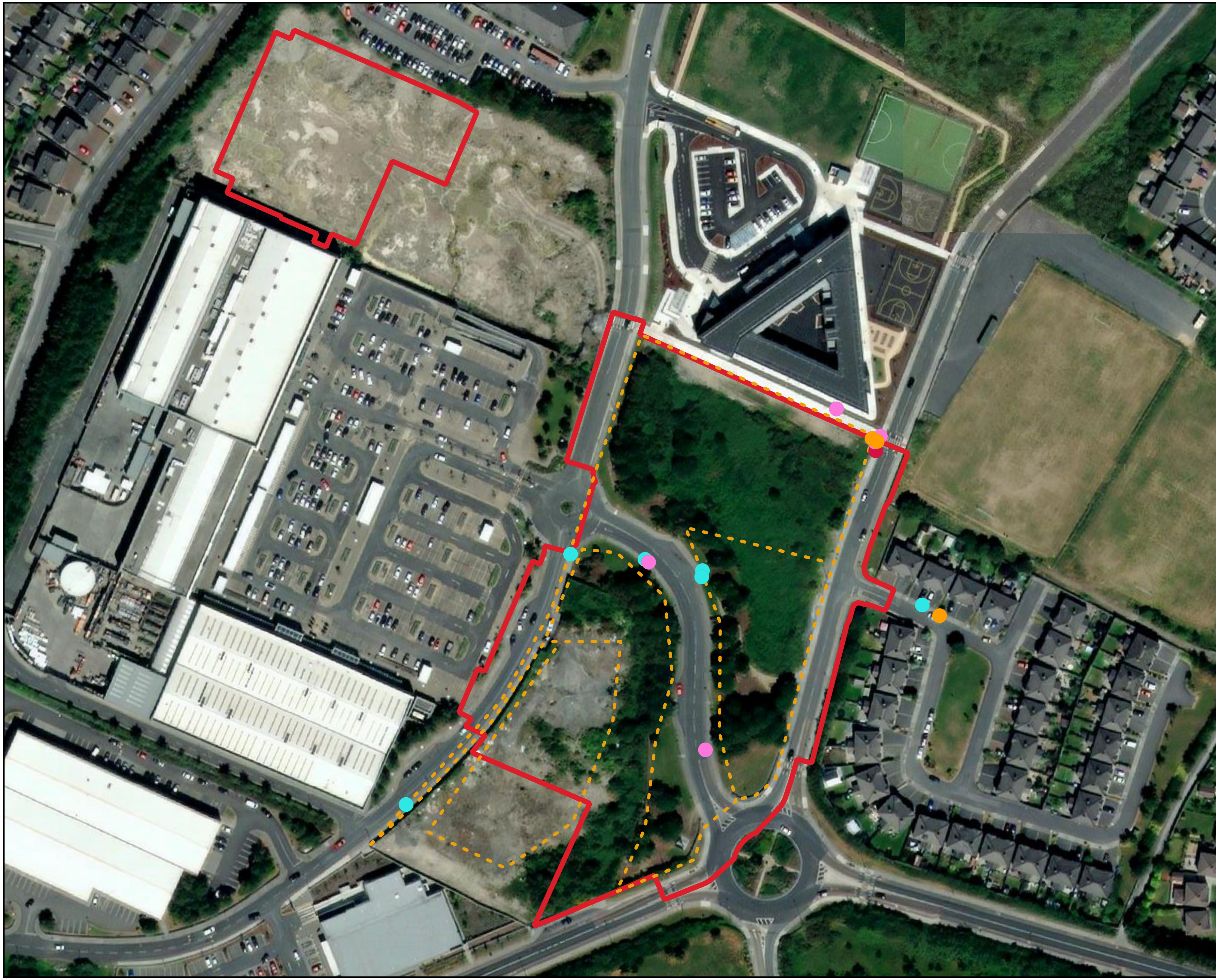


Plate 4-6 Total Bat Passes Per Night



Map Legend

- Site Boundary
- Manual Transect Route

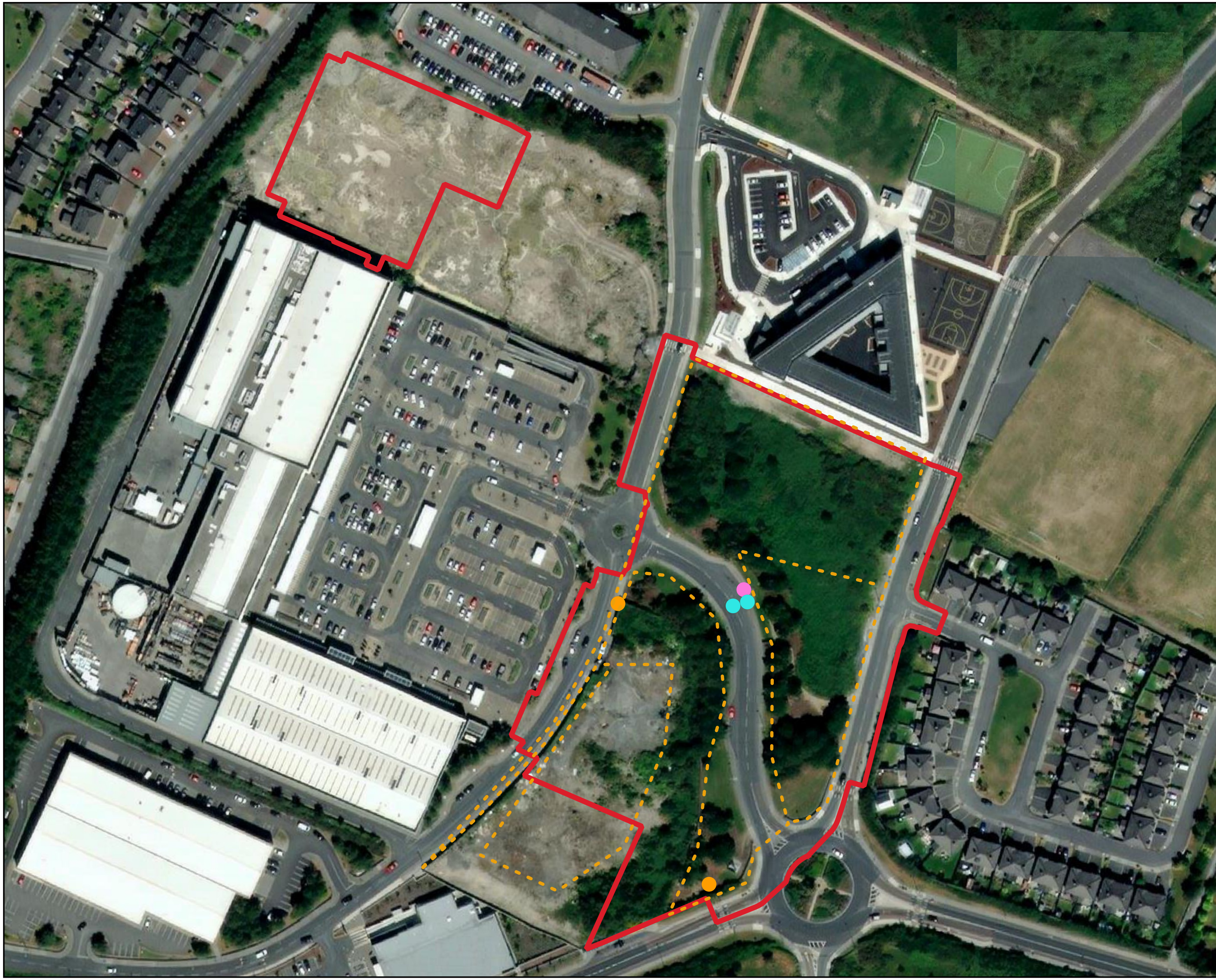
Dusk Survey Results

- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle

N

Dusk Survey Results 27/07/2021	Dusk Survey Results 27/07/2021
Project Title	Knocknacarra District Centre LRD
Drawn By: NC	Checked By: AJ
Project No.: 210206	Drawing No.: Fig 4-1
Scale: 1:2000	Date: 14/12/2022

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: www.mkoireland.ie



Map Legend

Site Boundary

Manual Transect Route

Dawn Survey Results

Leisler's bat

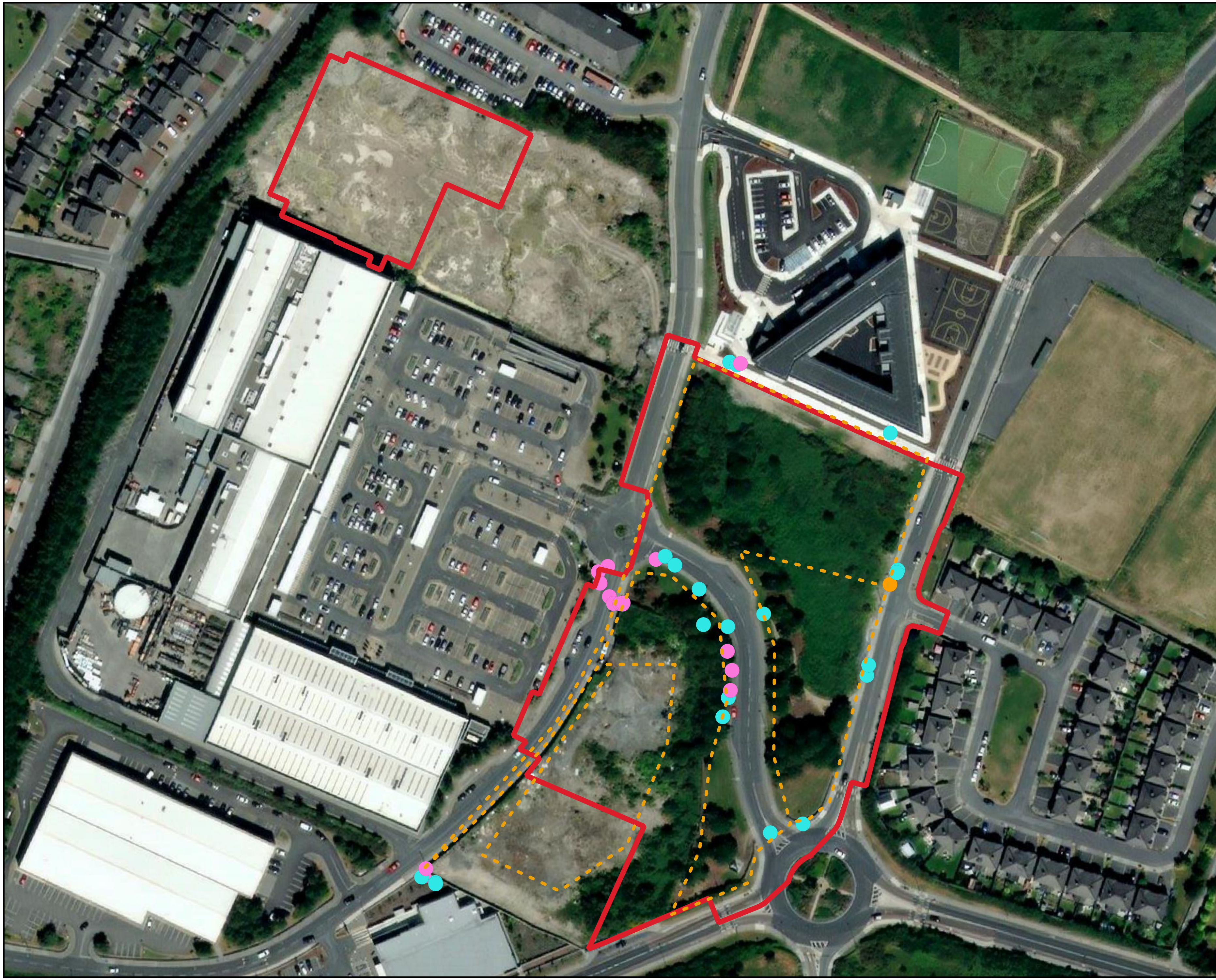
Common pipistrelle

Soprano pipistrelle

N

Drawing Title Dawn Survey Results 10/08/2021	
Project Title Knocknacarra District Centre LRD	
Drawn By NC	Checked By AJ
Project No. 210206	Drawing No. Fig 4-2
Scale 1:2000	Date 14/12/2022

MKO
Planning and
Environmental
Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie



Map Legend

- Site Boundary
- Manual Transect Route

Dusk Survey Results

- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle

Drawing Title
Dusk Survey Results
24/08/2021

Project Title
Knocknacarra District Centre LRD

Drawn By	Checked By
NC	AJ
Project No.	**Drawing No.**
210206	Fig 4-3
Scale	**Date**
1:2000	14/12/2022

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: www.mkoireland.ie

4.3.3 Static Detector Survey Results

Two static detectors were deployed on the site at four different locations (Figure 3-1), based on likely areas of bat activity, for a total of 29 nights. These detectors allowed a specified look into species composition, commuting and foraging activities within the site.

All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.4.2 (Wildlife Acoustics, MA, USA). Bat species were identified using established call parameters, to create site-specific custom classifiers. All identified calls were also manually verified. In total 8,171 bat passes were recorded.

Analysis of the detector recordings positively identified five bats to species level. Bat species included: Soprano pipistrelle *(Pipistrellus pygmaeus)* (n=5,960) and Common pipistrelle *(Pipistrellus pipistrellus)* (n=1,940). Leisler's bat *(Nyctalus leisleri)* (n=265) was encountered less frequently. Nathusius' pipistrelle (*Pipistrellus nathusii*) (n=3) and brown long-eared bat *(Plecotus auritus)* (n=3) was rarely encountered, with less than 1% of total bats recorded (Plate 4-7).

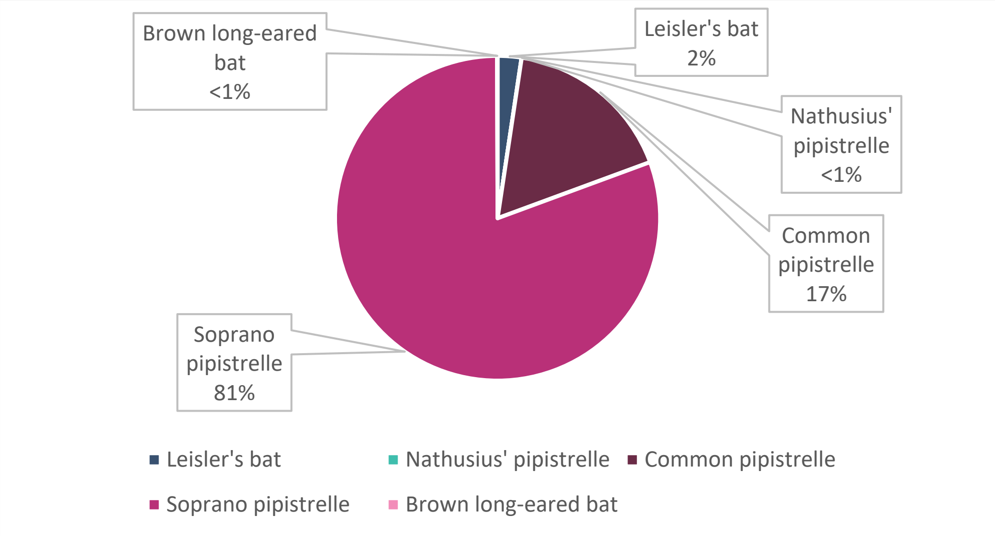


Plate 4-7 Species Composition – Static Detectors

Plate 4-8 shows total bat passes per detector. Detector 7067-1 was located in the northwest corner of the site adjacent to a treeline and a lone tree. Activity here appears to be higher than other detector locations potentially due to the presence of suitable linear habitat features which could provide potential commuting and foraging routes. Detector 7103-1 was located beside the area of spoil and bare ground and scattered trees. Detector 7067-2 was located in the centre of the site, between scattered trees and the public road. Detector 7103-2 was located to the south of the site, near scrub and an area of amenity grassland adjacent to the road.

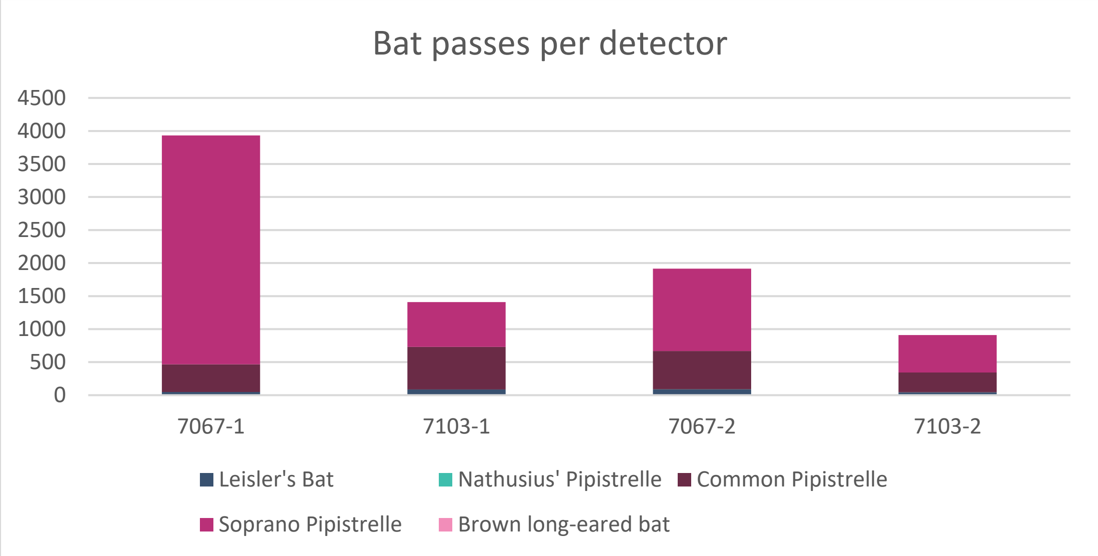


Plate 4-8 Total Bat Passes Per Detector

Analysis of the detector recordings also highlighted the total bat passes per night. Species composition per night is shown in Plate 4-9. Nights from the 27th of July to the 10th of August are associated with the first deployment locations D7067-1 and D7103-1. Nights from the 10th of August to the 28th of August include bat passes from the second deployment locations D7067-2 and D7103-2. The graph demonstrates that soprano and common pipistrelle species were most commonly recorded during the survey periods. These species are common and widespread across Ireland. Activity varied across each deployment and each night.

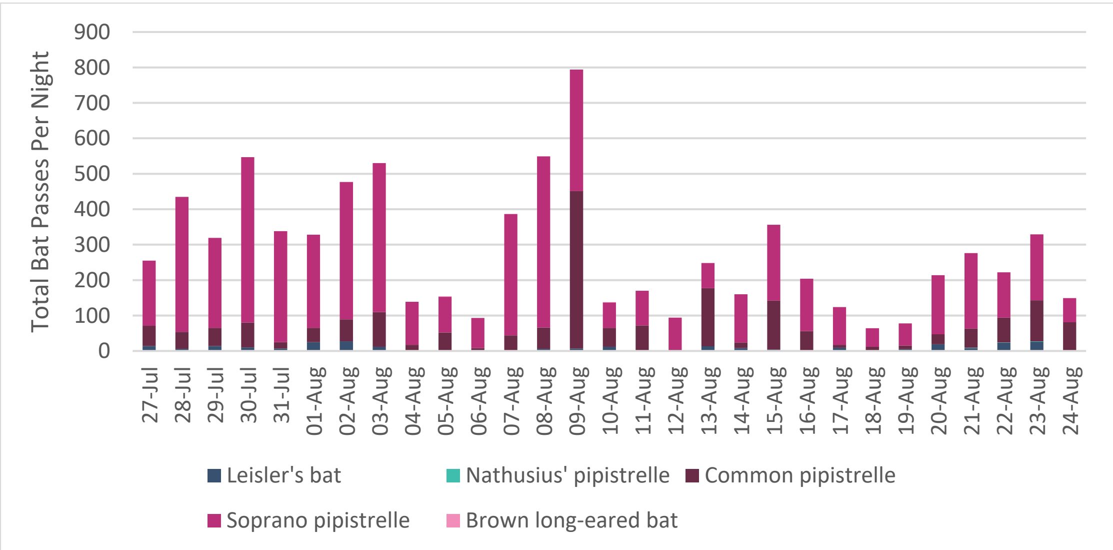


Plate 4-9 Total Bat Passes per Night

4.4 Importance of Bat Population Recorded at the Site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the '*Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976-2022.

Bats as an Ecological Receptor have been assigned *Local Importance (Higher value)* on the basis that the habitats within the Proposed Development site are utilized by a regularly occurring bat population of *Local Importance.*

The results of the bat surveys, carried out in 2021 indicate that the Proposed Development site does not provide significant suitable habitat for a roosting bat population of ecological significance. No roosting site of *National Importance* (i.e. site greater than 100 individuals) was recorded within the site.

5. ASSESSMENT OF LIKELY EFFECTS

5.1 Loss of Roosting Habitat

No evidence of roosting bats and no potential roost features were identified within the Proposed Development site during the daytime inspections and dusk and dawn activity surveys. Overall, the site is not considered to provide significant suitable roosting habitat for bat species and habitats were assessed as having *'Negligible'* suitability for roosting bats. Given that no potential for impact on roosting bats exists there is no requirement for mitigation. No potential for significant impact on bat roosting habitat exists.

5.2 Loss of Foraging and Commuting Habitat

Table 5-1 Assessment of Potential Impacts on Commuting/Foraging Bats

Description of Effect	The Proposed Development will result in the loss of some linear habitat features i.e., all immature hedgerow (16 metres), all scattered trees and parkland (0.37 hectares) and all scrub (0.79 hectares) habitat within the site. Scattered trees and immature hedgerow within the Proposed Development boundary were assessed as *Moderate* suitability for foraging and commuting bats. These habitats provide connectivity to the wider landscape. The loss of these landscape features during construction could result in the fragmentation of foraging and commuting corridors for bat species.
Characterisation of unmitigated effect	The loss of linear habitat features would constitute a permanent slight effect on commuting and foraging bats. While the trees individually are of limited biodiversity value, collectively they contribute to ecological and habitat connectivity throughout the site and with the wider area. The magnitude of this impact is Slight at the local scale given the small number affected.
Assessment of Significance prior to mitigation	This is a permanent slight effect on a receptor of *Local Importance (Higher Value).* The loss of a small number of trees within the site is considered significant at a local scale but not significant at a county, national or international scale.
Mitigation	A landscape plan has been prepared for the development which outlines plans for additional tree planting. The landscape plan also includes areas of open amenity grassland and mixed native woodland planting. The proposed landscape plan includes for the planting of a linear strip of native hedgerow, planting of 111 predominantly native trees, rain gardens, open green spaces and green roofs, to ameliorate immature hedgerow, scrub and tree loss and ensure there is no net loss in suitable ecological habitat features.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted.

5.3 Disturbance

Table 5-2 Assessment of Potential Impacts from Disturbance on Bats

Description of Effect	Construction and operation of the Proposed Development will result in increased human activity, noise and lighting within the proposed site. Therefore, the potential for disturbance to bats requires consideration.

	However, the Proposed Development is in close proximity to existing residential and commercial developments to the south and east as well as busy local roads. It is likely that bat species in the area are accustomed to some levels of disturbance.
Characterisation of unmitigated effect	In the absence of appropriate design, the development has the potential to disturb bats by illumination of commuting and foraging areas. This is assessed as a temporary slight effect.
Assessment of Significance prior to mitigation	This is assessed as a temporary slight effect on a receptor of Local Importance (Higher Value).
Mitigation	Where lighting is unavoidable during construction, low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Development, and consequently on bats i.e., Lighting will be directed away from mature trees/treelines around the periphery of the site boundary to minimize disturbance to bats. Directional accessories will be used to direct light away from these features, e.g., through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. The lighting plan for the operational phase of the Proposed Development, has been designed with consideration of the following: Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), *Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010)* to minimise light spillage, thus reducing any potential disturbance to bats. The design will incorporate the following: › The site entrance is designed in accordance with the requirements of IS 13201-2:2015 for a lighting class level of P3. The residential development is designed in accordance with lighting class level of P4. › The main proposed lighting scheme throughout the residential roads and walkways within the development consists of LED streetlights mounted on 4m to 8m poles. (Refer to drawing G023-PMEP-01-00-DR-E-01 for Site Lighting layout and G025-PMEP-01-00-DR-E-02 for the Site Lighting Iso-Lux Contour Lux Levels layout). The height of public lighting poles are in accordance with Galway City Council specification requirements. › All pole mounted streetlights within the Residential development have been designed with zero-degree tilt and will have zero light uplift to ensure limited unwanted light spill. › Each street light fitting will be controlled via an individual Photoelectric Control Unit (PECU). The operation of the lighting will be on a dusk-dawn profile, 35 lux on/18 lux off. In addition, all lighting will be dimmed by 30% post curfew, this will limit the amount of upward sky glow at night. For this development. post curfew is considered to be 11pm. › Utilisation of 3000K colour correlated temperature LED luminaires in the residential road and circulation routes. Site entrance will utilise 4000K LED luminaires.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted.

6. CONCLUSION

Five bat species were recorded across the Proposed Development site. No evidence of roosting bats was identified on the site of the Proposed Development. Foraging and commuting was mainly associated with scattered trees and areas of scrub at the centre of the site along the main road.

This report provides a full and comprehensive assessment of the potential for impact on bat populations within the site boundary. The surveys and assessment provided in this report are in accordance with the relevant industry guidance. Following consideration of the residual effects (post mitigation) it is noted that the Proposed Development will not result in any significant effects on bats.

Provided that the Proposed Development is constructed and operated in accordance with the design, best practice and mitigation that is described within this report; no significant impacts on local bat populations is anticipated at any geographic scale.

7. BIBLIOGRAPHY

Andrews, H. (2018) Bat Roosts in Trees. AEcol, Bridgewater.

Aughney, T., Kelleher, C. & Mullen, D. (2008) *Bat Survey Guidelines: Traditional Farm Buildings Scheme.* The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.

Aughney, T., Langton, S. & Roche, N. (2011) *Brown long - eared bat roost monitoring scheme for the Republic of Ireland: synthesis report 2007 - 2010. Irish Wildlife Manual s, No. 56.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Bontadina, F., Schofield, H. and Naef-Daenzer, B. (2002) *Radio-tracking reveals that lesser horseshoe bats (Rhinolophus hipposideros) forage in woodland.* Journal of Zoology 258: 281–290.

ILP (2018) *Guidance Note 08/18: Bats and Artificial Lighting in the UK. Bats and the Built Environment Series.* Institute of Lighting Professionals, Warwickshire, UK.

Boye, P., & Dietz, M. (2005). *Development of good practice guidelines for woodland management for bats.* English Nature.

CIEEM (2013) *Competencies for Species Surveys: Bats.* Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (ed) (2016) *Bat Surveys for Professional Ecologists – Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, England.

Fossitt, J. A. (2000) *A Guide to Habitats in Ireland.* The Heritage Council Dublin Ireland.

Kelleher, C. & Marnell, F. (2006*) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25.* National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

Mitchell-Jones, A.J. & McLeish, A.P. (eds) (2004) *'Bat Workers' Manual'* (3rd edn). JNCC, Peterborough.

Mitchell-Jones, A.J. (2004) *Bat Mitigation Guidelines.* English Nature, Peterborough.

N6 Galway City Ring Road, Environmental Impact Assessment Report (2018): N6 Galway City Ring Road - Planning Documents

N6 Galway City Transport Project; Ecological information presented in the Route Selection Report: Chapter 4: http://www.n6galwaycity.ie

National Roads Authority (2006) *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.* National Roads Authority, Dublin Ireland.

National Roads Authority (2006b) *Guidelines for the Treatment of Bats during the Construction of National Road Schemes.* National Roads Authority, Dublin, Ireland.

Russ, J.M. (2012) *British Bat Calls: A Guide to Species Identification.* Pelagic Publishing, Exeter.

Stone, E. L., Jones, G., & Harris, S. (2009). Street lighting disturbs commuting bats. *Current biology*, *19* (13), 1123-1127.

Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation. The Bat Conservation Trust, England.

APPENDIX 6-2

IRISH WATER LETTER

CONFIRMATION OF FEASIBILITY

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Conor O' Loughlin

Ormond House
Upper Ormond Quay
Dublin 7
Dublin
D07N5YH

31 August 2022

Our Ref: CDS22004822 Pre-Connection Enquiry
Knocknacarra, Galway City, Co. Galway

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Multi/Mixed Use Development of 300 unit(s) at Knocknacarra, Galway City, Co. Galway, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - Feasible without infrastructure upgrade by Irish Water
- **Wastewater Connection** - Feasible without infrastructure upgrade by Irish Water

The proposed Development indicates that Irish Water assets are present on the site. The Developer has to demonstrate that proposed structures and works will not inhibit access for maintenance or endanger structural or functional integrity of the assets during and after the works. Drawings (showing clearance distances, changing to ground levels) and Method Statements should be included in the Detailed Design of the Development. A wayleave in favour of Irish Water will be required over the assets that are not located within the Public Space.

For design submissions and queries related to diversion/build near or over, please contact IW Diversion Team via email address diversions@water.ie

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

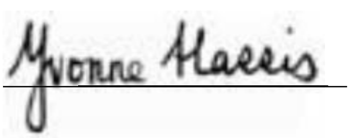
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,



Yvonne Harris
Head of Customer Operations

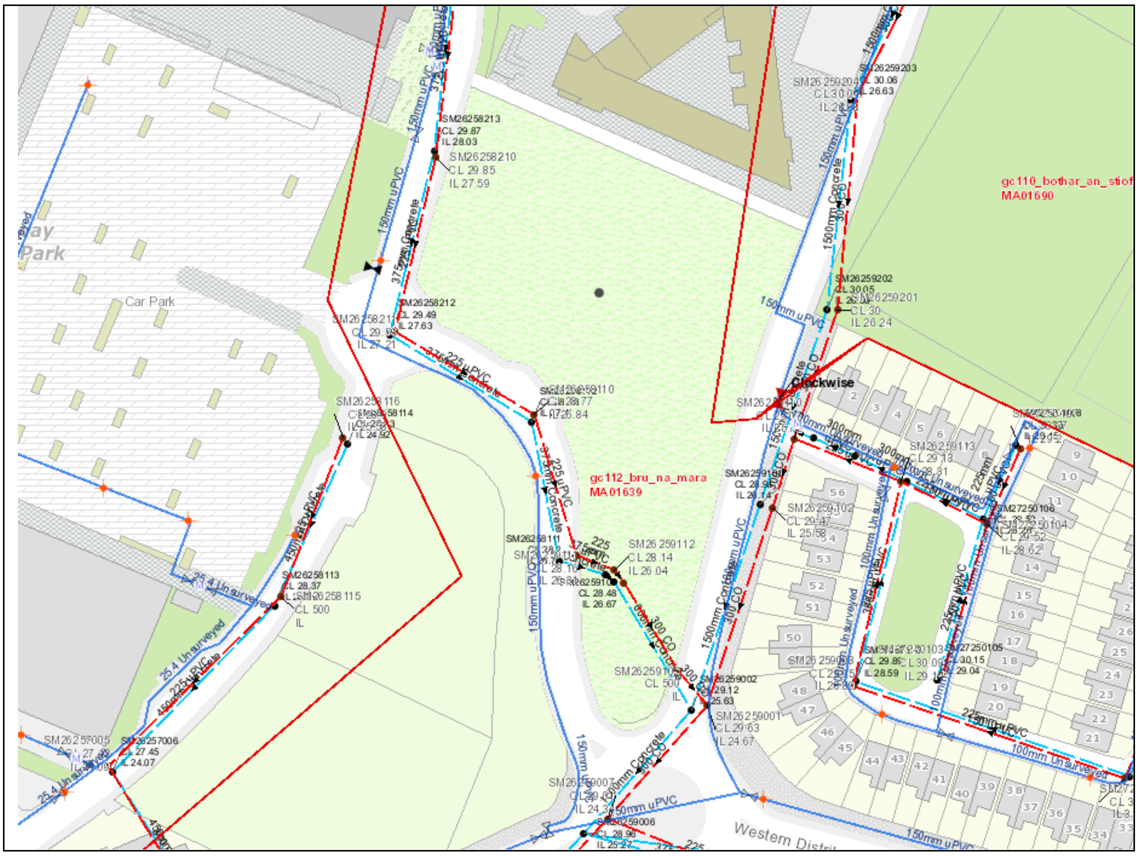
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Irish Water's Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email datarequests@water.ie



Note: The information provided on the included maps as to the position of Irish Water's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water's network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

APPENDIX 8-1

SITE SPECIFIC FLOOD RISK ASSESSMENT

Knocknacarra District Centre LRD

Site Specific Flood Risk Assessment

180191-DBFL-XX-XX-RP-C-0002

INFRASTRUCTURE

December 2022

DBFL CONSULTING ENGINEERS

Project Title:	Knocknacarra District Centre LRD		
Document Title:	Site Specific Flood Risk Assessment		
File Ref:	180191-DBFL-XX-XX-RP-C-0002		
Status:	S0 Initial Status	Rev:	P02

Rev.	Date	Description	Prepared	Reviewed	Approved
P01	29/07/2022	Draft Planning	COL	NCG	DJR
P01	22/08/2022	Final Draft Planning	COL	NCG	DJR
P01	25/08/2022	Planning	COL	NCG	DJR
P02	02/12/2022	Draft Planning	COL	NCG	DJR
P02	12/12/2022	Planning	COL	NCG	DJR

Contents

Figures

Tables

1.0 Introduction

1.1 Background

DBFL Consulting Engineers were commissioned by the applicant to prepare a Site Specific Flood Risk Assessment (SSFRA) for the proposed mixed-use development Knocknacarra District Centre, Gort na Bro, Rahoon, Galway.

1.2 Objectives

The objectives of this report are to inform the planning authority regarding flood risk for the potential development of the lands. The report will assess the site and development proposals in accordance the requirements of "*The Planning System and Flood Risk Management Guidelines for Planning Authorities*".

The report will provide the following;

- The site's flood zone category.
- Information to allow an informed decision of the planning application in the context of flood risk.
- Appropriate flood risk mitigation and management measures for any residual flood risk

1.3 Flood Risk Assessment Scope

This SSFRA relates only to the proposed development, Knocknacarra District Centre and its immediate surroundings. This report uses information obtained from various sources, together with an assessment of flood risk for the existing land and proposed development. The report follows the requirements of '*The Planning System & Flood Risk Management – Guidelines for Planning Authorities',* (referred to as the *Guidelines* for the remainder of this report).

1.4 Approach

Chapter 2 of this report considers '*The Planning System & Flood Risk Management – Guidelines for Planning Authorities'* as they relate to the proposed application.

Flood risk identification is presented in Chapter 3 and initial flood risk assessment in Chapter 4. A more detailed assessment of specific flood risk and residual risk relating to the proposed development is presented in Chapter 5.

Conclusions and recommendations are presented in Chapter 6.

1.5 Existing Site

The subject site is located to the North of the Western Distributor Road and is bounded to the west by the existing Gateway Retail Park, which is approximately 2.6 Km from Galway City Centre. The site's southern boundary immediately bounds an Aldi supermarket. The primary school Gaelscoil Mhic Amhlaigh is to the north and residential developments are to the east. Refer to Figure 1.1 for site location. The site is approximately 3.03 Ha.

The site is within the Specific Local Objective Area of 'Enterprise, Light Industry and Commercial' in the Draft Galway City Council Development Plan 2023-2029.

Figure 1-1-Site Location (Site Boundary Indicative Only).

Site Boundary

The topography of the site is gently sloping with a 2m fall from the north western corner to the south eastern corner in the northern half of the site, and a 2m fall from the eastern boundary to the western boundary in the southern half of the site as shown in Figure 1.2. A topographical survey of the Site is provided as a background to the proposed site services drawing 1-04-X-XXX-DR-DBFL-CE-1201 Proposed Roads Layout.

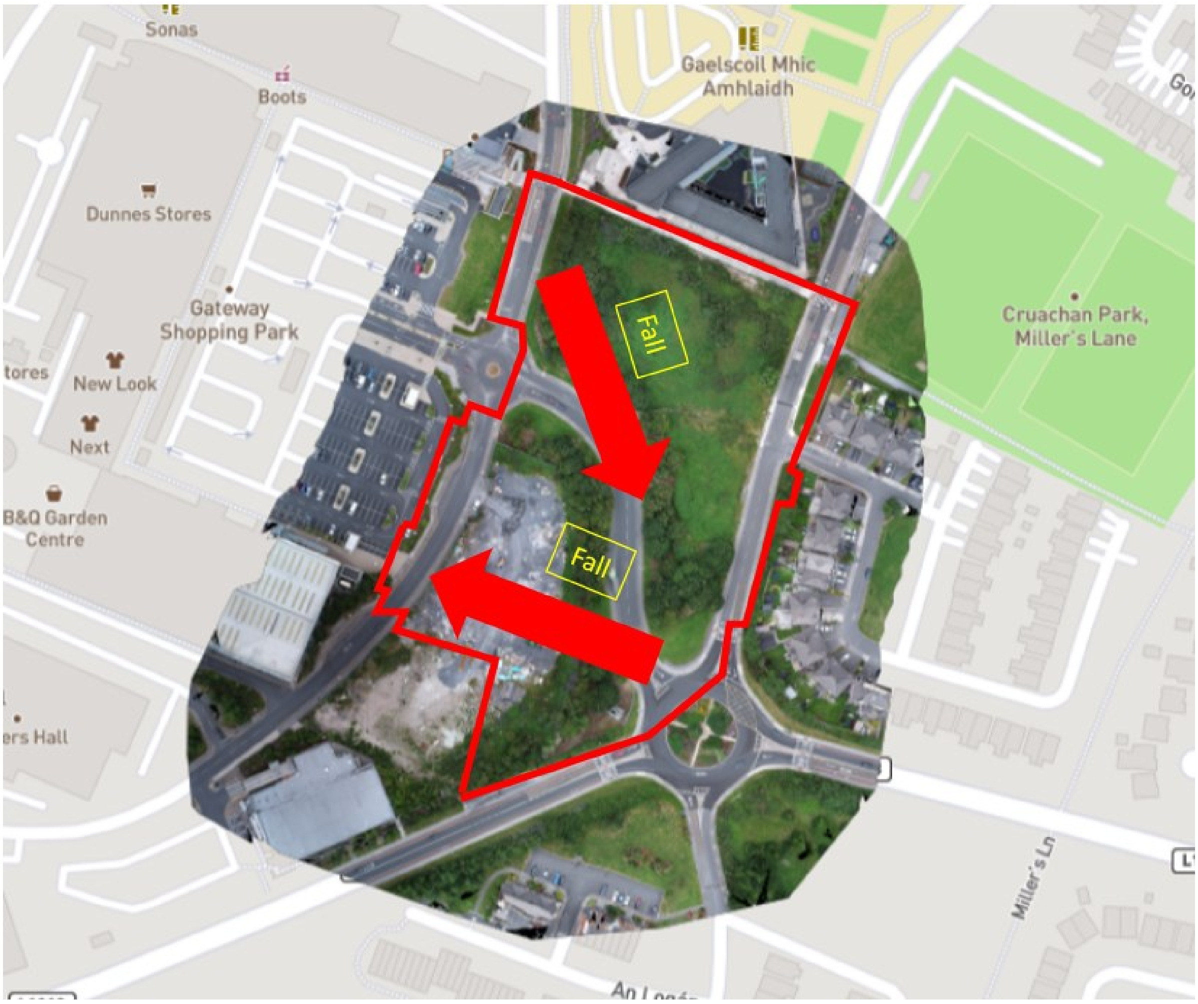


Figure 1-1- Site Topography (Site Boundary Indicative Only)

The subject site is within the Galway Bay North catchment. The Corrib River and the coast are approximately 2.7 Km to the east and 1.8 Km to the south of the subject site respectively.

1.6 Proposed Development

The development will consist of

1. Provision of 227 no. residential apartments in 7 no. blocks comprising the following:

a. Block A1: 14 no. 1 bed apartments & 24 no. 2 bed apartments in a block ranging between 3-5 storeys in height;

b. Block A2: 25 no. 1 bed apartments & 15 no. 2 bed apartments in a block ranging between 1-5 storeys in height;

c. Block B1: 3 no. 1 bed apartments, 18 no. 2 bed apartments & 3 no. 3 bed apartments in a block ranging between 3-4 storeys in height;

d. Block B2: 13 no. 1 bed apartments & 21 no. 2 bed apartments in a block ranging between 4-5 storeys in height.

e. Block B3: 5 no. 1 bed apartments, 22 no. 2 bed apartments & 1 no. 3 bed apartment in a block ranging between 3-5 storeys in height;

f. Block B4: 11 no. 1 bed apartments & 26 no. 2 bed apartments in a block ranging between 3-5 storeys in height;

g. Block B5: 13 no. 1 bed apartments & 13 no. 2 bed apartments in a block ranging between 3-4 storeys in height.

2. Provision of 1,009.7 sq.m of ground floor commercial units as follows:

   i. Unit A101: 411.7 sq.m;

   ii. Unit A102: 138.2 sq.m;

   iii. Unit B201: 99.7 sq.m;

   iv. Unit B202: 133.9 sq.m;

   v. Unit B301 3: 226.2 sq.m.

3. Provision of a Community Facility (117.8 sq.m);
4. Provision of Tenant Amenity Facilities (99.4 sq.m);
5. Provision of a Childcare Facility (561.3 sq.m) including an external secure play area;
6. Provision of 49 no. surface car parking spaces including EV charging spaces;
7. Provision of bicycle parking comprising 114 no. short stay and 436 no. long stay spaces;

8. Provision of realigned road between Gort na Bró and Gateway Retail Park Road;
9. Change of use of existing underground void to 181 bay underground car park;
10. Provision of shared communal and private open spaces, bin storage, public lighting, site landscaping, services, signage, substation, and all associated site development works required to accommodate the proposed development.

2.0 Planning System & Flood Risk Management Guidelines

2.1 General

"*The Planning System and Flood Risk Management Guidelines for Planning Authorities",* November 2009 and its Technical Appendices outline the requirements for a site specific flood risk assessment.

Residential development is classified as "highly vulnerable development" according to Table 3.1 of the Guidelines. Table 3.2 of the Guidelines indicates that the Sequential Approach mechanism requires this type of development to be in Flood zone C i.e. outside the 1000 year flood extents. (It may also be compatible within flood zone categories A and B but a Justification Test for development management is then required to determine this.)

2.2 Flood Risk Assessment Stages

This site specific flood risk assessment will initially use existing flood risk information to determine the flood zone category of the Site i.e. to check if the Guidelines Sequential Approach has been applied, see Figure 2.1 below for details.

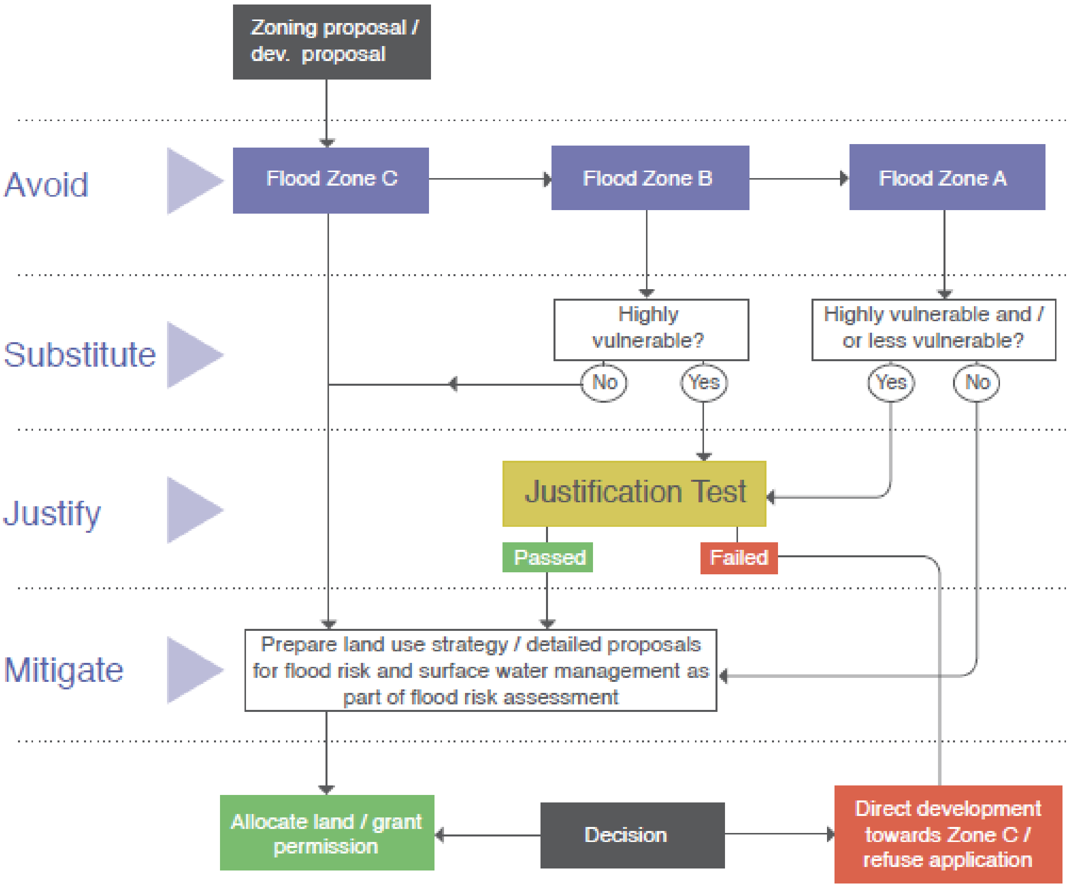


Figure 2-1- Sequential Approach mechanism in the Planning Process

Flood risk is normally assessed by a flood risk identification stage followed by an initial flood risk assessment. A more detailed flood risk assessment stage then follows which includes an assessment of surface water management, flood risk and mitigation measures to be applied.

The following report sections outline the flood risk assessment stages for the proposed development which follow the requirements of the Guidelines' Technical Appendices.

3.0 Flood Risk Identification Stage

3.1 General

The initial flood risk identification stage uses existing information to identify and confirm whether there may be flooding or surface water management issues for the lands that may warrant further investigation.

3.2 Information Sources Consulted

Information sources consulted for the identification exercise are outlined in table 1 below.

Table 1- Information sources consulted

Information Source	Comments
Predictive and historic flood maps, and Benefiting Lands Maps, such as those at http://www.floodmaps.ie;	OPW www.floodmaps.ie website consulted.
Expert advice from OPW who may be able to provide reports containing the results of detailed modelling and flood-mapping studies, including critical drainage areas, and information on historic flood events, including flooding from all sources;	Historic flood hazard maps and info obtained from OPW's floodmaps.ie website
Predictive fluvial flood maps.	Draft PFRA flood extents map consulted.
Previous Strategic Flood Risk Assessments;	Western CFRAM Study.
Topographical maps, in particular digital elevation models produced by aerial survey or ground survey techniques;	OSI Maps consulted & Site topographic survey undertaken.
Information on flood defence condition and performance;	No flood defence information available.
Alluvial deposit maps of the Geological Survey of Ireland (which would allow the potential for the implementation of source control and infiltration techniques, groundwater and overland flood risk to be assessed). These maps, while not providing full coverage, can indicate areas that have flooded in the past (the source of the alluvium) and may be particularly useful at the early stages of the FRA process where no other information is available;	GSI maps consulted.
Walkover survey to assess potential sources of flooding, likely routes for flood waters and the site's key features, including flood defences;	Walkover survey conducted.

National, regional & local spatial plans, such as the National Spatial Strategy, regional planning guidelines, development plans & local area plans provide key information on existing and potential future receptors.	Draft Galway City Council Development Plan 2023-2029 consulted.
Local Information & Local Libraries	Local landowner consulted
'Liable to flood' markings on the old '6 Inch' maps;	Historic OSI maps consulted.

3.2.1 OPW Predictive, Historic & Benefiting Lands Maps & Flood Hazard Information

From consultation of the OPW website www.floodmaps.ie there were no OPW land commission schemes or benefitting lands zones within the development boundary (see Appendix A for website report).

The OPW floodmaps.ie report shows no previous flood events within 2.5km of the subject site.

3.2.2 Previous Strategic Flood Risk Assessments & Predictive Flood Maps

As part of the EU Floods Directive, the OPW is undertaking a Catchment Flood Risk Assessment and Management (CFRAM) Study. An initial part of this Study was a national Preliminary Flood Risk Assessment (PFRA) to identify areas at risk of significant flooding. The PFRA report and maps are available at www.floodinfo.ie and identify areas deemed to be at risk of flooding (referred to as Areas for Further Assessment, or 'AFAs'), as they require more detailed assessment on the extent and degree of flood risk by the later CFRAM Studies.

The PFRA map for the subject site is reproduced in Appendix B. The flood extents maps indicates that the eastern area of the subject site could be impacted by a potential fluvial flood risk zone. No risk of pluvial or coastal flooding is highlighted on the subject site. It should be noted the OPW PFRA mapping was a high level preliminary flood risk assessment which as outlined in the PFRAM report was based on 'dropping' various depths and intensities of rainfall over a range of durations, and modelling how that rainfall would flow over the land and, in particular, pond in low-lying areas. It is noted in the PFRAM report that due to the level of the analysis undertaken, it did not take into account local drainage structures such as culverts through embankments or other local drainage that would not be resolved in the DTM (digital terrain model) at a national scale.

The Western Catchment Flood Risk Assessment and Management (CFRAM) study provides further assessment of areas identified in the PFRA for further investigation. The subject site's catchment area was not identified in the PFRA for further investigation therefore it is outside the Western CFRAM "Area of Further Assessment" boundary for Galway City.

The Draft Galway City Development Plan Strategic Flood Risk Assessment, 2013-2029 (SFRA) was also consulted to review flood risk. The SFRA was undertaken by JBA Consulting and the scope of the FRA was to provide a broad (wide area) assessment of all types of flood risk to inform strategic land-use planning decisions. The SFRA flood map, provided in Appendix C, indicates that the subject site may be impacted by a potential flood risk zone. It should be noted that the school recently constructed under Reg Ref 15/11 and the school recently granted planning permission under Reg Ref 18/134 to the north of the subject site are within the same potential SFRA flood zone area. From Inspection of the survey levels the area of potential flood risk does not appear to correspond with the existing site levels / topography. We would also note from the SFRA that no further investigative works / revisions were undertaken for this area within Section 8 “Specific Development Site Review” of the SFRA and the site has been zoned CI, “Enterprise, Light Industry and Commercial”.

3.2.3 Tidal Flood Maps

Tidal flooding is not relevant as the subject site is approximately 1.8 Km from the coast and more than 28m above sea level.

3.2.4 Other Sources

Other information sources were consulted to determine if there was any additional flood risk to the subject site, these included:

- Topographical surveys of the area – no evidence based on topography.
- Flood defences Information – no flood defence information available.
- Soil data from EPA and GSI – Soils identified as ‘Mineral poorly drained (Mainly acidic)’ in the central area of the site and as ‘Shallow, rocky, peaty/non-peatymineral complexes (Mainly acidic)’ in the majority of the site. Subsoils identified as ‘Karstified bedrock outcrop or subcrop’ in the south and part of the northern area of the site, and as ‘Till derived from granites’ in the central and northern areas of the site.
- Groundwater information from GSI – Groundwater vulnerability is classified as ‘extreme’ in the central area and north eastern end of the site. The groundwater vulnerability in the rest of the site is classified as ‘Rock at or near surface or Karst’. The bedrock aquifer is identified as ‘Generally unproductive except for Local Zones’.
- Walkover survey – No evidence of flooding within the development lands.
- Development Plan & Local Area plan – lands are within the Specific Local Objective Area of ‘Enterprise, light industry and commercial’.
- EPA Website Watercourse Data – according to this source there are two watercourses adjacent to the subject site. According to the EPA website, one watercourse flows within the site and one watercourse flows to the east of the site, named by the EPA

Database as 'Knocknacarra' (see Figure 3.1 below). The location and extents of these watercourses correlate with the fluvial flood risk represented in the PFRA Maps and the Galway City Council Development Plan 2023-2029.

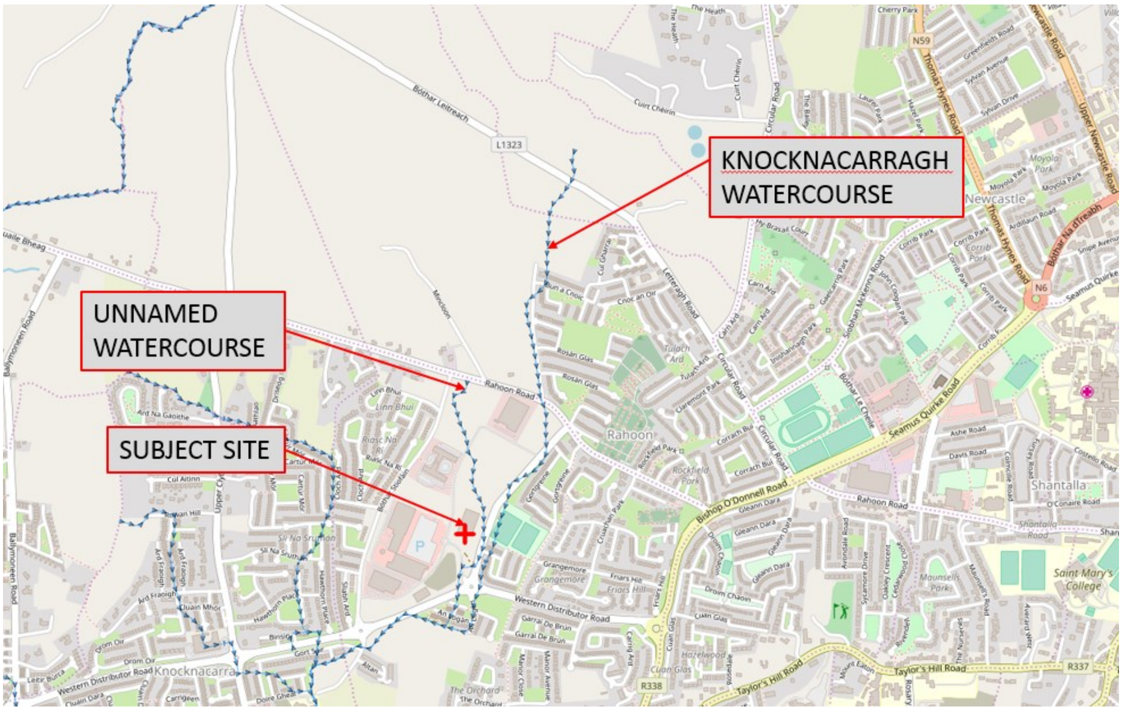


Figure 3-1- EPA Watercourse

- Existing Local Authority Drainage Records – existing 375mm and 450mm diameter surface water sewers are located to the west of the subject site, which ultimately discharge to the existing 1500mm diameter surface water sewer along the 'Gort Na Bró' road to the east of the site. The location of the Knocknacarra Stream correlates with the location of the 1500mm diameter surface water sewer which appears to have culverted this stream.
- N6 Galway City Ring Road Flood Risk Assessment Study prepared by Hydro Environmental Ltd for the Galway City outer bypass was also consulted. A link road from the proposed ring road is proposed adjacent to the site therefore the flood risk assessment encompasses the potential fluvial flood risk identified in the PFRA Maps and the Draft Galway City Council Development Plan 2023-2029. The study concludes that this fluvial flood risk is not realistic as the EPA historic watercourses no longer exist having been replaced and realigned by a surface water network as part of development in 1996. Hydro Environmental Ltd modelled the existing storm network shown in Figure 3.2 to confirm that the area is not at risk of flooding. The modelling was carried out using the Microdrainage software program and applying the estimated design flows from the OPW Flood Studies Update (FSU) for the 1000-year storm event at five nodal

points (FSU Nodal Point 1 to FSU Nodal Point 5 as shown below). As a result of the modelling the study concluded that the surface water sewer installations have a broad capacity for the 100 year event and there is no existing risk of flooding in the area.

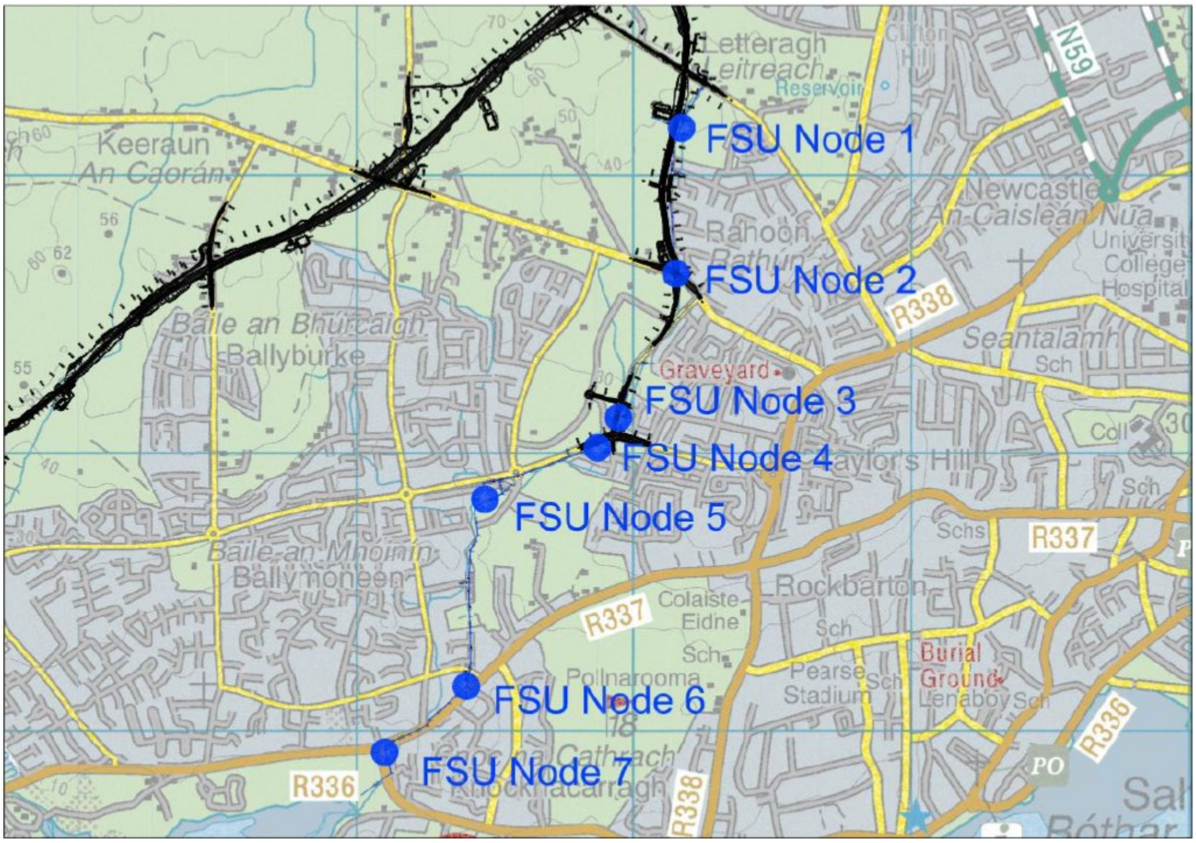


Figure 3-2- Existing SW drainage modelled by Hydro Environmental Ltd and FSU nodal points.

- Local Information & Local Authority Consultation – a meeting was held by Galway City Council with DBFL Consulting Engineers on the 30th November 2018 to discuss development on the subject site in relation to drainage and potential flood risks in the subject site based on the information available. Galway City Council concluded that the PFRA mapping and the SFRA mapping did not take account of the site-specific features and therefore the site is not considered to be at risk of fluvial flooding up to the 1 in 100 year storm.
- Historic Maps – no evidence of flooding or marsh areas within the Site.

From a review of the ‘other sources’ above there does not appear to be evidence of flood risk to the development lands.

3.3 Source-Pathway-Receptor Model

A Source-Pathway-Receptor model was produced to summarize the possible sources of floodwater, the people and assets (receptors) that could be affected by potential flooding (with specific reference to the proposals) and the pathways by which flood water for a 0.1%AEP (Annual Exceedance Probability) and 1%AEP storms could reach the receptors, see table 2. It provides the probability and magnitude of the sources, the performance and response of pathways and the consequences to the receptors in the context of the development proposals. These sources, pathways and receptors will be assessed further by the initial flood risk assessment stage.

Table 2- Source-pathway-receptor analysis

Source	Pathway	Receptor	Likelihood	Consequence	Risk
Tidal	Tidal flooding from coast (1.8 Km away from subject site).		Remote		
Fluvial	Overbank existing streams and rivers.	Future development.	Low	Medium	Low
Surface Water Drainage (Pluvial)	Flooding from development's surcharging drainage systems	Future development.	Possible	Medium	Moderate
Groundwater flooding	Rising GWL on the site		Remote		
Human or Mechanical Error (Pluvial)	New drainage network blocks	Development draining to the surface water network	Possible	Medium	Moderate

4.0 Initial Flood Risk Assessment Stage

The only flood risks to the proposed development at Knocknacarra identified from Stage 1 are;

- A low risk of fluvial flooding;
- Pluvial flood risk following development.

4.1 Initial Fluvial Flood Risk Assessment

The PFRA flood extents map and the Draft Galway City Council Development Plan 2023-2029 identified a potential fluvial flooding risk on the eastern area of the site. The flood risk extents correlate with two watercourses represented within the subject site in the EPA Maps, including the Knocknacarra Watercourse to the east of the site.

Following a similar approach as in the N6 Galway City Ring Road Flood Risk Assessment Study carried out by Hydro Environmental Ltd, DBFL Consulting Engineers have modelled the existing surface water drainage to demonstrate that there is no fluvial flood risk within or in the immediate surroundings of the subject site. See Appendix E for extent of drainage modelling.

The drainage modelling was completed using the Microdrainage software programme and utility records obtained from Galway City Council, which included invert and cover levels of the surface water sewer network. The design flows inputted into the model for the 100 year event were calculated using the Qmed and growth factors estimation tool from the OPW Flood Studies Update (FSU) Web Portal, similar to the N6 Galway City Ring Road Flood Risk Assessment Study. Figure 4.1 and Table 3 below summarize the growth factors and Qmed values obtained from the OPW FSU Web Portal, and the design flows calculated for various return periods respectively.

It is noted that two sewer lines within the surface water drainage model have a capacity lower than the design flows calculated for 100 year return period. However, a simulation of the drainage modelled for the critical storm, accounting for an additional 20% flow for climate change, indicate that the water levels in the two sewers do not surpass the existing cover levels. The Microdrainage modelling and simulation results (refer to Appendix E) show that the existing surface water drainage adjacent to the subject site have sufficient capacity to accommodate the 100 year critical storm event. Therefore, it can be concluded that the surface water sewer installations have capacity for the 100 year storm event and the potential flood risk identified by the PFRAM mapping and the Galway City Council Development Plan can be discounted.

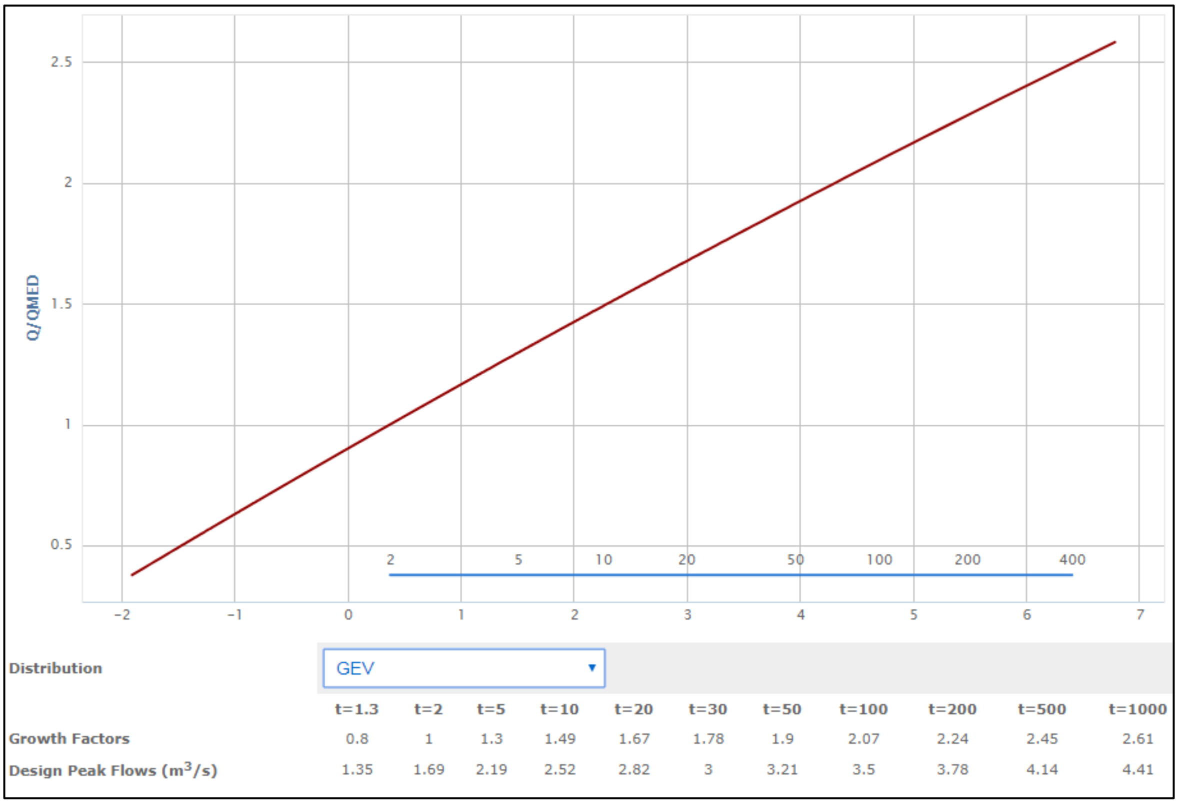


Figure 4-1- Growth factors from FSU Web Portal.

Table 3- Design flows.

Return Period	Growth Factor	Design Flow (m^3/s)				
		Node 1	Node 2	Node 3	Node 4	Node 5
Qmed (Urban Estimate)	-	0.315	0.426	0.741	0.931	1.998
Q5	1.3	0.41	0.553	0.964	1.211	2.598
Q10	1.49	0.47	0.635	1.104	1.39	2.98
Q20	1.67	0.53	0.711	1.24	1.55	3.34
Q50	1.9	0.6	0.81	1.41	1.77	3.8

Q100	2.07	0.652	0.882	1.533	1.93	4.14

4.2 Initial Pluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified that there could be potential for pluvial flood risk within the development related to future drainage networks to serve the proposed development. These have potential to cause local flooding unless they are designed in accordance with the regulations e.g. GDSDS and to take account of flood exceedance e.g. for storms return periods over 1%AEP.

The Source-Pathway-Receptor model also identified that the proper operation and maintenance of the drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockages etc.

4.3 Flood Zone Category

Following assessment of the flood risks to the Site and available flood data it is considered that the Site is within Flood Zone Category C as defined by the Guidelines. The type of development proposed is therefore appropriate for this flood zone category. The Guidelines Sequential Approach is therefore met and the ‘Avoid’ principal achieved.

5.0 Detailed Flood Risk Assessment Stage

5.1 General

Since the type of development proposed is appropriate for the Flood zone category of the Site, the detailed flood risk assessment stage will only consider pluvial flood risk in relation to the following;

- Proposed Surface Water Management measures.
- Flood Exceedance.
- Impact of proposals on flood risk to adjacent areas.
- Effects of climate change.
- Sustainable Urban Structure.
- Residual risks.
- Effectiveness of any flood mitigation measures.

5.2 Surface Water Management

The proposed storm-water proposals and drainage design for the development are designed in accordance with the GDSDS. The proposals include SUDs measures to reduce the runoff for the development including a landscaped podium with planting in Site 2, and permeable paving and permeable car parking spaces as part of Site 1. One Stormtech attenuation tank and one concrete storage tank are proposed for Site 1 and Site 2 respectively to accommodate the 100 year critical storm plus a 20% climate change provision. The concrete tank storage system accommodating surface water from Site 2 will be located under the ground floor car park.

5.2.1 Sustainable Urban Drainage System Proposals

The SUDS proposals for the development include;

- One concrete attenuation tank under the ground floor car park in Site 2 to provide storage (156m^3).
- One Stormtech attenuation tank in Site 1 to provide storage (361m^3).
- A landscaped courtyard with green areas and raised planters in Site 2 to provide interception storage and treatment.
- Green roofs on apartment blocks.

- Permeable paving and permeable car parking spaces.
- A Class 1 Bypass Separators to be provided on the outfall from each network.

5.2.2 Surface Water Attenuation and Storage

Storm-water attenuation for the development has been sized in accordance with the requirements of the GDSDS. Run-off rates from the proposed development to the public system are in accordance with the GDSDS.

5.3 Flood Exceedance

For storms greater than the 1%AEP pluvial event, the development's drainage network design will be exceeded. The falls of the ground floor car park in Site 2 and the proposed diverted access road to the development will be designed to route flood water away from building core entry points in direction to the drainage outfall. The falls within the pedestrian and civic amenities areas in Site 1 will also divert the flood water to the drainage outfall. Refer to Appendix D for overland flow routes.

Building floor levels are set a minimum of 0.5m above 100-year flood level in accordance with recommended minimum freeboards.

5.4 Impact on Adjacent Areas

Adjacent areas will not be impacted by the development for up to the 1%AEP flood event, however if larger storms >1%AEP exceed the capacity of the development's drainage system then overland flood routes may be directed towards existing and proposed roads.

5.5 Climate Change

The potential impact of climate change has been allowed for as follows;

- Pluvial flood risk - drainage system and attenuation storage design allow for a 20% increase in rainfall intensities, as recommended by the GDSDS.

5.6 Sustainable Urban Structure

5.6.1 Access & egress during flood events

The access and egress arrangements for the development are via the proposed diversion of the existing access road to the retail park. Based on relevant flood modelling undertaken above, it is anticipated that for a 0.1% AEP flood event the development can be safely accessed and exited through the proposed vehicular entrance.

5.7 Residual Risks

Remaining residual flood risks, following the detailed assessment include the following;

1. Pluvial flooding from the private drainage system related to a pipe blockage or from flood exceedance.
2. Pluvial flooding from the development's drainage system for storms in excess of the 100 year design capacity.

5.8 Mitigation Measures

Proposed mitigation measures to address residual flood risks are summarized below;

M1. Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.

M2. In the event of storms exceeding the 100-year design capacity of the drainage system, flood water will be routed away from buildings.

5.8.1 Effectiveness of Mitigation Measures

It is considered that the flood risk mitigation measures if implemented are sufficient to provide a suitable level of protection to the proposed development. A regularly maintained drainage system will ensure that it remains effective and in good working order should a large pluvial storm occur.

Should extreme pluvial flooding occur that is in excess of the development's drainage capacity i.e. probability less than 1%AEP, then overland flood routes to the drainage outfall should protect the development. Refer to Appendix D for overland flow routes.

6.0 Conclusions

The Site Specific Flood Risk Assessment for the proposed development at Knocknacarra was undertaken in accordance with the requirements of the Planning System and Flood Risk Management Guidelines for Planning Authorities", November 2009.

Following the flood risk assessment stages it was determined that the Site is within Flood Zone C as defined by the Guidelines.

It is concluded that the;

- <u>Residential development proposed is appropriate for the Site's flood zone category.</u>
- <u>Planning System and Flood Risk Management Guidelines Sequential Approach is met and the 'Avoid' principal achieved.</u>
- <u>A Justification Test is not required as the site is in Flood Zone C.</u>

The development was concluded as having a good level of flood protection up to the 100 year return event. For pluvial floods exceeding the 100 year capacity of the drainage system then the proposed flood routing mitigation measures should protect the areas with lower finish floor levels by directing flood water to the drainage outfall.

- Appendix A OPW FLOOD HAZARD WEBSITE REPORT

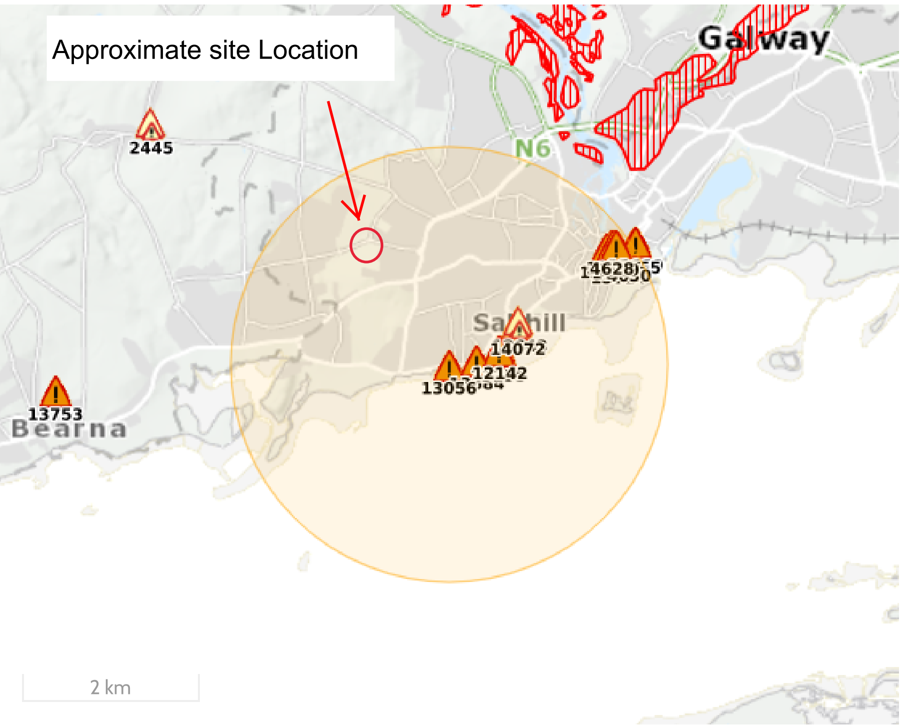
Past Flood Event Local Area Summary Report

OPW Oifig na nOibreacha Poiblí Office of Public Works

Report Produced: **1/12/2022 15:41**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

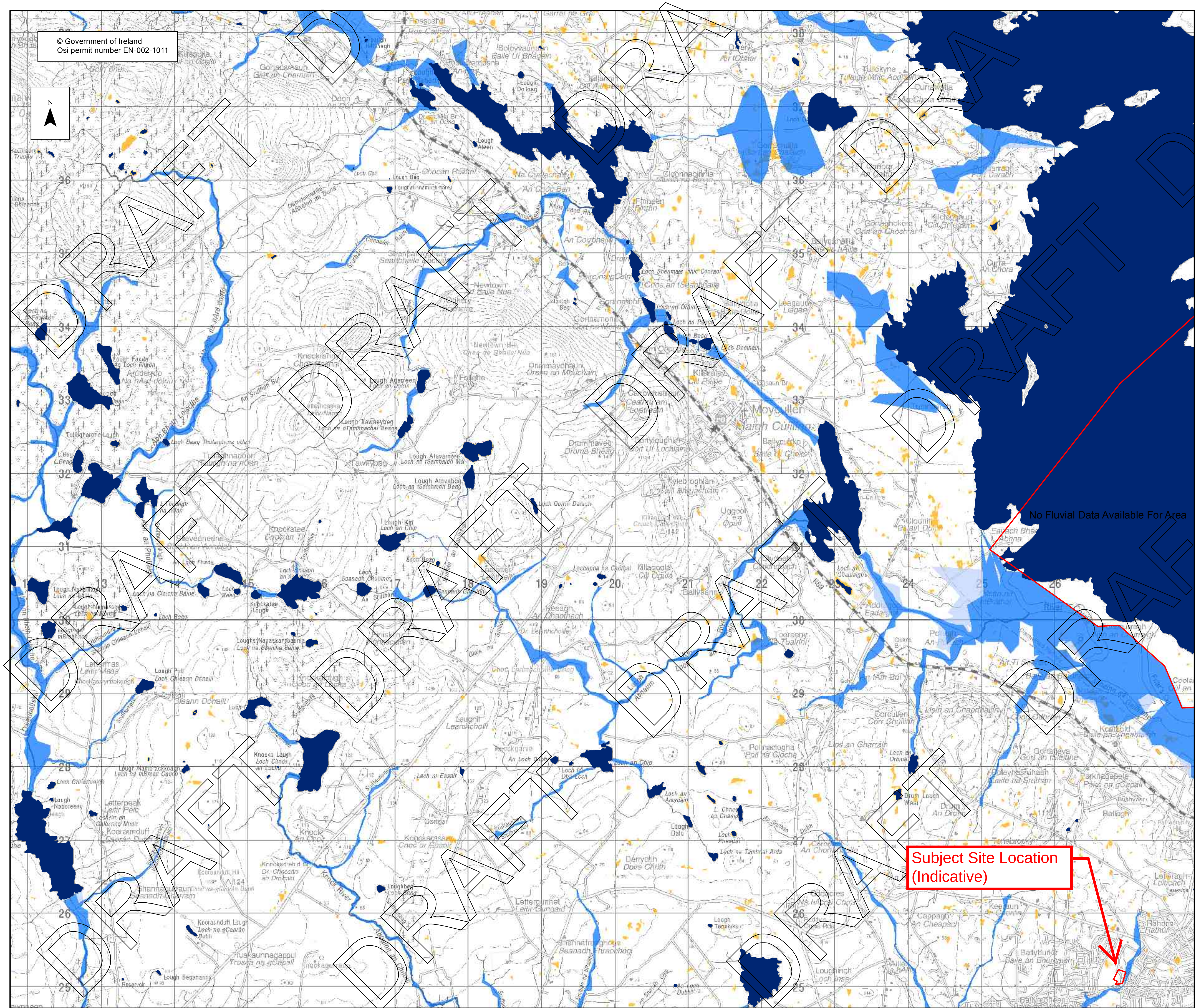
* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

17 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Coastal flooding in Galway and Salthill on18th January 2014 (ID-12142)	18/12/2013	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
2.	Quay Street Galway Jan 1995 (ID-4628)	17/01/1995	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
3.	Flood Street Galway Jan 1995 (ID-4629)	17/01/1995	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
4.	Docks Galway Jan 1995 (ID-4630)	17/01/1995	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
5.	Flooding at Salthill Promenade Galway on 18/12/2019 (ID-14072)	18/12/2019	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
6.	Flooding at Spanish Arch Galway on 18/12/2019 (ID-14073)	18/12/2019	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		

	Name (Flood_ID)	Start Date	Event Location
7.	Flooding at Galway City on 01/02/2014 (ID-13055) Additional Information: Reports (0) Press Archive (0)	01/02/2014	Approximate Point
8.	Flooding at Salthill on 01/02/2014 (ID-13056) Additional Information: Reports (0) Press Archive (0)	01/02/2014	Approximate Point
9.	Flooding at Salthill on 01/12/2015 (ID-13235) Additional Information: Reports (0) Press Archive (0)	01/12/2015	Approximate Point
10.	Flooding at Galway City/Salthill on 13/01/2020 (ID-13684) Additional Information: Reports (0) Press Archive (0)	13/01/2020	Approximate Point
11.	Flooding at Galway City and Salthill on 05/12/2015 (ID-13373) Additional Information: Reports (0) Press Archive (0)	05/12/2015	Approximate Point
12.	Flooding at Galway City on 06/12/2015 (ID-13399) Additional Information: Reports (0) Press Archive (0)	06/12/2015	Approximate Point
13.	Flooding at Galway City on 02/01/2016 (ID-13514) Additional Information: Reports (0) Press Archive (0)	02/01/2016	Approximate Point
14.	Flooding at Galway City on 08/02/2019 (ID-13643) Additional Information: Reports (0) Press Archive (0)	08/02/2019	Approximate Point
15.	Coastal flooding in Galway and Salthill on 3rd January 2014 (ID-12144) Additional Information: Reports (1) Press Archive (0)	03/01/2014	Approximate Point
16.	Flooding in Galway City on 28th January 2013 (ID-11900) Additional Information: Reports (1) Press Archive (0)	28/01/2013	Approximate Point
17.	Coastal flooding in Galway and Salthill on 1st February 2014 (ID-12143) Additional Information: Reports (1) Press Archive (0)	n/a	Approximate Point

- Appendix B PRELIMINARY FLOOD RISK ASSESSMENT MAP



0.5 0.25 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5
Kilometers

Location Plan :

Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents
- Lakes / Turloughs

PFRA Outcomes

- Probable Area for Further Assesment
- Possible Area for Further Assesment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland

Project :
PRELIMINARY FLOOD RISK ASSESMENT (PFRA)

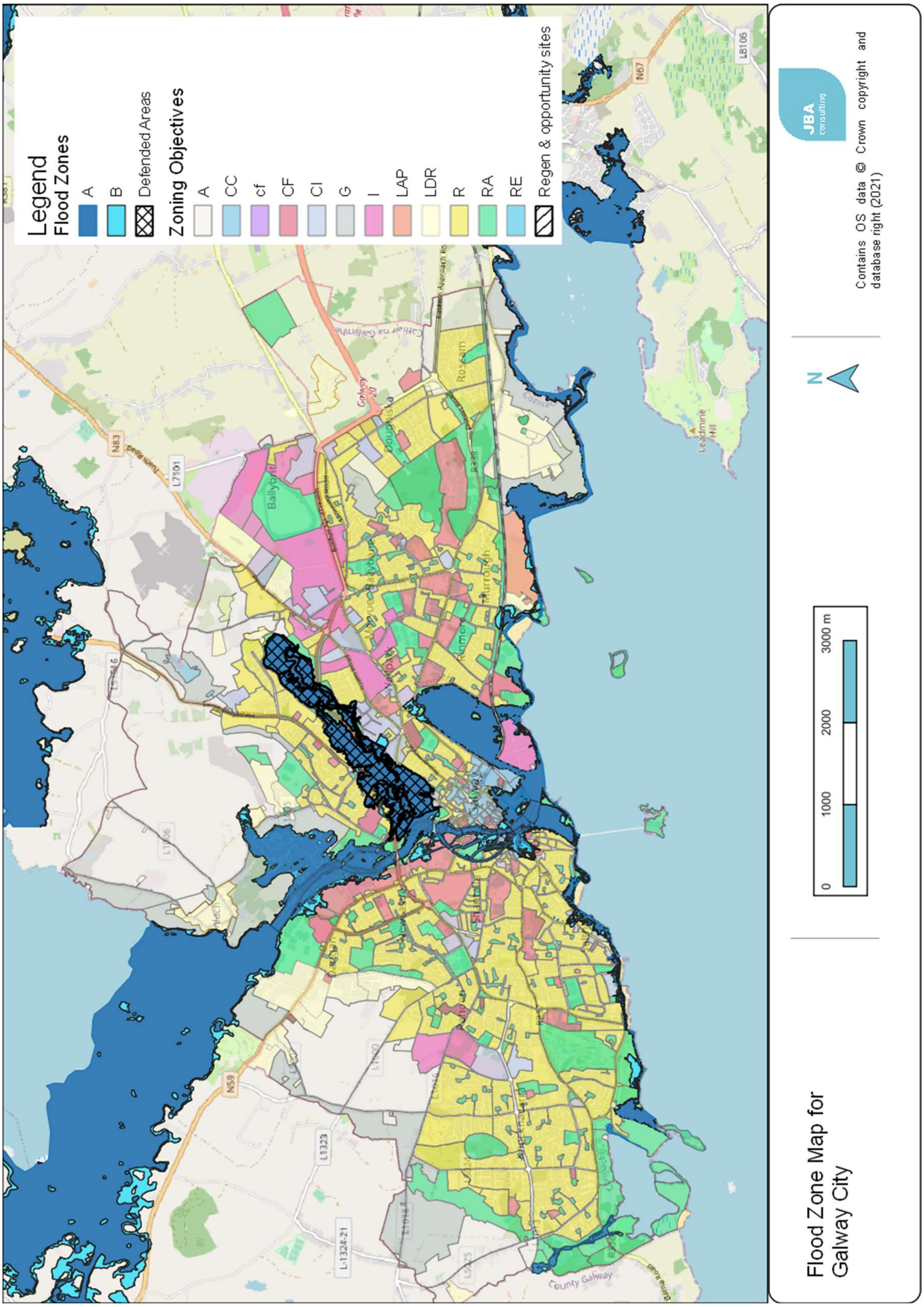
Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By : PJW	Date : July2011
Checked By : MA	Date : July 2011
Figure No. : 2019 / MAP / 226 / A	Revision 0
Drawing Scale : 1:50,000	Plot Scale : 1:1 @ A3

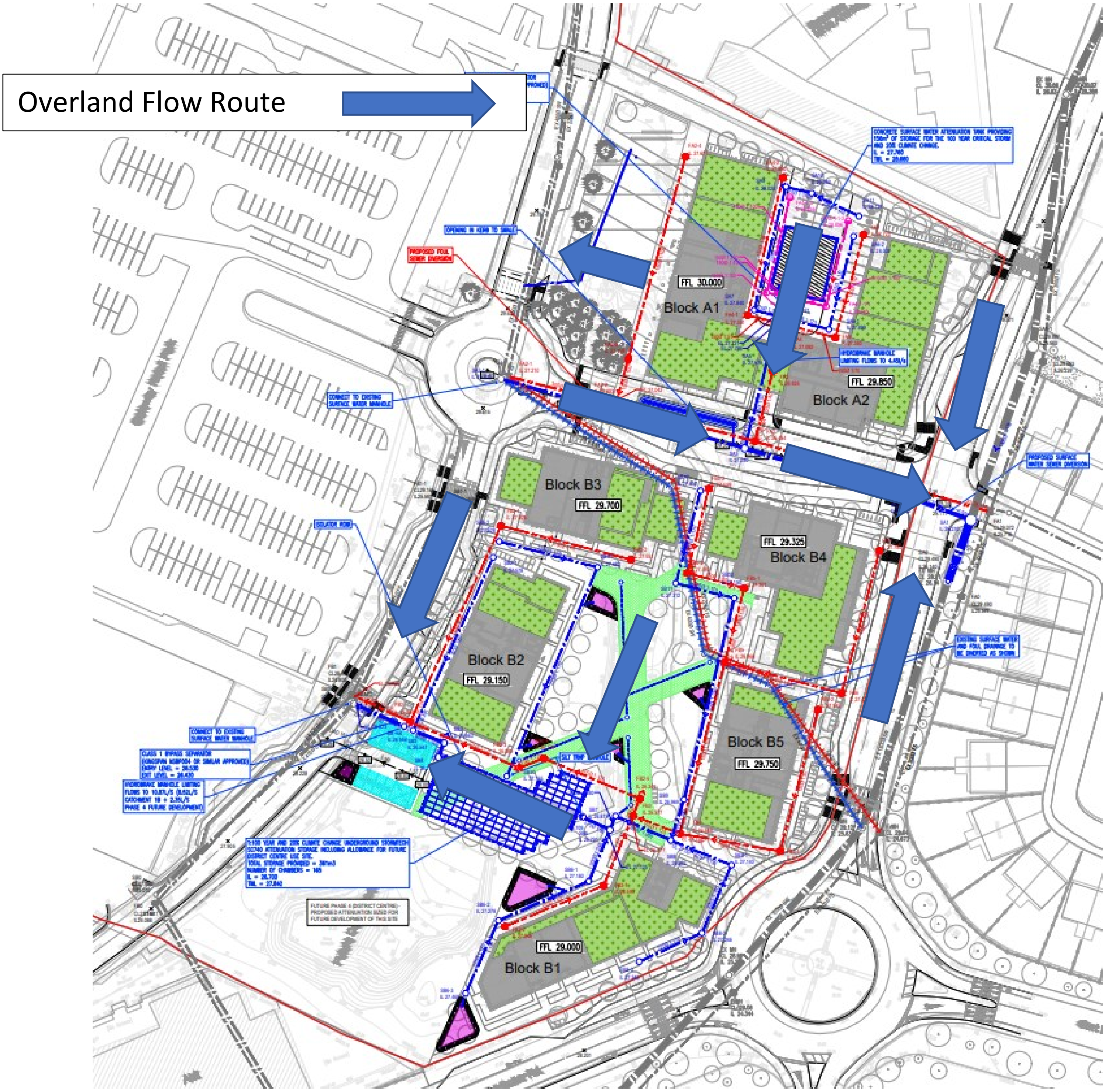
- Appendix C Galway City Development Plan 2023-2029 - Strategic Flood Risk Assessment

Appendices

A Flood Zone Mapping



- Appendix D Flood Exceedance Route


Overland Flow Route
Block A1
FFL 30.000
Block A2
FFL 29.850
Block B3
FFL 29.700
Block B4
FFL 29.325
Block B2
FFL 29.150
Block B5
FFL 29.750
Block B1
FFL 29.000

- Appendix E Existing Drainage Modeling

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	0
Ratio R	0.261	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	14.180	1.038	13.7	0.000	4.00	652.0	0.600	o	600	Pipe/Conduit	
1.001	65.230	0.844	77.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.002	29.600	1.046	28.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.003	36.800	2.050	18.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.004	33.064	0.100	330.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.005	67.380	0.230	293.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.006	29.600	1.960	15.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.007	62.000	0.440	140.9	0.000	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.008	68.200	0.316	215.8	0.000	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.009	93.600	0.444	210.8	0.000	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.010	95.700	0.080	1196.3	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.39	4.04	39.308	0.000	652.0	0.0	0.0	6.61	1869.3	652.0
1.001	48.86	4.43	38.270	0.000	652.0	0.0	0.0	2.77	783.8	652.0
1.002	48.46	4.54	37.426	0.000	652.0	0.0	0.0	4.59	1297.7	652.0
1.003	48.07	4.64	36.380	0.000	652.0	0.0	0.0	5.77	1630.2	652.0
1.004	46.64	5.06	34.330	0.000	652.0	0.0	0.0	1.33	377.1«	652.0
1.005	44.17	5.85	34.230	0.000	652.0	0.0	0.0	1.42	400.8«	652.0
1.006	43.94	5.93	34.000	0.000	652.0	0.0	0.0	6.29	1777.7	652.0
1.007	43.03	6.25	31.440	0.000	652.0	0.0	0.0	3.15	3562.6	652.0
1.008	41.85	6.70	31.000	0.000	652.0	0.0	0.0	2.54	2875.8	652.0
1.009	40.38	7.31	30.684	0.000	652.0	0.0	0.0	2.57	2910.0	652.0
1.010	37.64	8.60	29.940	0.000	652.0	0.0	0.0	1.23	2176.0	652.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.011	87.600	0.120	730.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.012	40.720	0.330	123.4	0.000	0.00	230.0	0.600	o	1500	Pipe/Conduit	
1.013	94.300	0.460	205.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.014	99.500	0.400	248.8	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.015	99.000	0.530	186.8	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.016	123.900	0.740	167.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.017	55.500	0.650	85.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.018	62.400	0.070	891.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.019	40.800	0.260	156.9	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.020	20.000	0.160	125.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.021	63.800	0.510	125.1	0.000	0.00	651.0	0.600	o	1500	Pipe/Conduit	
1.022	48.470	0.360	134.6	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.023	46.780	0.380	123.1	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.024	109.500	3.720	29.4	0.000	0.00	397.0	0.600	o	1500	Pipe/Conduit	
1.025	40.000	0.710	56.3	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.026	58.700	0.960	61.1	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.027	80.300	1.180	68.1	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.028	42.000	0.730	57.5	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.029	40.800	0.610	66.9	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.030	4.034	0.020	201.7	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.031	50.000	0.410	122.0	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.032	111.200	0.140	794.3	0.000	0.00	2210.0	0.600	o	1800	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.011	35.95	9.53	29.860	0.000	652.0	0.0	0.0	1.58	2791.6	652.0
1.012	35.65	9.70	29.740	0.000	882.0	0.0	0.0	3.86	6822.3	882.0
1.013	34.79	10.23	29.410	0.000	882.0	0.0	0.0	2.99	5287.9	882.0
1.014	33.86	10.84	28.950	0.000	882.0	0.0	0.0	2.72	4798.3	882.0
1.015	33.10	11.36	28.550	0.000	882.0	0.0	0.0	3.14	5540.7	882.0
1.016	32.26	11.99	28.020	0.000	882.0	0.0	0.0	3.31	5853.5	882.0
1.017	32.00	12.19	27.280	0.000	882.0	0.0	0.0	4.64	8206.1	882.0
1.018	31.10	12.92	26.630	0.000	882.0	0.0	0.0	1.43	2524.2	882.0
1.019	30.86	13.11	26.560	0.000	882.0	0.0	0.0	3.42	6047.1	882.0
1.020	30.76	13.20	26.300	0.000	882.0	0.0	0.0	3.84	6778.2	882.0
1.021	30.44	13.48	26.140	0.000	1533.0	0.0	0.0	3.83	6775.5	1533.0
1.022	30.20	13.70	25.630	0.000	1533.0	0.0	0.0	3.70	6530.2	1533.0
1.023	29.98	13.90	25.270	0.000	1533.0	0.0	0.0	3.87	6830.3	1533.0
1.024	29.73	14.13	24.890	0.000	1930.0	0.0	0.0	7.92	13992.6	1930.0
1.025	29.61	14.25	21.170	0.000	1930.0	0.0	0.0	5.72	10107.8	1930.0
1.026	29.42	14.42	20.460	0.000	1930.0	0.0	0.0	5.49	9701.3	1930.0
1.027	29.16	14.68	19.500	0.000	1930.0	0.0	0.0	5.20	9194.8	1930.0
1.028	29.03	14.80	18.320	0.000	1930.0	0.0	0.0	5.66	10001.9	1930.0
1.029	28.90	14.93	17.590	0.000	1930.0	0.0	0.0	5.25	9274.7	1930.0
1.030	28.89	14.95	16.680	0.000	1930.0	0.0	0.0	3.37	8581.3	1930.0
1.031	28.70	15.15	16.660	0.000	1930.0	0.0	0.0	4.34	11045.5	1930.0
1.032	27.68	16.24	16.250	0.000	4140.0	0.0	0.0	1.69	4308.2	4140.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.033	98.840	0.410	241.1	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.033	27.22	16.78	16.110	0.000	4140.0	0.0	0.0	3.08	7846.5	4140.0

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.261
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)	16.000	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	OFF
Inertia Status	OFF

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	10, 10, 10

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	10080 Winter	1	+10%					39.657
1.001	S2	10080 Winter	1	+10%					38.722
1.002	S3	10080 Winter	1	+10%					37.794
1.003	S4	10080 Winter	1	+10%					36.685
1.004	S5	10080 Winter	1	+10%	1/15 Summer				35.752
1.005	S6	10080 Winter	1	+10%	1/15 Summer				35.315
1.006	S7	10080 Winter	1	+10%					34.287
1.007	S8	10080 Winter	1	+10%					31.841
1.008	S9	10080 Winter	1	+10%					31.439
1.009	S10	10080 Winter	1	+10%					31.101
1.010	S11	5760 Winter	1	+10%					30.577
1.011	S12	5760 Winter	1	+10%					30.423
1.012	S13	5760 Winter	1	+10%					30.241
1.013	S14	5760 Winter	1	+10%					29.871
1.014	S15	5760 Winter	1	+10%					29.428
1.015	S16	5760 Winter	1	+10%					28.995
1.016	S17	5760 Winter	1	+10%					28.442

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	-0.251	0.000	0.64		652.0	OK	
1.001	S2	-0.148	0.000	0.92		652.0	OK	
1.002	S3	-0.232	0.000	0.64		652.0	OK	
1.003	S4	-0.295	0.000	0.48		652.0	OK	
1.004	S5	0.822	0.000	2.09		652.0	SURCHARGED	
1.005	S6	0.485	0.000	1.80		652.0	SURCHARGED	
1.006	S7	-0.313	0.000	0.46		652.0	OK	
1.007	S8	-0.799	0.000	0.25		652.0	OK	
1.008	S9	-0.761	0.000	0.29		652.0	OK	
1.009	S10	-0.783	0.000	0.26		652.0	OK	
1.010	S11	-0.863	0.000	0.33		652.0	OK	
1.011	S12	-0.937	0.000	0.29		652.0	OK	
1.012	S13	-0.999	0.000	0.25		882.0	OK	
1.013	S14	-1.039	0.000	0.21		882.0	OK	
1.014	S15	-1.022	0.000	0.22		882.0	OK	
1.015	S16	-1.055	0.000	0.19		882.0	OK	
1.016	S17	-1.078	0.000	0.18		882.0	OK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.017	S18	5760 Winter	1	+10%					27.699
1.018	S19	5760 Winter	1	+10%					27.345
1.019	S20	5760 Winter	1	+10%					27.074
1.020	S21	5760 Winter	1	+10%					26.814
1.021	S22	5760 Winter	1	+10%					26.744
1.022	S23	5760 Winter	1	+10%					26.295
1.023	S24	5760 Winter	1	+10%					25.925
1.024	S25	5760 Winter	1	+10%					25.296
1.025	S26	5760 Winter	1	+10%					21.796
1.026	S27	5760 Winter	1	+10%					21.035
1.027	S28	5760 Winter	1	+10%					20.042
1.028	S29	5760 Winter	1	+10%					18.941
1.029	S30	5760 Winter	1	+10%					18.242
1.030	S31	10080 Summer	30	+10%					18.103
1.031	S32	8640 Summer	100	+10%					18.087
1.032	S33	1440 Winter	1	+10%	1/360 Summer				18.050
1.033	S34	8640 Summer	100	+10%					17.241

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.017	S18	-1.081	0.000	0.17		882.0	OK	
1.018	S19	-0.785	0.000	0.46		882.0	OK	
1.019	S20	-0.986	0.000	0.26		882.0	OK	
1.020	S21	-0.986	0.000	0.26		882.0	OK	
1.021	S22	-0.896	0.000	0.34		1533.0	OK	
1.022	S23	-0.835	0.000	0.41		1533.0	OK	
1.023	S24	-0.845	0.000	0.40		1533.0	OK	
1.024	S25	-1.094	0.000	0.16		1930.0	OK	
1.025	S26	-0.874	0.000	0.37		1930.0	OK	
1.026	S27	-0.925	0.000	0.31		1930.0	OK	
1.027	S28	-0.958	0.000	0.28		1930.0	OK	
1.028	S29	-0.879	0.000	0.36		1930.0	OK	
1.029	S30	-0.848	0.000	0.39		1930.0	OK	
1.030	S31	-0.377	0.000	0.90		1932.6	OK	
1.031	S32	-0.373	0.000	0.33		1932.5	OK	
1.032	S33	0.000	0.000	1.19		4143.4	SURCHARGED	
1.033	S34	-0.669	0.000	0.72		4140.1	OK	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - Scotland and Ireland

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	16.000	Add Flow / Climate Change (%)	0
Ratio R	0.261	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	100	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	14.180	1.038	13.7	0.000	4.00	652.0	0.600	o	600	Pipe/Conduit	
1.001	65.230	0.844	77.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.002	29.600	1.046	28.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.003	36.800	2.050	18.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.004	33.064	0.100	330.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.005	67.380	0.230	293.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.006	29.600	1.960	15.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
1.007	62.000	0.440	140.9	0.000	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.008	68.200	0.316	215.8	0.000	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.009	93.600	0.444	210.8	0.000	0.00	0.0	0.600	o	1200	Pipe/Conduit	
1.010	95.700	0.080	1196.3	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.39	4.04	39.308	0.000	652.0	0.0	0.0	6.61	1869.3	652.0
1.001	48.86	4.43	38.270	0.000	652.0	0.0	0.0	2.77	783.8	652.0
1.002	48.46	4.54	37.426	0.000	652.0	0.0	0.0	4.59	1297.7	652.0
1.003	48.07	4.64	36.380	0.000	652.0	0.0	0.0	5.77	1630.2	652.0
1.004	46.64	5.06	34.330	0.000	652.0	0.0	0.0	1.33	377.1«	652.0
1.005	44.17	5.85	34.230	0.000	652.0	0.0	0.0	1.42	400.8«	652.0
1.006	43.94	5.93	34.000	0.000	652.0	0.0	0.0	6.29	1777.7	652.0
1.007	43.03	6.25	31.440	0.000	652.0	0.0	0.0	3.15	3562.6	652.0
1.008	41.85	6.70	31.000	0.000	652.0	0.0	0.0	2.54	2875.8	652.0
1.009	40.38	7.31	30.684	0.000	652.0	0.0	0.0	2.57	2910.0	652.0
1.010	37.64	8.60	29.940	0.000	652.0	0.0	0.0	1.23	2176.0	652.0

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.011	87.600	0.120	730.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.012	40.720	0.330	123.4	0.000	0.00	230.0	0.600	o	1500	Pipe/Conduit	
1.013	94.300	0.460	205.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.014	99.500	0.400	248.8	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.015	99.000	0.530	186.8	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.016	123.900	0.740	167.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.017	55.500	0.650	85.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.018	62.400	0.070	891.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.019	40.800	0.260	156.9	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.020	20.000	0.160	125.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.021	63.800	0.510	125.1	0.000	0.00	651.0	0.600	o	1500	Pipe/Conduit	
1.022	48.470	0.360	134.6	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.023	46.780	0.380	123.1	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.024	109.500	3.720	29.4	0.000	0.00	397.0	0.600	o	1500	Pipe/Conduit	
1.025	40.000	0.710	56.3	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.026	58.700	0.960	61.1	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.027	80.300	1.180	68.1	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.028	42.000	0.730	57.5	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.029	40.800	0.610	66.9	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
1.030	4.034	0.020	201.7	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.031	50.000	0.410	122.0	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	
1.032	111.200	0.140	794.3	0.000	0.00	2210.0	0.600	o	1800	Pipe/Conduit	

Network Results Table

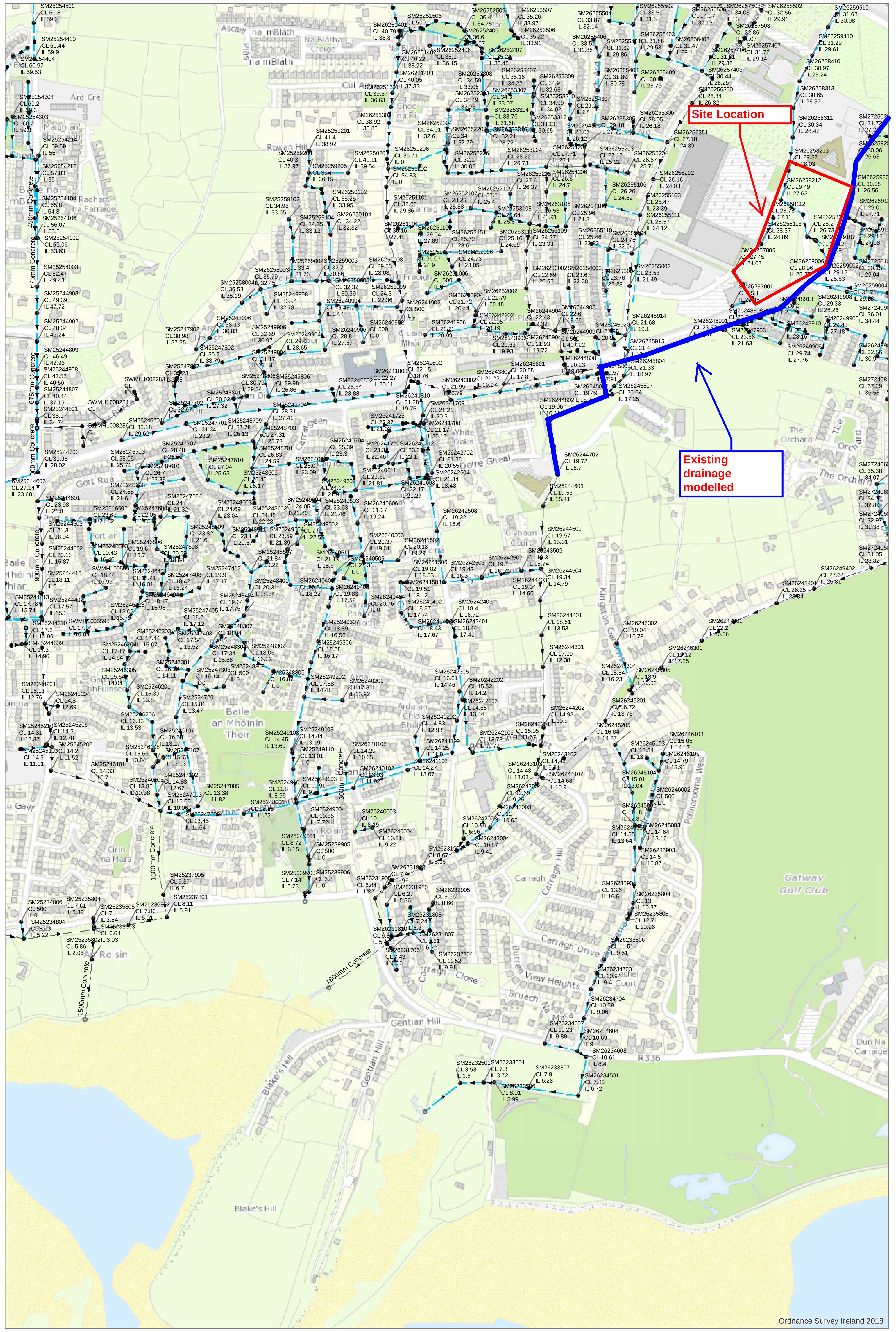
PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.011	35.95	9.53	29.860	0.000	652.0	0.0	0.0	1.58	2791.6	652.0
1.012	35.65	9.70	29.740	0.000	882.0	0.0	0.0	3.86	6822.3	882.0
1.013	34.79	10.23	29.410	0.000	882.0	0.0	0.0	2.99	5287.9	882.0
1.014	33.86	10.84	28.950	0.000	882.0	0.0	0.0	2.72	4798.3	882.0
1.015	33.10	11.36	28.550	0.000	882.0	0.0	0.0	3.14	5540.7	882.0
1.016	32.26	11.99	28.020	0.000	882.0	0.0	0.0	3.31	5853.5	882.0
1.017	32.00	12.19	27.280	0.000	882.0	0.0	0.0	4.64	8206.1	882.0
1.018	31.10	12.92	26.630	0.000	882.0	0.0	0.0	1.43	2524.2	882.0
1.019	30.86	13.11	26.560	0.000	882.0	0.0	0.0	3.42	6047.1	882.0
1.020	30.76	13.20	26.300	0.000	882.0	0.0	0.0	3.84	6778.2	882.0
1.021	30.44	13.48	26.140	0.000	1533.0	0.0	0.0	3.83	6775.5	1533.0
1.022	30.20	13.70	25.630	0.000	1533.0	0.0	0.0	3.70	6530.2	1533.0
1.023	29.98	13.90	25.270	0.000	1533.0	0.0	0.0	3.87	6830.3	1533.0
1.024	29.73	14.13	24.890	0.000	1930.0	0.0	0.0	7.92	13992.6	1930.0
1.025	29.61	14.25	21.170	0.000	1930.0	0.0	0.0	5.72	10107.8	1930.0
1.026	29.42	14.42	20.460	0.000	1930.0	0.0	0.0	5.49	9701.3	1930.0
1.027	29.16	14.68	19.500	0.000	1930.0	0.0	0.0	5.20	9194.8	1930.0
1.028	29.03	14.80	18.320	0.000	1930.0	0.0	0.0	5.66	10001.9	1930.0
1.029	28.90	14.93	17.590	0.000	1930.0	0.0	0.0	5.25	9274.7	1930.0
1.030	28.89	14.95	16.680	0.000	1930.0	0.0	0.0	3.37	8581.3	1930.0
1.031	28.70	15.15	16.660	0.000	1930.0	0.0	0.0	4.34	11045.5	1930.0
1.032	27.68	16.24	16.250	0.000	4140.0	0.0	0.0	1.69	4308.2	4140.0

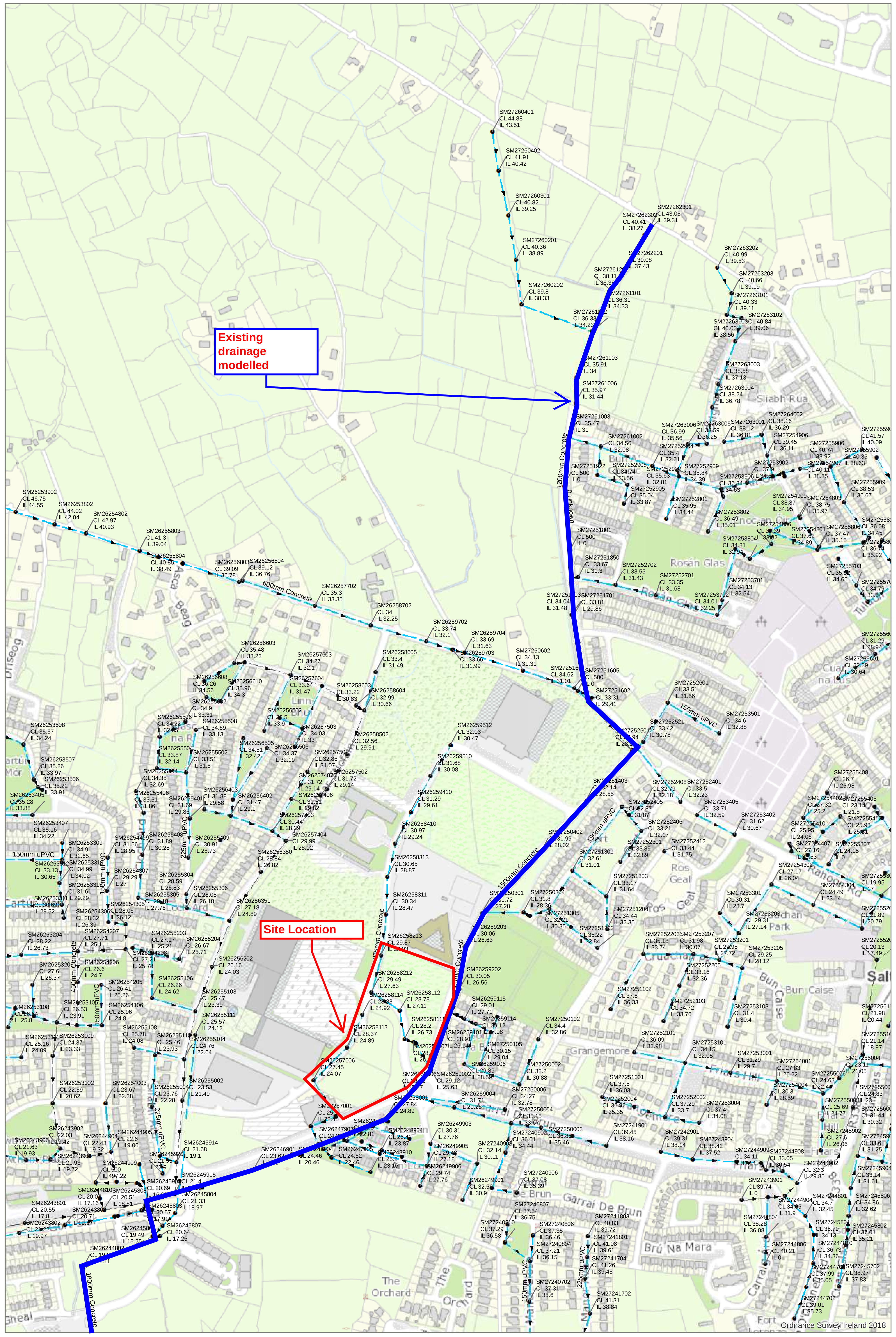
Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.033	98.840	0.410	241.1	0.000	0.00	0.0	0.600	o	1800	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.033	27.22	16.78	16.110	0.000	4140.0	0.0	0.0	3.08	7846.5	4140.0





UISCE ÉIREANN : IRISH WATER

Legend

Storm Manholes

Manhole Type

- Standard
- Backdrop
- Cascade
- Catchpit
- Bifurcation
- Hatchbox
- Lamphole
- Hydrobrake
- Other; Unknown

Storm Discharge Points

Discharge Type

- Outfall
- Overflow
- Soakaway
- Other; Unknown
- Surface Gravity Mains
- Surface Gravity Mains Private
- Surface Water Pressurised Mains
- Surface Water Pressurised Mains Private

Storm Inlets

Inlet Type

- Gully
- Standard
- Other; Unknown
- Storm Culverts
- Storm Open Drains
- Storm Detention Areas

0 0.075 0.15 0.3 Km

Coordinate System: TM65 Irish Grid
Projection: Transverse Mercator

Scale @ A1:	**1:5,000**
Drawing No.:	**DBLF- 0119**
Drawn By:	**JS**
Checked By:	**.**
Approved By:	**.**
Drawn Date	**14/01/2019**
Checked Date:	**.**
Approved Date:	**.**

N

Map Template Design: kcarroll@water.ie

Stormwater Sewers Knocknacarra Area
Information Request DBLF Consulting

DBFL CONSULTING ENGINEERS

Registered Office
Ormond House
Upper Ormond Quay
Dublin 7 Ireland D07 W704

+ 353 1 400 4000
info@dbfl.ie
www.dbfl.ie

Cork Office
14 South Mall
Cork T12 CT91

+ 353 21 202 4538
info@dbfl.ie
www.dbfl.ie

Waterford Office
Suite 8b The Atrium
Maritana Gate, Canada St
Waterford X91 W028

+ 353 51 309 500
info@dbfl.ie
www.dbfl.ie

APPENDIX 13-1

TRAFFIC IMPACT ASSESSMENT REPORT

Knocknacarra District Centre LRD

Traffic and Transport Assessment

180191-X-20-BK01-L01-RP-DBFL-CE-0001

TRANSPORTATION

December 2022

DBFL CONSULTING ENGINEERS

Project Title:	Knocknacarra District Centre LRD		
Document Title:	Traffic and Transport Assessment		
File Ref:	180191-X-20-BK01-L01-RP-DBFL-CE-0001		
Status:	P1 - Information S - Issued	Rev:	P03

Rev.	Date	Description	Prepared	Reviewed	Approved
1	08/08/22	First Draft Issue	Elena Cuena	Aimee Dunne	Robert Kelly
2	22/08/22	Final Draft Stage 2 Submission	Elena Cuena	Aimee Dunne	Robert Kelly
3	26/08/22	Final Stage 2 Submission	Elena Cuena	Aimee Dunne	Robert Kelly
4	30/11/22	Draft LRD Stage 3 Submission	Elena Cuena	Aimee Dunne	Robert Kelly
5	13/12/202	Final LRD Stage 3 Submission	Elena Cuena	Aimee Dunne	Robert Kelly

Contents

Figures

Tables

1 INTRODUCTION

1.1 BACKGROUND

DBFL Consulting Engineers (DBFL) has been commissioned by Glenveagh Properties to undertake a Traffic and Transport Assessment (TTA) for a proposed residential development located in Knocknacarra District Centre, Rahoon, Galway.

The proposed development comprises the provision of a total of 227 no. apartment units across seven blocks, comprising 84 no .1-bed, 139 no. 2-bed and 4 no. 3-bed apartments. The development will also include commercial floor space over 1,009.07 sqm, a community facility of 117.8sqm, along with a 561.3 sqm childcare facility which will all be within accessible walking distances for local residents.

The provision also includes for 550 no. cycle parking spaces (comprising 114 no. short stay and 436 no. long stay spaces). In terms of car parking, 49 no. spaces will be provided at surface level and change of use of existing underground void to 181 no. basement car park spaces. The development also includes for the realignment of the road between Gort Na Bró and the Gateway Retail Park Road.

This report has been produced to address any potential concerns that the local planning authority may have pertaining to the level of impact of the proposed development may generated upon the local transportation system.

1.2 SCOPE OF ASSESSMENT

The objective of this TTA is to assess and quantify:

- The principal accessibility characteristics of the existing local receiving environment,
- The proposed method of access for pedestrians, cyclists and vehicles travelling to / from the proposed development,
- The identification of the potential scale of impact upon the local transport network and
- The identification and assessment of mitigation measures to minimise any likely significant effects identified.

The scope of the assessment covers transport and sustainability issues including vehicular and pedestrian access, cyclist and public transport connectivity and capacity. The findings of the assessment contained within this report are based on existing and proposed road infrastructure layout arrangements (e.g., mitigation works that are to be implemented by the applicant), site visits, traffic observations and junction vehicle turning count data commissioned specifically for the purpose of this assessment.

The availability and the subsequent review of this information will enable the planning authority to gain a more detailed understanding of the proposed development at an early stage. This information will enable the authority to respond in an appropriate manner in the context of the scale and nature of the potential impact generated by the development.

1.3 APPRAISAL METHODOLOGY

Our approach to the study accords with policy and guidance both at a national and local level. Accordingly, the adopted methodology represents best practices, current and emerging guidance, exemplified by a series of publications, all of which advocate this method of analysis. Key publications consulted include;

- '*Traffic and Transport Assessment Guidelines'* (May 2014) National Road Authority (Now TII)
- *'Traffic Management Guidelines'* Dublin Transportation Office & Department of the Environmental and Local Government (May 2003);
- *Design Manual for Urban Roads and Streets* (DMURS) (May 2019);
- *Sustainable Urban Housing: Design Standards for New Apartments* (December 2020);
- Galway City Development Plan 2017–2023
- Draft Galway City Development plan 2023-2029

The approach to the preparation of this assessment subsequently involves the use of relevant data and established analytical techniques such that the conclusions are sufficiently robust and supported by evidence. In summary the assessment methodology incorporated a number of key inter-related stages, including;

- **Site Audit**: A site audit was undertaken to quantify (i) existing transport infrastructure characteristics, (ii) identify local traffic management arrangements, (iii) public transport network and interchange provision, (iv) establish the level of accessibility to the site in terms of walking, cycling and public transport, (iv) identify the level of retail, medical, service, educational, leisure and amenity provision currently available within different minute travel durations to/from the subject site. An inventory of the local road network was also developed as this stage of the assessment.

- Background Review: This important exercise incorporated two parallel tasks which included (a) an examination of the local regulatory and development management documentation, and (b) an analysis of previous 'transport' related, strategic and specific studies of development and transport infrastructure proposals across the local area.
- Traffic Counts: Traffic Counts were undertaken in October 2022. These included classified Junction Turning Counts (JTC) at three key nodes and Queue Length Surveys (QLS) in two key nodes to establish vehicle types, volume and speeds. The analysis of the survey findings assists in establishing the local baseline traffic demand characteristics in the immediate area of the proposed residential development.
- Proposed Development: The proposed residential developments key 'traffic and transportation' attributes are confirmed as influenced by the proposed development's land use, size, unit type and size (bedrooms), street and footpath / cycle route layouts, car parking provision and management, bicycle parking and level of connectivity provided by the scheme proposals integration with the external transport networks and the associated access to local and regional travel destinations.
- Trip Generation: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development. The exercise includes an analysis of accumulative impacts as influenced by key third party committed developments across the study area.
- Trip Distribution: Based upon both the existing traffic characteristics and the network layout in addition to the spatial / land use configuration and density of the urban structure across the catchments area of the development, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.
- Network Analysis: Further to quantifying the predicted impact of vehicle movements across the local road network for the adopted optimum site access strategy, more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2024, 2029 and 2039 development scenarios.

1.4 PRE-APPLICATION CONSULTATION

As part of the Large-scale Residential Development (LRD) process a pre-application S247 consultation was undertaken. A subsequent Stage 2 LRD meeting was then held (date: 27 September 2022) following which, Galway City Council (GCC) prepared a written Opinion on the Stage 2 submission for the Gateway Phase 3 development (GCC LRD Ref. No: 22/01).

The GCC Opinion included a number of points from the GCC Transportation Planning Division, which identified a number of transport items to be addressed in the final submission. The following summarises the items raised within the GCC Opinion and how these have been addressed within the final planning application:

Item 7) The proposed application should include a movement strategy and demonstrate how the proposed layout has been designed to ensure the provision of a sustainable pedestrian and cycle circulation plan for the entire site and this should include how this development and its connection points will interface with the wider surrounding area, such as recreational facilities, school, cycle paths and pedestrian connections. The application should include a clear management protocol with regards to the manage of the private access points through the communal areas.

Details regarding the proposed pedestrian and cyclist facilities connecting the proposed development are found within **Section 4** of this TTA. Furthermore, the existing and proposed transportation linkages plans [DBFL Drawing No. **180191-1-90-X-XXX-DR-DBFL-CE-1111** and DBFL Drawing No. **180191-1-90-X-XXX-DR-DBFL-CE-1112**] demonstrate how the proposed development will further enhance pedestrian / cyclist connectivity and permeability for residents of both the proposed development and the wider surrounding area.

Item 8.e) [In relation to the civic open space] It should also demonstrate that it will not be a default for traffic / servicing route and the design should include for prevention of such movements / servicing.

The proposed servicing strategy for the development is discussed in **Section 4** of the TTA.

Item 14.a) The proposed application should include for assessment of car parking in the context of existing provision on site and the original generous accommodation at basement level designed to service all the lands outlined in Blue. All such documentation should have regard to future in accordance with safe routes to schools' policy, proximity to GTS, designated bus routes and note that the outlined surface car parking and paladin fencing, at the southern boundary, were not *deemed acceptable at pre-planning consultation level, and such boundary areas would require more substantial landscaping / public realm.*

The proposed car parking arrangements, quantum and locations are discussed in detail in **Section 8** of this TTA, whilst the locations of the proposed car parking areas in the context of the wider pedestrian and cyclist facilities is discussed in **Section 4** of the report.

Item 14.b) *A need should be demonstrated for the proposed on street car parking near the pedestrian crossing for the school. In addition, impacts should be examined, and such areas of public civic and other amenity spaces, which erodes the civic space would usually be omitted.*

The on-street car parking previously proposed to be located adjacent the civic space has been removed, instead a 16m loading bay is proposed to service the commercial units to the east of the public open space. Further detail on the servicing arrangements are found in **Section 4** of this TTA.

Item 15.a) *The proposed application should demonstrate compliance, and consent, with the reservation of strategic routes, N6, and road widening of adjacent roadways, Western Distributor Road.*

The proposed scheme has been developed with consideration of and to comply with the reservation of strategic routes, as discussed in Section 2.5.4. Whilst the approval for the N6 Galway City Ring Road has recently been quashed, the proposed realignment of the Link Street and formation of a four-arm signalised junction on Gort no Bró with the Link Street connecting to the Gateway Retail Park is in accordance with the N6 GCRR design.

Item15.b) *The applicant must demonstrate compliance with the car parking standards for the City Development Plan (CDP) or provide justification for departures from the standard. The demonstration of compliance should include comparison tables of CDP standard, the proposal and the clearly referenced justification basis of the proposal. The applicant must demonstrate how parking will be managed in all its forms including but not limited to the following particulars:*

- *i) Car parking spaces shall not be sold, rented or otherwise sub-let or leased to other parties.*
- *ii) Car park serving the entire campus site shall be managed through signage and other appropriate physical measures to ensure segregation of parking by use.*

A detailed explanation and justification for the proposed car parking provision in comparison to the CDP standards is provided in **Section 4.2** of this TTA, whilst the proposed car parking management strategy is discussed in **Section 8** of the report.

Item 15.c) The applicant must demonstrate within the documents a commitment to undertake and implement the measures outlined in the Mobility Management Plan (Travel Plan) for the overall Campus and to ensure the future tenants of the proposed development comply with the strategy of the Mobility Plan. A Mobility Manage for the overall Campus shall be appointed to oversee and co-ordinate the preparation of individual plans.

A Mobility Management Plan (MMP) has been prepared and submitted as part of the planning application documentation.

Item 15.d) BusConnects Galway, the District Centre Campus is a key traffic generator and attractor. It is currently served by a mix of public and private roads on which bus routes operate currently or will operate in the future under the GTS and emerging BusConnects projects. The applicant must demonstrate in the application that it has considered the impact of the proposed development in the existing and emerging bus routes impacted by and impacting BusConnects Galway, including but not limited by the following;

i. *Ensure there is adequate Bus Parking to futureproof the upgrading of the Bus Services at this location. The existing 405 service will increase in frequency and it is likely that this area due to the nature and density of the development will act as a significant transport Hub for the Knocknacarra area.*
ii. *Ensure the design of the Bus pull in areas are to standard and that adequate length and width is allowed for.*
iii. *A 4 bay bus shelter will be required*
iv. *Demonstrate how buses will enter and exit from the development, provide Autoturn drawings.*

A Public Transport Capacity Assessment has been undertaken for the proposed development, the details of which are found within **Appendix A** of the TTA. The proposed relocated bus stop on the Link Road has been extended to 30m, therefore capable of accommodating two buses at any one time. The layout of the bus stop, bus shelter and swept path of buses turning at the roundabout are shown in **DBFL Drawing No. 180191-1-04-X-XXX-DR-DBFL-CE-1201**.

Item 15.g) The applicant must demonstrate that it has a coherent phased preliminary construction traffic management plan covering all phases envisaged in this development. The preliminary traffic management plan shall include proposals to prevent/minimise disruption to public transport, vehicular, cycle and pedestrian traffic in the receiving environment including existing public transport routes and public roads, private roads and footpaths in the vicinity.

A Construction and Environmental Management Plan (CEMP) has been prepared and submitted as part of the planning application documentation and contains details regarding the proposed construction phasing and measures to avoid/minimise disruption to the surrounding transport network during construction. A Construction Traffic Management Plan (CTMP) will be prepared and submitted for agreement with Galway City Council (GCC) prior to the commencement of any construction activity on site.

1.5 REPORT STRUCTURE

As introduced above, this TTA seeks to clarify the potential level of influence generated by the proposed development upon the local road network and subsequently ascertain the existing and future operational performance of the local transport system. The structure of the report responds to the various stages of this exercise including the key tasks summarised below.

Chapter 2 of this report describes the existing conditions at the proposed development location and surrounding area, while **Chapter 3** provides a summary of the relevant transport policies that influence the design and appraisal of the subject commercial proposals.

A description of the proposed development scheme and the proposed site access arrangements is described in **Chapter 4**, as well as the bicycle and car parking strategies.

Chapter 5 outlines the trip generation exercise carried out and the adopted methodology for applying growth factors to establish design year network traffic flows and the predicted scale of impact upon both the local road network. It also summarises the potential traffic impact of the proposals assessed for the design year. **Chapter 6** outlines the network impact. **Chapter 7** summarises the analysis undertaken in the key junctions.

The Parking Management Strategy is detailed in **Chapter 8.**

The main conclusions and recommendations derived from the analysis are summarised in **Chapter 9**.

2 RECEIVING ENVIRONMENT

2.1 LOCATION

The subject site will form part of the Knocknacarra District Centre, Rahoon, Galway. It is located in Knocknacarra north of the Western Distributor Road, approximately 3km west from Galway City Centre. The general location of the subject site in relation to the surrounding suburbs is illustrated in **Figure 2-1**, while the extents of the subject site boundary and neighbouring lands are indicatively shown in **Figure 2-2.**

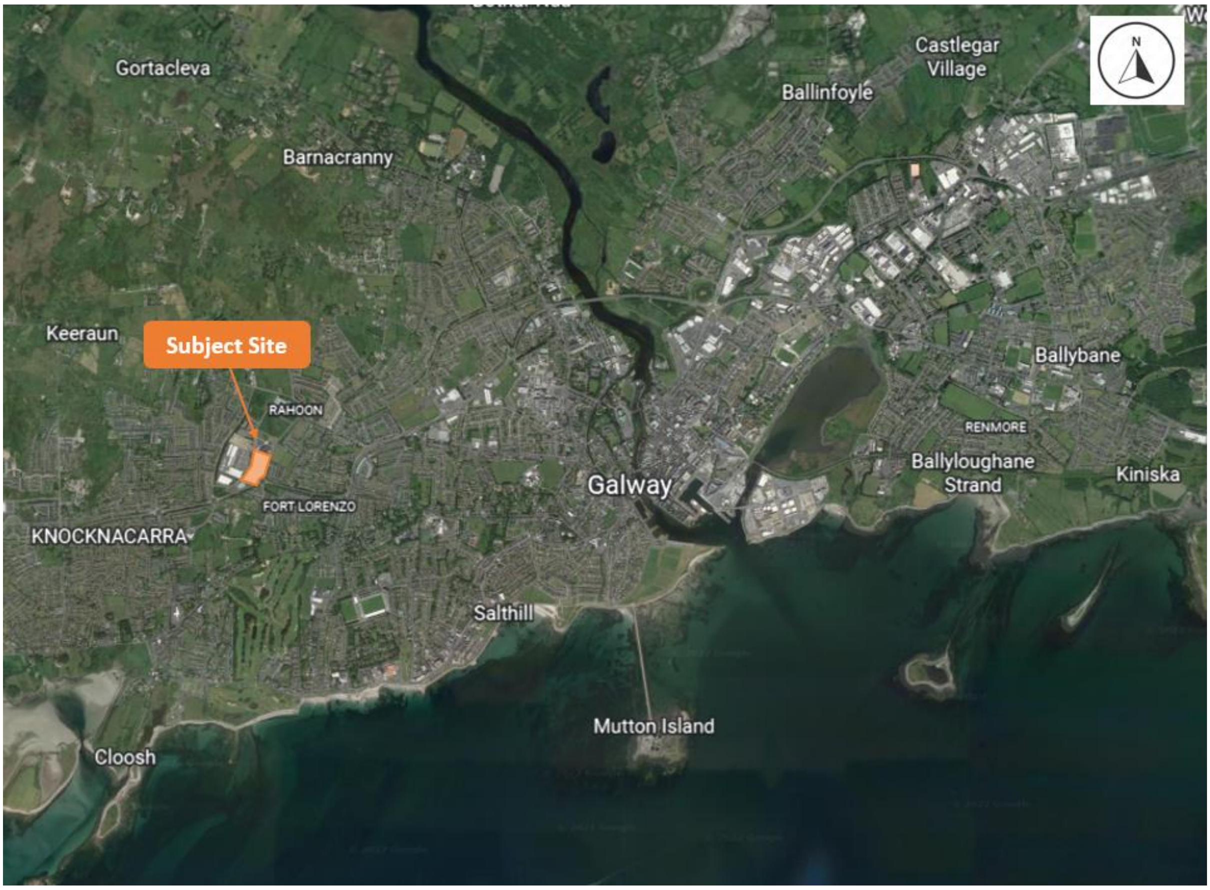


Figure 2-1: Subject Site Location

The Knocknacarra District Centre is split into four phases, illustrated in **Figure 2-2** below.

- Phase 1 and Phase 2 – Operational
- Phase 3 – Proposed Development.
- Phase 4 – Future District Centre Use Site

Figure 2-2 Knocknacarra Proposed Development within the District Centre

2.2 LOCAL AMENITIES

The subject site is surrounded by a mix of different uses, although it is located largely in a residential area. The site is conveniently located, being bound by the Gateway Shopping Park to the west, Lidl and Aldi supermarkets located to the south-west. To the north/northwest are a number of commercial/manufacturing activities, including Aviva, RSA and Abbvie.

The Gaelscoil Mhic Amhlaigh School is located immediately along the north boundary of the site. To the east and south is predominantly residential activity. Knocknacarra National School is located 10 min walking distance to the south.

The subject site benefits from many open spaces, such as the two soccer pitches east of the Gaelscoil Mhic Amhlaigh school. There are also a family activity centre and a sport centre, Pure Skill, in the vicinity of the site.

Figure 2-3 Local Amenities in the vicinity of the site

2.3 EXISTING TRANSPORTATION INFRASTRUCTURE

2.3.1 Road Network

The local road network in vicinity of the existing and proposed development site is made up of single carriageway local and connector roads. The Western Distributor Road is a major link, connecting Knocknacarra North and South with Galway City Centre through Bishop O'Donnell Road. The junctions in vicinity of the site are uncontrolled with roundabout junctions along the Western Distributor Road. There is a 50km/h speed limit on the roads adjacent to the site.

Figure 2-4 Existing Road Network

The existing Gateway Retail Park can be accessed from the Western Distributor Road from the south and the Rahoon Road from the north.

- From the Western Distributor Road, there are two access points:
  - The main access point is through the Gort Na Bró Roundabout, from which one arm connects directly to a mini roundabout via a link road providing access to the existing Gateway Retail Park.
  - The second access point is from the Bóthair Stiofáin roundabout, via an uncontrolled T-junction which connects to the local road (Gateway Retail Park) which in turns connects to the mini roundabout at the access to the existing Gateway Retail Park.
- Access from the north is via the uncontrolled the Rahoon Road T-junction which leads to another uncontrolled T junction with a local road (Gateway Retail Park) which in turn links to the mini roundabout at the access to the existing Gateway Retail Park.

2.3.2 Existing Cycling and Pedestrian Facilities

Western Distributor Road

There are footpaths and on-road cycle lanes on both sides of the road as shown in **Figure 2-5**. Both are continuous all along the Western Distributor Road from the Bishop O'Donnell roundabout to the Ballymoneen Road roundabout. Cycle lanes are approximately 1.4 m width each and footpaths are 2.0m.

At the five-arm roundabout at Gort Na Bró raised zebra crossings are provided on three arms, the Western Distributor south and west and Gort Na Bró. Uncontrolled at grade crossings with drop kerbs are provided on the link road to Gateway Retail Park and on the southern arm.

At the four-arm roundabout with Bóthair Stiofáin raised zebra crossings are provided on three arms, Western Distributor Road east and west and Bóthair Stiofáin. Uncontrolled at grade crossing with drop kerbs is provided on the southern arm.

Figure 2-5 Western Distributor Road

Bóthair Stiofáin

There are no dedicated cycle facilities on Bóthair Stiofáin. A footpath is provided on the western side of the road only, as shown in **Figure 2-6**.

Figure 2-6 Bóthair Stiofáin

Gort Na Bró

Gort Na Bró, has no dedicated cycle facilities; however, there are footpaths both sides of the road, continuous from the Western Distribution Road roundabout to the junction with Rahoon Road, with an approximate width of 2m each.

There are two raised zebra crossings provided at Gaelscoil Mhic Amhlaigh. The southern crossing, shown in **Figure 2-7**, connects to a combined footway/cycleway which runs along the southern edge of the school, illustrated in **Figure 2-8**.

Figure 2-7 Gort Na Bró. Southern Raised zebra crossing.

This shared path on the southern side of the school is approximately 4.5m wide, serving as a link from Gort Na Bró to the local Gateway Retail Park link. **Figure 2-8** shows this link from Gort Na Bró.

Figure 2-8 Footway/Cycleway in the south side of Gaelscoil Mhic Amhlaigh.

Access to the Gateway Retail Park

On the internal road network in the Gateway Retail Park, there are footpaths provided throughout on both sides of the roads. A raised zebra crossing is provided on the road north of the mini roundabout, illustrated in **Figure 2-9.**

This provides access to the Gaelscoil Mhic Amhlaigh connecting to the aforementioned shared footway / cycleway which runs along the southern edge of the school.

Figure 2-9 Zebra crossing connecting to the Gateway Retail Park.

A raised cycle track of approximately 1.5m width is provided on both sides of the road that links Bóthair Stiofáin to the mini roundabout at the access to the main retail car park. A section of this road is illustrated in **Figure 2-10**.

Figure 2-10 Gateway Retail Park internal link road

On the Link Road, which connects the Gateway Retail Park to the Gort Na Bró roundabout, there are no dedicated cycle facilities, but footpaths are provided on both sides of the road, as shown in **Figure 2-11**.

Figure 2-11 Link Road access to Gateway Retail Park

2.3.3 Public Transport

The subject site is well served in terms of public transport provision. It is adjacent several bus routes with one bus stop currently located on the Link Road which connects the Gateway Retail

Park and the Gort Na Bró roundabout. **Figure 2-12** below illustrates the existing bus routes and stops in the vicinity of the proposed development.

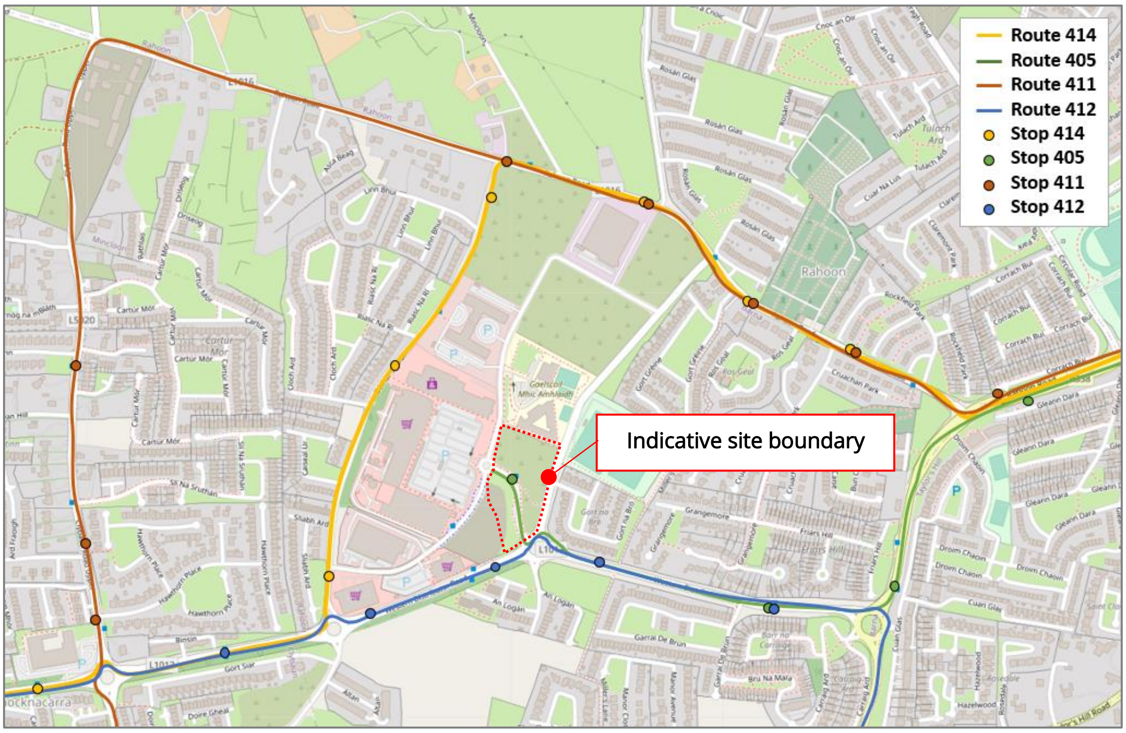


Figure 2-12 Existing Bus Routes and Stops adjacent to the proposed development

The key routes for the site are the 405, 412, 411 and 414 whose stops are within a 10-minute catchment. **Table 2-1** below provides the frequency of the above-named bus routes.

Bus Service	Route No.	Destination	No. Services		
			Mon – Fri	Sat	Sun
Bus Eireann	405	Ballybane - Eyre Square – Rahoon	44	40	23
		Rahoon – Eyre Square - Ballybane	45	40	23
City Direct	412	Cappagh Rd. – Eyre Square	19	-	-
		Eyre Square - Cappagh Rd.	20	-	-
City Direct	411	Cappagh Rd. – Eyre Square	33	25	16
		Eyre Square - Cappagh Rd.	32	25	16
City Direct	414	Barna - Eyre Square	2	-	-
		Eyre Square - Barna	3	-	-

Table 2-1 Bus Services adjacent to the proposed development

Further analysis regarding the current available capacity on bus services serving the proposed development and capability of accommodating additional demand for these services arising from the proposed development are found in the Public Transport Capacity Assessment in **Appendix A**.

2.4 EXISTING SITE ACCESSIBILITY

2.4.1 Walking Catchment

The pedestrian catchments accessible from the subject site are shown in **Figure 2-13** below for different walking times, from 5 minutes to 20 minutes. There are numerous facilities that are currently accessible within this catchment.

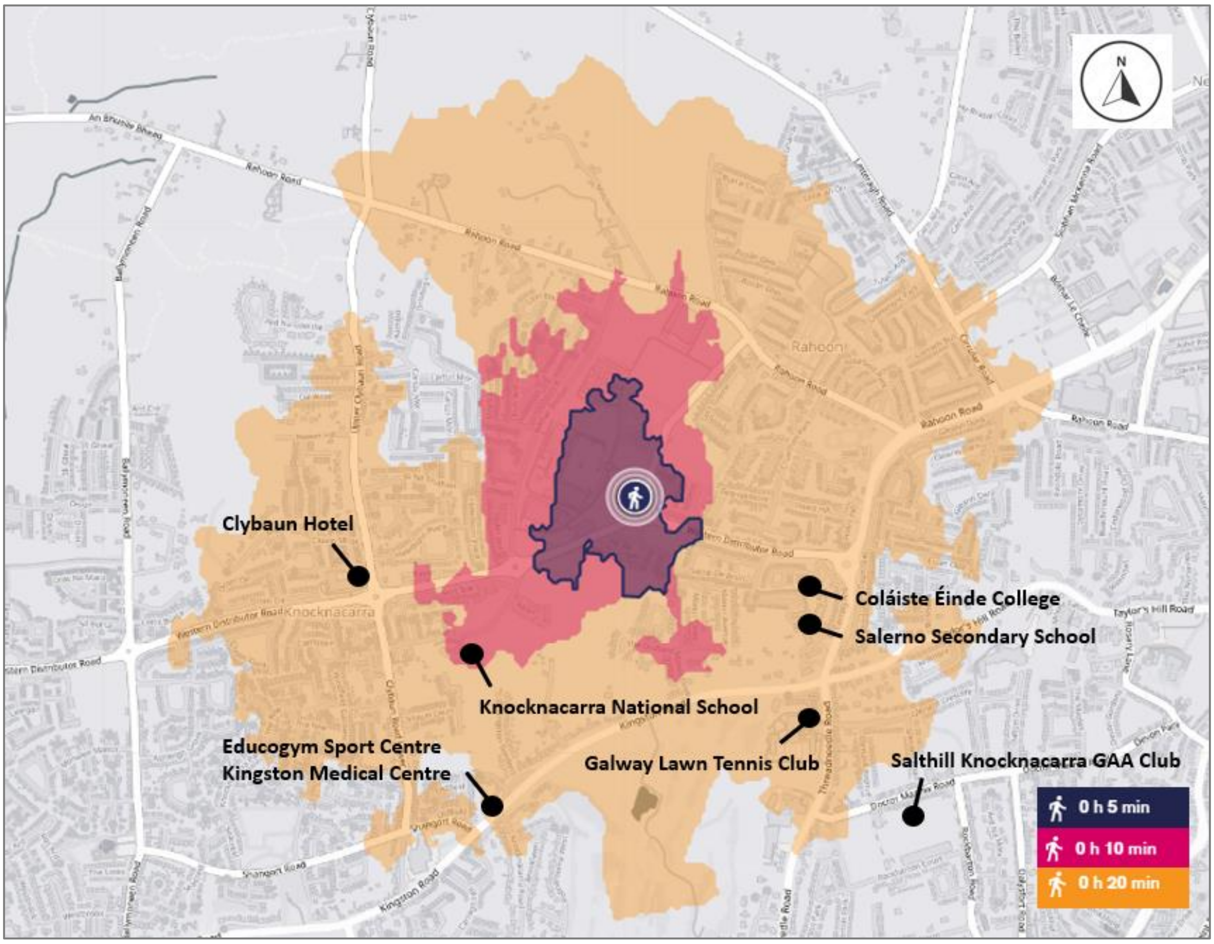


Figure 2-13 Walking Catchment (Source: Travel Time Map)

In 5-minutes walking time, the Gateway Shopping Park and the Gaelscoil Mhic Amhlaigh School as the site is bounded by them. There are a Lidl and Aldi stores and several leisure facilities such as Skill zone. The bus stops for routes 412, 405 and 414 are reachable within this time.

In 10-minutes walking time, the Knocknacarra National School and the bus stop for route 411 on Rahoon Road are accessible.

Within a 10-minute and 20-minute walking time, a number of additional educational facilities are reachable, such as the Coláiste Éinde College and the Salerno Secondary School. Leisure facilities are also accessible, like the swimming Pool facilities at Clybaun Hotel, the Knocknacarra GAA Club, the Galway Lawn Tennis Club and Educogym Sport Centre. The Kingston Medical Centre is also included in this catchment. The bus stop for Routes 402 and 410 on Shangort Road and the stop for Routes 411, 412 on Clybaun Road are also reachable within this time.

2.4.2 Cycling Catchment

The cycling catchments accessible from the subject site were divided in 10 minutes, 20 minutes, and 40 minutes ranges, illustrated in **Figure 2-14**.

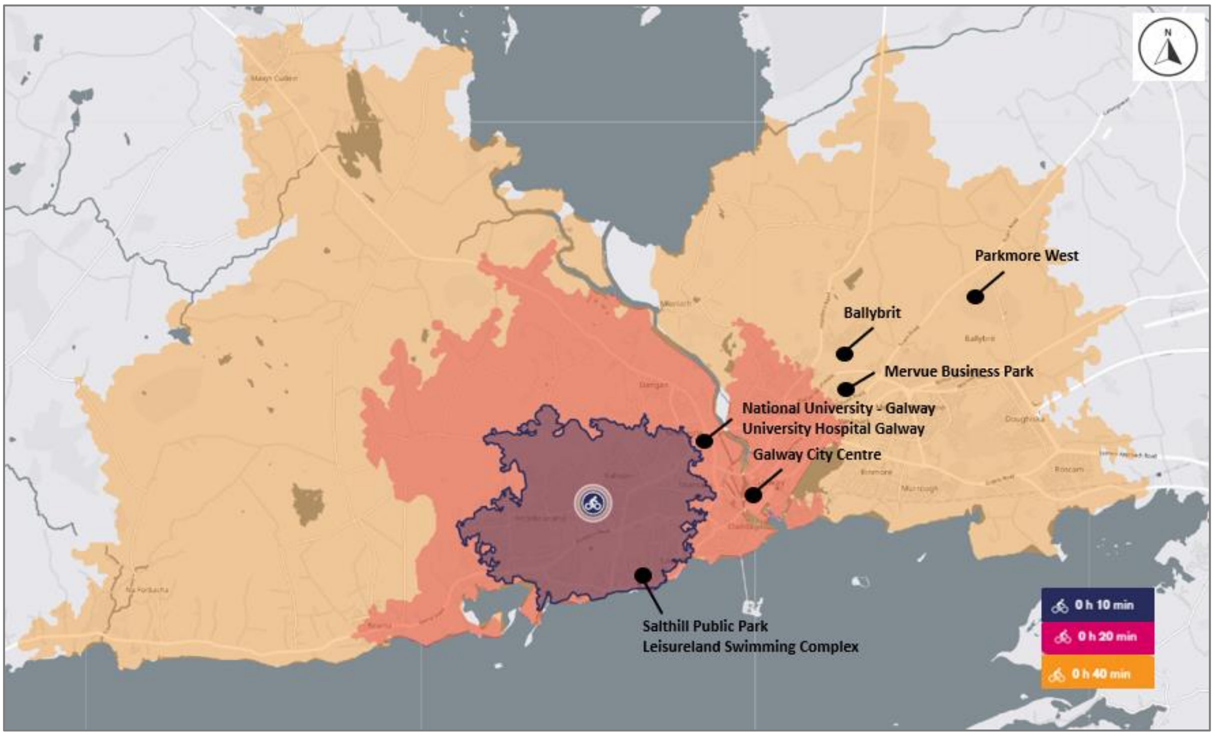


Figure 2-14 Cycling Catchment. (Source: Travel Time Map)

Within 10-minutes cycling, all aforementioned educational facilities are easily accessible.

Within 20 minutes cycling time, the city centre is reached, as well as the University Hospital and the National University of Ireland in Galway. Leisure facilities such as the Salthill Public Park, Leisureland Swimming complex and Terryland Retail area are also accessible within this time.

Within 40 minutes cycling time, the whole area of Galway City is accessible. This includes industrial sites such as the Parkmore West Business Park, Ballybrit, and the Mervue Business Park. The Atlantic Technological University is also included in this catchment. Leisure sites are also accessible, such as the Silver Strand Beach, the Salthill Devon Soccer Pitches and the Bearna Golf Club.

2.4.3 Public Transport Catchment

The catchments accessible by public transport from the subject site are illustrated in **Figure 2-15**, divided into 30 minutes, 40 minutes, and 50 minutes ranges.

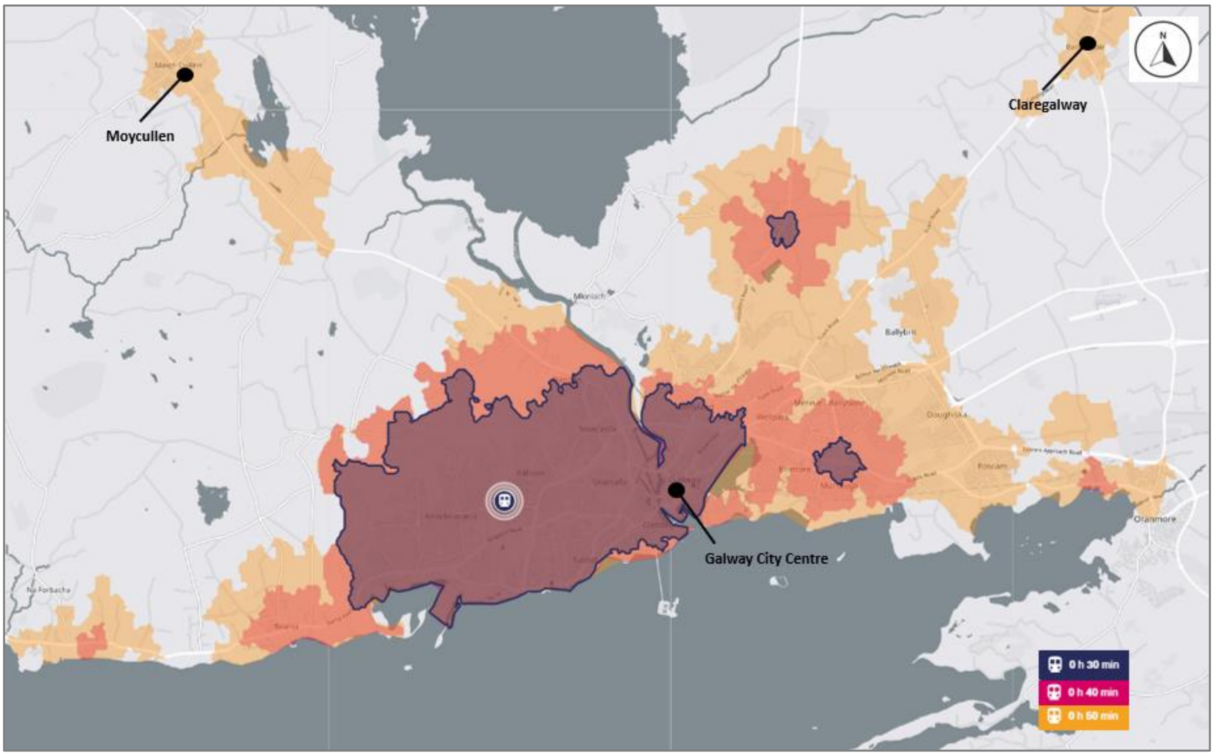


Figure 2-15 Public Transport Catchment. (Source: Travel Time Map)

Within a 30 minute trip by public transport, the city centre is accessible, as well as most of the facilities and sites included in the 20 minutes cycling catchment. The 30 minutes catchment includes settlements such as Moycullen and Claregalway.

2.5 EMERGING TRANSPORTATION INFRASTRUCTURE

2.5.1 Cycle Network

The Galway Transport Strategy (GTS), detailed in **Section 3.2**, assumes that there is a need for future provision and improvement of safer facilities for both pedestrians and cyclists. It sets out a proposal for a city-wide high quality cycle network to be implemented over the next 20 years, taking cognisance of existing facilities, previous proposals, journey types most suited to cycling and travel desire lines.

The cycle network improvements in the surroundings of the subject site are listed below and shown in **Figure 2-16**.

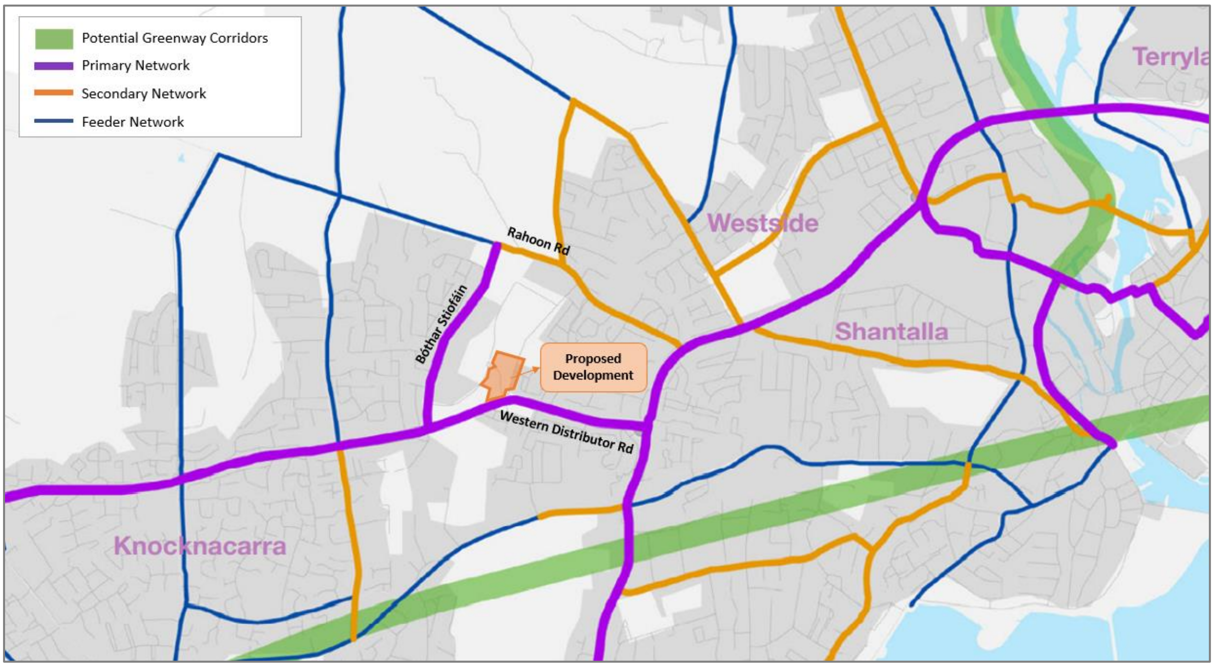


Figure 2-16 GTS Proposed Cycle Network in the surroundings of the site (Source: Galway Transport Strategy 2016)

The following key upgrades relevant to the subject development site include:

- Western Distributor Road – Currently on-road cycle lanes from Blake Roundabout to Deane Roundabout. It is marked to be part of the Primary Network, by upgrading the existing on-road cycle lanes to off-road and install raised adjacent cycle lanes.
- Bothar Stiofain - Currently there are no facilities in place. It is proposed to be included within the Primary Network, by installing on-road cycle lanes on both sides of the road.
- Rahoon Road (east of the junction with Bothar Stiofain) – Currently there are no facilities in place, as the direct link between these roads is incomplete. It is proposed to be part of the Secondary, by installing raised adjacent cycle lanes along both sides of residential road if and when it is developed.
- Rahoon Road (west of the junction with Bothar Stiofain) – Provide traffic calming measures and signage to reduce motorised traffic speeds and advertise presence of cyclists.

2.5.2 Millars Lane Scheme

The Millar's Lane Pedestrian and Cycle route is a scheme being delivered by Galway City Council. The scheme proposes an off-road shared pedestrian and cyclist route extending from Manor Avenue / Manor Drive to Rahoon Road as indicated in **Figure 2-17.**

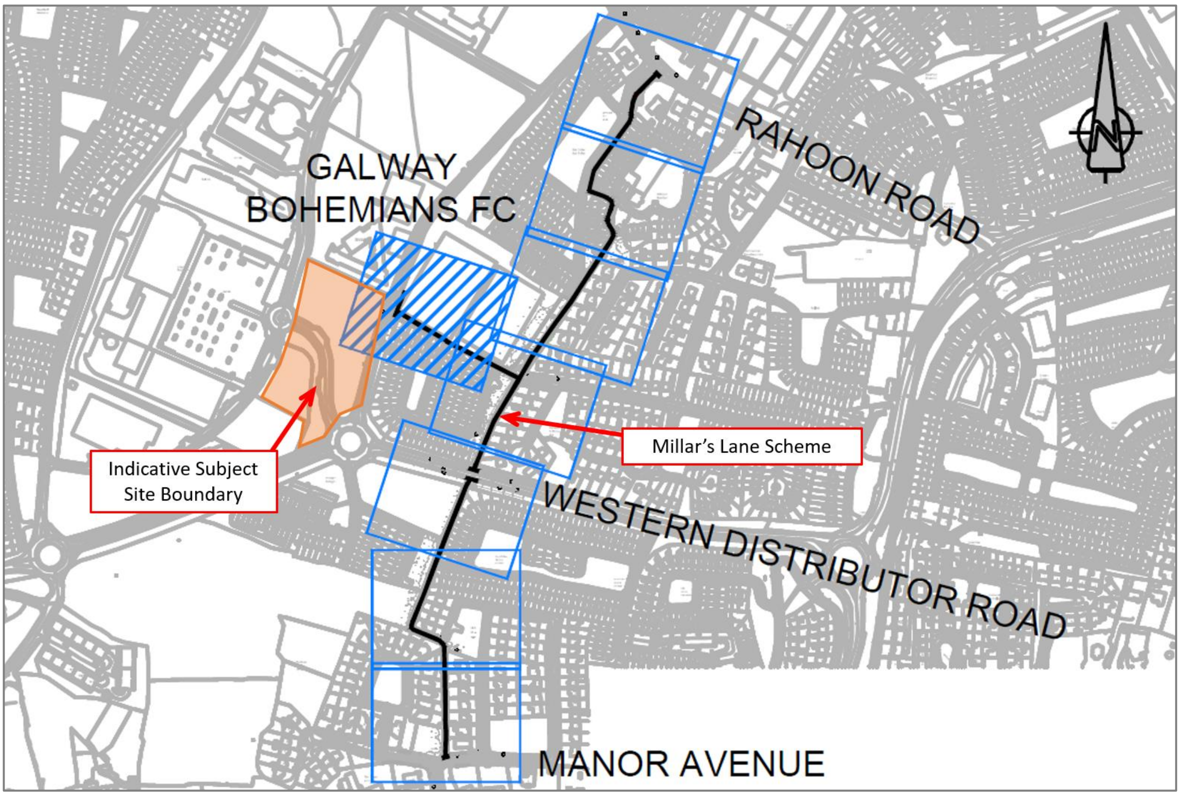


Figure 2-17: Proposed Millars Lane Pedestrian and Cycle Route
(Source: General Arrangement Drawings, AECOM, 2021)

It will support permeability into adjacent residential estates, providing an off-road walking and cycling route for residents and for children travelling to school. When complete the Miller's Lane scheme will link into the wider Galway City Cycle Network, supporting travel by bike beyond the Knocknacarra / Rahoon area.

As part of the proposals for the Miller's Lane project public lighting will also be provided along the route. A spur will connect to the existing Zebra crossing on Gort Na Bró providing a direct connection to the Gaelscoil Mhic Amhlaigh. The scheme proposals in the context of the subject development and Gort Na Bró are shown in Figure 2-18.

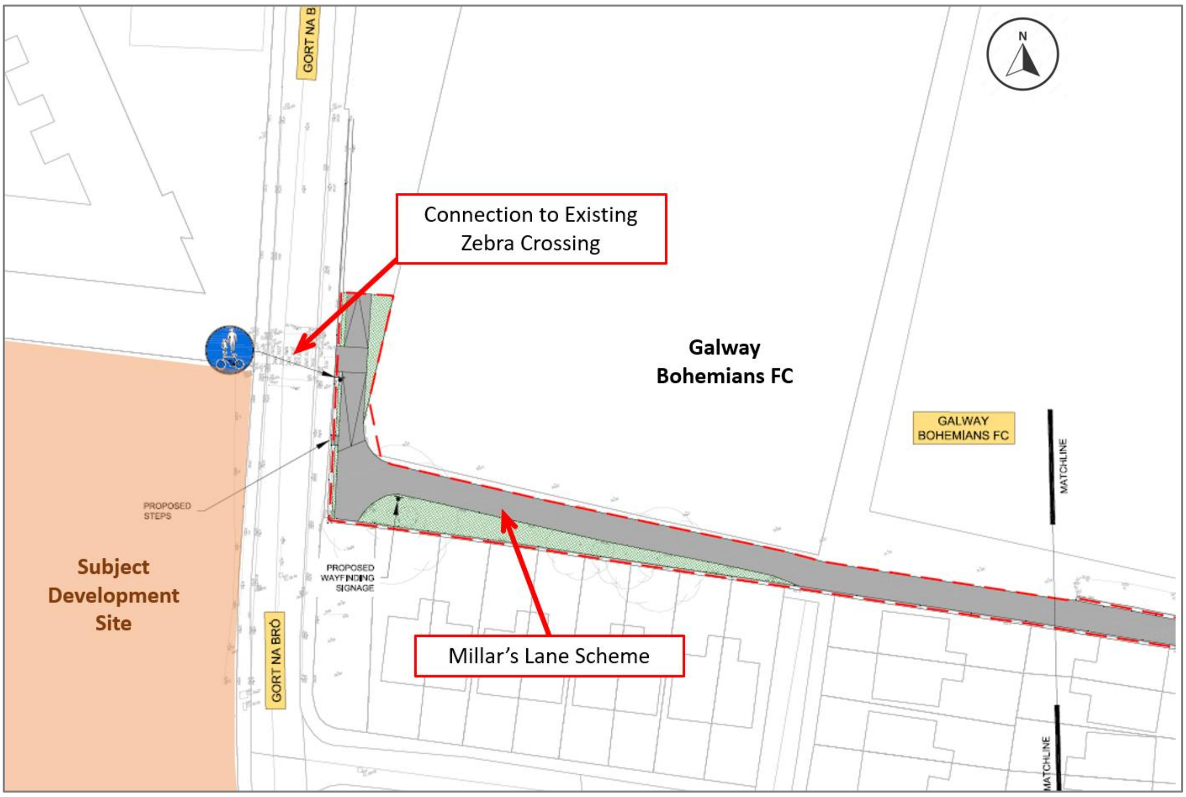


Figure 2-18: Millars Lane Scheme Proposed Got Na Bró Connection
(Source: General Arrangement Drawings, AECOM, 2021)

2.5.3 Public Transport

The GTS sets out the short, medium, and long-term strategy for the implementation of an integrated transport system which includes walking, cycling and public transport. A cross-city network proposal was developed based on linking the residential origins to the key destination locations by analysing the 2011 POWSCAR data, illustrated in the **Figure 2-19**.

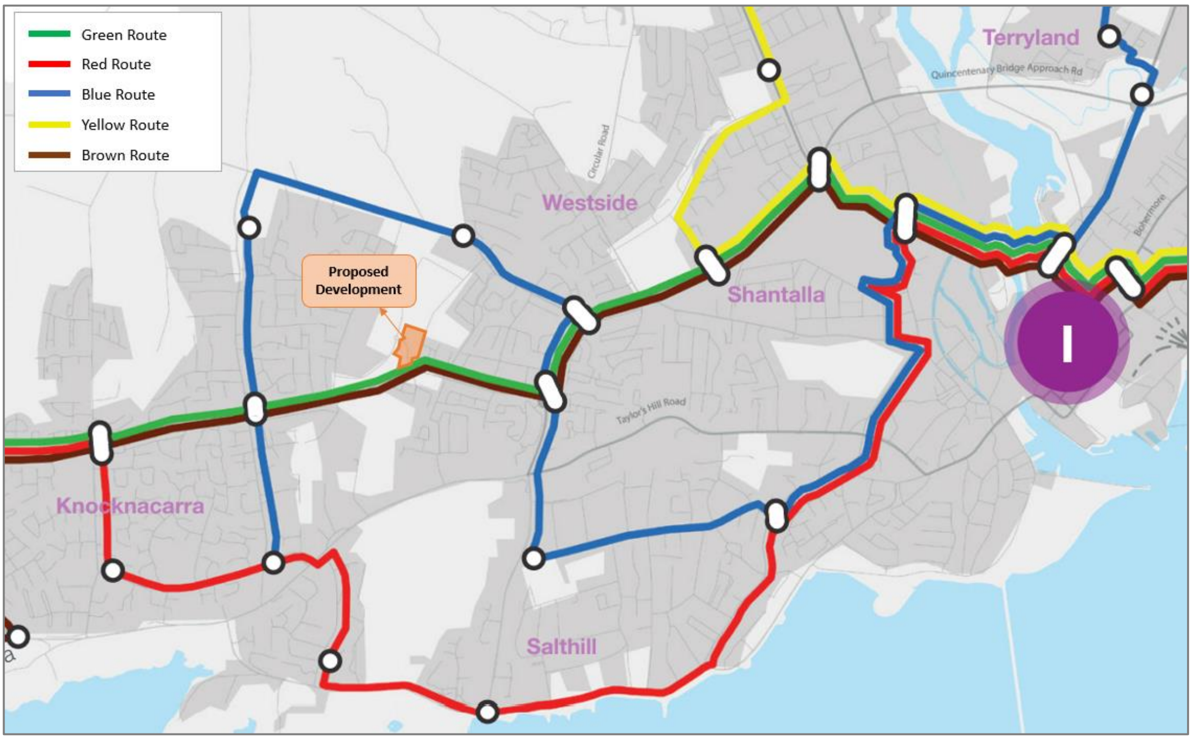


Figure 2-19 GTS Proposed Bus Routes in the surroundings of the site (Source: Galway Transport Strategy 2016)

The proposed routes in the surroundings of the site are listed below.

- Green Route: Knocknacarra – City Centre – Parkmore Industrial Estate (via Seamus Quirke Road and Dublin Road).
- Brown Route: Bearna – City Centre – Oranmore (via Seamus Quirke Road and Deerpark Industrial Estate).
- Blue Route: Clybaun Road – City Centre – Castlegar (via Dr. Mannix Road and Tirellan).

In terms of Public Transport infrastructure, the Western Distributor Road is highlighted for bus priority measures with bus lanes proposed on both sides of the road. These will tie into the existing bus lanes on Bishop O'Donnell/Seamus Quirke Road.

2.5.4 Road Network

Galway County Council together with Galway City Council is proposing to develop the N6 Galway City Ring Road (N6 GCRR) around Galway City. It is a key component of the GTS, as it is predicted that the construction of this bypass will result in a 20% decrease of vehicular traffic within Galway city centre.

The proposals include the upgrade of the Western Distributor Road / Gort Na Bró roundabout to a signalised crossroad junction. Similarly, the proposals include for the upgrade and realignment of the Rahoon Road/Gort Na Bró Junction to a signalised junction, affording greater priority to public transport movements and improving pedestrian and cycling facilities.

Most notably and relevant to the subject development site, the proposals include the removal of the Link Street from the Western Distributor Road / Gort Na Bró junction. Instead, a new four arm signalised junction is proposed on Gort Na Bró and new Link Road connecting to the Gateway Retail Park access roundabout, as shown in the **Figure 2-20** below.

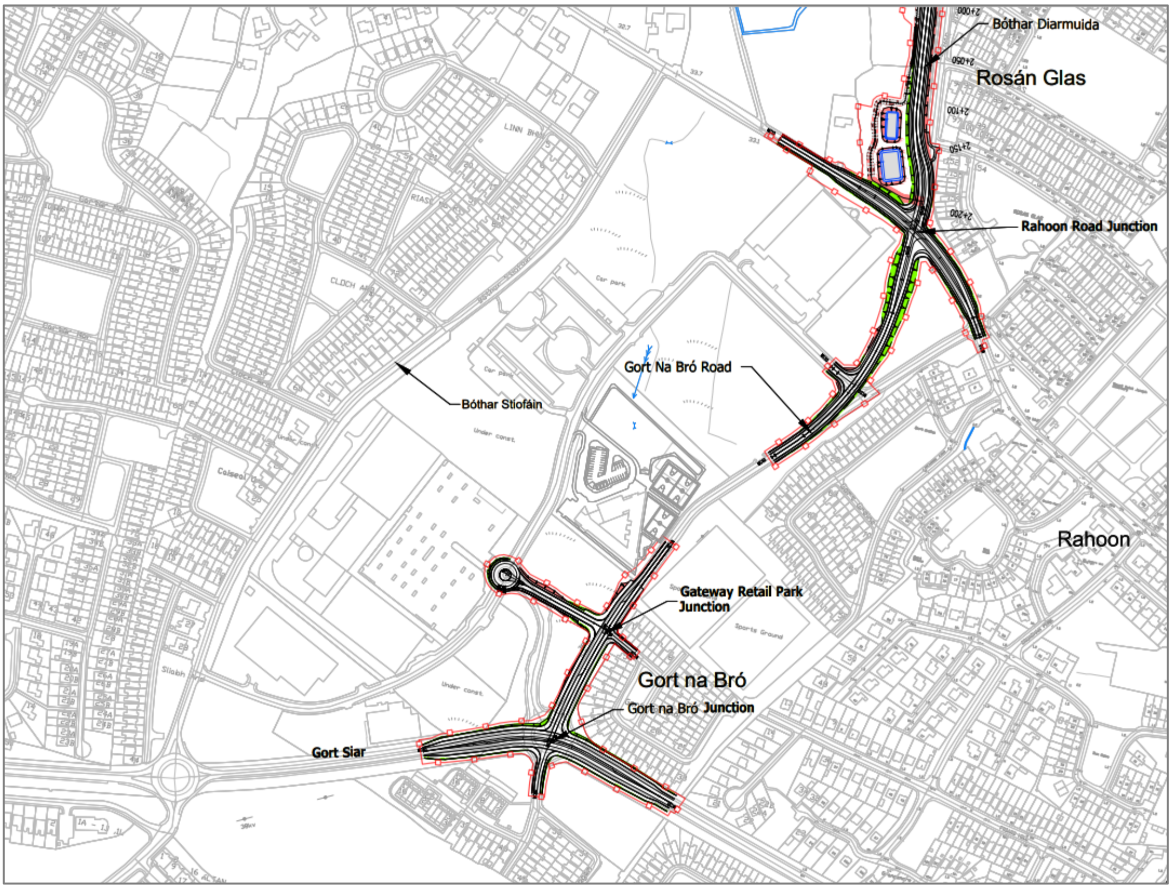


Figure 2-20 Latest published (August 2020) N6 GCRR Design

At the time of writing this report the N6 GCRR scheme had been granted permission by An Bord Pleanála in December 2021, although has subsequently been quashed following An Bord Pleanála accepting that they had failed to consider the 2021 Climate Action Plan. The N6 GCCR has been considered within subsequent chapters of this TTA, to ensure the proposed development does not adversely impact any potential future delivery of the N6 GCRR and complies with the reservation of strategic routes.

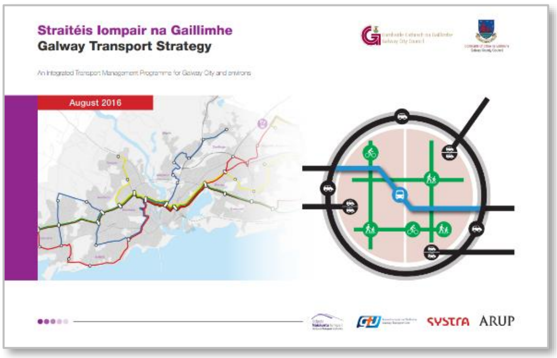
3 POLICY FRAMEWORK

3.1 INTRODUCTION

In the context of transportation, the subject site policy framework is influenced by the following key documents. A common theme through each of these key documents is the emphasis placed upon the importance of travel demand management, with many identifying the need to implement mobility management plans with the objective of promoting sustainable travel patterns.

- Galway Transport Strategy
- Galway City Development Plan 2017-2023
- Draft Galway City Development Plan 2023-2029
- National Sustainable Mobility Policy (2022)
- Sustainable Urban Housing: Design Standards for New Apartments (2018)

3.2 GALWAY TRANSPORT STRATEGY



Galway City Council & Galway County Council, in partnership with the National Transport Authority, have developed the Galway Transport Strategy (GTS), an Integrated Transport Strategy for Galway City & Environs.

The GTS sets out a series of actions and measures, covering infrastructural, operational and policy elements to be implemented in Galway over the next 20 years and sets out a framework to deliver the projects in a phased manner. The GTS identifies the following guiding principles;

- To promote and encourage sustainable transport, and in particular to make it convenient and attractive to walk, cycle or use public transport.
- To improve accessibility and permeability to, and within the city centre, for pedestrians, cyclists, and public transport users, while also maintaining an appropriate level of access for vehicular traffic for commercial and retail purposes.

- To maximize the safety and security of pedestrians, cyclists, and other transport users, particularly within the core city centre.
- To manage and increase transport capacity (where necessary), for the efficient movement of people and goods into and within the city.
- To provide opportunities to enhance the city centre public realm through traffic management and transport interventions.
- To maintain and develop transport infrastructure and services to a high degree of quality and resilience.
- To adopt a “smarter technology” approach to all transport interventions, whereby transport infrastructure and services are future proofed.

The GTS includes proposals within the area of interest:

- *Pedestrian network* – *“Outside of the city centre, emphasis will be given to increasing permeability within suburban residential areas, improving and updating pedestrian networks, increasing pedestrian safety and maximising pedestrian accessibility to the public transport network”*
- *Public transport* – The GTS proposes a cross-city network proposal, based on linking the residential origins to the key destination proposals. **Figure 3-1** illustrates the proposed bus routes.

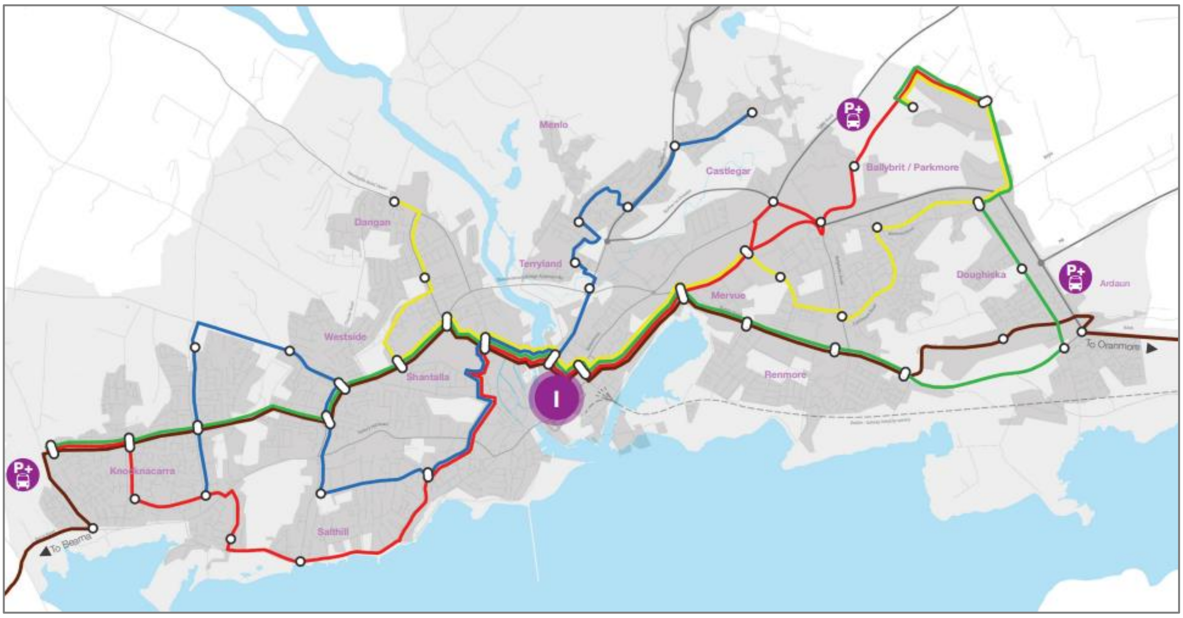


Figure 3-1 Galway Transport Strategy. Proposed Core Bus Routes

- *Cycling network* – It will be expended and improved as illustrated in **Figure 3-2** below. *"The overall inspiration of the proposed cycle network is to provide a safe and comfortable environment for cyclists in the city and surrounding areas, in turn supporting an increase in the number of cyclists and encouraging a greater modal shift from the private car to cycling."*

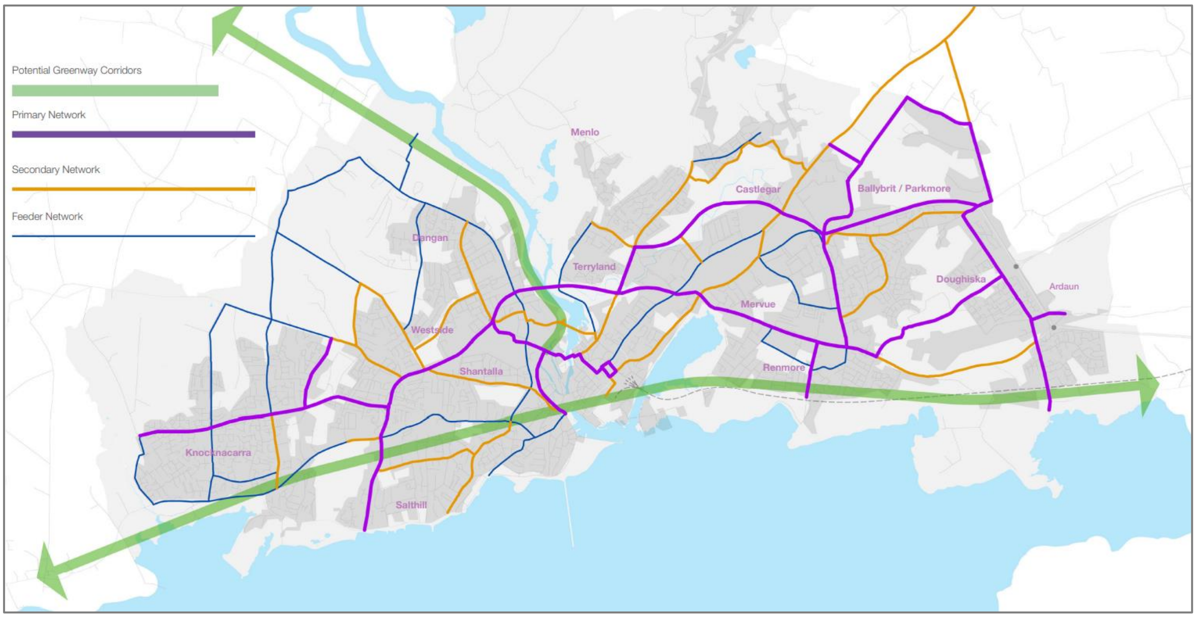
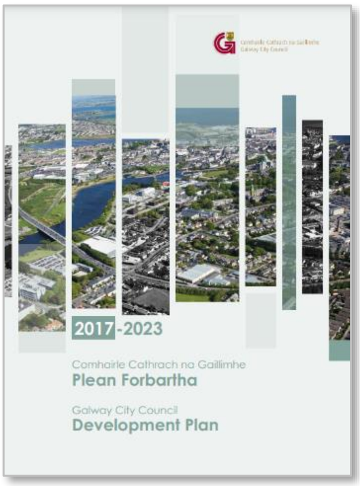


Figure 3-2 Galway Transport Strategy - Proposed Cycle Network

3.3 GALWAY CITY DEVELOPMENT PLAN 2017-2023



The Galway City Development Plan 2017-2023 sets out Galway City Council's policies for the sustainable development of Galway City to 2023. These include objectives for the zoning of land, the provision of infrastructure, the conservation and protection of the environment, and the integration of planning and sustainable development with the social, community and cultural requirements of the city and its population.

The Galway City Development Plan includes proposals and Specific Objectives and Policies within the area of interest:

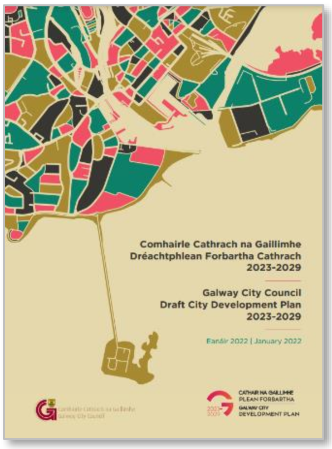
- *Community Spaces*: Medium/Long term Specific objectives - *"Develop pedestrian and cycle ways at Knocknacarra, linking residential areas with existing and future services and amenities as supported in the Galway Transport Strategy."*

- *Open Spaces*: Short term Specific Objectives – "*Acquire and develop predominately for public use, lands zoned for recreation and amenity use in conjunction with new housing at Knocknacarra*"
- *Policy 2.4 Neighbourhood Concept*: It is the policy of the Council to promote the neighbourhood concept in existing residential areas and in new developments, Knocknacarra area is included in this framework. Ensure the design of residential developments have regard to the Guidelines for Planning Authorities on Sustainable Residential Development in Urban Areas (2009) and the accompanying Urban Design Manual – A Best Practice Guide and the Design Manual for Urban Roads and Streets (2013).
- *Policy 3.5 Public Transport:* Support the GTS proposals for implementation of a local city bus network which will include for a high frequency cross-city network and all associated infrastructure requirements, traffic management and priority arrangements.
- *Policy 3.6 Cycling and Walking:* Support GTS proposals for expansion and upgrade to existing cycle network. Improve bicycle parking at key locations. Expand Public Bike Share Scheme.
- *Policy 3.6 Cycling and Walking:* Improve the city pedestrian network. Promote, facilitate and maintain maximum connectivity and permeability for pedestrians and cyclists in the design of new developments in accordance with the Design Manual for Urban Road and Streets (2013) and Permeability a Best Practice Guide, NTA (2015).
- *Policy 3.8 Mobility Management and Smart Technologies:* Support and promote the use of smarter mobility and Intelligent Transport Solutions (ITS) to increase efficiency, safety and co-ordination across all transport networks. Promote the implementation of Travel Plans with employers and schools.

The following policies are set out as part of Galway City Council Development Plan 2017-2023 in the Land Use Zoning Objectives and Development Standards and Guidelines:

- *11.10.2 - Travel Plans*, also known as Mobility Management Plans, are required for proposed development with the potential to employ over 100 people.
- *11.10.3 - Cycle parking requirements* for developments are 1 no. cycle stand per 20 car spaces provided. For every additional 50 car parking spaces, an additional cycle stand should be provided. Each cycle stand should accommodate a minimum of five bicycles. Cycle parking must be sheltered where appropriate.

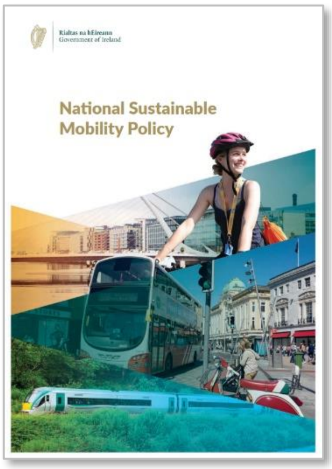
3.4 DRAFT GALWAY CITY DEVELOPMENT PLAN 2023-2029



Galway City Council commenced the review of the current Galway City Development Plan 2017-2023 on early 2021 and preparation of a new City Development Plan for the period 2023 to 2029. This will set out Galway City Council's policies and objectives to guide the sustainable development of the City over the lifetime of the Plan to 2029.

It will provide an integrated, coherent spatial framework which has been prepared following extensive consultation with members of the public, statutory bodies and relevant stakeholders.

3.5 NATIONAL SUSTAINABLE MOBILITY POLICY



The National Sustainable Mobility Policy was published in April 2022 by the Department of Transport and replaces Smarter Travel 2009. The overall aim of the Policy is to "*set out a strategic framework for 2030 for active travel and public transport to support Ireland's overall requirement to achieve a 51% reduction in carbon emissions by the end of this decade*".

The Policy is a direct response to the fact that continued growth in demand for road transport is not sustainable due to the resulting adverse impacts of increasing congestion levels, localised air pollution, contribution to global warming and the additional negative impacts to health through promoting increasingly sedentary lifestyles. The following 3 key Policy areas and 10 goals form the basis of the National Sustainable Mobility Policy:

Safe and Green Mobility

1. Improve mobility safety
2. Decarbonise public transport
3. Expand availability of sustainable mobility in metropolitan areas
4. Expand availability of sustainable mobility in regional and rural areas
5. Encourage people to choose sustainable mobility over the private car

People Focuses Mobility

6. Take a whole journey approach to mobility, promoting inclusive access for all

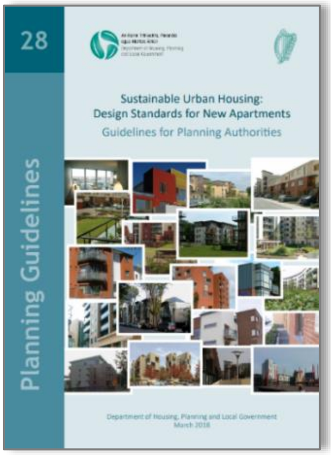
7. Design infrastructure according to Universal Design Principles and the Hierarchy of Road Users model
8. Promote sustainable mobility through research and citizen

Better Integrated Mobility

9. Better integrate land use and transport planning at all levels
10. Promote smart and integrated mobility through innovative technologies and development of appropriate regulation

The policy is accompanied by an Action Plan with a total 91 actions organised by goal to be completed by 2025. Each action has been assigned to a specific government department or body with the hope of creating accountability for their implementation. The success of the policy will be measured using an annual National Household Travel Survey administered by the National Transport Authority.

3.6 SUSTAINABLE URBAN HOUSING: DESIGN STANDARDS FOR NEW APARTMENTS



This guideline document was produced by the Department of Housing, Planning and Local Government (DHPLG) (updated December 2020). The purpose of this document is to set out standards for apartment development, mainly in response to circumstances that had arisen whereby some local authority standards were at odds with national guidance.

With the demand for housing increasing, this means that there is a need for an absolute minimum of 275,000 new homes in Ireland's cities by 2040. It is therefore critical to ensure that apartment living is an increasingly attractive and desirable housing option for a range of household types and tenures.

These Guidelines apply to all housing developments that include apartments that may be made available for sale, whether for owner occupation or for individual lease. They also apply to housing developments that include apartments that are built specifically for rental purposes, whether as 'Build To Rent' or as 'shared accommodation'.

Cycling provides a flexible, efficient and attractive transport option for urban living and these guidelines require that this transport mode is fully integrated into the design and operation of all new apartment development schemes.

The quantum of car parking or the requirement for any such provision for apartment developments will vary, having regard to the types of location in cities and towns that may be suitable for apartment development, broadly based on proximity and accessibility criteria.

For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure, where possible, the provision of an appropriate number of drop off, service, visitor parking spaces and parking for the mobility impaired. Provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles, cycle parking and secure cycle storage.

3.7 DEVELOPMENT MANAGEMENT STANDARDS

Reference has been made to Chapter 11.3 of the Galway City Development Plan 2017-2023 (GDP), Chapter 11.3 of the Galway City Development Plan 2023-2029 (Draft GDP) and Chapter 4 of Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities, as published by the Department of Housing, Planning and Local Government (DHPLG) in March 2018.

For the purposes of considering residential development proposals, the Galway City Council Development Plans have divided the administrative area into four areas, regarding the different characters of the residential neighbourhoods in the city. The subject site is located within the area designated as Outer Suburbs, as illustrated in **Figure 3-3.**

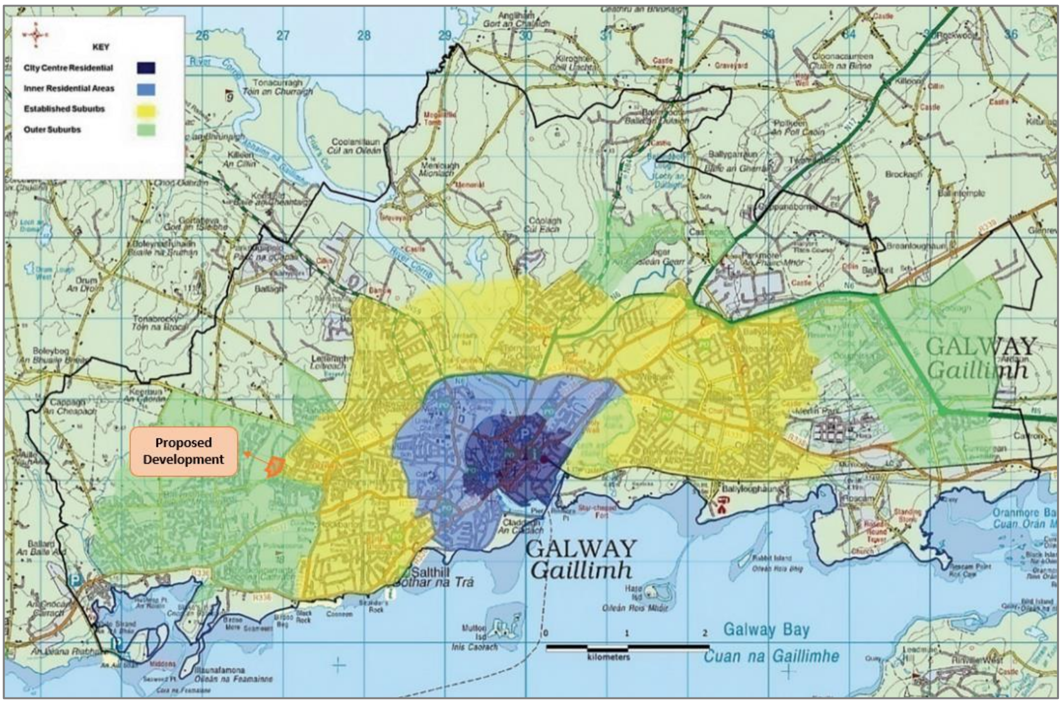


Figure 3-3 Neighbourhood Areas defined in the GCDP

Furthermore, in reference to the DHPLG guidance, the location of the subject development site can be classified as an *"Accessible Urban Location"*. This stands for areas with reasonable walking distance to employment locations and to frequent urban bus services.

Car Parking

For residential developments located within an Accessible Urban Location, the DHPLG design standards, in reference to local authority development management requirements, state that:

"In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances."

The maximum car parking standards in reference to (i) the GCDP 2017-2023 requirements; (ii) Draft GCDP 2023-2029 requirements and (iii) the DHPLG guidelines are outlined in **Table 3-1** below:

Land Use	GCDP (Outer Suburbs)		Draft GCDP (Outer Suburbs)*		DHPLG	
	Short Stay	Long Stay	Short Stay	Long Stay	Short Stay	Long Stay
Apartments	1/dwelling	1/dwelling	1/dwelling	1/dwelling	Car Parking provision to be minimized.	Car Parking provision to be minimized.
Creche	N/A	1/20 sqm	N/A	1/20 sqm	N/A	N/A
Retail	N/A	1/15 sqm	N/A	1/15 sqm	N/A	N/A

Table 3-1 Car Parking Provision Standards

* It is noted that the Draft GCDP 2023-209 car parking standards for developments in the Outer Suburbs provides a number of options in order to provide for flexibility in residential layouts, these options are:

- *Option 1*: 2 on-site spaces per dwelling and 1 grouped visitor space per 3 dwellings
- *Option 2:* 1 on-site space per dwelling and 1 grouped visitor space per dwellings
- *Option 3*: 1.5 grouped spaces per dwelling and 1 grouped visitor space per 3 dwellings
- *Option 4*: 3 spaces for dwellings over 200m^2 and I grouped visitor space per 3 dwellings
- *Option 5:* 1 space for one bedroom residential dwellings and 1 grouped visitor per 3 dwellings

For the purposes of the subject development Option 2 has been considered.

Disabled Parking

Regarding the provision of dedicated disabled car parking spaces, neither the GCDP 2017-2023 nor the Draft GCDP 2023-2029 explicitly state a specific requirement or standard for these spaces. However, it is noted that a standard of 5% of car park spaces should be provided in accordance with national guidance, principally Part M: Access and Use Building Regulations 2010.

Electric Vehicle Car Parking

The GCDP 2017-2023 only states a requirement of "*one parking space shall be equipped with one fully functional and clearly marked EV charging point*" in relation to commercial developments. Whilst the Draft GCDP 2023-2029 states;

- *"Installation of recharging points for EV for both, new buildings and existing buildings undergoing major renovations for more than ten car parking spaces and ducting infrastructure (consisting of conduits for electric cables) for at least one in every 5 car parking spaces to enable the subsequent installation of recharging points for electric vehicles."*
- *"10% of communal and private spaces shall be adapted and suitable for Electric car (EV) chargers."*

Consequently, it is proposed that at least 10% of spaces will be equipped with charging points and all car park spaces will be equipped with the necessary ducting to facility the future installation of charging points.

Cycle Parking

The GCDP stands that *"In residential developments, where appropriate, a minimum of one cycle stand per 20 car spaces or over shall be provided. For every additional 50 car parking spaces, an additional cycle stand should be provided. Each cycle stand should accommodate a minimum of five bicycles"*

The Draft GCDP stands that the following should apply for apartments:

- *"A general minimum standard of 1 cycle storage space per bedroom shall be applied"*
- *"Visitor cycle parking shall also be provided at a standard of 1 space per 2 residential units."*

For commercial developments, *"the number of cycle stands shall be equivalent to 25% of the number of car parking spaces"*

Land Use	GDP		Draft GDP		DHPLG	
	Short Stay	Long Stay	Short Stay	Long Stay	Short Stay	Long Stay
Apartments	N/A	1 cycle stand / 20 car spaces	1 / 2 unit	1 / Bed	1 / 2 units	1 / Bed
Creche	N/A	N/A	N/A	N/A	N/A	N/A
Retail	N/A	N/A	Equivalent to 25% of no. car parking spaces	N/A	N/A	N/A

Table 3-2 Cycle Parking Provision Standards

4 PROPOSED DEVELOPMENT

4.1 GENERAL LAYOUT

The proposed development includes 227 no. apartment units in 7 no. blocks (comprising 84 no. 1-bed, 139 no. 2-bed and 4 no. 3-bed apartments). It also includes the provision of 1,009.7 sqm of commercial floor space, community facility (117.8 sqm), tenant amenity facilities (99.4 sqm) and a childcare facility (561.3 sqm).

The development proposes 550 no. cycle parking spaces including 114 no. short stay and 436 no. long stay spaces. A total of 49 surface level car parking spaces including 17 no. electric vehicle spaces and 5 no. universal access parking spaces will be provided. A further 181 no. car park spaces will be provided in an underground car park. The proposals also include the realignment of the road between Gort na Bró and Gateway Retail Park Road. The scheme also includes the provision of shared communal and private open spaces areas, bin storage, public lighting, site landscaping, services, signage, substation and all associated site development works. **Figure 4-1** below provides an overview of the proposed layout.

Figure 4-1 General Proposed Development Layout

Vehicular Access

The vehicular access arrangements for the new Knocknacarra District Centre will include the following new features:

- Closure of the existing link road connecting the Western Distributor Road/ Gort Na Bró roundabout and Gateway Retail Park roundabout.
- Provision of a new four-arm signalised junction on Gort Na Bró to provide access to both the Gateway Retail Park and subject development site.
- New link road connecting the signalised junction and Gateway Retail Park roundabout.

Consequently, these proposed changes result in converting the Gort Na Bró Roundabout from a 5-arm to a 4-arm roundabout and the Gort Na Bró T-junction from a 3-arm priority T-junction to a 4-arm signalised junction, in line with the proposed N6 Galway City Ring Road (N6 GCRR) scheme.

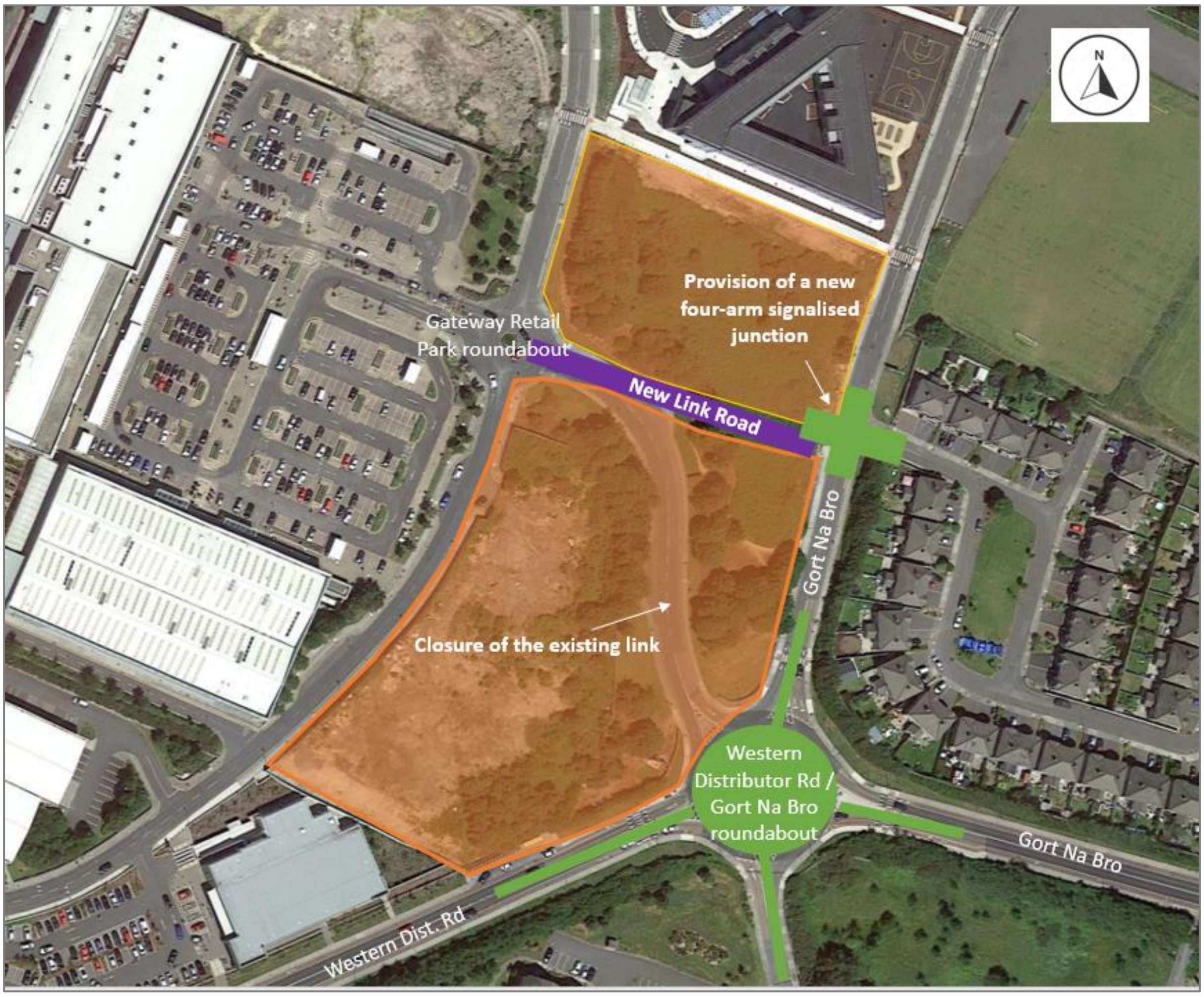


Figure 4-2 Proposed Main Access Arrangement

The proposed residential access locations within the site are proposed through three areas, illustrated in **Figure 4-3** below:

- From the link road, vehicular access to the Podium carpark located between blocks A1 and A2.
- From the local road, vehicular access to the car park adjacent to the Block B apartments and the Plaza.
- From the local road, vehicular access to the Gateway Retail Park basement car park;

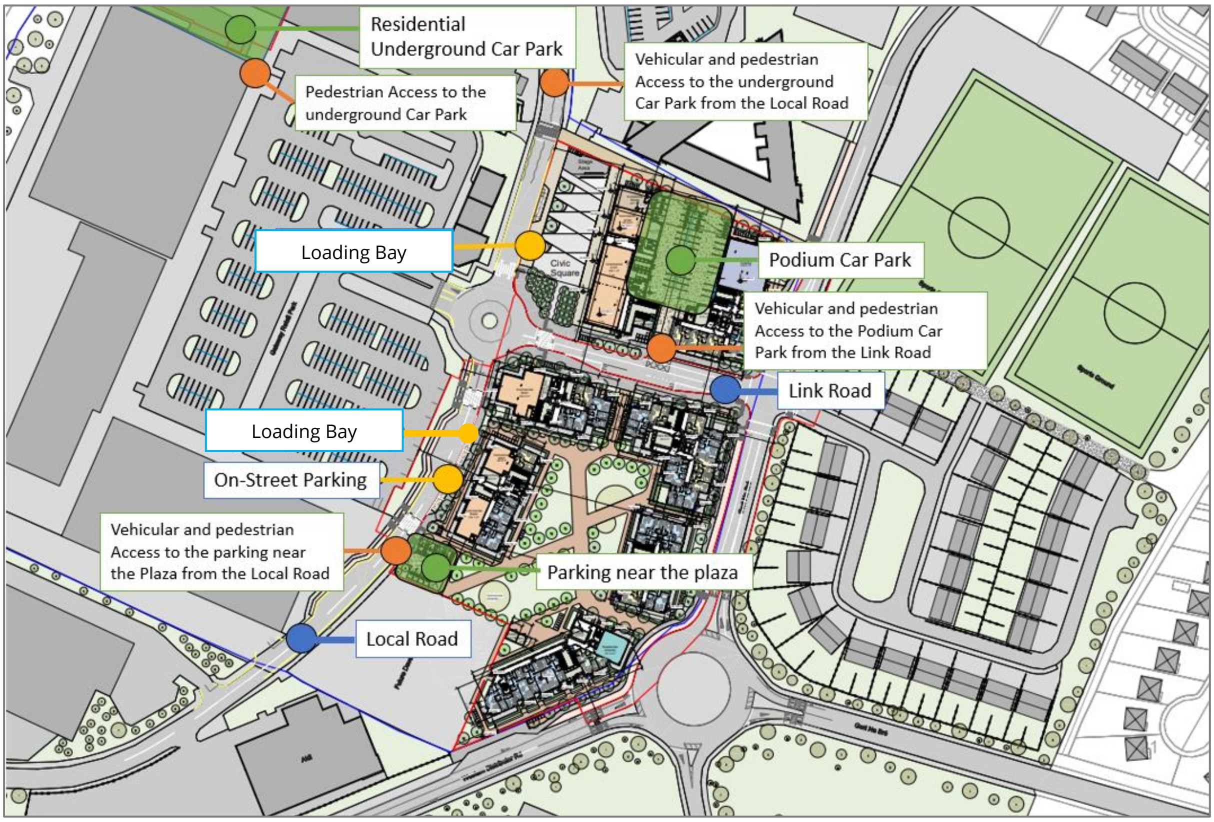


Figure 4-3 Proposed vehicular access to the site

There are also 2 no. non-residential public car park spaces proposed on the Gateway Retail Park local road, with an on street drop off area on Gort na Bró adjacent to the proposed creche. This is capable of accommodating up to two cars and has been provided to prevent errant motorists from stopping on-road and blocking traffic whilst dropping-off / picking up at the creche.

There are also 2 no. on-street loading bays located adjacent to Block B2 and the Civic Square.

The proposed access arrangements and car parking locations are discussed in more detail in **Section 8**.

Pedestrians and Cyclists

The provision of high-quality pedestrian and cyclist facilities within the development is central to the design principles adopted in relation to the development proposals, involving the following;

- Pedestrian crossings at key locations to provide permeability throughout the site.
- New dedicated and segregated cycle provision will be provided, on Gort na Bró and wide shared facilities on both sides of the Link Street connecting the new signalised junction and Gateway Retail Park roundabout.

Links provided as part of the subject development will allow both pedestrians and cyclists to easily access the site from the Western Distributor Road, Gort Na Bró Roundabout, Gateway Retail Park road and proposed new link road.

Figure 4-4 shows the main pedestrian links and crossing through the development site.

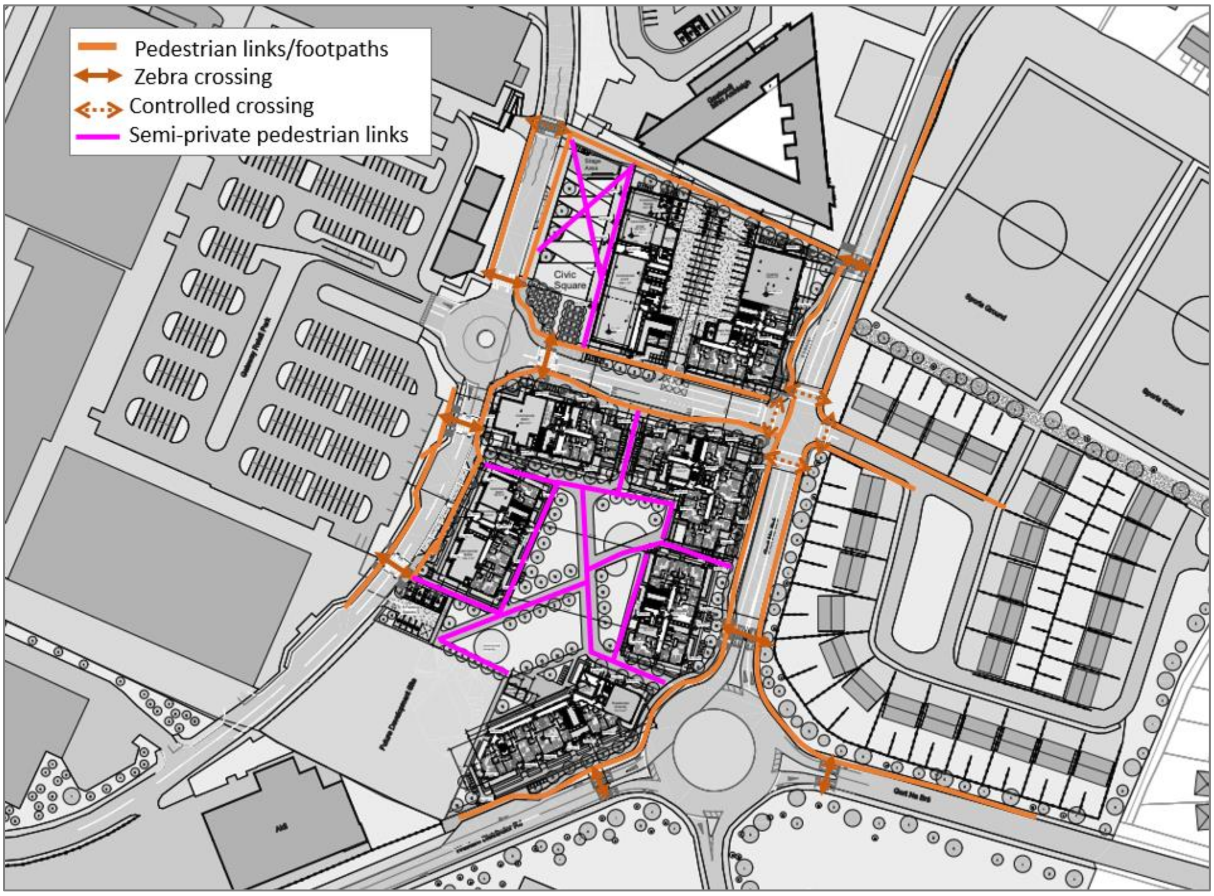


Figure 4-4 Pedestrian links and crossings in the proposed site

For pedestrians, segregated footpaths will be provided directly adjacent the proposed two-way cycle lane, linking to the shared facilities at the junctions. At the proposed new signalised junction on Gort Na Bró, all arms will have signalised pedestrian crossings, with the crossing on the western arm (New Link Road) being a Toucan crossing, as shown in **Figure 4-5**, enabling cyclists to cross at this location without dismounting.

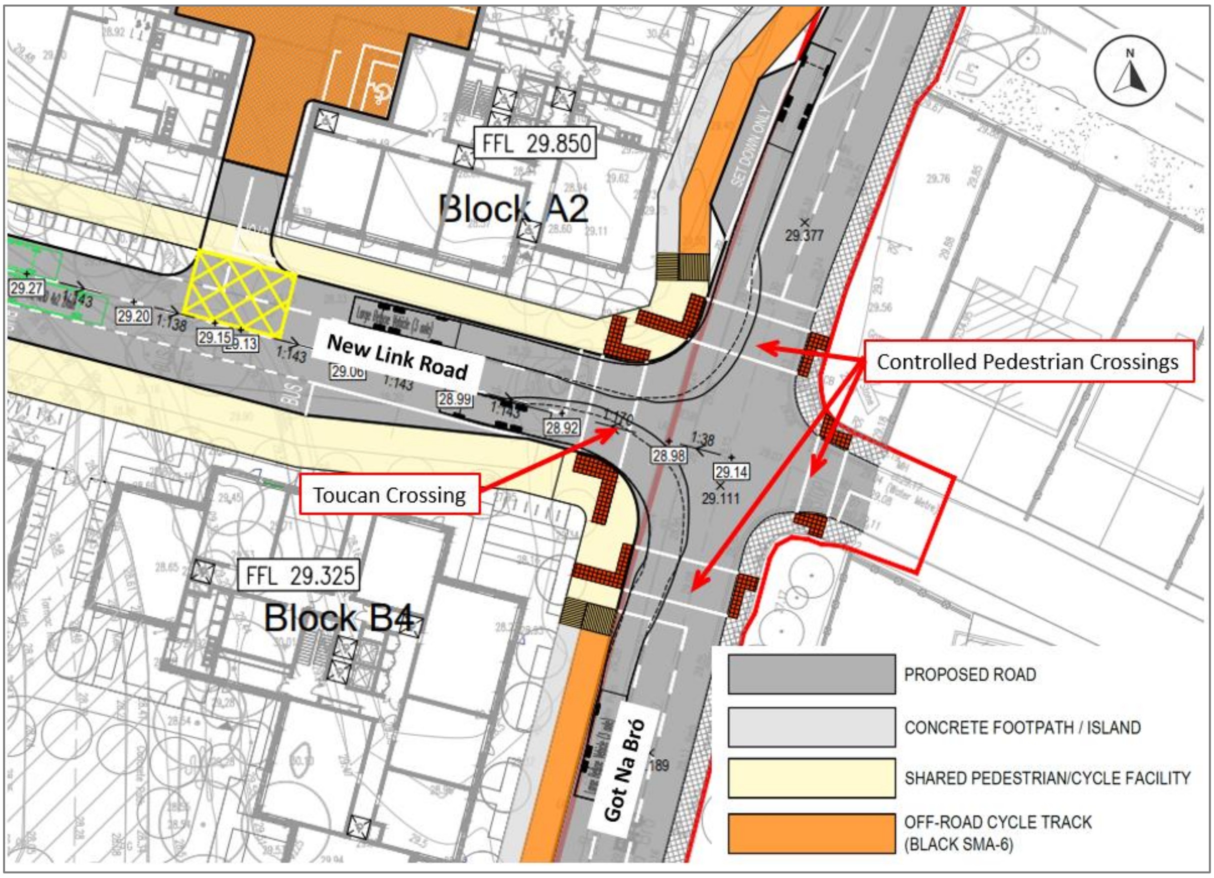


Figure 4-5: Pedestrian/Cyclist Facilities at Proposed Gort Na Bró Signalised Junction

In addition to the above, a further four raised Zebra crossings will be provided for pedestrians/cyclists. These will be located on the 1) the new Link Road (eastern arm) of the Gateway Retail Park roundabout, 2) on Gateway Retail Park Road (northern arm) of the roundabout 3) on Gateway Retail Park Road (southern arm) of the roundabout and 4) on the Gateway Retail Park Road adjacent the access to the car park access.

These crossings, as indicated in **Figure 4-6**, will provide safe, direct crossing points for pedestrians and cyclists whilst also being a traffic calming measure in this area.

Additionally, the current zebra crossing provided to the northwest corner of the development which connects to the combined footway/cycleway at Gaelscoil Mhic Amhlaigh is proposed to be upgraded to a Toucan crossing, as also indicated in **Figure 4-6** below.

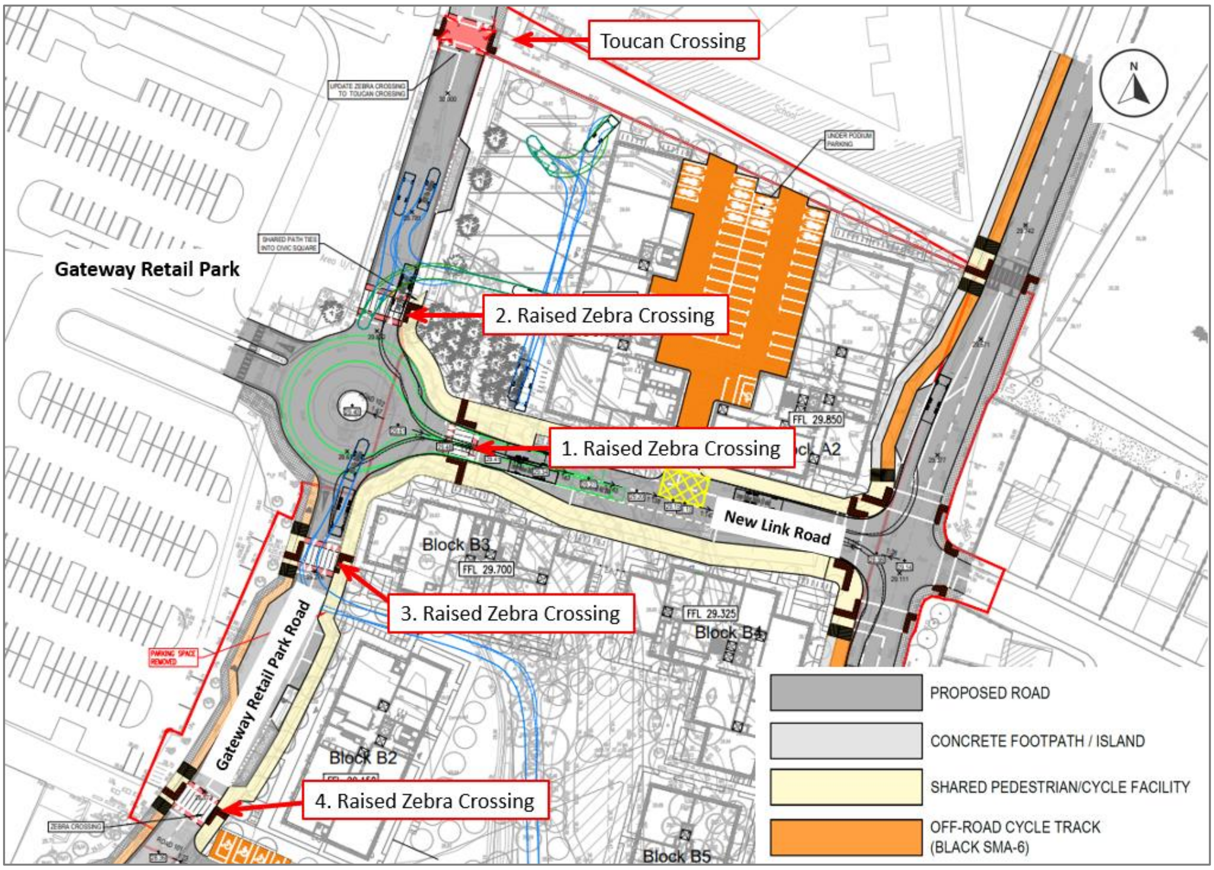


Figure 4-6: Proposed Pedestrian/Cyclist Crossing Facilities

The pedestrian facilities proposed as part of the subject development have been located along anticipated pedestrian desire lines, to provide direct, attractive connections not only across the site itself but to the surrounding lands, services and amenities in the wider area. Consequently, it will provide a high level of service for pedestrians, ensuring connectivity and permeability to, through and from the subject site. This expanded network will also offer and enhanced public realm and is a community gain for the wider residential area and adjacent schools.

In addition to the aforementioned facilities above, a network of cycle facilities will also be provided as part of the subject development. A new 2.75m two-way cycle track will be provided along the western side of Gort Na Bró and the southern side of the proposed New Link Road, as illustrated in **Figure 4-7** below. These will connect with the existing cycle facilities along the Gateway Retail Park Road.

The cycle facilities to be delivered as part of the proposed development are an enhancement to the existing cycle network within this area. The segregated cycle track and dedicated crossings will significantly improve safety and level of service for cyclists and will enhance cycle connectivity for the wider area, adjacent schools and the proposed development.

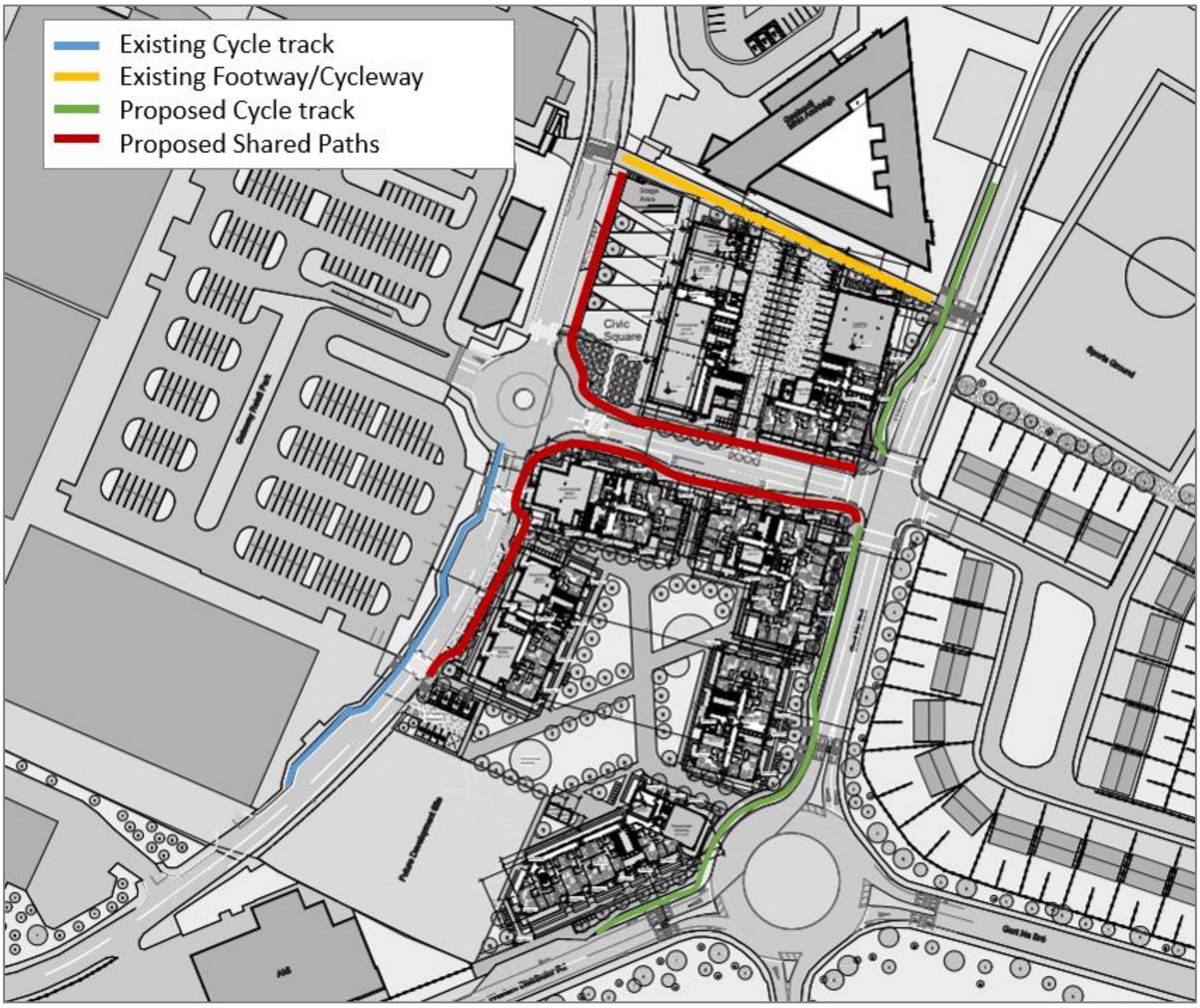


Figure 4-7 Cycle facilities in the proposed site

As noted previously in Section 2.5.2, the subject development will benefit from the proposed Millars Lane Pedestrian and Cycling Scheme which runs from Manor Avenue / Manor Drive to Rahoon Road. This scheme is located east of the subject site and a connection to the facility will be possible via the existing Zebra crossing on Gort Na Bró as shown in Figure 4-8.

Figure 4-8: Proposed Millar's Lane Pedestrian and Cycle Route

Public Transport

A bus stop will be provided on the southern side of the proposed New Link Road, as shown in **Figure 4-9**. This will replace the current bus stop located on the existing Link Road. Buses will be able to perform a U-turn at the existing Gateway Retail Park roundabout, which is illustrated by the green colour swept path same figure and also shown on **DBFL Drawing No. 180191-1-04-X-XXX-DR-DBFL-CE-1201**.

The bus stop will be 30m in length and therefore able to accommodate two buses at any one time and thereby accommodate an increase in frequency of the existing 405 service. A new bus shelter will also be provided for this stop.

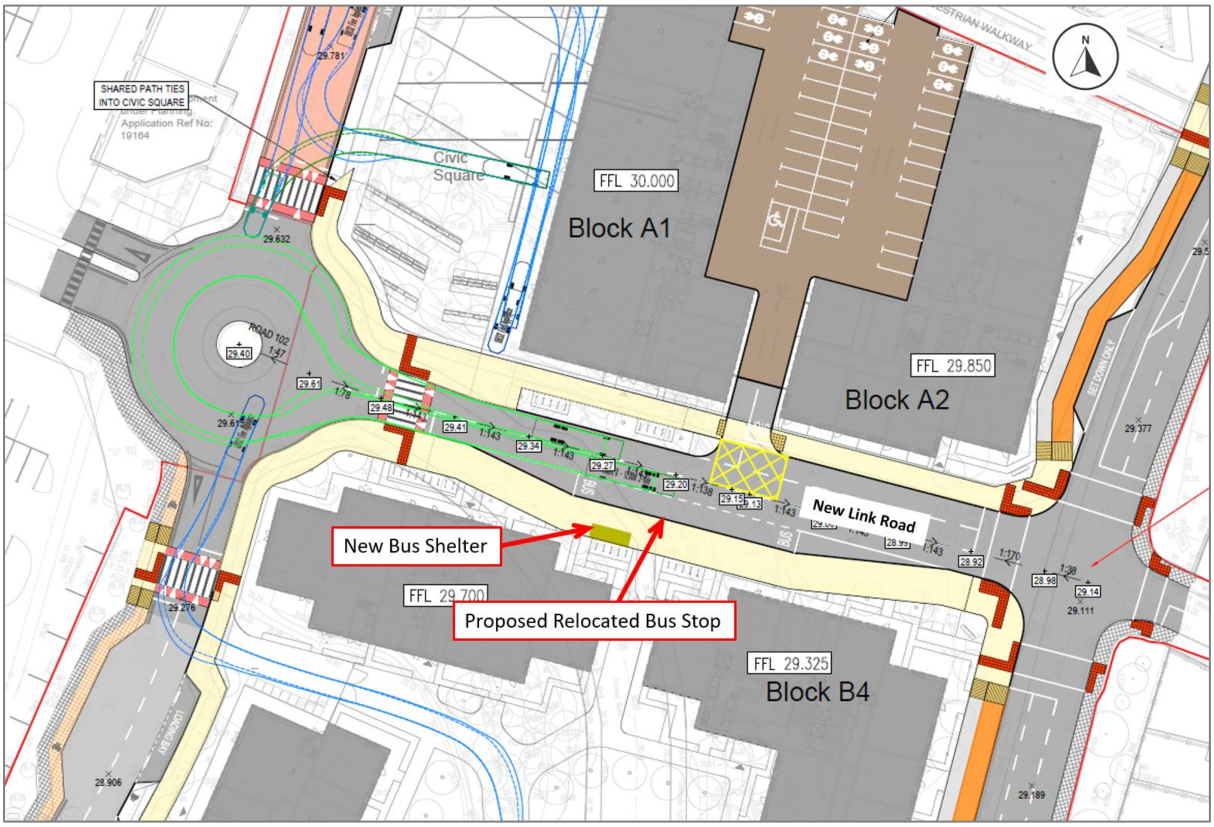


Figure 4-9: Proposed Location of Relocated Bus Stop

4.2 PARKING PROVISION

4.2.1 Car Parking

The proposed development provides a total of 230 no. car park spaces. This level of provision is considered to be appropriate to accommodate the demand for both residents and visitors in accordance with the planning requirements. **Table 3-1** in **Section 3.7** summarised the ***maximum*** car parking standards in reference to (i) the GCDP 2017-2023, (ii) Draft GCDP 2023-2029, and (iii) the DHPLG guidelines.

With regards to the proposed development schedule, **Table 4-1** below outlines the car parking provision for the development in reference to these guidelines.

Land Use	No. Units	Proposed	GDP			Draft GDP			DHPLG		
			Short Stay	Long Stay	Total	Short Stay	Long Stay	Total	Short Stay	Long Stay	Total
Apartments	227	182	227	227	**454**	227	227	**454**	-	-	-
Creche	561.3 sqm	48	-	28	**28**	-	28	**28**	-	-	-
Retail	1009.7 sqm		-	67	**67**	-	67	**67**	-	-	-
Total		**230**	227	322	**549**	227	322	**549**	-	-	-

Table 4-1 Car Parking Provision Requirements

Residential Car Parking Provision

In terms of car parking provided for the apartment units, a total of 182 no. car park spaces will be provided. This equates to a car parking ratio of 0.8 spaces per apartment. The spaces will be provided across the Knocknacarra District Centre, comprising the following:

- 39 no. car park spaces provided in Block A1/A2 podium car park;
- 8 no. spaces provided in the Block B surface car park; and
- 135 no. spaces provided in the Phase 2 basement car park.

Further detail on the location, proposed allocation and management of the residential car parking is detailed within the Parking Management Strategy in **Section 7**.

4.2.2 Car Ownership Levels

The 2016 Census Small Area Population Statistics of other apartments buildings within Galway with similar characteristics as the proposed development was reviewed to determine the current car ownership levels, and which are likely to be reflected in the proposed development. The Small Area Populations that were examined as part of this review were the following, and whose location is illustrated in **Figure 4-10**.

- 1 – SAP Reference: 068003055 – Altan Apartments.
- 2 – SAP Reference: 068003028 – Bun Caise Apartments.

Figure 4-10 Apartments buildings utilised for the review

Figure 4-11 below shows the modal split of the small areas utilised for the review. Values are similar for work and school purposes, both with the results indicating that 50-52% use active travel modes and 30-32% using public transport.

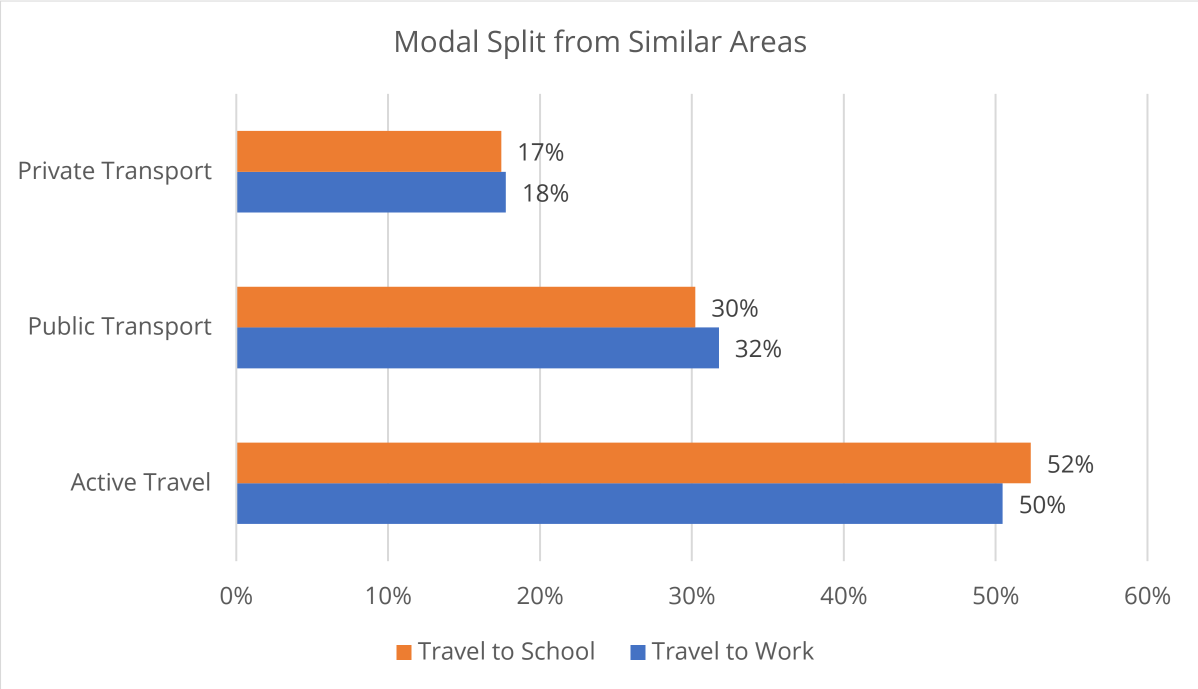


Figure 4-11 Modal Split from Similar Small Areas in Galway

Figure 4-12 below summarises the car ownership from these areas, where the results show that 20% of the households do not own a car, while 58% own 1 no. car.

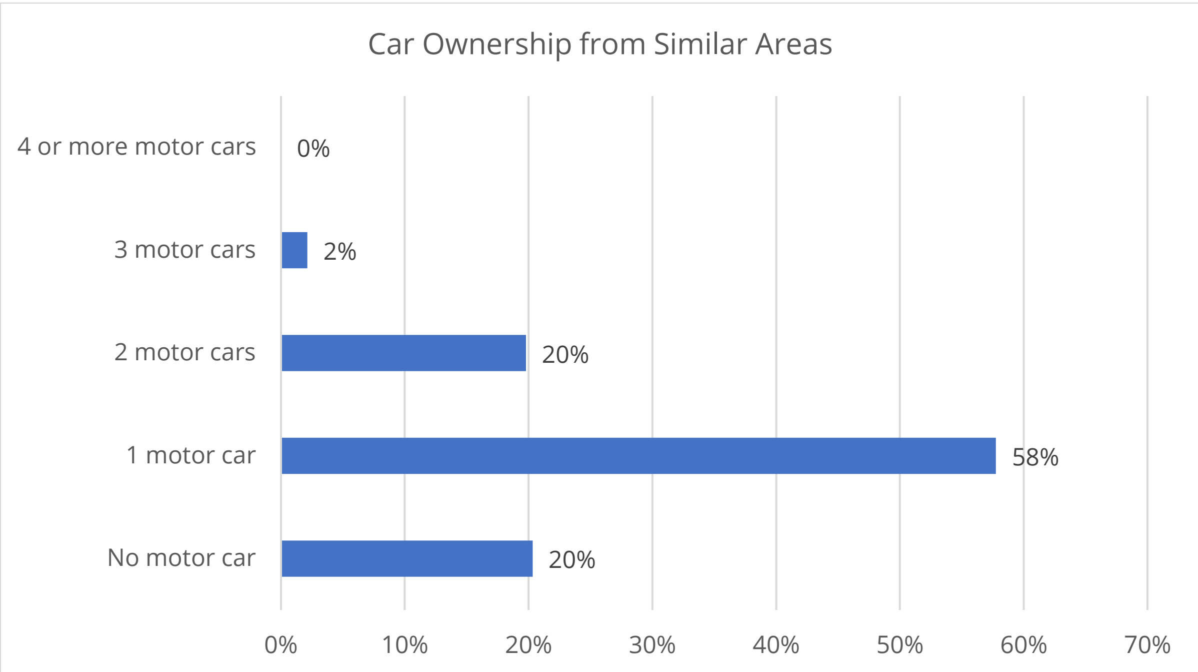


Figure 4-12 Car Ownership from Similar Small Areas in Galway

Based on this, it would be reasonable to target that 20% of the household units within the proposed development will not own a car and that the reduction from 1.0 space per unit should be 0.2, therefore the resulting car parking ratio for residential units would be 0.8 per unit. Given the strong proximity to local services and employment and the good accessibility of the proposed site, this is an appropriate and sustainable parking ratio.

Furthermore, it is important to consider the DHPLG and guidelines for *Accessible Urban Locations*, with the document stating that:

"… the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances."

Therefore, the provision of 182 no. car park spaces for the apartment units, equating to 0.8 spaces per unit is considered to be appropriate to accommodate the parking demand generated by the proposed development.

The proposed provision of 0.8 spaces per unit is also in accordance with the CSO data analysis detailed above, which found car ownership levels for apartments in areas of comparable accessibility characteristics to have an equivalent rate of 0.80 car park spaces per unit. The CSO data analysis also established a trend for high sustainable mode shares by residents of those apartment units, being in the region of that 50-52% for active travel modes and 30-32% for public transport when commuting / travel to school.

Non-Residential Car Parking Provision

Given the nature of the development, it is expected that the commercial element of the proposed development will largely serve the future residents/occupants of the apartment blocks who can easily walk to/from these commercial units. Additionally, given its proximity to the existing Gateway Retail Park it is likely that a significant proportion of the trips generated by the proposed commercial activity would be linked with trips to the existing retail activity i.e. a person driving and parking in the existing retail park could also walk over to one of the commercial units in the proposed development.

Given the synergies that existing between the proposed residential activity, existing retail activity and proposed commercial activity, the proposed commercial activity is expected to generate negligible additional demand for customer car parking.

Therefore, only a limited number of new on-street car parking spaces (2 no. spaces located adjacent Block B2 on western site boundary) will be provided which can be used by customers /

visitors to the commercial activity. It is noted, customers/visitors will also be able to avail of the existing car park in the Retail Park which has ample capacity to accommodate additional car parking demand.

Similarly, the proposed creche activity will largely serve residents of the proposed development and the surrounding area. It is noted that, a separate pick up / drop off area for the creche facility is provided for on Gort Na Bró, which is capable of accommodating 2 no. cars.

A total of 48 no. spaces will be available in the underground basement car park for staff of the retail / creche activity. Under the Development Plan a maximum of 95 no. spaces are required for the retail and creche activity. The proposed provision therefore complies with the Development Plan standards.

Further detail on the location, proposed allocation and management of the non-residential car parking is detailed within the Parking Management Strategy in **Section 7**.

Disabled Parking

The proposals include the provision of 5 no. disabled parking spaces, of which 4 no. spaces are located in the car park south of Block B2 and 1 no. spaces are located in the podium car park as indicated in **Figure 4-13**.

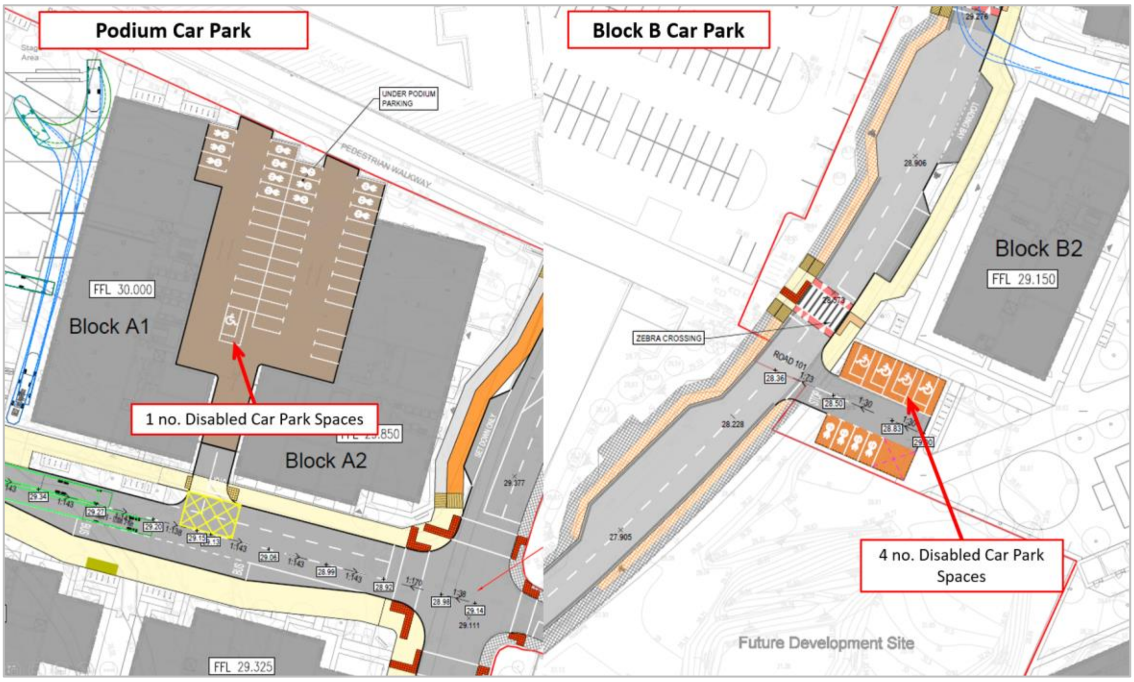


Figure 4-13: Disabled Car Parking Space Locations

Electric Vehicle Car Parking

In accordance with both national guidance and the emerging Draft GCDP 2023-2029 requirements, 10% of the car parking spaces are required to be equipped with Electric Vehicle (EV) charging points, equating to 23 spaces. A total of 55 no. EV Spaces will be provided (as discussed below) with the remaining spaces being equipped with the necessary ducting to enable fitting of charging points in the future as and when required. At surface level the proposals include the provision of 17 no. EV spaces, of which 4 no. spaces are located in the car park south of Block B2 and 13 no. spaces are located in the podium car park as indicated in **Figure 4-14**.

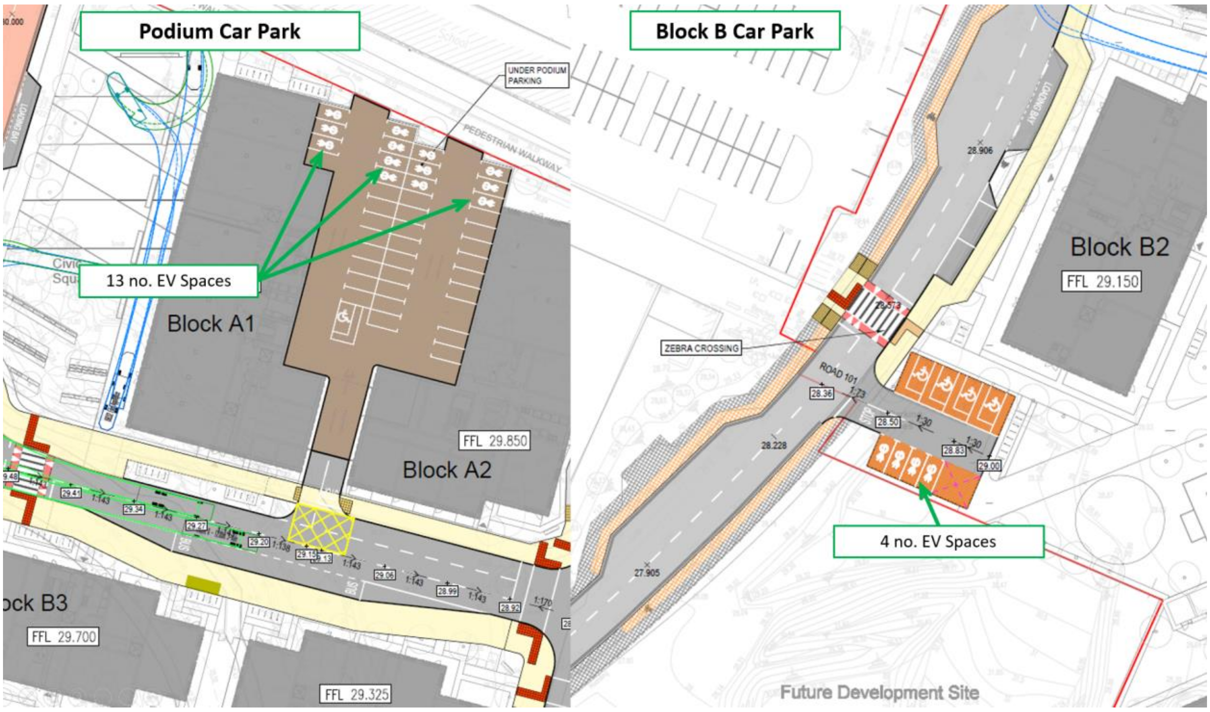


Figure 4-14: Location of Proposed EV Charging Spaces

The remaining 38 no. EV spaces will be located in the basement car park as shown in **Figure 4-15**.

Figure 4-15: EV Car Park Spaces in Underground Car Park

4.2.3 Cycle Parking

Reference has been made to **Table 3-2** in **Section 3.7** which summarised the cycle parking standards as set out within (i) the GCDP 2017-2023, (ii) Draft GCDP 2023-2029, and (iii) the DHPLG guidelines. The corresponding required number of cycle parking spaces based on the proposed development schedule are summarised in **Table 4.2**:

Land Use	No. Units	GDP			Draft GDP			DHPLG		
		Short Stay	Long Stay	Total	Short Stay	Long Stay	Total	Short Stay	Long Stay	Total
Apartments	227	-	11	**11**	114	374	**488**	114	374	**488**
Creche	561.3 sqm	-	-	**-**	-	-	**-**	-	-	**-**
Retail	1009.7 sqm	-	-	**-**	-	-	**-**	-	-	**-**
Total		-	11	**11**	114	374	**488**	114	374	**488**

Table 4-2 Cycle Parking Provision Requirements

Under draft GCDP's and DHPLG's requirements, a total provision of 488 spaces are required for the subject development. In response to both the Development Plan and the DHPLG requirements a total of 550 no. cycle parking spaces, comprising 436 no. long stay and 114 no. short stay spaces, are provided. This proposed provision well exceeds the requirements of the Development Plan and the DHPLG guidelines.

A breakdown of the type of cycle parking spaces to be provided are shown in **Table 4-3**:

Land Use	No. Units / SQM	Proposed Development Provision		
		Short Stay	Long Stay	Total
Apartments	227	114	374	**488**
Creche	561.3 sqm	-	62	**62**
Retail	1009.7 sqm			
Total		114	436	550

Table 4-3 Proposed Cycle Parking Provision

As shown above, the proposed long stay cycle parking provision for the apartments is in accordance with both the draft GCDP and the DHPLG requirements, comprising 374 no. spaces, equating to one space per bedroom. A further 62 no. long stay spaces have been provided above that required.

Whilst there is no requirement in the Development plan to provide long stay cycle parking for staff of the creche/retail units, these spaces will be available to those users and/or as additional long stay cycle parking for the residents of the apartment units. The long stay spaces will be provided in covered, secure cycle stores.

The short stay cycle parking, comprising 114 no. spaces, is also in accordance with the requirements for the apartments as per the DHPLG requirements, equating to a rate of 1 space per 2 units. The visitor cycle parking will be distributed across the site located in areas which are convenient, accessible, safe and close to core entrances and exits.

4.3 Servicing Arrangements

The following sections outline the proposed servicing and emergency access arrangements for the proposed development.

4.3.1 Deliveries and Loading / Unloading

Two loading areas have been provided along the western edge of the proposed development, as shown in **Figure 4-16**. The loading area adjacent the civic open plaza will service the commercial units in Block A1. Whilst the loading area adjacent Block B2 will be used to service units in that same area. The provision of the loading areas will avoid the need for any servicing or delivery vehicles to enter the plaza areas.

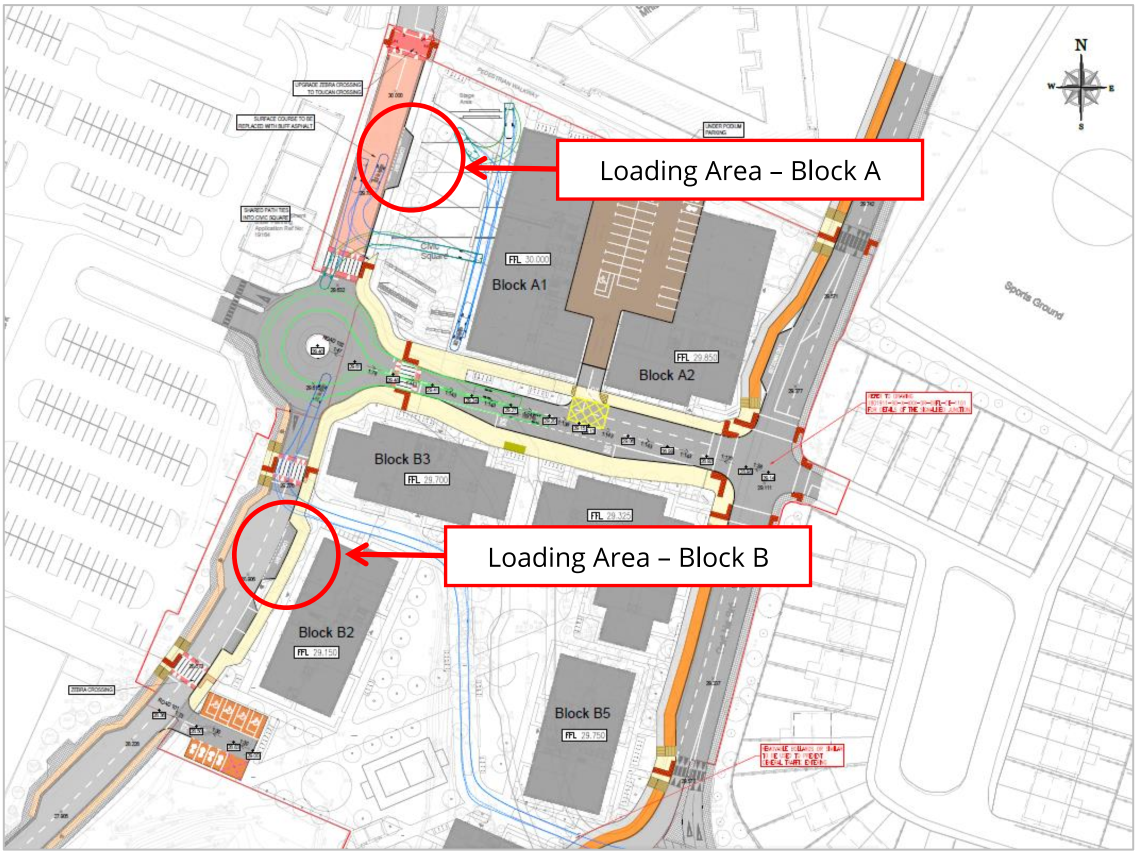


Figure 4-16: Proposed Loading Areas

The loading areas will also be available for use by delivery vans e.g. delivering parcels or packages to residents of the development and thereby avoid the potential for delivery vans to stop on-street and block or obstruct traffic on the adjacent network.

4.3.2 Refuse Collections

Refuse collection for the residential activity will take place from a staging area adjacent the podium car park access for Blocks A1 – A2. While refuse collection for Blocks B1 – B5 will take place from three separate staging areas as shown in **Figure 4-17**. Refuse collection for the commercial units will take place from the aforementioned loading areas. Tracking of refuse vehicles and routes through the site are illustrated in DBFL **Dwg No. 180191-1-04-X-XXX-DR-DBFL-CE-1201 Rev. P02.**

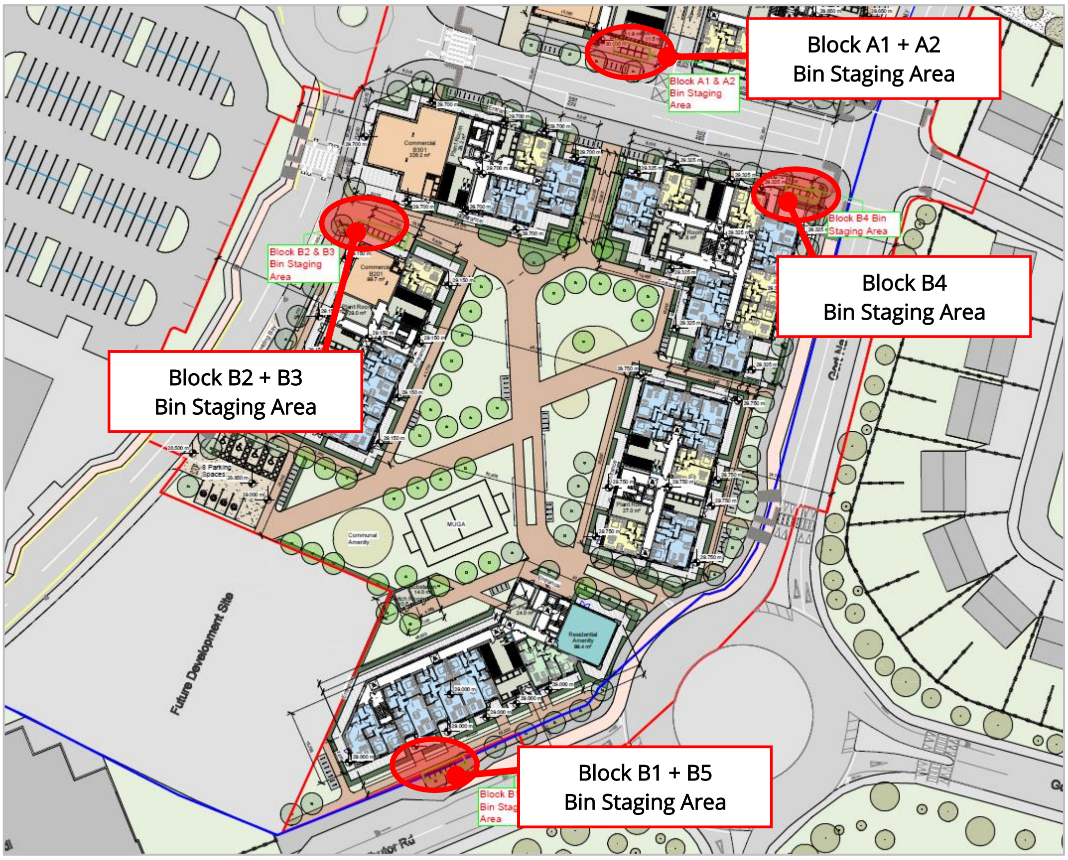


Figure 4-17: Bin Collection Staging Areas

4.3.3 Fire Tender Access

The proposed fire tender access strategy for the site is illustrated on DBFL **Drawing No. 180191-1-04-X-XXX-DR-DBFL-CE-1201 Rev. P01.**

5 TRIP GENERATION AND DISTRIBUTION

5.1 INTRODUCTION

The following section outlines the predicted impact that the proposed development could potentially generate upon the external public road network.

5.2 TRAFFIC SURVEYS

To gain an understanding of the current traffic conditions and current traffic flows, traffic surveys were undertaken at three key junctions in the vicinity of the site on Saturday 1st October 2022 and Tuesday 4th October 2022. These traffic surveys were undertaken by TRACSIS and included Junction Turning Counts (JTCs) and Queue Length Surveys, the location of which are shown in **Figure 5-1**. Both surveys were undertaken during a 12-hour period, from 07.00 am to 19.00 pm.

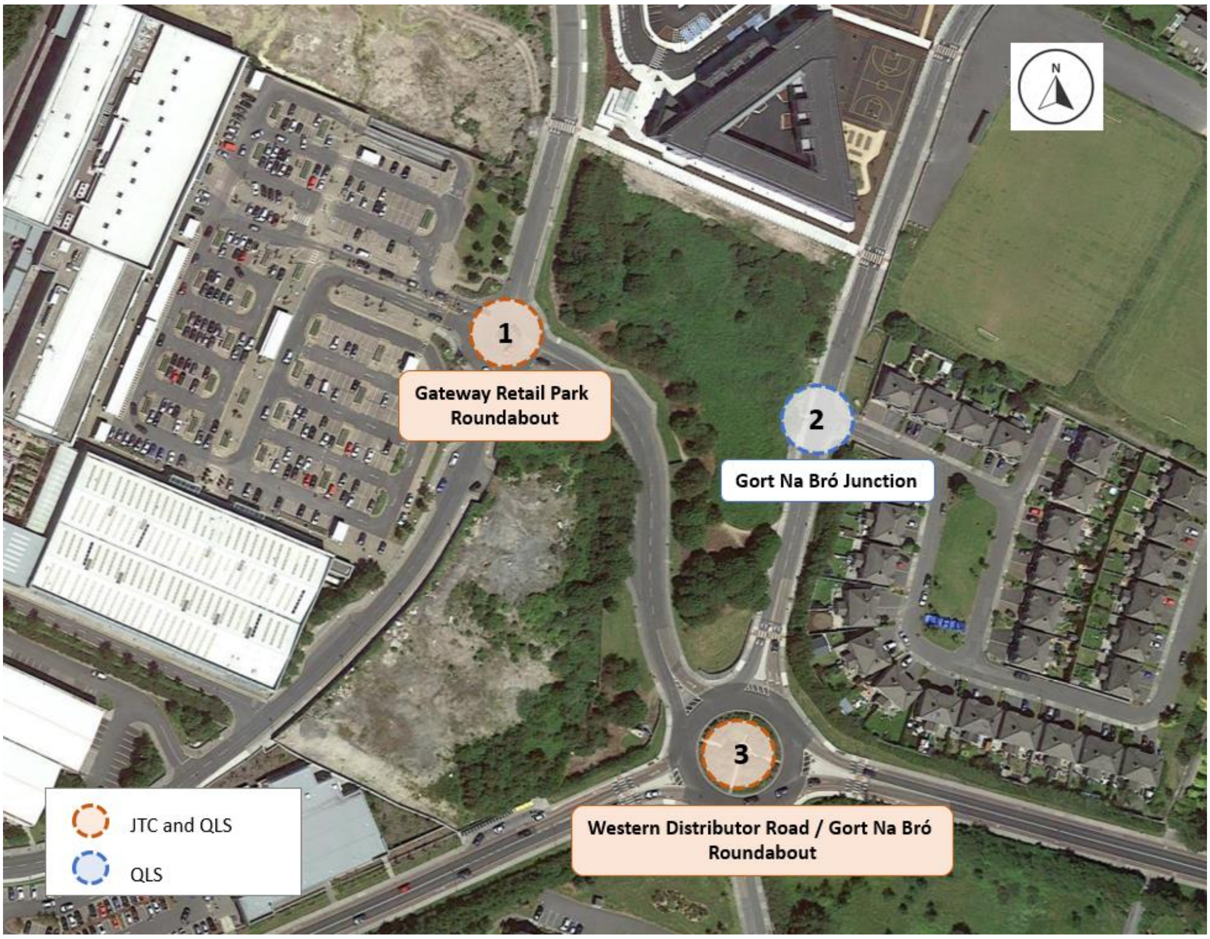


Figure 5-1: Location of Traffic Surveys – 2022

The peak hour flows have been identified as occurring between 08:15 - 09:15 for the AM peak, between 13:45 - 14:45 for the Interpeak and between 16:45 - 17:45 for the PM peak. During the weekend, the peak was identified to be between 15:15 - 16:15.

The total traffic profile of the three junctions surveyed is illustrated in **Figure 5-2** and **Figure 5-3** for Tuesday 04th October and Saturday 1st October 2022.

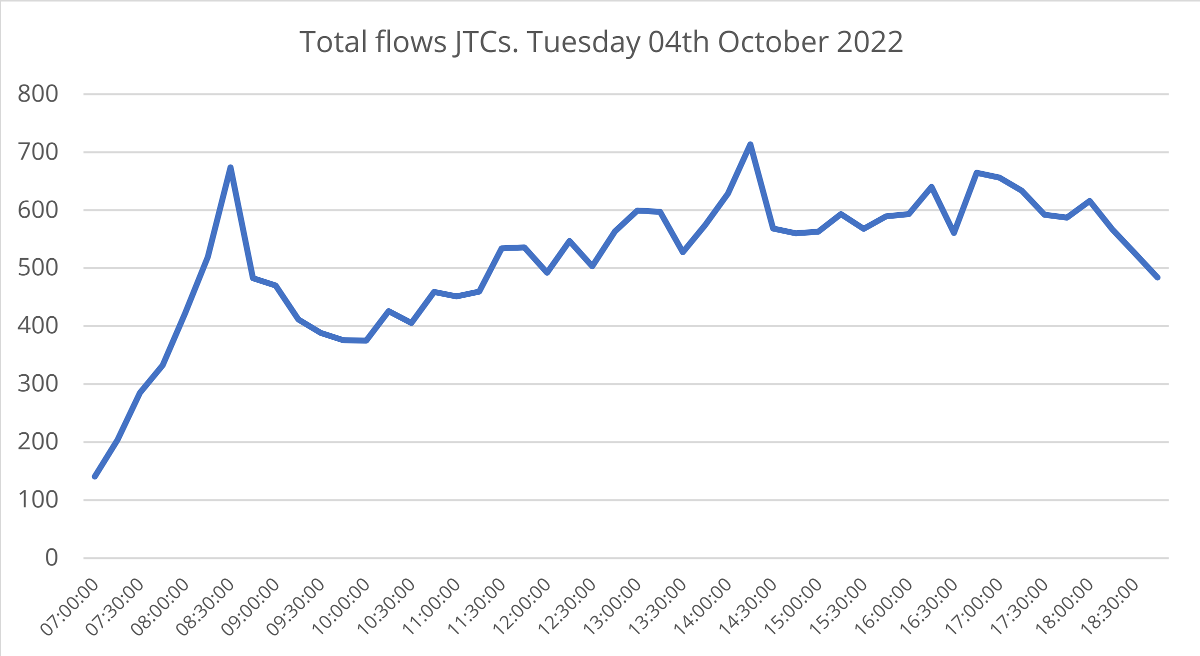


Figure 5-2 Total flows – Tuesday 4th October 2022

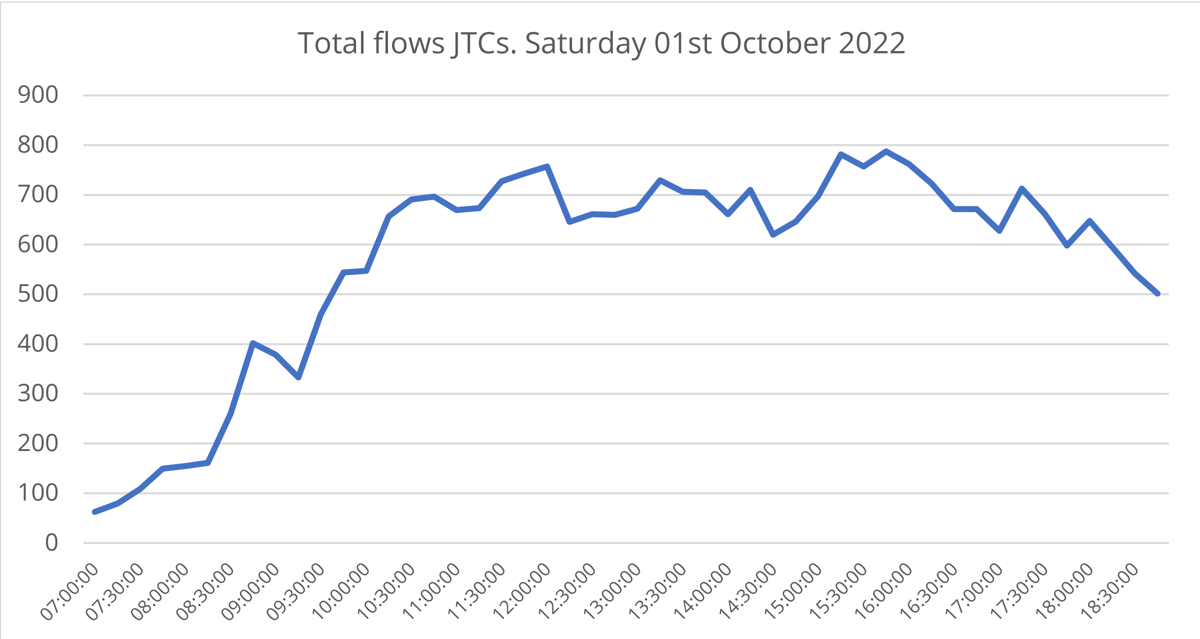


Figure 5-3 Total flows – Saturday 1st October 2022

In addition, historical traffic survey data undertaken in 2018 has been utilised to gain an understanding of traffic flows through local junctions on the wider surrounding network of the site. These were carried out by NDC for the preparation of the previous Traffic and Transport Assessment (TTA) and included JTCs (Junction Turning Counts) and ATCs (Automatic Traffic Counts). The location of which are shown in **Figure 5-4.** The ATC data was collected for a one-week period from Monday 15th October 2018 to Sunday 21st October. The JTC surveys were carried out on Tuesday 16th October and Saturday 20th October.

Figure 5-4: Location of Traffic Surveys – 2018 Previous TTA

5.3 TRIP GENERATION

To estimate the potential level of vehicle trips that could be generated by the proposed residential development, reference has been made to the TRICS database. TRICS provides trip rate information for a variety of different land uses and development types, which can be applied to the subject development.

TRICS data is primarily UK based, although a number of Irish sites have recently been included and the number of Irish sites continues to expand. Nevertheless, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Notwithstanding the above, internal research undertaken by TRICS has shown that there is no direct evidence of trip rate variation by country or region. The use of English, Scottish, Welsh and Irish data takes into account important site selection filtering factors such as levels of population, location type, local public transport provision, and development size and car ownership level, amongst others.

Data supplied for inclusion in TRICS undergoes a procedure of validation testing, and there is no evidence from this procedure suggesting that data from Ireland bears any significant fundamental differences to that from the other countries included. Consequently, we consider that TRICS will provide a reasonable indication of traffic generation from the proposed development.

Table 5-1 summarises the predicted vehicle trip rates of the potential traffic flows in and out of the proposed development during the morning and afternoon weekday peak hour periods and weekend peak hour using data from TRICS. The TRICS output data is provided within **Appendix B**.

The proposed development comprises the provision of 227 no. apartment units, a retail unit along with a childcare facility.

TRICS Rates	AM (08:15-09:15)			Interpeak (13:45-14:45)			PM (16:45-17:45)			Weekend (15:15-16:15)		
	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
Private Apartments	0.060	0.156	0.216	0.094	0.078	0.155	0.152	0.084	0.236	0.118	0.070	0.173
Retail	0.905	0.453	1.359	2.369	2.363	4.731	1.306	1.831	3.137	2.148	2.353	4.501

Table 5-1: Proposed Development Trip Rates

Based on the above trip rates, potential peak hour vehicle traffic flow has been calculated for the proposed development, summarised in **Table 5-2** that shows the predicted AM and PM peak hour traffic generated by the subject development.

Some of the trips from residential units will be internal trips, i.e. trips between the retail park and residential units, meaning they would not create additional vehicle trips on the network. Therefore, these trip rates applied are likely to represent a conservative, worst-case scenario in terms of trip generation. They are considered to be in excess of the likely trip generation particularly when considering current trends relating to car ownership, car sharing and a wider general increase in sustainable modal shares.

Unit Type	No. of Units	AM (08:15-09:15)			Interpeak (13:45-14:45)			PM (16:45-17:45)			Weekend (15:15-16:15)		
		Arrival	Departure	Two-Way	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way	Arrival	Departure	Two-Way
Private Apartments	227	14	35	49	21	18	35	34	19	54	27	16	39
Retail	1009.7 sqm	10	5	15	26	26	53	15	20	35	24	26	50
Total		24	40	64	48	44	88	49	40	89	51	42	90

Table 5-2: Proposed Development Trip Generation

Trip Distribution

The assignment of the predicted vehicle trips generated by the subject development across the local road network is distributed as per the following assumptions;

- For both arrival and departure profile, it is estimated that 75% of the trips will have their origin/destination in the car park located in the Gateway Retail Park, as 75% of the residential car park spaces will be located there. The 20% and 5% trips remaining are estimated to have their origin/destination in the proposed podium and surface car park areas located north and south sides of the new Link Road respectively.
- From analysing the distribution of traffic movements exiting from the existing surrounding development, it was estimated that 63% of the outbound traffic will be heading eastward from the proposed development. Given the fact that many services like offices, colleges, schools etc are located east of the proposed development, it is feasible that residential trips from the proposed development will follow a similar distribution. The remaining 37% of the outbound traffic was assumed to be moving westward.
- Conversely, 63% of the vehicle arrivals were assumed to be coming from the east and the remaining 37% of the traffic approaching from the west.

The proposed vehicle trip distribution through the network for the arrival and departing vehicles are demonstrated in **Figure 7** in **Appendix C.**

5.4 TRAFFIC GROWTH

The assessment adopts an Opening Design Year of 2024. In accordance with TII (NRA) Guidance, a Future Design Years of 2029 (+5 years) and 2039 year (+15 years) have therefore been adopted.

The TII Project Appraisal Guidelines for National Roads (PAG) have been utilised to determine the traffic growth forecast rates. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for.

Although traffic growth may not increase at the rates once predicted, to ensure a robust analysis of the impact of traffic upon the local road network we have adopted growth rates using the Transport Infrastructure Ireland (TII) traffic projections. Table 6.1 (Unit 5.3 – Travel Demand Projections) within the TII Project Appraisal Guidelines provides Annual Growth Factors for the different regions within Ireland. The subject site lies within 'Galway Metropolitan Area' with the growth factors as outlined within **Table 5-3** below.

Metropolitan Area	Low Sensitivity Growth				Central Growth				High Sensitivity Growth			
	2016-2030		2030-2040		2016-2030		2030-2040		2016-2030		2030-2040	
	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV	LV	HV
Galway	1.0154	1.0201	1.0077	1.0164	1.0169	1.0217	1.0097	1.0182	1.0203	1.025	1.0131	1.0217

Table 5-3: National Traffic Growth Forecasts: Annual Growth Factors (Extract from Table 6.1 PAG)

Applying the annual factors outlined above for the adopted Opening Year of 2024 and Future Design Years of 2029 (Opening Year +5 years) and 2039 (Opening Year +15 years), the following growth rates have been adopted to establish corresponding 2024, 2029 and 2039 baseline network flows.

- 2024 – 1.0341 (or 3.4%) for LVs.
- 2029 – 1.1245 (or 12.4%) for LVs.
- 2039 – 1.2384 (or 23.8%) for LVs.

6 NETWORK IMPACT

6.1.1 Assessment Scope

Assessment Scenarios

Two different traffic scenarios have been assessed, namely (a) the 'Base' (Do-Minimum) traffic characteristics and (b) the 'Post Development' (Do-Something) traffic characteristics.

The 'Do Minimum' traffic scenario takes into account the potential level of traffic that could be generated by the 'committed development' in addition to the existing flows (with TII growth rates applied) travelling across the network.

The proposed development traffic flows are then added to the network's 'Do Minimum' traffic flows to establish the new 'Do Something' traffic flows.

In summary the following scenarios are considered:

Do Minimum

- A1 – 2024 Base Flows
- A2 – 2029 Base Flows
- A3 – 2039 Base Flows

Do Something

- B1 – 2024 Do Minimum (A1) + Proposed Development Flows
- B2 – 2029 Do Minimum (A2) + Proposed Development Flows
- B3 – 2039 Do Minimum (A3) + Proposed Development Flows

6.1.2 Assessment Period

The peak hour flows have been identified as occurring between 08:15 - 09:15 for the AM peak, between 13:45 - 14:45 for the Interpeak and between 16:45 - 17:45 for the PM peak. During the weekend, the peak was identified to be between 12:00 - 13:00. These peak hour periods form the basis of the 2024, 2029 and 2039 network assessments.

6.1.3 Network Vehicle Flows

The following figures as included in **Appendix C** present the vehicle flows across the local road network for each of the adopted development scenarios:

- **Figure 4** – 2024 Do Minimum

- **Figure 5** – 2029 Do Minimum
- **Figure 6** – 2039 Do Minimum
- **Figure 9** – 2024 Do Something
- **Figure 10** – 2029 Do Something
- **Figure 11** – 2039 Do Something

6.2 IMPACTS OF PROPOSALS

6.2.1 Road Impact

The NRA/TII document entitled Traffic and Transport Assessment Guidelines (2014) provides thresholds in relation to the impact of a proposed development upon the local road network. It is considered material when the level of traffic it generates surpasses the thresholds of 10% and 5% on normal and congested networks respectively. When such levels of impact are generated a more detailed assessment should be undertaken to ascertain the specific impact upon the network's operational performance.

Table 6-1 details the specific scale of network impact predicted at each of the key local junctions during the 2024, 2029 and 2039 design years as a result of the subject development proposals. For key local junctions, it can be seen that the proposed development upon full completion would have a minor impact on a number of key surrounding junctions.

ID	Junction	Design Year	Percentage Impact			
			AM	Interpeak	PM	Weekend
1	Gateway Retail Park Roundabout	2024	5.79%	5.98%	5.64%	4.56%
		2029	5.32%	5.50%	5.19%	4.19%
		2039	4.83%	4.99%	4.71%	3.81%
2	Gort Na Bró Junction	2024	5.31%	5.91%	6.01%	5.57%
		2029	4.88%	5.43%	5.52%	5.12%
		2039	4.43%	4.93%	5.01%	4.65%
3	Western Distributor Road / Gort Na Bró Roundabout	2024	2.78%	4.76%	4.26%	5.01%
		2029	2.55%	4.38%	3.91%	4.61%
		2039	2.32%	3.97%	3.55%	4.18%

Table 6-1: Network Impact Through Key Off Site Junctions

Figure 6-1, **Figure 6-2**, **Figure 6-4** and **Figure 6-4** below details the total number of two-way vehicle trips that will pass through the key off-site junctions in the 2039 Future Design Year and the resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development.

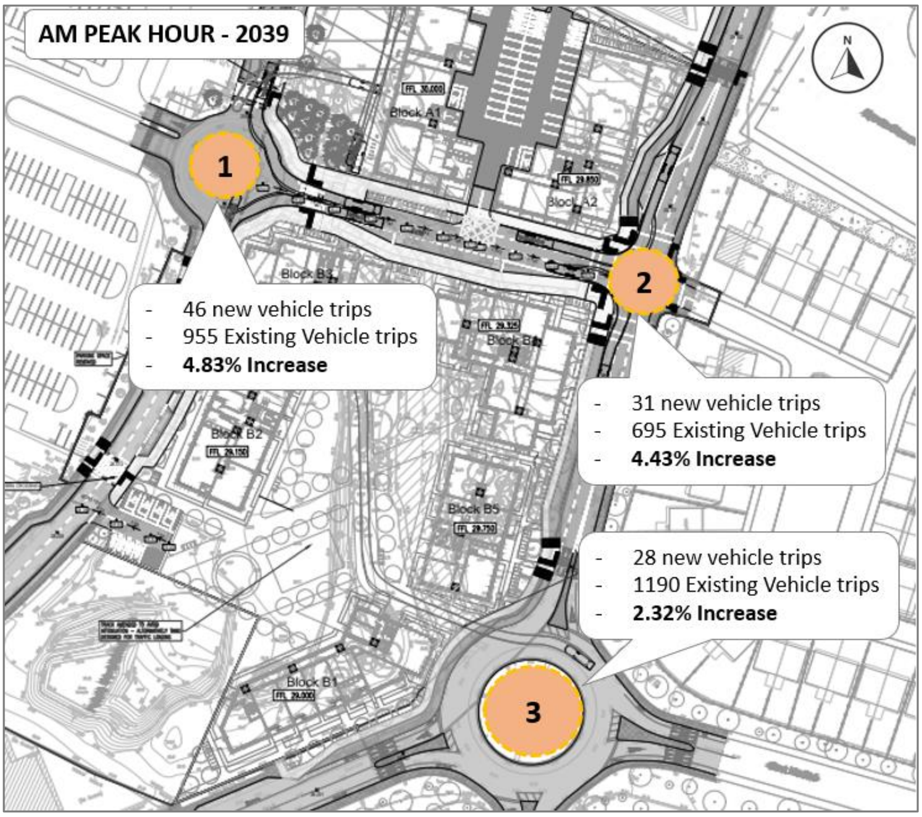


Figure 6-1 Increase in Vehicle Trips generated in the key off-site junctions – AM Peak.

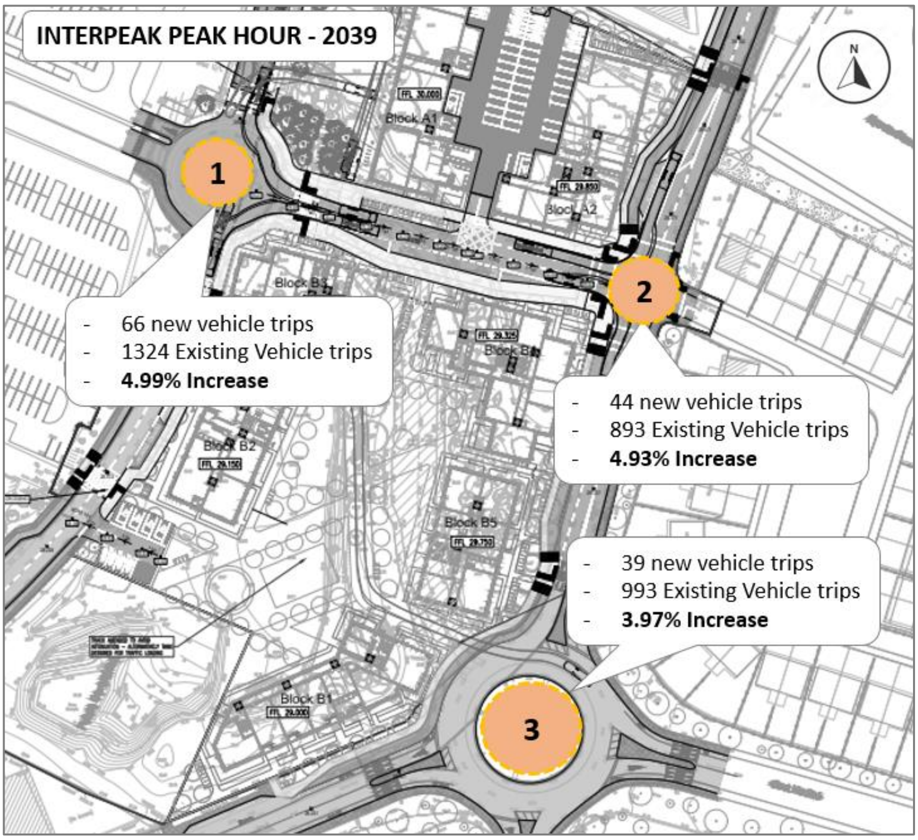


Figure 6-2 Increase in Vehicle Trips generated in the key off-site junctions – Interpeak.

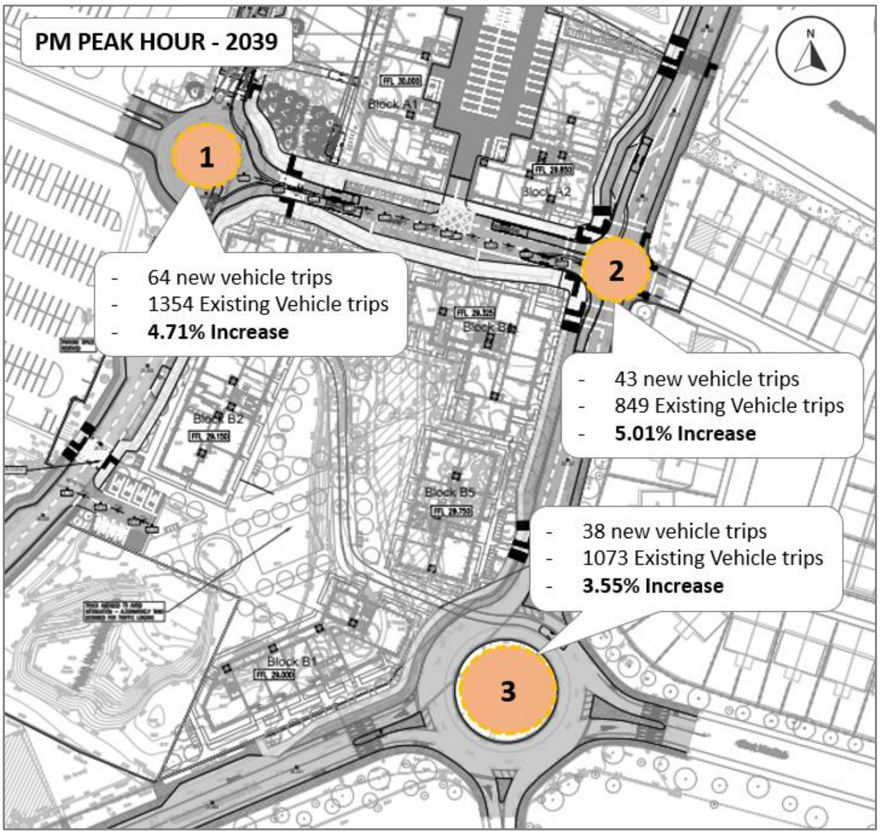


Figure 6-3 Increase in Vehicle Trips generated in the key off-site junctions – PM Peak.

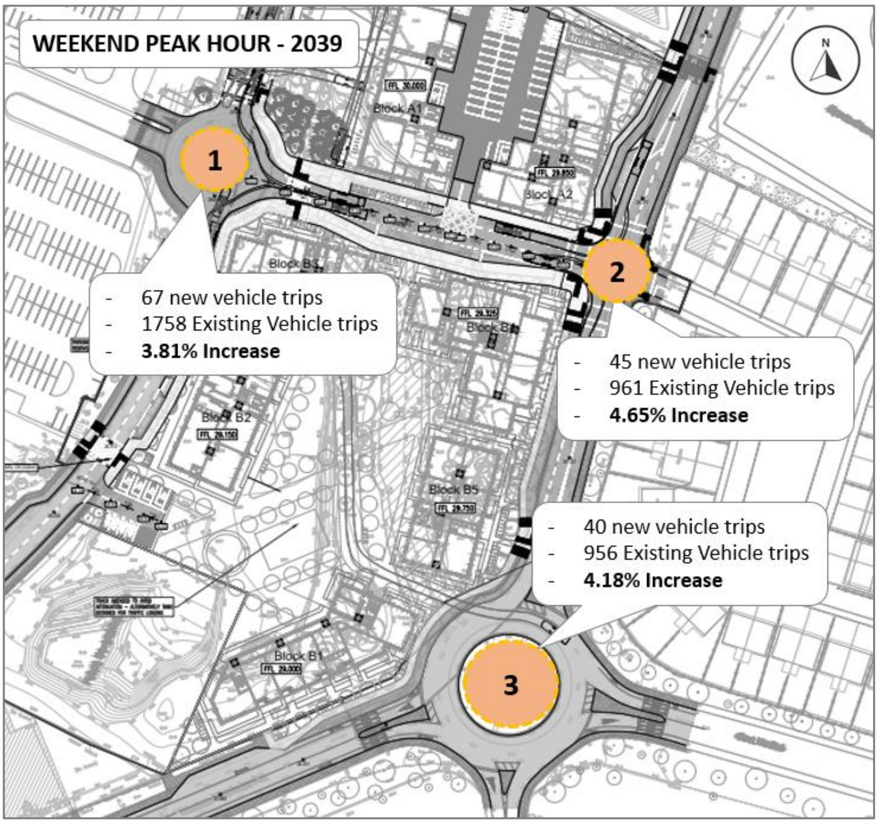


Figure 6-4 Increase in Vehicle Trips generated in the key off-site junctions – Weekend Peak.

For all key off-site junctions, it can be seen that the proposed development would have sub-threshold impacts (i.e. <10%). Nonetheless, to ensure a robust assessment of the impact of the proposed development impacts, detailed assessments regarding the Junction 1, 2 & 3's operational performance have been undertaken as detailed in **Chapter 7** of this report.

6.2.2 Public Transport Impact

A Public Transport Capacity Assessment has been prepared, contained in **Appendix A** of this report, and establishes the scale of impact that the proposed development is predicted to generate upon the public transport network and quantifies the capacity of the public transport network to accommodate the proposed development.

The assessment confirms that the completion and full occupation of the development will result in an increased demand for bus seats, with an additional 50 bus users during the weekday AM Commuter Peak (06:00 to 10:00) and PM Commuter Peak (16:00 to 20:00). The additional demand on the surrounding bus routes created by the proposed development for all routes is therefore 2% of the AM and 1% of the PM overall available capacity. The impact is therefore considered to have a negligible impact on the operation and capacity of the current public transport network.

It should also be remembered that service providers are commercial in nature, running their businesses based on existing demand, rather than medium to longer term future demand. Bus services are provided based on real demand rather than potential demand. If there is an increased demand for services, or indeed if there is a deficit in a service provision, operators generally react to improve facilities if it makes commercial sense to do so. More customers means more revenue generated.

6.3 MITIGATION STRATEGY

A package of integrated mitigation measures has been identified to off-set the additional local demand that the proposed residential development on the subject zoned lands could potentially generate as a result of the forecast increase in vehicle movements by residents of the scheme. The strategy includes specific measures for both the construction and operational stages of the proposed development.

6.3.1 Construction Stage

The Construction Management Plan (an outline CMP will be prepared and submitted as part of the final application), the associated Construction Traffic Management Plan (CTMP) along with an accompanying Construction and Waste Management Plan will incorporate a range of integrated control measures and associated management initiatives with the objective of mitigating the impact of the proposed developments on-site construction activities.

6.3.2 Operational Stage

With the objective of mitigating the potential impact of the proposed development as predicted in **Section 6.2** above during its operational stage, the following initiatives and associated timescale for their implementation have been identified and subsequently form an integral part of the subject development proposals.

- *Management – A Mobility Management (MMP)* is to be compiled with the aim of guiding the delivery and management of coordinated initiatives by the scheme promotor. The MMP ultimately seeks to encourage sustainable travel practices for all journeys by residents and visitors travelling to and from the proposed development.
- *Cycle parking provision* – A high provision of cycle parking for both residents and visitors has been incorporated into the subject scheme in the interest of encouraging and supporting travel by bicycle.
- *Infrastructure* – It is proposed to incorporate new cycle facilities along Gort Na Bró and the new Link Road as part of the development. These will facilitate high quality links for cyclists, serving not only the proposed development but wider area and key destinations such as the Gaelscoil Mhic Amhlaigh and Gateway Retail Park.

7 NETWORK ANALYSIS

7.1 INTRODUCTION

The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package ARCADY for roundabouts and TRANSYT for signal controlled junctions. When considering signalised junctions, a Degree of Saturation (DoS) of greater than 90% (0.90) would indicate a junction to be approaching capacity, as operation above this DoS value is poor and deteriorates quickly. Similarly, for priority-controlled junctions, a Ratio of Flow to Capacity (RFC) of greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and deteriorates quickly.

Junctions no. 1 & 3, which are roundabouts, have been modelled with ARCADY. A 90-minute weekday AM, Interpeak and PM period has been simulated in all models, from 08:00 to 09:30, from 13:30 to 15:00 and from 16:30 to 18:00. Additionally, a 90-minute weekend period has been included in the simulation, from 15:00 to 16:00.

Junction no. 2, corresponding to a signalised junction, has been modelled with TRANSYT. The simulation has been performed with 60-minute weekday AM, Interpeak & PM peak periods, from 08:15 to 09:15, from 13:45 to 14:45 and from 16:45 to 17:45. Likewise, a 60-minute weekend period has also been considered for the simulation, from 15:15 to 16:15.

The key junctions included within the network analysis are illustrated in **Figure 7-1**.

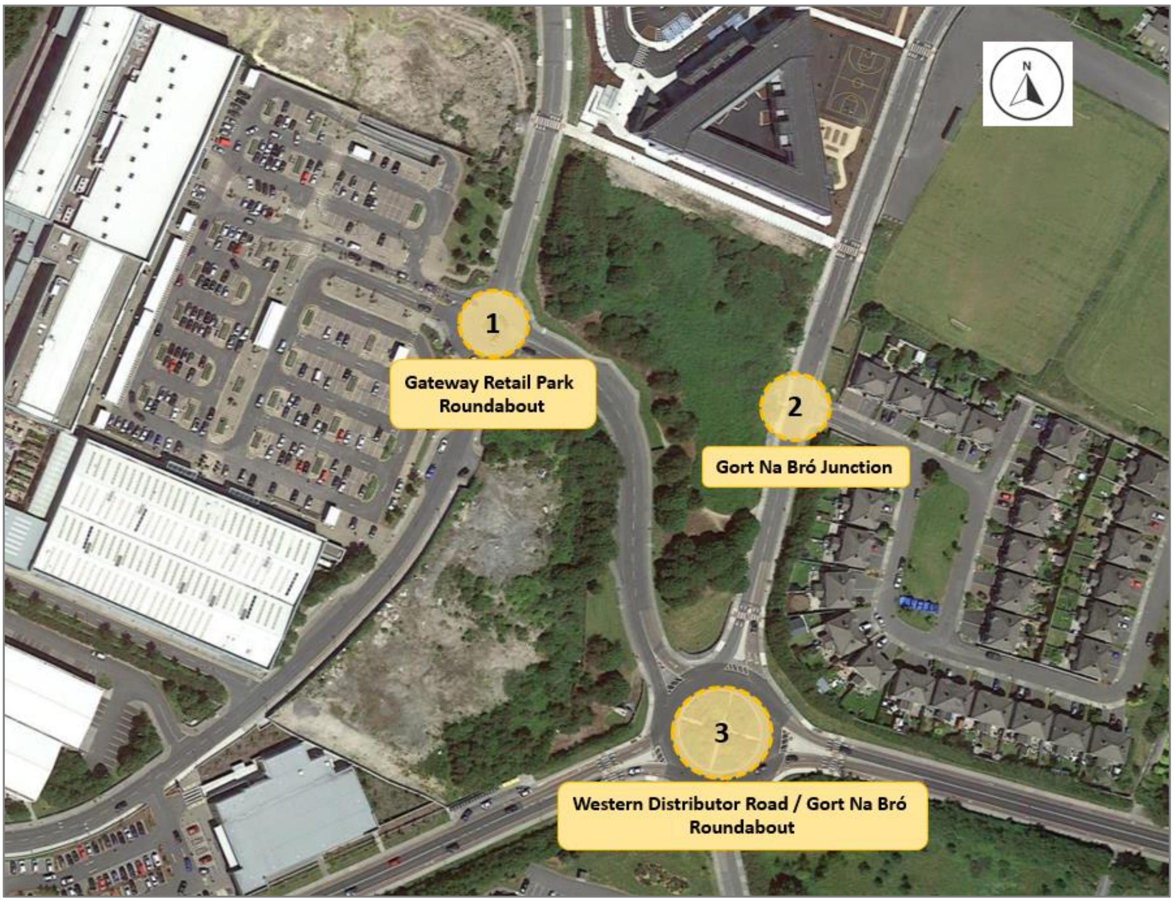


Figure 7-1: Junctions Included Within the Network Analysis

A copy of the ARCADY Output Files and TRANSYT Output Files can be found in **Appendix D** and **Appendix E** respectively.

7.2 JUNCTION 1: GATEWAY RETAIL PARK ROUNDABOUT

The 4-arm roundabout that gives access to Gateway Shopping Park has been analysed for all of the modelling scenarios the Junction 9 ARCADY software package. The results of the operational assessment are outlined below. In the Do Minimum and Do Something Scenarios, the four arms were labelled as follows within the ARCADY model, as shown in **Figure 7-2;**

- Arm 1: New Link Road to Gort Na Bró
- Arm 2: South arm
- Arm 3: Western arm towards Gateway Shopping Park
- Arm 4: Northern arm

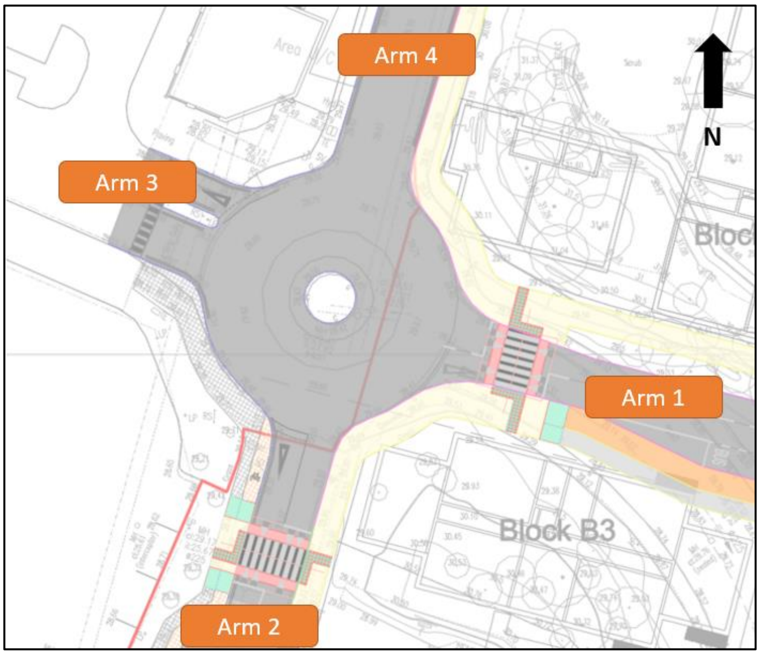


Figure 7-2: Junction 1 Gateway Retail Park Roundabout

7.2.1 Do Minimum Scenario

The results of the ARCADY analysis for the Do Minimum scenario of the Gateway Retail Park roundabout are summarised in **Table 7-1** below. The results indicate that the roundabout in the Do Minimum scenario will operate within capacity for the AM, Interpeak and PM peaks in all assessed years. The maximum RFC value occurs in 2039, with in the PM peak on Arm 3, equal to 0.56, and a queue of 1.3 PCUs.

During the Weekend peak hour, Arm 3 is shown to operate with an RFC of 0.74 and a corresponding queue of 3.1PCUs in 2039 assessment year.

Year	Scenario	Arm	Description	Queue (PCU)	Delay (s)	RFC
2024	AM Peak	1	New Link Road	0.1	3.44	0.13
		2	South Arm	0.8	7.68	0.44
		3	Western Arm	0.2	4.2	0.16
		4	Northern Arm	0.3	4.84	0.21
	Interpeak	1	New Link Road	0.4	4.22	0.26
		2	South Arm	0.7	7.66	0.4
		3	Western Arm	0.7	5.89	0.42
		4	Northern Arm	0.2	5.39	0.18
	PM Peak	1	New Link Road	0.4	4.43	0.28
		2	South Arm	0.6	7.21	0.36
		3	Western Arm	0.9	6.13	0.47
		4	Northern Arm	0.2	5.32	0.16
	Weekend	1	New Link Road	0.8	6.18	0.44
		2	South Arm	1.1	11.56	0.51

		3	Western Arm	1.7	9.43	0.62
		4	Northern Arm	0.2	6.25	0.13
2029	AM Peak	1	New Link Road	0.2	3.53	0.14
		2	South Arm	0.9	8.38	0.48
		3	Western Arm	0.2	4.32	0.17
		4	Northern Arm	0.3	5.02	0.23
	Interpeak	1	New Link Road	0.4	4.44	0.29
		2	South Arm	0.8	8.32	0.44
		3	Western Arm	0.9	6.39	0.46
		4	Northern Arm	0.3	5.64	0.2
	PM Peak	1	New Link Road	0.5	4.68	0.31
		2	South Arm	0.6	7.75	0.39
		3	Western Arm	1	6.69	0.51
		4	Northern Arm	0.2	5.56	0.18
	Weekend	1	New Link Road	1	6.8	0.48
		2	South Arm	1.4	13.44	0.57
		3	Western Arm	2.2	11.03	0.67
		4	Northern Arm	0.2	6.6	0.15
2039	AM Peak	1	New Link Road	0.2	3.63	0.16
		2	South Arm	1.1	9.41	0.54
		3	Western Arm	0.2	4.5	0.19
		4	Northern Arm	0.3	5.23	0.25
	Interpeak	1	New Link Road	0.5	4.74	0.32
		2	South Arm	1	9.34	0.5
		3	Western Arm	1.1	7.14	0.52
		4	Northern Arm	0.3	6.02	0.23
	PM Peak	1	New Link Road	0.5	5.04	0.35
		2	South Arm	0.8	8.55	0.44
		3	Western Arm	1.3	7.54	0.56
		4	Northern Arm	0.3	5.91	0.21
	Weekend	1	New Link Road	1.3	7.84	0.54
		2	South Arm	2	17.08	0.65
		3	Western Arm	3.1	14.23	0.74
		4	Northern Arm	0.2	7.12	0.17

Table 7-1: Junction 1 - Do Minimum Analysis Results

7.2.2 Do Something Scenario

The ARCADY results for the Do Something scenario for Junction 1 Gateway Retail Park roundabout are presented in **Table 7-2** below.

During the AM, Interpeak and PM peak hours, the junction is shown to perform within capacity for all assessed years. In the 2039 AM Peak, the highest RFC occurs on Arm 2, with a value of 0.55, and a corresponding queue of 1.2 PCUs, whilst in the PM peak, the highest RFC occurs on Arm 3, with a value of 0.56, and a queue of 1.3 PCUs.

During the Weekend peak hour, the highest RFC for 2039 occurs in Arm 3 has a maximum RFC of 0.74, and a queue of 3.0 PCUs.

Year	Scenario	Arm	Description	Queue (PCU)	Delay (s)	RFC
2024	AM Peak	1	New Link Road	0.2	3.51	0.14
		2	South Arm	0.8	7.91	0.45
		3	Western Arm	0.2	4.13	0.15
		4	Northern Arm	0.3	5.03	0.24
	Interpeak	1	New Link Road	0.4	4.39	0.29
		2	South Arm	0.8	8.14	0.43
		3	Western Arm	0.7	5.83	0.42
		4	Northern Arm	0.3	5.65	0.22
	PM Peak	1	New Link Road	0.4	4.59	0.31
		2	South Arm	0.6	7.64	0.39
		3	Western Arm	0.9	6.03	0.46
		4	Northern Arm	0.2	5.54	0.19
	Weekend	1	New Link Road	0.9	6.49	0.46
		2	South Arm	1.3	12.59	0.55
		3	Western Arm	1.7	9.23	0.61
		4	Northern Arm	0.2	6.57	0.17
2029	AM Peak	1	New Link Road	0.2	3.6	0.15
		2	South Arm	1	8.65	0.5
		3	Western Arm	0.2	4.26	0.17
		4	Northern Arm	0.3	5.22	0.26
	Interpeak	1	New Link Road	0.5	4.62	0.31
		2	South Arm	0.9	8.89	0.47
		3	Western Arm	0.9	6.33	0.46
		4	Northern Arm	0.3	5.95	0.24
	PM Peak	1	New Link Road	0.5	4.62	0.31
		2	South Arm	0.9	8.89	0.47
		3	Western Arm	0.9	6.33	0.46
		4	Northern Arm	0.3	5.95	0.24
	Weekend	1	New Link Road	1.1	6.88	0.49
		2	South Arm	1.6	13.91	0.59
		3	Western Arm	2.2	10.8	0.67
		4	Northern Arm	0.2	6.44	0.12
2039	AM Peak	1	New Link Road	0.2	3.71	0.17
		2	South Arm	1.2	9.76	0.55
		3	Western Arm	0.2	4.44	0.19
		4	Northern Arm	0.4	5.45	0.28
	Interpeak	1	New Link Road	0.6	5.44	0.35
		2	South Arm	1.2	11.05	0.53
		3	Western Arm	1.2	7.77	0.51
		4	Northern Arm	0.4	6.98	0.27
	PM Peak	1	New Link Road	0.6	5.26	0.38

		2	South Arm	0.9	9.16	0.47
		3	Western Arm	1.3	7.4	0.56
		4	Northern Arm	0.3	6.2	0.24
	Weekend	1	New Link Road	1.4	8.36	0.57
		2	South Arm	2.4	19.53	0.69
		3	Western Arm	3	13.89	0.74
		4	Northern Arm	0.3	7.52	0.21

Table 7-2: Junction 1 - Do Something Analysis Results

Results show that, with the additional development traffic, the roundabout continues to perform within capacity for all future scenarios assessed.

7.3 JUNCTION 3: WESTERN DISTRIBUTOR ROAD / GORT NA BRÓ ROUNDABOUT

For the purposes of the network analysis, the Western Distributor Road / Gort Na Bró / An Logán roundabout has been assessed as a four-arm roundabout. This takes into account the proposals as part of the Galway City Ring Road scheme (previously outlined in Section 2.5.4) which seeks to remove the current fifth arm of the roundabout which connects to the Gateway Retail Park roundabout.

Consequently, the 4-arm roundabout has been analysed for all design years and Do Minimum and Do Something scenarios using the Junctions 9 ARCADY software package. The results of the operational assessment are outlined below. In the Do Minimum and Do Something Scenarios, the four arms were labelled as follows within the ARCADY model;

- Arm 1: Western Distributor Road (E)
- Arm 2: An Logán
- Arm 3: Western Distributor Road (W)
- Arm 4: Gort Na Bró

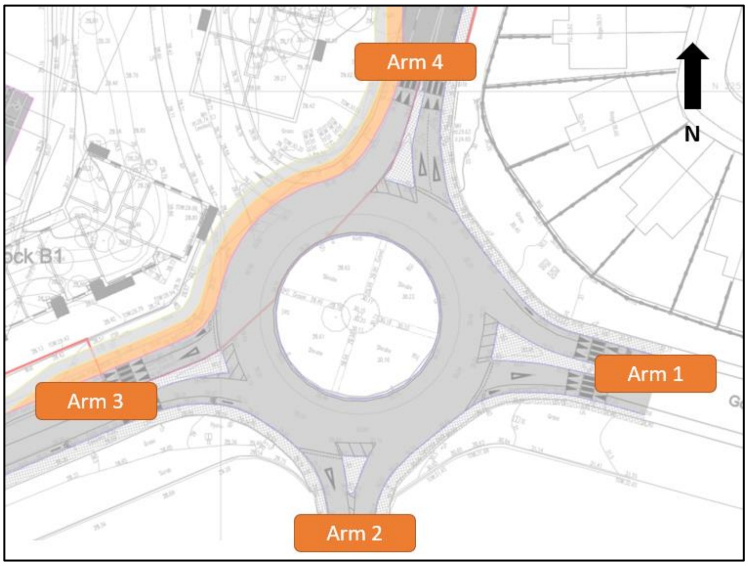


Figure 7-3: Junction 3 Western Distributor Road / Gort Na Bró Roundabout

7.3.1 Do Minimum Scenario

The Do Minimum operational performance is outlined below in **Table 7-3**. Junction 3 operates within capacity in the AM, Interpeak and PM Peaks for all assessed years. In the 2039 AM peak, the highest RFC occurs, on Arm 3 Western Distributor Road (W), with a value of 0.79, and a queue of 3.5 PCUs. In the 2039 PM peak Arm 1 presents the highest RFC with a value of 0.55, and a queue of 1.2 PCUs.

In the Weekend Peak for 2039, the performance is within capacity, The highest RFC of 0.62 occurs also on Arm 3, and a queue of 1.6 PCUs.

Year	Scenario	Arm	Description	Queue (PCU)	Delay (s)	RFC
2024	AM Peak	1	New Link Road	0.5	4.69	0.33
		2	South Arm	0	4.09	0.02
		3	Western Arm	1.9	13.64	0.65
		4	Northern Arm	0.3	5.54	0.22
	Interpeak	1	New Link Road	0.5	4.62	0.33
		2	South Arm	0	4.01	0.01
		3	Western Arm	1.4	11.28	0.58
		4	Northern Arm	0.1	4.49	0.08
	PM Peak	1	New Link Road	0.8	5.62	0.46
		2	South Arm	0	4.3	0.01
		3	Western Arm	1.1	10.06	0.53
		4	Northern Arm	0	4.21	0.04
	Weekend	1	New Link Road	0.5	4.68	0.34
		2	South Arm	0	4.05	0.02
		3	Western Arm	1.1	9.78	0.52
		4	Northern Arm	0.1	4.41	0.07
2029	AM Peak	1	New Link Road	0.6	4.94	0.36

		2	South Arm	0	4.2	0.03
		3	Western Arm	2.4	16.54	0.72
		4	Northern Arm	0.3	5.88	0.25
	Interpeak	1	New Link Road	0.6	4.84	0.36
		2	South Arm	0	4.09	0.01
		3	Western Arm	1.7	12.93	0.64
		4	Northern Arm	0.1	4.61	0.09
	PM Peak	1	New Link Road	1	6.07	0.5
		2	South Arm	0	4.44	0.01
		3	Western Arm	1.4	11.26	0.58
		4	Northern Arm	0	4.28	0.04
	Weekend	1	New Link Road	0.6	4.91	0.37
		2	South Arm	0	4.15	0.02
		3	Western Arm	1.3	10.82	0.57
		4	Northern Arm	0.1	4.53	0.08
2039	AM Peak	1	New Link Road	0.7	5.25	0.4
		2	South Arm	0	4.33	0.03
		3	Western Arm	3.5	22.09	0.79
		4	Northern Arm	0.4	6.33	0.28
	Interpeak	1	New Link Road	0.6	5.15	0.39
		2	South Arm	0	4.21	0.01
		3	Western Arm	2.3	15.72	0.7
		4	Northern Arm	0.1	4.78	0.1
	PM Peak	1	New Link Road	1.2	6.76	0.55
		2	South Arm	0	4.62	0.01
		3	Western Arm	1.7	13.15	0.64
		4	Northern Arm	0.1	4.42	0.05
	Weekend	1	New Link Road	0.7	5.24	0.41
		2	South Arm	0	4.28	0.02
		3	Western Arm	1.6	12.53	0.62
		4	Northern Arm	0.1	4.69	0.09

Table 7-3: Junction 3 - Do Minimum Analysis Results

7.3.2 Do Something Scenario

The Do Something operational performance is outlined below in **Table 7-4**.

In the AM, Interpeak an PM peaks, the performance is within capacity. In the 2039 AM Peak, the highest RFC occurs on Arm 3 Western Distributor Road (W), with a value of 0.79, and a queue of 3.6 PCUs, whilst in the PM peak, the same arm has a RFC of 0.65, and a queue of 1.8 PCUs.

In the Weekend, the performance is within capacity for all assessed years. In 2039, the highest RFC occurs in Arm 3, with a RFC of 0.63, and a queue of 0.1 PCUs.

Year	Scenario	Arm	Description	Queue (PCU)	Delay (s)	RFC
2024	AM Peak	1	New Link Road	0.5	4.69	0.33

		2	South Arm	0	4.09	0.02
		3	Western Arm	1.9	13.64	0.65
		4	Northern Arm	0.3	5.54	0.22
	Interpeak	1	New Link Road	0.5	4.62	0.33
		2	South Arm	0	4.01	0.01
		3	Western Arm	1.4	11.28	0.58
		4	Northern Arm	0.1	4.49	0.08
	PM Peak	1	New Link Road	0.8	5.62	0.46
		2	South Arm	0	4.3	0.01
		3	Western Arm	1.1	10.06	0.53
		4	Northern Arm	0	4.21	0.04
	Weekend	1	New Link Road	0.5	4.68	0.36
		2	South Arm	0	4.05	0.02
		3	Western Arm	1.1	10.05	0.53
		4	Northern Arm	0.1	4.54	0.1
2029	AM Peak	1	New Link Road	0.6	5.02	0.37
		2	South Arm	0	4.23	0.03
		3	Western Arm	2.5	16.89	0.72
		4	Northern Arm	0.4	6.09	0.28
	Interpeak	1	New Link Road	0.6	5	0.38
		2	South Arm	0	4.15	0.01
		3	Western Arm	1.8	13.37	0.65
		4	Northern Arm	0.1	4.74	0.12
	PM Peak	1	New Link Road	1.1	6.36	0.52
		2	South Arm	0	4.55	0.02
		3	Western Arm	1.4	11.71	0.59
		4	Northern Arm	0.1	4.42	0.07
	Weekend	1	New Link Road	0.6	5.09	0.39
		2	South Arm	0	4.22	0.02
		3	Western Arm	1.3	11.15	0.57
		4	Northern Arm	0.1	4.66	0.11
2039	AM Peak	1	New Link Road	0.7	5.35	0.41
		2	South Arm	0	4.37	0.03
		3	Western Arm	3.6	22.76	0.79
		4	Northern Arm	0.5	6.58	0.31
	Interpeak	1	New Link Road	0.8	5.86	0.41
		2	South Arm	0	4.7	0.01
		3	Western Arm	2.6	17.98	0.71
		4	Northern Arm	0.2	5.43	0.13
	PM Peak	1	New Link Road	1.3	7.12	0.57
		2	South Arm	0	4.7	0.01
		3	Western Arm	1.8	13.64	0.65
		4	Northern Arm	0.1	4.53	0.07
	Weekend	1	New Link Road	0.8	6	0.43
		2	South Arm	0	4.78	0.02

		3	Western Arm	1.9	14.27	0.63
		4	Northern Arm	0.1	5.31	0.12

Table 7-4: Junction 3 - Do Something Analysis Results

Results show that, with the additional development traffic, the roundabout continues to perform within capacity for all future scenarios assessed.

7.4 JUNCTION 2: GORT NA BRÓ SIGNALISED JUNCTION

For the purposes of the network analysis, Junction 2 on Gort Na Bró has been assessed as a four-arm signalised junction. This takes into account the proposals as part of the Galway City Ring Road scheme (previously outlined in Section 2.5.4) which seeks to realign the link road connecting to the Gateway Retail Park and create a four arm signalised junction.

Consequently, the signalised 4-arm junction at Gort Na Bró & the New Link Road has been analysed for all design years Do Minimum and Do Something scenarios using the ARCADY software package. The results of the operational assessment are outlined below.

In the Do Minimum and Do Something Scenarios, the four arms were labelled as follows within the TRANSYT model;

- Arm 1: New Link Road
- Arm 2: Gort Na Bró (N)
- Arm 3: Gort Na Bró (E)
- Arm 4: Gort Na Bró (S)

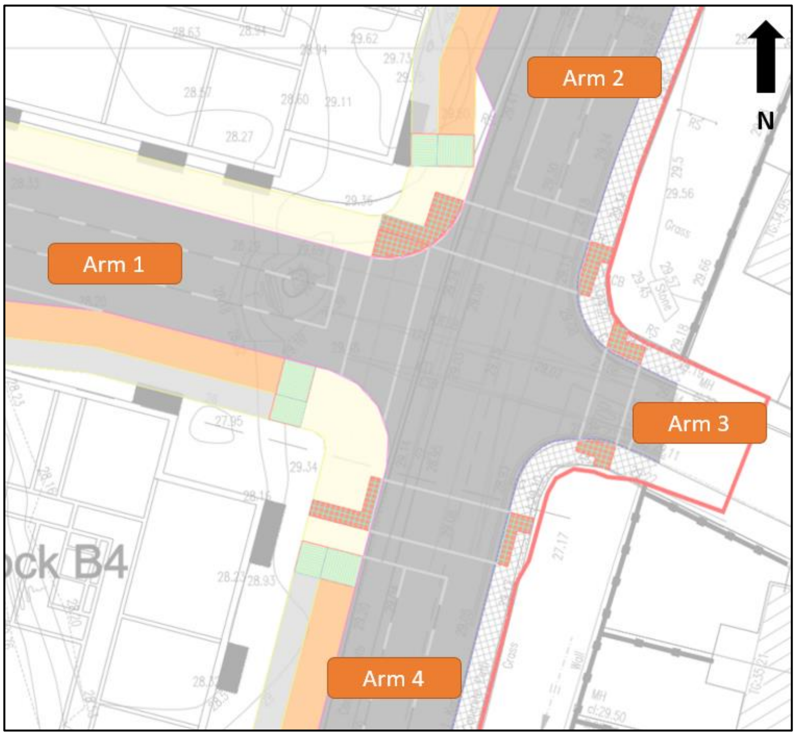


Figure 7-4: Junction 2 Gort Na Bró Signalised Junction

7.4.1 Do Minimum Scenario

The Do Minimum Operational Assessment Results for Junction 5 are summarised below in **Table 7-5.**

In the AM and PM peaks, the operation is within capacity for all assessed years. In the 2039 AM Peak, the maximum Degree of Saturation (DOS) occurs on Arm 2 Gort Na Bró (N), on the straight & Left Turn stream, with a value of 59% and Mean Max Queue of 5.58 PCUs. In the PM peak, the maximum DOS of 78% occurs on the Arm 1 New Link Road, on Straight & Right Turn, with a queue of 9.11 PCUs. For the Interpeak, the Arm 1 Straight & Right Turn stream is close to the capacity threshold with a DOS of 87% and a queue of 11.83 PCUs.

In the Weekend Peak hour, the operation is within capacity, with the highest DOS of 85% occurring on the Straight & Right Turn stream of Arm 4 Gort Na Bro (S), and a queue of 13.64 PCUs. This stream is approaching the capacity threshold of 90%.

Year	Scenario	Arm	Arm name	Description	DOS (%)	Mean Delay (s)	Mean Max Queue (pcus)
2024	AM Peak	1	New Link Road	Left Turn	3	29.55	0.29
				Straight & Right Turn	36	38.19	3.83
		2	Gort Na Bró (N)	Straight & Left Turn	52	48.59	4.53
				Right Turn	2	38.17	0.15

		3	Gort Na Bró (E)	Straight, Left & Right Turns	25	52.8	0.99
		4	Gort Na Bró (S)	Straight & Left Turn	41	19.19	3.46
				Right Turn	8	48.89	0.29
	Interpeak	1	New Link Road	Left Turn	4	31.09	0.39
				Straight & Right Turn	70	50.95	8.13
		2	Gort Na Bró (N)	Straight & Left Turn	44	59.65	1.86
				Right Turn	8	47.91	0.34
		3	Gort Na Bró (E)	Straight, Left & Right Turns	20	51.45	0.77
		4	Gort Na Bró (S)	Straight & Left Turn	52	18.46	6.31
				Right Turn	4	37.47	0.35
	PM Peak	1	New Link Road	Left Turn	4	32.63	0.4
				Straight & Right Turn	65	50.88	6.92
		2	Gort Na Bró (N)	Straight & Left Turn	34	55.42	1.36
				Right Turn	9	48.01	0.37
		3	Gort Na Bró (E)	Straight, Left & Right Turns	11	49.4	0.4
		4	Gort Na Bró (S)	Straight & Left Turn	55	19.08	6.84
				Right Turn	5	35.85	0.42
	Weekend	1	New Link Road	Left Turn	1	32.52	0.14
				Straight & Right Turn	56	46.97	5.66
		2	Gort Na Bró (N)	Straight & Left Turn	53	64.12	2.32
				Right Turn	13	48.7	0.55
		3	Gort Na Bró (E)	Straight, Left & Right Turns	11	49.53	0.43
		4	Gort Na Bró (S)	Straight & Left Turn	71	23.37	9.86
				Right Turn	4	35.8	0.34
2029	AM Peak	1	New Link Road	Left Turn	3	30.31	0.34
				Straight & Right Turn	40	39.99	4.29
		2	Gort Na Bró (N)	Straight & Left Turn	53	48.03	4.91
				Right Turn	2	37.35	0.18
		3	Gort Na Bró (E)	Straight, Left & Right Turns	28	53.45	1.09
		4	Gort Na Bró (S)	Straight & Left Turn	47	20.36	3.87
				Right Turn	8	49.01	0.32
	Interpeak	1	New Link Road	Left Turn	4	31.86	0.42
				Straight & Right Turn	79	59.77	9.65
		2	Gort Na Bró (N)	Straight & Left Turn	48	61.53	2.06
				Right Turn	9	48.01	0.37
		3	Gort Na Bró (E)	Straight, Left & Right Turns	22	52.02	0.86
		4	Gort Na Bró (S)	Straight & Left Turn	56	19.39	7.05
				Right Turn	5	36.66	0.4
	PM Peak	1	New Link Road	Left Turn	4	32.64	0.42
				Straight & Right Turn	71	54.09	7.76
		2	Gort Na Bró (N)	Straight & Left Turn	37	56.48	1.49
				Right Turn	10	48.21	0.43
		3	Gort Na Bró (E)	Straight, Left & Right Turns	12	49.66	0.46
		4	Gort Na Bró (S)	Straight & Left Turn	60	20.14	7.63
				Right Turn	5	35.88	0.47

	Weekend	1	New Link Road	Left Turn	2	32.53	0.16
				Straight & Right Turn	61	48.87	6.31
		2	Gort Na Bró (N)	Straight & Left Turn	57	67.22	2.58
				Right Turn	14	48.85	0.58
		3	Gort Na Bró (E)	Straight, Left & Right Turns	13	49.8	0.49
		4	Gort Na Bró (S)	Straight & Left Turn	77	26.16	11.33
				Right Turn	4	35.83	0.39
2039	AM Peak	1	New Link Road	Left Turn	3	30.32	0.36
				Straight & Right Turn	45	40.91	4.8
		2	Gort Na Bró (N)	Straight & Left Turn	59	50.2	5.58
				Right Turn	2	37.35	0.18
		3	Gort Na Bró (E)	Straight, Left & Right Turns	30	54.17	1.19
		4	Gort Na Bró (S)	Straight & Left Turn	51	21.88	4.4
				Right Turn	9	49.14	0.34
	Interpeak	1	New Link Road	Left Turn	5	31.88	0.46
				Straight & Right Turn	87	72.32	11.83
		2	Gort Na Bró (N)	Straight & Left Turn	53	64.12	2.32
				Right Turn	10	48.21	0.43
		3	Gort Na Bró (E)	Straight, Left & Right Turns	24	52.41	0.92
		4	Gort Na Bró (S)	Straight & Left Turn	62	20.72	8.1
				Right Turn	5	36.68	0.42
	PM Peak	1	New Link Road	Left Turn	5	32.66	0.47
				Straight & Right Turn	78	60.2	9.11
		2	Gort Na Bró (N)	Straight & Left Turn	40	57.96	1.68
				Right Turn	11	48.31	0.46
		3	Gort Na Bró (E)	Straight, Left & Right Turns	13	49.8	0.49
		4	Gort Na Bró (S)	Straight & Left Turn	66	21.79	8.81
				Right Turn	6	35.94	0.52
	Weekend	1	New Link Road	Left Turn	2	32.53	0.16
				Straight & Right Turn	67	51.8	7.22
		2	Gort Na Bró (N)	Straight & Left Turn	63	72.31	2.97
				Right Turn	15	49.15	0.64
		3	Gort Na Bró (E)	Straight, Left & Right Turns	14	49.97	0.53
		4	Gort Na Bró (S)	Straight & Left Turn	85	32.81	13.64
				Right Turn	5	35.85	0.42

Table 7-5: Junction 2 Do Minimum Results

7.4.2 Do Something Scenarios

Th Do Something Operational Assessment Results is outlined below in **Table 7-6.**

In the AM and PM peaks, the operations is within capacity for all assessed years. In the 2039 AM Peak, the highest DOS occurs on the Straight and Left Turn stream of Arm 2 Gort Na Bro (N), with a DOS of 62% and Mean Max Queue of 5.72 PCUs. In the 2039 PM Peak, the highest DOS occurs on the Straight and Left Turn of Arm 1 New Link Road, with a value of 84%, and a queue of 10.3 PCUs.

In the Interpeak peak, the operation is not within capacity for 2039. The DOS on Arm 1 New Link Road is higher than the capacity threshold (90%) with a value of 93 and a queue of 14.28 PCUS.

In the Weekend Peak, the operation is within capacity, with the highest DOS occurring on the same stream (Straight and Right Turn) of Arm 4 Gort Na Bro (S), with a value of 88% and a Mean Max Queue of 15 PCUs. This stream is approaching the capacity threshold of 90%.

Year	Scenario	Arm	Arm name	Description	DOS (%)	Mean Delay (s)	Mean Max Queue (pcus)
2024	AM Peak	1	New Link Road	Left Turn	3	29.58	0.36
				Straight & Right Turn	41	39.18	4.43
		2	Gort Na Bró (N)	Straight & Left Turn	52	48.59	4.53
				Right Turn	3	38.21	0.2
		3	Gort Na Bró (E)	Straight, Left & Right Turns	25	52.8	0.99
		4	Gort Na Bró (S)	Straight & Left Turn	44	19.52	3.71
				Right Turn	8	48.89	0.29
	Interpeak	1	New Link Road	Left Turn	4	31.87	0.44
				Straight & Right Turn	78	58.89	9.49
		2	Gort Na Bró (N)	Straight & Left Turn	44	59.65	1.86
				Right Turn	10	48.21	0.43
		3	Gort Na Bró (E)	Straight, Left & Right Turns	20	51.45	0.77
		4	Gort Na Bró (S)	Straight & Left Turn	55	19.08	6.84
				Right Turn	4	36.63	0.35
	PM Peak	1	New Link Road	Left Turn	4	32.65	0.44
				Straight & Right Turn	71	53.9	7.71
		2	Gort Na Bró (N)	Straight & Left Turn	34	55.42	1.36
				Right Turn	11	48.31	0.46
		3	Gort Na Bró (E)	Straight, Left & Right Turns	11	49.4	0.4
		4	Gort Na Bró (S)	Straight & Left Turn	58	19.84	7.44
				Right Turn	5	35.85	0.42
	Weekend	1	New Link Road	Left Turn	2	32.54	0.19
				Straight & Right Turn	62	49.11	6.38
		2	Gort Na Bró (N)	Straight & Left Turn	53	64.12	2.32
				Right Turn	14	49	0.61
		3	Gort Na Bró (E)	Straight, Left & Right Turns	11	49.53	0.43
		4	Gort Na Bró (S)	Straight & Left Turn	74	24.84	10.65
				Right Turn	4	35.8	0.34
2029	AM Peak	1	New Link Road	Left Turn	3	29.59	0.38
				Straight & Right Turn	44	39.88	4.84

		2	Gort Na Bró (N)	Straight & Left Turn	56	50.17	5.02
				Right Turn	3	38.21	0.2
		3	Gort Na Bró (E)	Straight, Left & Right Turns	28	53.45	1.09
		4	Gort Na Bró (S)	Straight & Left Turn	47	20.18	4.07
				Right Turn	8	49.01	3.16
	Interpeak	1	New Link Road	Left Turn	5	31.88	0.46
				Straight & Right Turn	85	67.41	11.02
		2	Gort Na Bró (N)	Straight & Left Turn	48	61.53	2.06
				Right Turn	11	48.31	0.46
		3	Gort Na Bró (E)	Straight, Left & Right Turns	22	50.02	0.86
		4	Gort Na Bró (S)	Straight & Left Turn	60	20.11	7.61
				Right Turn	5	36.66	0.4
	PM Peak	1	New Link Road	Left Turn	5	32.66	0.47
				Straight & Right Turn	77	58.47	8.79
		2	Gort Na Bró (N)	Straight & Left Turn	37	56.48	1.49
				Right Turn	12	48.42	0.48
		3	Gort Na Bró (E)	Straight, Left & Right Turns	12	49.66	0.46
		4	Gort Na Bró (S)	Straight & Left Turn	63	21.03	8.27
				Right Turn	5	35.88	0.47
	Weekend	1	New Link Road	Left Turn	2	32.55	0.21
				Straight & Right Turn	67	51.48	7.08
		2	Gort Na Bró (N)	Straight & Left Turn	57	67.22	2.258
				Right Turn	16	49.3	0.67
		3	Gort Na Bró (E)	Straight, Left & Right Turns	13	49.8	0.49
		4	Gort Na Bró (S)	Straight & Left Turn	80	28.33	12.28
				Right Turn	4	35.83	0.39
2039	AM Peak	1	New Link Road	Left Turn	4	30.34	0.41
				Straight & Right Turn	50	42.2	5.44
		2	Gort Na Bró (N)	Straight & Left Turn	62	52.83	5.72
				Right Turn	3	38.23	0.23
		3	Gort Na Bró (E)	Straight, Left & Right Turns	30	54.17	1.19
		4	Gort Na Bró (S)	Straight & Left Turn	52	21.06	4.59
				Right Turn	8	47.91	0.34
	Interpeak	1	New Link Road	Left Turn	5	31.92	0.51
				Straight & Right Turn	93	89.16	14.28
		2	Gort Na Bró (N)	Straight & Left Turn	53	64.12	2.32
				Right Turn	12	48.42	0.48
		3	Gort Na Bró (E)	Straight, Left & Right Turns	24	52.41	0.92
		4	Gort Na Bró (S)	Straight & Left Turn	65	21.62	8.72
				Right Turn	5	36.68	0.42
	PM Peak	1	New Link Road	Left Turn	5	32.71	0.52
				Straight & Right Turn	84	67.02	10.3
		2	Gort Na Bró (N)	Straight & Left Turn	40	57.96	1.68
				Right Turn	13	48.7	0.55
		3	Gort Na Bró (E)	Straight, Left & Right Turns	13	49.8	0.49

		4	Gort Na Bró (S)	Straight & Left Turn	69	22.94	9.52
				Right Turn	6	35.94	0.52
	Weekend	1	New Link Road	Left Turn	2	32.56	0.23
				Straight & Right Turn	73	55.54	8.14
		2	Gort Na Bró (N)	Straight & Left Turn	63	72.31	2.97
				Right Turn	17	49.59	0.73
		3	Gort Na Bró (E)	Straight, Left & Right Turns	14	49.97	0.53
		4	Gort Na Bró (S)	Straight & Left Turn	88	37.72	15
				Right Turn	5	35.85	0.42

Table 7-6 Junction 2 Do Something Results

Results show that, regardless the additional development traffic, the roundabout would perform proximate to capacity during the Interpeak for year 2039.

8 PARKING MANAGEMENT STRATEGY

8.1 RESIDENTIAL CAR PARKING PROVISION

The proposed residential car parking is provided across three separate areas. The majority of the car parking serving the residential development is proposed within the unused void space in the Phase 2 Gateway Retail Park basement car park. The remaining car parking is provided at surface level adjacent the Block B apartments and within the podium carpark located between blocks A1 and A2.

Figure 8-1 below illustrates the proposed parking locations within the site with associated pedestrian and vehicular access points.

As outlined in **Section 4.2** previously, the residential parking provision has been determined with reference to the requirements of the '*'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for urban Planning Authorities*" and analysis of CSO data on current car ownership and travel mode shares within small areas with similar accessibility characteristics to that of the subject development site.

Consequently, a car parking ratio of 0.8 spaces per unit has been proposed for the residential aspect of the proposed development. **Table 8-1** summarises the number and location of the car park spaces to be provided.

Use	Location	No. Spaces
Residential Spaces	Block A1/A2 Podium – Podium Car Park	39
	Block B1-B5 Surface Parking	8
	Residential Underground Car Park	135
	TOTAL	182

Table 8-1 Residential Car Parking Allocation Proposal

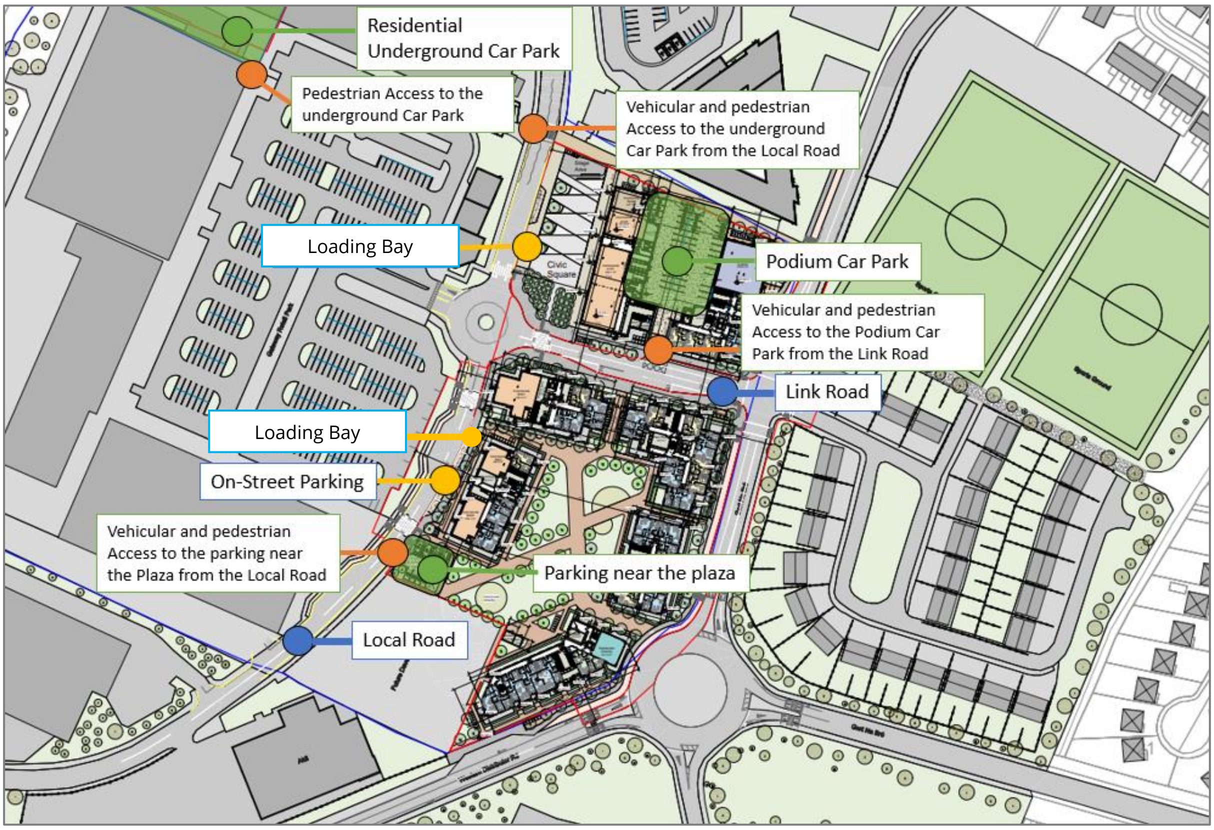


Figure 8-1 Proposed residential parking location and access

8.1.1 Podium Car Park

The Podium carpark is an at grade parking area located between blocks A1 and A2, as illustrated in **Figure 8-2**. 39 No. parking spaces have been allocated within this carpark including 1 no. disabled space and 13 no. EV spaces.

Vehicular access to this carpark is provided off the New Link Road and will be controlled by means of an automated gate/barrier.

The pedestrian access is provided off the Link Road and through the stairwells in Blocks A1 and A2. The disabled users parking space are provided near the entrance to both Block A1 and A2.

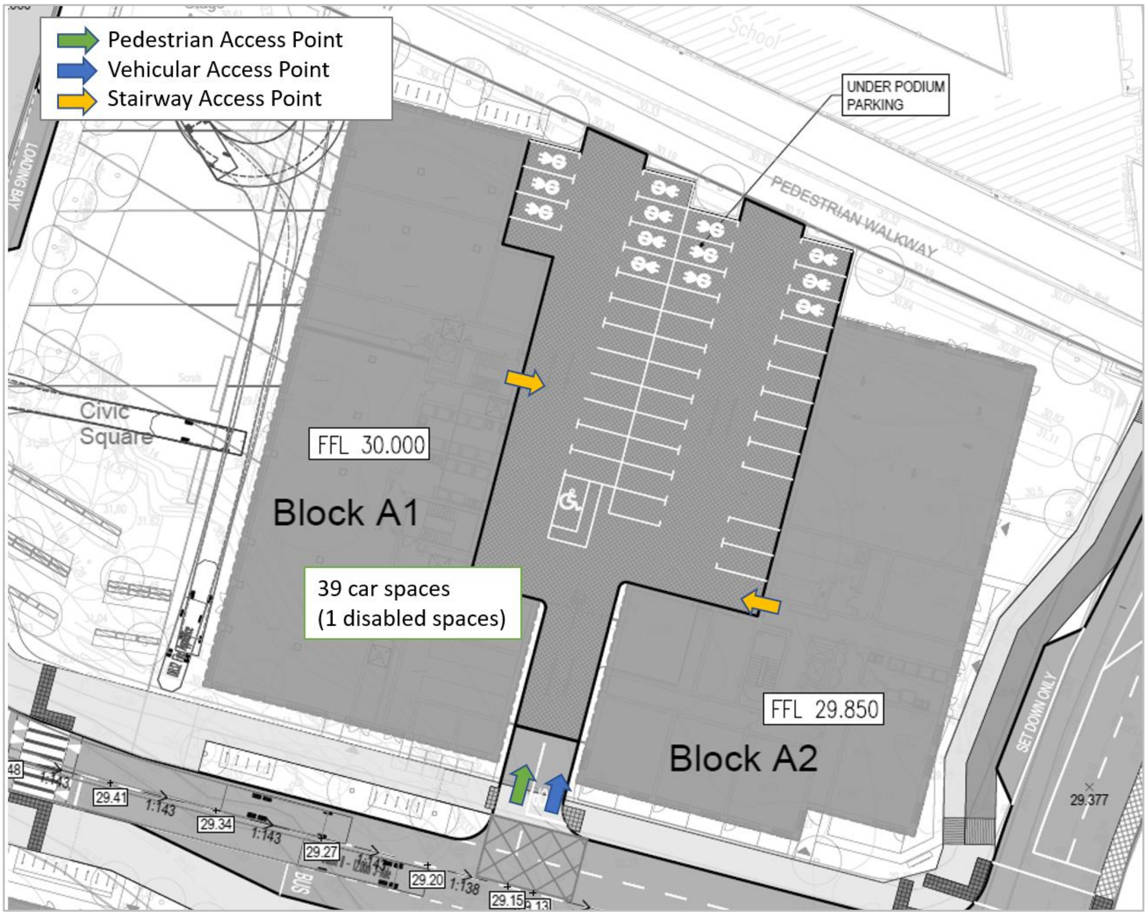


Figure 8-2 Podium Car Park – Access Points

8.1.2 Parking Adjacent Blocks B1 – B5

A surface car park comprising 8 no. spaces will be provided adjacent Blocks B1 – B5. This will be accessed from the Gateway Retail Park Local Road as shown in **Figure 8-3** below. Of the 8 No. parking spaces, 4 no. disabled spaces and 4 no. EV spaces will be provided.

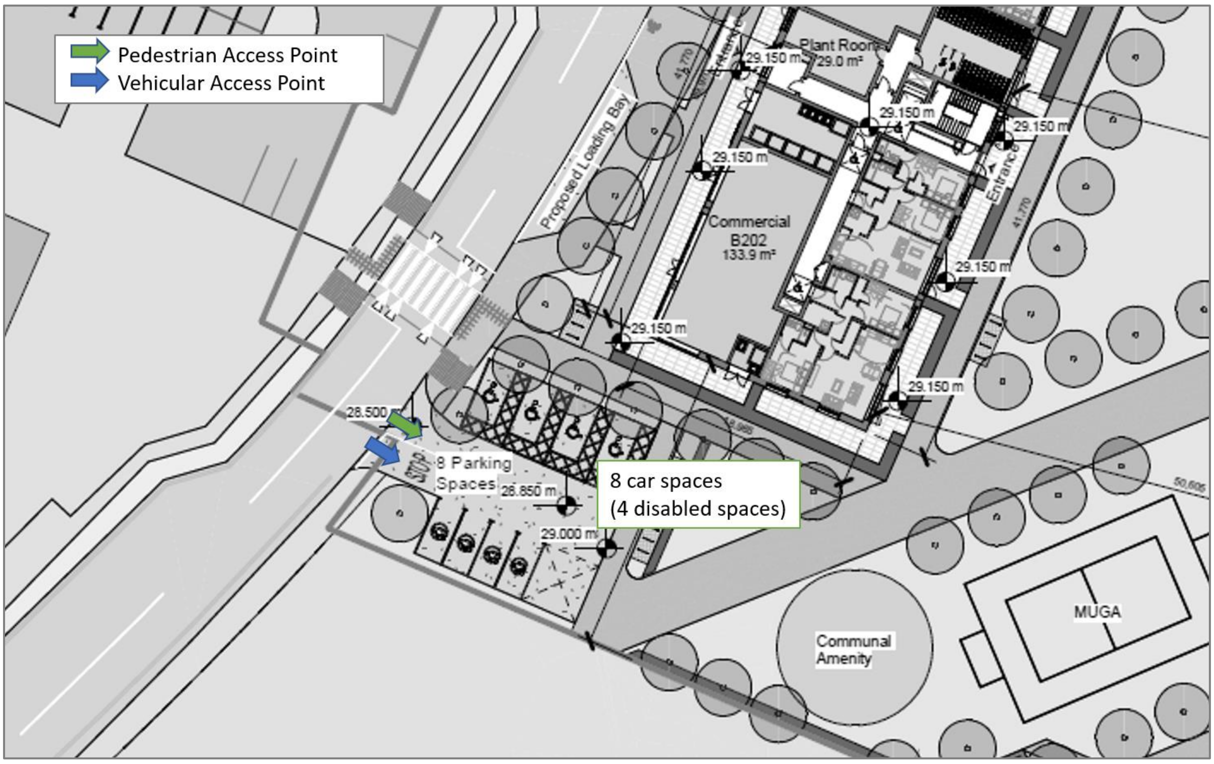


Figure 8-3 Car Park near the Plaza – Access Points

8.1.3 Gateway Retail Park Phase 2 Underground Car Park

The Phase 2 Gateway Retail Park underground car park will accommodate the remainder of the residential car park spaces within the void space comprising 181 no. car parking spaces. The vehicular access to this basement carpark is provided off the Local Road, by means of a two-way ramp, as shown in **Figure 8-4** below.

Figure 8-4 Vehicular Access to the Underground Car Park

Phase 2 service yard entrance is located adjacent to the underground carpark access ramp.

Within the underground carpark the residential parking zone will be delineated using bollards and appropriate signage. Automated fob-controlled barriers will be located at the entry and exit from the residential carpark zone, as shown in **Figure 8.6**.

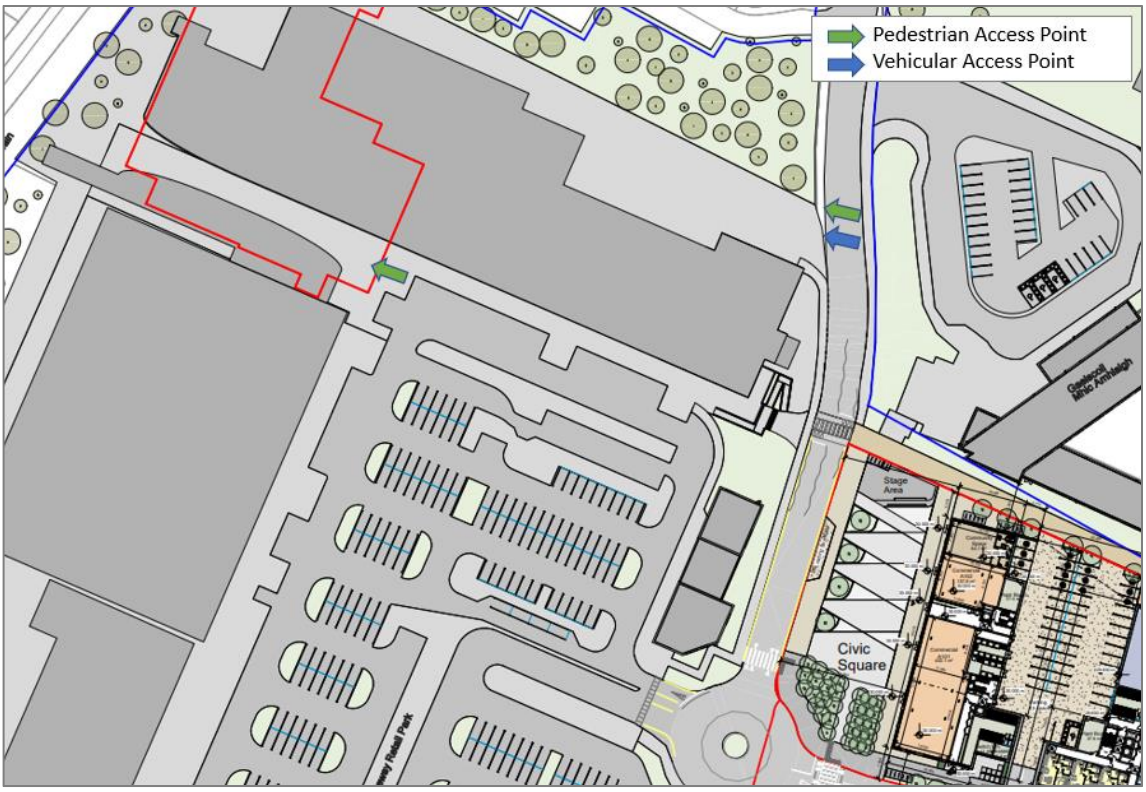


Figure 8-5 Access to the Underground Car Park

Disabled Car Park Spaces

The disabled spaces required is typically 5%. This means that for the 49 no. surface level spaces provided, a total of 3 no. disabled spaces are required for the proposed development. As noted previously, 5 no. disabled spaces are provided in the podium and surface level car parks.

Pedestrian Access

A 1.8m pedestrian walkway will be delineated within the carpark circulatory carriageway connecting the pedestrian points of entry with the residential carpark area. The residents can access the carpark on foot using the pedestrian stairs adjacent to vehicular ramp at the entrance from the Local Road near the school, and also through Stair S2 from the retail carpark, which provides both stair and lift options. The layout of the proposed underground car park area is shown in **Figure 8.6** and also on Reddy **Dwg No. GRP-1-01-SW-L00-DR-RAU-AR-1089**.

The current retail operating hours are 8:30am to 10pm Monday to Saturday and 9am-10pm on Sunday. The appropriate level of lighting and CCTV surveillance will be provided to ensure safety of residents outside of the retail park operating hours, especially during the darkness and night.

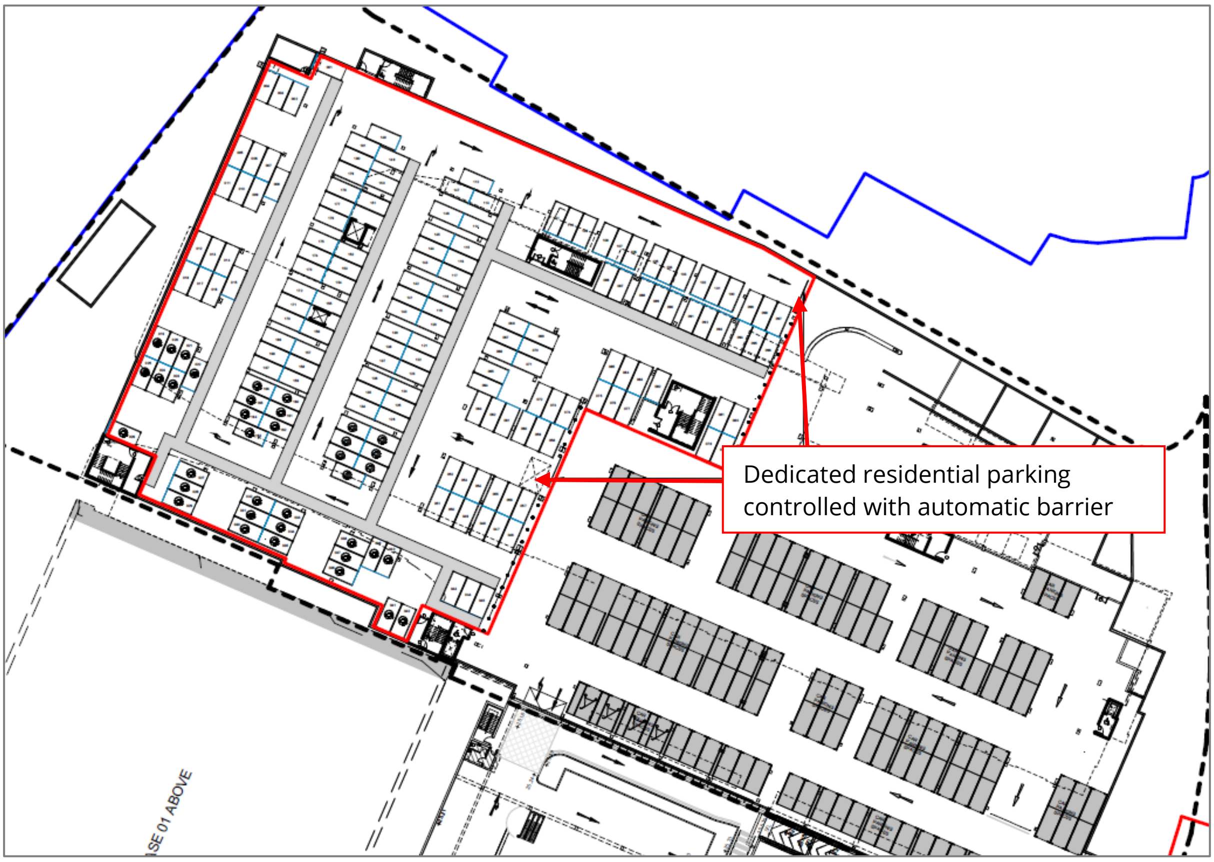


Figure 8-6: Proposed Underground Residential Car Parking Area

8.2 NON-RESIDENTIAL PARKING PROVISION

The proposal includes an additional 2 no. on street car park spaces for non-residential purposes adjacent Block B2, and 2 no. car spaces adjacent to the creche for the drop off activity. A total of 48 no. spaces will be available in the underground basement car park for staff of the retail / creche activity.

9 SUMMARY AND CONCLUSIONS

9.1 SUMMARY

DBFL Consulting Engineers (DBFL) has been commissioned by Glenveagh Properties to undertake a Traffic and Transport Assessment (TTA) for a proposed residential development located in Knocknacarra District Centre, Rahoon, Galway.

The proposed development comprises the provision of a total of 227 apartment units across seven blocks. The development will also include local retail units along with a childcare facility which all within accessible walking distances for local residents.

The purpose of this report was to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of transport impact generated as a result of the proposed residential development.

The on-site car parking allocation has been derived for this development with consideration of both the Galway City Development Plan and the DHPLG 'Sustainable Urban Housing: Design Standards for New Apartments'. Ample cycle parking is proposed along with other initiatives to promote sustainable travel.

The principal findings that can be drawn from this Traffic & Transport Assessment are as follows:

- The subject site is ideally positioned within the urban environment to maximise access to/from the site utilising sustainable forms of travel including walking, cycling and public transport.
- The subject site and the proposals being promoted will deliver a number of benefits for pedestrians and cycles with a network of dedicated, shared and quite street linkages integrating with the off-site network to provide attractive, safe and convenient connections to the Knocknacarra urban environment.
- The subject scheme proposes to provide 230 no. car parking spaces (comprising 182 no. resident spaces equating to a car park ratio of 0.8 spaces per residential unit). The total provision for apartments is less than the maximum required as per the Galway Development Plan and in accordance with the DHPLG guidelines.
- In terms of cycle parking, the proposals provide 550 no. cycle parking spaces for the residential apartments, comprising 114 no. spaces allocated for visitors and 436 no. for

the long stays. It has been noted that this provision exceeds both the GDP and DHPLG requirements.

- The network analysis has demonstrated that the scale of impact predicted to be generated as a result of the potential traffic generated movements from the site access is significantly below the 10% threshold for all junctions assessed. However, as Junctions 1 – 3 are key access to the site, they were also modelled, using PICADY/TRANSYT.
- Results showed low RFC values for Junction 1 and Junction 3, meaning they would perform within capacity. However, Junction 2 (Gort Na Bro Signalised Junction) obtained higher RFC values for the Interpeak in 2039 for the Do-Minimum scenario. This means the Junction would perform approaching capacity regardless of the proposed development.

9.2 CONCLUSIONS

In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed development will be nominal. This is based on the anticipated levels of traffic generated by the proposed development, the existing and future road infrastructure and the information and analysis summarised in the above report.

DBFL believe that the proposals represent a sustainable and practical approach to development on the subject lands and there are no significant traffic or transportation related reasons that should prevent the granting of planning permission for the proposed development.

Appendix A : Public Transport Capacity Assessment

Registered Office
Ormond House
Upper Ormond Quay
Dublin 7 Ireland
D07 W704

+ 353 1 400 4000
info@dbfl.ie
www.dbfl.ie

Cork Office
14 South Mall
Cork Ireland
T12 CT91

+ 353 21 202 4538
info@dbfl.ie
www.dbfl.ie

Galway Office
Odeon House
7 Eyre Square
Galway Ireland
H91 YNC8

+353 91 335599
info@dbfl.ie
www.dbfl.ie

Waterford Office
Suite 8b The Atrium
Maritana Gate Canada Street
Waterford Ireland
X91 W028

+ 353 51 309 500
info@dbfl.ie
www.dbfl.ie

TECHNICAL NOTE 180191-DBFL-TN-001

Subject:	Public Transport Capacity Assessment	**Produced by:**	EC
Project:	Knocknacarra District Centre LRD	**Checked by:**	AD
Job No:	180191	**Date:**	29 November 2022

1. INTRODUCTION

This Technical Note (TN) comprises the assessment of current & future bus capacity within the vicinity of the proposed residential development located in Knocknacarra District Centre, Rahoon, Galway.

It should be remembered that bus service providers are commercial in nature, running their businesses based on current demand rather than medium to longer term future demand. In simple terms, bus services are provided based on actual existing footfall rather than potential future demand. If there is an increased demand for services with full or over-capacity services, operators then generally react to improve facilities if it makes commercial sense to do so. More customers mean more revenue generated by the services.

Notwithstanding the above, the purpose of this assessment is to review the potential impact of the development upon the existing and future bus services in the vicinity of the site. The analysis of the existing and future services is based on an assessment methodology which includes trip generation assessment, modal split assumptions, and assignment/distribution. These assumptions have been based on real data extracted from the Central Statistics Office (CSO) 2016 Small Area Map Data, available through the SAP online mapping tool. This data was used to quantify the anticipated demand for services as a result of the proposed development locally, based fully on adjacent CSO Statistical Small Areas.

The first step was to review the current public transport services. The bus stops within an easy walking distance of the subject site were identified, with the current bus services, frequency and capacity studied and assessed.

This assessment focuses on the peak AM and PM commuter periods for the development – this represents the period of highest demand on the network consistent with the TII Traffic & Transport Assessment Guidelines (May 2014).

2. EXISTING BUS LOCATIONS AND SERVICES

For commuting, a walking distance to / from Bus Stops of up to 1km is generally considered to be acceptable. For the purposes of this assessment, it is assumed an 8-10min walk time as being appropriate, reflecting a distance of 700-1,000m depending on speed of walking.

The subject site is well served in terms of public transport provision. It is adjacent several bus routes with one bus stop currently located on the Link Road which connects the Gateway Retail Park and the Gort Na Bró roundabout. **Figure 2-1** below illustrates the existing bus routes and stops in the vicinity of the proposed development and a 10-minute walking catchment from the site.

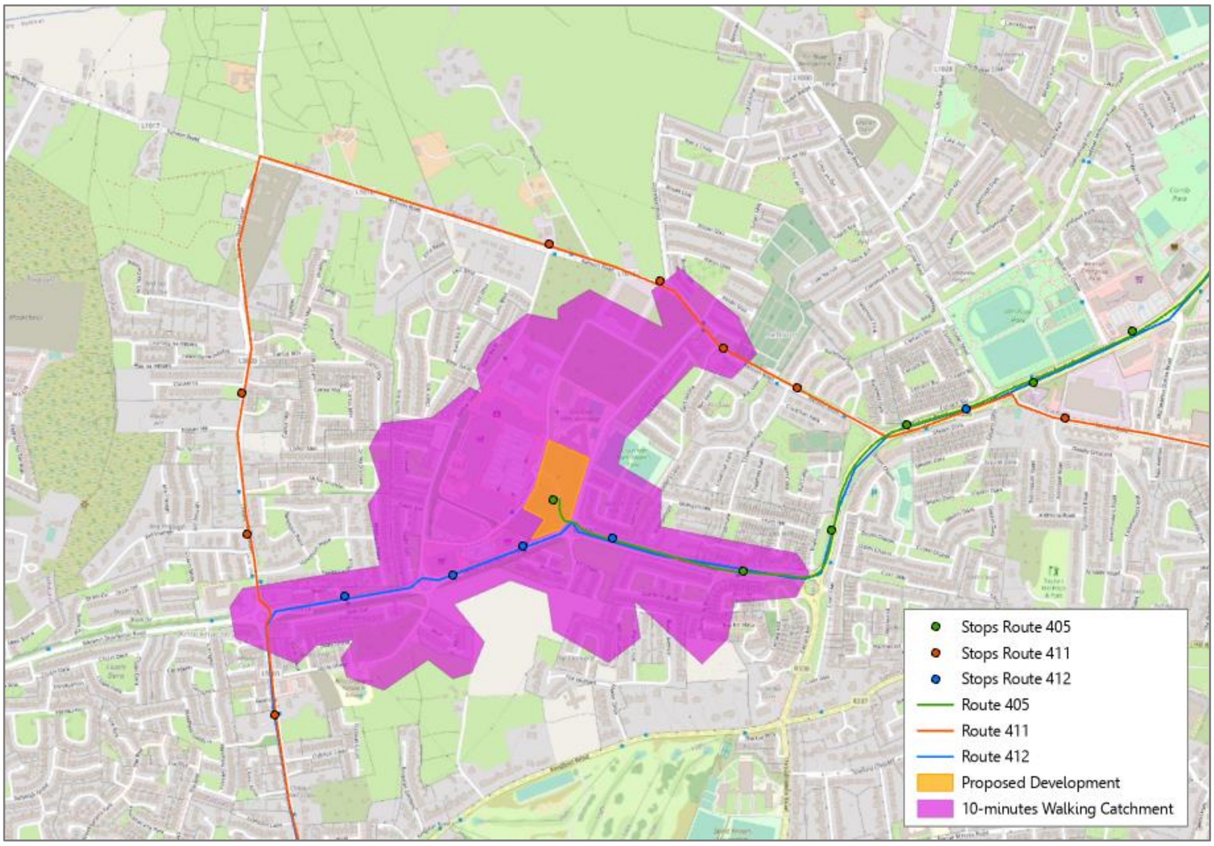


Figure 2-1 Existing Bus Routes and Stops adjacent to the proposed development

The key routes for the site are the 405, 412 and 411 and whose stops are within a 10-minute catchment. **Table 2-1** below provides the operator and frequencies of the above-named bus routes.

Bus Service	Route No.	Destination	No. Services		
			Mon – Fri	Sat	Sun
Bus Eireann	405	Ballybane - Eyre Square – Rahoon	45	41	24
		Rahoon – Eyre Square - Ballybane	45	41	24
City Direct	412	Cappagh Rd. – Eyre Square	20	-	-
		Eyre Square - Cappagh Rd.	21	-	-
City Direct	411	Cappagh Rd. – Eyre Square	31	25	18
		Eyre Square - Cappagh Rd.	30	25	18

Table 2-1 Bus Services adjacent to the proposed development

Route no. 405

Bus route no. 405 commences in the bus stop currently located on the Link Road which connects the Gateway Retail Park and the Gort Na Bró roundabout. The proposed development includes the replacement of this current bus stop and will allow buses to perform a U-turn at the existing Gateway Retail Park roundabout. The proposed location of the relocated bus stops is illustrated in **Figure 2-2**.

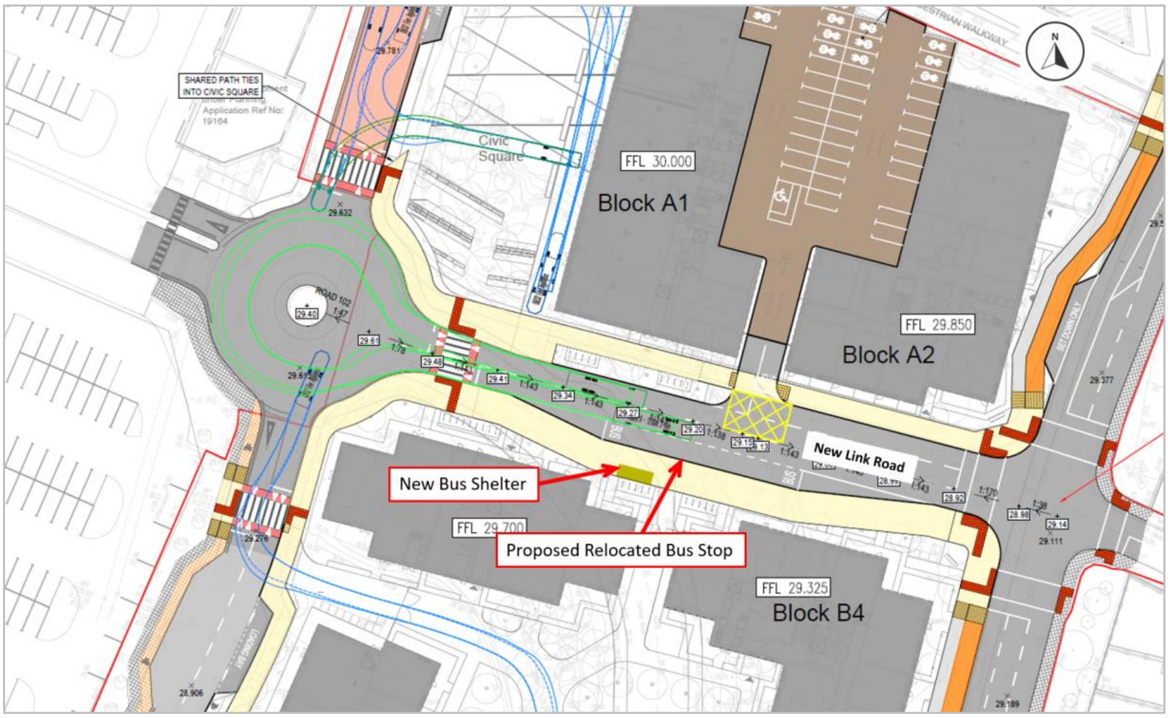


Figure 2-2 Proposed Location of Relocated Bus Stop

Bus Route no. 405 provides a two-way connection of the proposed development to Eye square, Ballybane and Ballybrit Industrial Estate via Gort Na Bro, Seamus Quirke Road, Lower Newcastle Rd, University Rd, St. Francis Rd, Prospect Hill, Bohermore, Tuam Rd, Connolly Avenue, Saint James Road, and Ballybane Rd.

This route, operated by Bus Eireann, provides services from Mondays to Fridays commencing at 06:35 from the bus stop located on the Link Road till 23:40, with a frequency of 20 minutes during all day except from 19:00 onwards with a frequency of 40 minutes. On Saturdays, the first service starts at 08:00 and operates till 23:40 with a frequency of 20 minutes during all day and 40 minutes from 19:40 onwards. On Sundays, the first service starts at 08:00 and operates till 23:20 with a frequency of 20 minutes during all day.

Bus route no. 412

The proposed development is within a 10-minute walking catchment of several bus stops of the route 412 located in Western Distributor Rd. The closest to the proposed development is called Gort Na Bro-Western Distributor Rd.

This route connects Cappagh Rd with Eyre Square via Western Distributor Road, Ballymoonen Rd, Shangort Rd, Clybaun Road Lower, Western Distributor Road, Bishop O'Donnell Rd, Seamus Quirke Road, Lower Newcastle Rd, University Rd, St. Francis Rd, Eglinton Street and Williamsgate Street.

Operated by City Direct, this route provides services only from Mondays to Fridays, commencing at 07:30 till 17:00, with a frequency of 30 minutes during all day.

Bus route no. 411

The proposed development is within a 10-minute walking catchment of the route no. 411 bus stop located in Rahoon Road, adjacent/opposite to the cemetery.

This route connects Cappagh Rd with Eyre Square via Western Distributor Road, Ballymoonen Rd, Shangort Rd, Clybaun Road Lower, Clybaun Road Upper, Rahoon Rd, Seamus Quirke Road, Lower Newcastle Rd, University Rd, St. Francis Rd and Eglinton Street.

Operated by City Direct, this route provides service from Mondays to Fridays from 07:00 till 23:00 with a frequency of 30 minutes. During Saturdays, from 08:00 to 21:00 with a frequency of 30 minutes. For Sundays, from 11:30 to 21:00 with a frequency of 30 minutes.

3. EXISTING BUS CAPACITY

The existing capacity on the local public transport network has been determined based on (i) frequency of services (i.e. timetabled services) and (ii) type / size of vehicle.

3.1. Frequency of the services

It is widely accepted in the industry that the periods of maximum demand generated upon the public transport networks on a typical weekday are focused upon the AM (06:00-10:00) and PM (16:00-20:00) periods as predominantly influenced by travel to work, school, and college patterns at any given location.

The no. of services passing by the stops identified as closest to the proposed development for each route for the AM and PM period is summarised in **Table 3-1** below.

Route No.	Bus Service	Destination	AM Peak (06:00 – 10:00)	PM Peak (16.00 – 20.00)
405	Bus Eireann	Ballybane - Eyre Square – Rahoon	8	12
		Rahoon – Eyre Square - Ballybane	11	10
412	City Direct	Cappagh Rd. – Eyre Square	5	3
		Eyre Square - Cappagh Rd.	5	4
411	City Direct	Cappagh Rd. – Eyre Square	5	7
		Eyre Square - Cappagh Rd.	5	8
Total no. Services			**39**	**44**

Table 3-1 No. Services of each route during the AM and PM peak

3.2. Type/size of vehicles

Table 3-2 below summarises the type of bus and its capacity of each bus route.

Route No.	Bus Service	Type	Capacity
405	Bus Eireann	Double decker	95
412	City Direct	Double decker	95
411	City Direct	Single decker	37

Table 3-2 Bus Routes Capacity

3.3. Existing Bus Capacity

Table 3-3 below provides a summary of the bus capacity during the identified peak public transport patronage times (i.e. AM 06:00-10:00 & PM 16:00-20:00). The existing bus capacity analysis reveals that, during peak travel periods, the existing bus services have the capacity to accommodate up to 3,125 no. passengers in the AM peak period and 3,595 no. passengers in the PM peak period.

Route No.	Bus Service	Destination	AM Peak (06:00 – 10:00)		PM Peak (16.00 – 20.00)	
			Services	Capacity	Services	Capacity
405	Bus Eireann	Ballybane - Eyre Square – Rahoon	8	760	12	1140
		Rahoon – Eyre Square - Ballybane	11	1045	10	950
412	City Direct	Cappagh Rd. – Eyre Square	5	475	3	475
		Eyre Square - Cappagh Rd.	5	475	4	475
411	City Direct	Cappagh Rd. – Eyre Square	5	185	7	259
		Eyre Square - Cappagh Rd.	5	185	8	296
Total no. Services & Capacity			**39**	**3125**	**44**	**3595**

Table 3-3 Total Bus Capacity during the AM and PM peak

4. PROPOSED DEVELOPMENT BUS DEMAND

The Central Statistics Office's SAPMAP (Small Areas Population Map) data has been investigated to determine the travel trends within the local vicinity of the subject residential development.

A number of small areas close to the subject site with similar characteristics were analysed to establish current commuter trends in the local area. This analysis will form the basis of the initial travel characteristics that could be generated by the proposed development.

Within the vicinity of the proposed development, there are several existing apartment blocks which are considered reflective of the type of development proposed in terms of accessibility to sustainable modes. Therefore, an analysis was undertaken comparing travel patterns and car ownership levels for those areas similar to that of the proposed development. **Figure 4.1** below illustrates the two small areas assessed, which codes are as follows;

- 1 – SAP Reference: 068003055 – Altan Apartments.
- 2 – SAP Reference: 068003028 – Bun Caise Apartments.

Figure 4-1 Apartments buildings utilised for the review

The same two Census Small Areas were assessed to identify the modal split within the subject area. The assessment reveals that walking has a share of 22% and bicycle 8%, which makes 30% of the modal share for the active modes, whilst vehicular traffic has a share of 58%, including as car driver and passenger, motorcycles and vans.

All commuting journeys made by Public Transport within the assessed areas represent a modal share of 10%. Working from Home represents a low share of 1%, although given the changes that have occurred in recent times due to the Covid-19 pandemic, this value might now be currently slightly higher.

However, for robustness of the analysis and the consideration of the most conservative scenario, these mode share will be assumed. **Figure 4-2** below shows the modal split for commuters of the CSO small areas considered in the analysis.

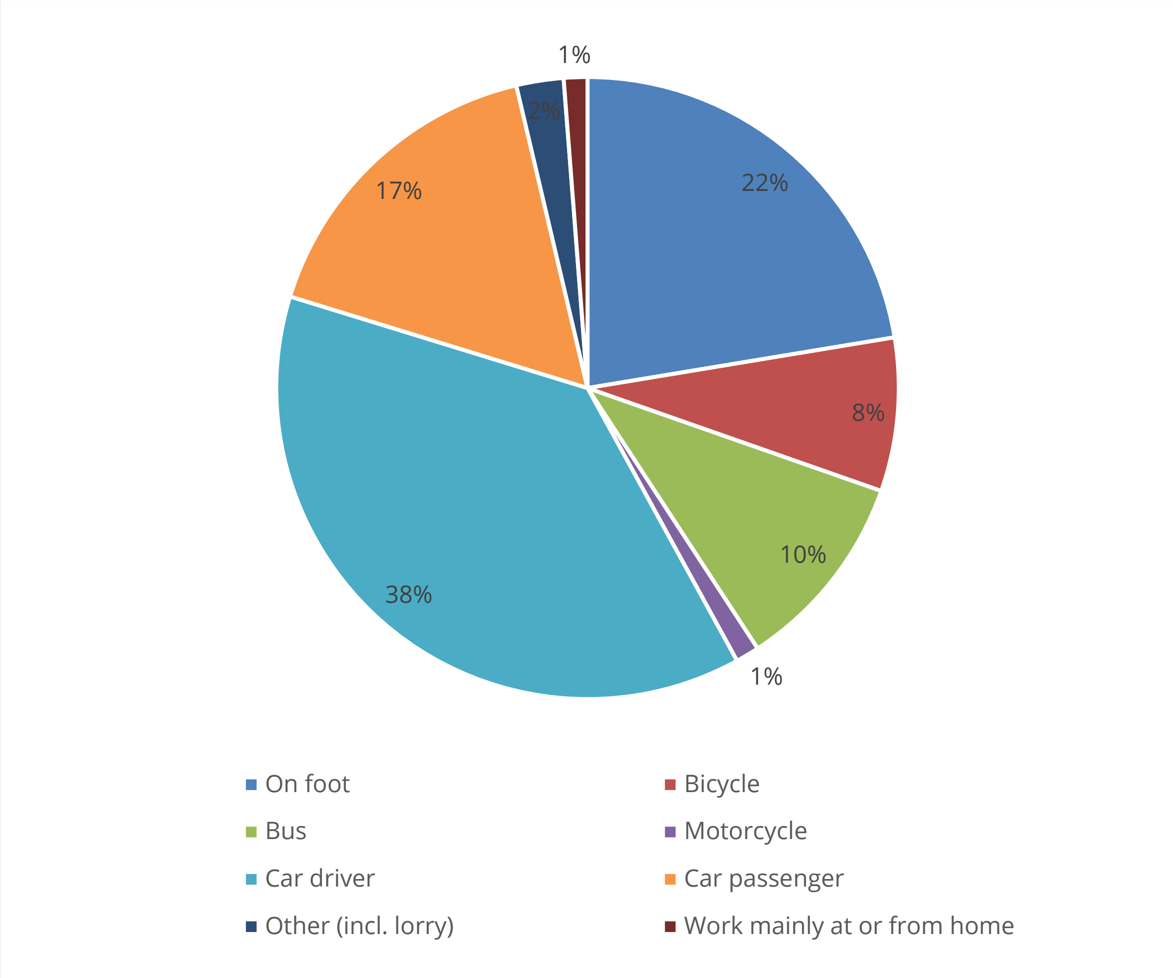


Figure 4-2 Modal Splits for Comparable Sites (Source: CSO SAPMAP)

To determine the number of additional commuters by bus, the percentage of commuters within the total populations of the two Small Areas were also considered. **Table 4.1** shows an average of 64% commuters of the total population of the two Small Areas.

Small Area	Population	Computers	% Commuters
1	262	163	62%
2	242	159	66%
Average			**64%**

Table 4-1 Percentage of commuters of the total population

This percentage was applied to the no. residents of the proposed Gateway Phase 3 residential development (744 no. based on bedspaces), that led to a figure of 476 no. commuters. Applying the modal share for the bus observed in similar areas (10%), a demand for approximately 50 seats on bus services during the AM and PM peak periods was determined. This is summarised in **Table 4-2** below.

Proposed Development	
No. Residents (Bedspaces)	744
Commuter Residents	476
% Modal Share for Bus	10%
Additional Bus Commuters	**50**

Table 4-2 Additional commuters due to the proposed development

4.1. Impact

In reference to the Public Transport Capacity outlined in **Table 3-3**, and the generated demand by the Proposed Development on Public Transport summarised in **Table 4-2** establishes that the additional bus trips that the proposed development is predicted to generate amounts to 2% and 1% of the total bus transport network capacity available during the AM (06:00-10:00) and PM (16:00-20:00) peak periods respectively. This impact is shown in **Table 4-3** below.

Impact	AM	PM
Current Capacity	3125	3595
Additional Bus Commuters	50	50
% Impact	**2%**	**1%**

Table 4-3 Impact on Existing Public Transport

5. CONCLUSIONS

The analysis of the existing bus services has been undertaken based on an assessment methodology which includes trip generation assessment, modal split assumptions, and assignment/distribution. These assumptions have been based on real data extracted from CSO 2016 Small Area Map Data. This data was used to quantify the anticipated demand for bus services as a result of the proposed development in this particular location, utilising current local modal shift patterns & statistics.

This Technical Note sets out the details of current bus services and bus capacity serving the site and the local area. The assessment confirms that the completion and full occupation of the development is anticipated to result in an increased demand for bus seats, with an additional 50 no. bus users during the weekday AM Commuter Peak (06:00 to 10:00) and PM Commuter Peak (16:00 to 20:00). The additional demand on the bus routes created by the proposed development for all routes is therefore 2% of the AM available capacity and 1% of the PM available capacity.

In conclusion the additional demand for bus services as a result of the proposed development can be accommodated on the existing services in the area without any noticeable effect. The analysis is based on 2016 CSO travel patterns, and whilst the development seeks to encourage modal shift, given the relatively small increase in predicted bus demand, any possible future changes in demand due to increased modal shift (walking, cycling, increased working from home and public transport etc) will still have only a negligible impact on bus capacity.

Whilst this Technical Note contains an assessment of current capacity, it should be remembered that service providers are commercial in nature, running their businesses based on existing demand, rather than medium to longer term future demand. Bus services are provided based on real demand rather than potential demand. If there is an increased demand for services, or indeed if there is a deficit in a service provision, Operators generally react to improve facilities if it makes commercial sense to do so. More customers means more revenue generated.

The proposed BusConnects Galway: Cross-City Link is one of the major projects identified for Galway City as part of the Galway Transport Strategy (GTS). The GTS sets out the short, medium, and long-term strategy for the implementation of an integrated transport system including walking, cycling and public transport and will further enhance service provision in the area in the future.

Appendix B : TRICS

Calculation Reference: AUDIT-638801-221114-1110

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 01 - RETAIL
Category : K - RETAIL PARK - EXCLUDING FOOD

TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	BO	BEDFORD	1 days
03	**SOUTH WEST**		
	DV	DEVON	1 days
	TB	TORBAY	1 days
04	**EAST ANGLIA**		
	NF	NORFOLK	1 days
06	**WEST MIDLANDS**		
	WM	WEST MIDLANDS	1 days
	WO	WORCESTERSHIRE	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	NE	NORTH EAST LINCOLNSHIRE	1 days
	SY	SOUTH YORKSHIRE	1 days
08	**NORTH WEST**		
	GM	GREATER MANCHESTER	2 days
09	**NORTH**		
	TW	TYNE & WEAR	2 days
10	**WALES**		
	CE	CEREDIGION	1 days
	CF	CARDIFF	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 1968 to 19170 (units: sqm)
Range Selected by User: 1968 to 20000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/14 to 08/05/21

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:

Thursday	1 days
Saturday	13 days
Sunday	1 days

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

Selected survey types:

Manual count	15 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:

Edge of Town Centre	2
Suburban Area (PPS6 Out of Centre)	5
Edge of Town	8

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

Calculation Reference: AUDIT-638801-221114-1112

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : C - FLATS PRIVATELY OWNED

TOTAL VEHICLES

Selected regions and areas:

02	**SOUTH EAST**		
	BH	BRIGHTON & HOVE	1 days
	CT	CENTRAL BEDFORDSHIRE	3 days
	HF	HERTFORDSHIRE	1 days
	PO	PORTSMOUTH	1 days
04	**EAST ANGLIA**		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	3 days
05	**EAST MIDLANDS**		
	NG	NOTTINGHAM	2 days
06	**WEST MIDLANDS**		
	WM	WEST MIDLANDS	1 days
07	**YORKSHIRE & NORTH LINCOLNSHIRE**		
	SY	SOUTH YORKSHIRE	1 days
08	**NORTH WEST**		
	MS	MERSEYSIDE	1 days
11	**SCOTLAND**		
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	2 days
13	**MUNSTER**		
	WA	WATERFORD	1 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	2 days

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

Primary Filtering selection:

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

Parameter: No of Dwellings
Actual Range: 51 to 332 (units:)
Range Selected by User: 50 to 372 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/14 to 23/06/21

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

Selected survey days:

Monday	2 days
Tuesday	11 days
Wednesday	5 days
Thursday	3 days
Friday	2 days

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

Selected survey types:

Manual count	23 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.

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

Selected Location Sub Categories:

Development Zone	2
Residential Zone	11
Built-Up Zone	5
No Sub Category	5

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	23 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 500m Range:
All Surveys Included
Population within 1 mile:

1,001 to 5,000	3 days
5,001 to 10,000	1 days
10,001 to 15,000	3 days
15,001 to 20,000	1 days
20,001 to 25,000	2 days
25,001 to 50,000	11 days
50,001 to 100,000	2 days

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

Population within 5 miles:

50,001 to 75,000	7 days
75,001 to 100,000	1 days
125,001 to 250,000	6 days
250,001 to 500,000	6 days
500,001 or More	3 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	12 days
1.1 to 1.5	10 days
1.6 to 2.0	1 days

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

Travel Plan:

Yes	2 days
No	21 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	23 days

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

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

LIST OF SITES relevant to selection parameters

1	**BH-03-C-01**	**BLOCK OF FLATS**		**BRIGHTON & HOVE**	
	OLD SHOREHAM RD				
	BRIGHTON				
	HOVE				
	Suburban Area (PPS6 Out of Centre)				
	Residential Zone				
	Total No of Dwellings:		71		
	Survey date: TUESDAY		*26/09/17*	*Survey Type: MANUAL*	
2	**CA-03-C-03**	**BLOCKS OF FLATS**		**CAMBRIDGESHIRE**	
	CROMWELL ROAD				
	CAMBRIDGE				
	Suburban Area (PPS6 Out of Centre)				
	No Sub Category				
	Total No of Dwellings:		82		
	Survey date: MONDAY		*18/09/17*	*Survey Type: MANUAL*	
3	**CT-03-C-01**	**BLOCKS OF FLATS**		**CENTRAL BEDFORDSHIRE**	
	WING ROAD				
	LEIGHTON BUZZARD				
	LINSLADE				
	Edge of Town Centre				
	Residential Zone				
	Total No of Dwellings:		175		
	Survey date: TUESDAY		*15/05/18*	*Survey Type: MANUAL*	
4	**CT-03-C-02**	**BLOCKS OF FLATS**		**CENTRAL BEDFORDSHIRE**	
	STANBRIDGE ROAD				
	LEIGHTON BUZZARD				
	Edge of Town Centre				
	Residential Zone				
	Total No of Dwellings:		62		
	Survey date: TUESDAY		*15/05/18*	*Survey Type: MANUAL*	
5	**CT-03-C-03**	**BLOCKS OF FLATS**		**CENTRAL BEDFORDSHIRE**	
	COURT DRIVE				
	DUNSTABLE				
	Edge of Town Centre				
	No Sub Category				
	Total No of Dwellings:		146		
	Survey date: TUESDAY		*15/05/18*	*Survey Type: MANUAL*	
6	**DL-03-C-17**	**BLOCKS OF FLATS**		**DUBLIN**	
	FINGLAS ROAD				
	DUBLIN				
	FINGLAS				
	Suburban Area (PPS6 Out of Centre)				
	Residential Zone				
	Total No of Dwellings:		332		
	Survey date: FRIDAY		*23/10/20*	*Survey Type: MANUAL*	
7	**DL-03-C-18**	**BLOCKS OF FLATS**		**DUBLIN**	
	HAROLD'S CROSS ROAD				
	DUBLIN				
	Suburban Area (PPS6 Out of Centre)				
	Residential Zone				
	Total No of Dwellings:		102		
	Survey date: WEDNESDAY		*19/05/21*	*Survey Type: MANUAL*	

LIST OF SITES relevant to selection parameters (Cont.)

8 **HF-03-C-03** **BLOCK OF FLATS** **HERTFORDSHIRE**
SHENLEY ROAD
BOREHAMWOOD

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 91
Survey date: THURSDAY *14/11/19* *Survey Type: MANUAL*

9 **MS-03-C-02** **BLOCKS OF FLATS** **MERSEYSIDE**
SOUTH FERRY QUAY
LIVERPOOL
BRUNSWICK DOCK
Suburban Area (PPS6 Out of Centre)
Development Zone
Total No of Dwellings: 184
Survey date: TUESDAY *13/11/18* *Survey Type: MANUAL*

10 **NF-03-C-01** **BLOCKS OF FLATS** **NORFOLK**
PAGE STAIR LANE
KING'S LYNN

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 51
Survey date: THURSDAY *11/12/14* *Survey Type: MANUAL*

11 **NF-03-C-02** **MIXED FLATS & HOUSES** **NORFOLK**
HALL ROAD
NORWICH
LAKENHAM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 82
Survey date: MONDAY *18/11/19* *Survey Type: MANUAL*

12 **NG-03-C-01** **HOUSES (SPLIT INTO FLATS)** **NOTTINGHAM**
LAWRENCE WAY
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 56
Survey date: TUESDAY *08/11/16* *Survey Type: MANUAL*

13 **NG-03-C-02** **HOUSES (SPLIT INTO FLATS)** **NOTTINGHAM**
CASTLE MARINA ROAD
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 135
Survey date: WEDNESDAY *09/11/16* *Survey Type: MANUAL*

14 **PO-03-C-01** **BLOCKS OF FLATS** **PORTSMOUTH**
CROSS STREET
PORTSMOUTH

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 90
Survey date: TUESDAY *05/06/18* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

15	**SA-03-C-01**	**BLOCK OF FLATS**		**SOUTH AYRSHIRE**
	RACECOURSE ROAD			
	AYR			
	Edge of Town Centre			
	Residential Zone			
	Total No of Dwellings:		51	
	Survey date: TUESDAY		*16/09/14*	*Survey Type: MANUAL*
16	**SF-03-C-01**	**BLOCKS OF FLATS**		**SUFFOLK**
	STATION HILL			
	BURY ST EDMUNDS			
	Edge of Town Centre			
	Built-Up Zone			
	Total No of Dwellings:		85	
	Survey date: THURSDAY		*18/12/14*	*Survey Type: MANUAL*
17	**SF-03-C-04**	**BLOCKS OF FLATS**		**SUFFOLK**
	SAINT MARY'S ROAD			
	IPSWICH			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		56	
	Survey date: WEDNESDAY		*16/09/20*	*Survey Type: MANUAL*
18	**SF-03-C-05**	**BLOCKS OF FLATS**		**SUFFOLK**
	FORE STREET			
	IPSWICH			
	IPSWICH WATERFRONT			
	Edge of Town Centre			
	Development Zone			
	Total No of Dwellings:		69	
	Survey date: WEDNESDAY		*23/06/21*	*Survey Type: MANUAL*
19	**SR-03-C-01**	**FLATS**		**STIRLING**
	FORTHSIDE WAY			
	STIRLING			
	Edge of Town Centre			
	No Sub Category			
	Total No of Dwellings:		80	
	Survey date: WEDNESDAY		*18/06/14*	*Survey Type: MANUAL*
20	**SR-03-C-03**	**BLOCK OF FLATS & TERRACED**		**STIRLING**
	KERSEBONNY ROAD			
	STIRLING			
	CAMBUSBARRON			
	Edge of Town			
	Residential Zone			
	Total No of Dwellings:		82	
	Survey date: TUESDAY		*01/09/20*	*Survey Type: MANUAL*
21	**SY-03-C-01**	**BLOCKS OF FLATS**		**SOUTH YORKSHIRE**
	HEELIS STREET			
	BARNSLEY			
	Edge of Town Centre			
	Built-Up Zone			
	Total No of Dwellings:		112	
	Survey date: TUESDAY		*08/09/20*	*Survey Type: MANUAL*
22	**WA-03-C-01**	**BLOCKS OF FLATS**		**WATERFORD**
	UPPER YELLOW ROAD			
	WATERFORD			
	Suburban Area (PPS6 Out of Centre)			
	Residential Zone			
	Total No of Dwellings:		51	
	Survey date: TUESDAY		*12/05/15*	*Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

23 WM-03-C-04 BLOCKS OF FLATS WEST MIDLANDS
GILLQUART WAY
COVENTRY
PARKSIDE
Edge of Town Centre
Residential Zone
Total No of Dwellings: 55
Survey date: FRIDAY 11/11/16 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/C - FLATS PRIVATELY OWNED

TOTAL 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	23	100	0.039	23	100	0.139	23	100	0.178
08:00 - 09:00	23	100	0.059	**23**	**100**	**0.183**	23	100	0.242
09:00 - 10:00	23	100	0.063	23	100	0.073	23	100	0.136
10:00 - 11:00	23	100	0.060	23	100	0.070	23	100	0.130
11:00 - 12:00	23	100	0.060	23	100	0.079	23	100	0.139
12:00 - 13:00	23	100	0.085	23	100	0.083	23	100	0.168
13:00 - 14:00	23	100	0.070	23	100	0.080	23	100	0.150
14:00 - 15:00	23	100	0.080	23	100	0.077	23	100	0.157
15:00 - 16:00	23	100	0.098	23	100	0.068	23	100	0.166
16:00 - 17:00	23	100	0.118	23	100	0.076	23	100	0.194
17:00 - 18:00	**23**	**100**	**0.163**	23	100	0.087	23	100	0.250
18:00 - 19:00	23	100	0.150	23	100	0.102	**23**	**100**	**0.252**
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.045			1.117			2.162

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:	51 - 332 (units:)
Survey date date range:	01/01/14 - 23/06/21
Number of weekdays (Monday-Friday):	23
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

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:

E(a)	15 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 500m Range:
All Surveys Included

Population within 1 mile:

1,001 to 5,000	1 days
10,001 to 15,000	1 days
15,001 to 20,000	3 days
20,001 to 25,000	4 days
25,001 to 50,000	6 days

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

Population within 5 miles:

5,000 or Less	1 days
25,001 to 50,000	1 days
75,001 to 100,000	1 days
100,001 to 125,000	1 days
125,001 to 250,000	3 days
250,001 to 500,000	5 days
500,001 or More	3 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	10 days
1.1 to 1.5	4 days
1.6 to 2.0	1 days

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

Petrol filling station:

Included in the survey count	0 days
Excluded from count or no filling station	15 days

This data displays the number of surveys within the selected set that include petrol filling station activity, and the number of surveys that do not.

Travel Plan:

No	15 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	15 days

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

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

LIST OF SITES relevant to selection parameters

1	**BO-01-K-01** **RETAIL PARK**		**BEDFORD**	
	RACE MEADOWS WAY			
	BEDFORD			
	KEMPSTON			
	Edge of Town			
	No Sub Category			
	Total Gross floor area:	19000 sqm		
	Survey date: SATURDAY	*17/10/20*	*Survey Type: MANUAL*	
2	**CE-01-K-01** **RETAIL PARK**		**CEREDIGION**	
	FFORDD PARC Y LLYN			
	ABERYSTWYTH			
	Edge of Town			
	No Sub Category			
	Total Gross floor area:	9570 sqm		
	Survey date: SATURDAY	*09/05/15*	*Survey Type: MANUAL*	
3	**CF-01-K-01** **RETAIL PARK**		**CARDIFF**	
	HEOL PONTPRENNAU			
	CARDIFF			
	PONTPRENNAU			
	Edge of Town			
	Residential Zone			
	Total Gross floor area:	1968 sqm		
	Survey date: SATURDAY	*17/03/18*	*Survey Type: MANUAL*	
4	**DL-01-K-03** **RETAIL PARK**		**DUBLIN**	
	OLD NAAS ROAD			
	DUBLIN			
	Suburban Area (PPS6 Out of Centre)			
	No Sub Category			
	Total Gross floor area:	10633 sqm		
	Survey date: SATURDAY	*04/10/14*	*Survey Type: MANUAL*	
5	**DV-01-K-02** **RETAIL PARK**		**DEVON**	
	HELE ROAD			
	TORQUAY			
	Suburban Area (PPS6 Out of Centre)			
	Retail Zone			
	Total Gross floor area:	3752 sqm		
	Survey date: SATURDAY	*30/03/19*	*Survey Type: MANUAL*	
6	**GM-01-K-14** **RETAIL PARK**		**GREATER MANCHESTER**	
	SNIPE WAY			
	ASHTON-UNDER-LYNE			
	Edge of Town			
	Retail Zone			
	Total Gross floor area:	7350 sqm		
	Survey date: THURSDAY	*22/10/15*	*Survey Type: MANUAL*	
7	**GM-01-K-17** **RETAIL PARK**		**GREATER MANCHESTER**	
	MANCHESTER ROAD			
	ALTRINCHAM			
	BROADHEATH			
	Suburban Area (PPS6 Out of Centre)			
	Retail Zone			
	Total Gross floor area:	4600 sqm		
	Survey date: SATURDAY	*08/05/21*	*Survey Type: MANUAL*	

LIST OF SITES relevant to selection parameters (Cont.)

8 **NE-01-K-01** **RETAIL PARK** **NORTH EAST LINCOLNSHIRE**
VICTORIA STREET NORTH
GRIMSBY

Suburban Area (PPS6 Out of Centre)
Built-Up Zone
Total Gross floor area: 4243 sqm
Survey date: SATURDAY 07/06/14 Survey Type: MANUAL

9 **NF-01-K-02** **RETAIL PARK** **NORFOLK**
PASTEUR ROAD
GREAT YARMOUTH

Edge of Town
No Sub Category
Total Gross floor area: 14565 sqm
Survey date: SATURDAY 14/10/17 Survey Type: MANUAL

10 **SY-01-K-01** **RETAIL PARK** **SOUTH YORKSHIRE**
KILNER WAY
SHEFFIELD
BIRLEY CARR
Edge of Town
Residential Zone
Total Gross floor area: 16187 sqm
Survey date: SATURDAY 12/09/20 Survey Type: MANUAL

11 **TB-01-K-01** **DUNELM & FURNITURE VILLAGE** **TORBAY**
AVOCET ROAD
EXETER
SOWTON IND. ESTATE
Edge of Town
Industrial Zone
Total Gross floor area: 2809 sqm
Survey date: SATURDAY 15/07/17 Survey Type: MANUAL

12 **TW-01-K-02** **RETAIL PARK** **TYNE & WEAR**
MIDDLE ENGINE LANE
WALLSEND
WILLINGTON
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 4500 sqm
Survey date: SATURDAY 14/11/15 Survey Type: MANUAL

13 **TW-01-K-03** **RETAIL PARK** **TYNE & WEAR**
BRUNTON WAY
NEWCASTLE UPON TYNE

Edge of Town
Retail Zone
Total Gross floor area: 3600 sqm
Survey date: SUNDAY 12/06/16 Survey Type: MANUAL

14 **WM-01-K-06** **RETAIL PARK** **WEST MIDLANDS**
WARWICK ROAD
COVENTRY

Edge of Town Centre
Built-Up Zone
Total Gross floor area: 12844 sqm
Survey date: SATURDAY 12/11/16 Survey Type: MANUAL

15 **WO-01-K-03** **RETAIL PARK** **WORCESTERSHIRE**
CARPET TRADES WAY
KIDDERMINSTER

Edge of Town Centre
Built-Up Zone
Total Gross floor area: 19170 sqm
Survey date: SATURDAY 10/10/20 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 01 - RETAIL/K - RETAIL PARK - EXCLUDING FOOD

TOTAL VEHICLES

Calculation factor: 100 sqm

BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	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	10	10122	0.191	10	10122	0.077	10	10122	0.268
08:00 - 09:00	15	8986	0.717	15	8986	0.291	15	8986	1.008
09:00 - 10:00	15	8986	1.470	15	8986	0.940	15	8986	2.410
10:00 - 11:00	15	8986	1.994	15	8986	1.556	15	8986	3.550
11:00 - 12:00	15	8986	2.359	15	8986	2.032	15	8986	4.391
12:00 - 13:00	**15**	**8986**	**2.418**	15	8986	2.248	15	8986	4.666
13:00 - 14:00	15	8986	2.385	15	8986	2.346	**15**	**8986**	**4.731**
14:00 - 15:00	15	8986	2.363	15	8986	2.368	15	8986	4.731
15:00 - 16:00	15	8986	2.314	**15**	**8986**	**2.379**	15	8986	4.693
16:00 - 17:00	15	8986	1.651	15	8986	2.275	15	8986	3.926
17:00 - 18:00	15	8986	1.191	15	8986	1.683	15	8986	2.874
18:00 - 19:00	14	9371	0.620	14	9371	1.085	14	9371	1.705
19:00 - 20:00	12	10345	0.306	12	10345	0.574	12	10345	0.880
20:00 - 21:00	11	9558	0.078	11	9558	0.210	11	9558	0.288
21:00 - 22:00	10	9779	0.028	10	9779	0.092	10	9779	0.120
22:00 - 23:00	1	3752	0.027	1	3752	0.027	1	3752	0.054
23:00 - 24:00	1	3752	0.000	1	3752	0.080	1	3752	0.080
Total Rates:			20.112			20.263			40.375

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.

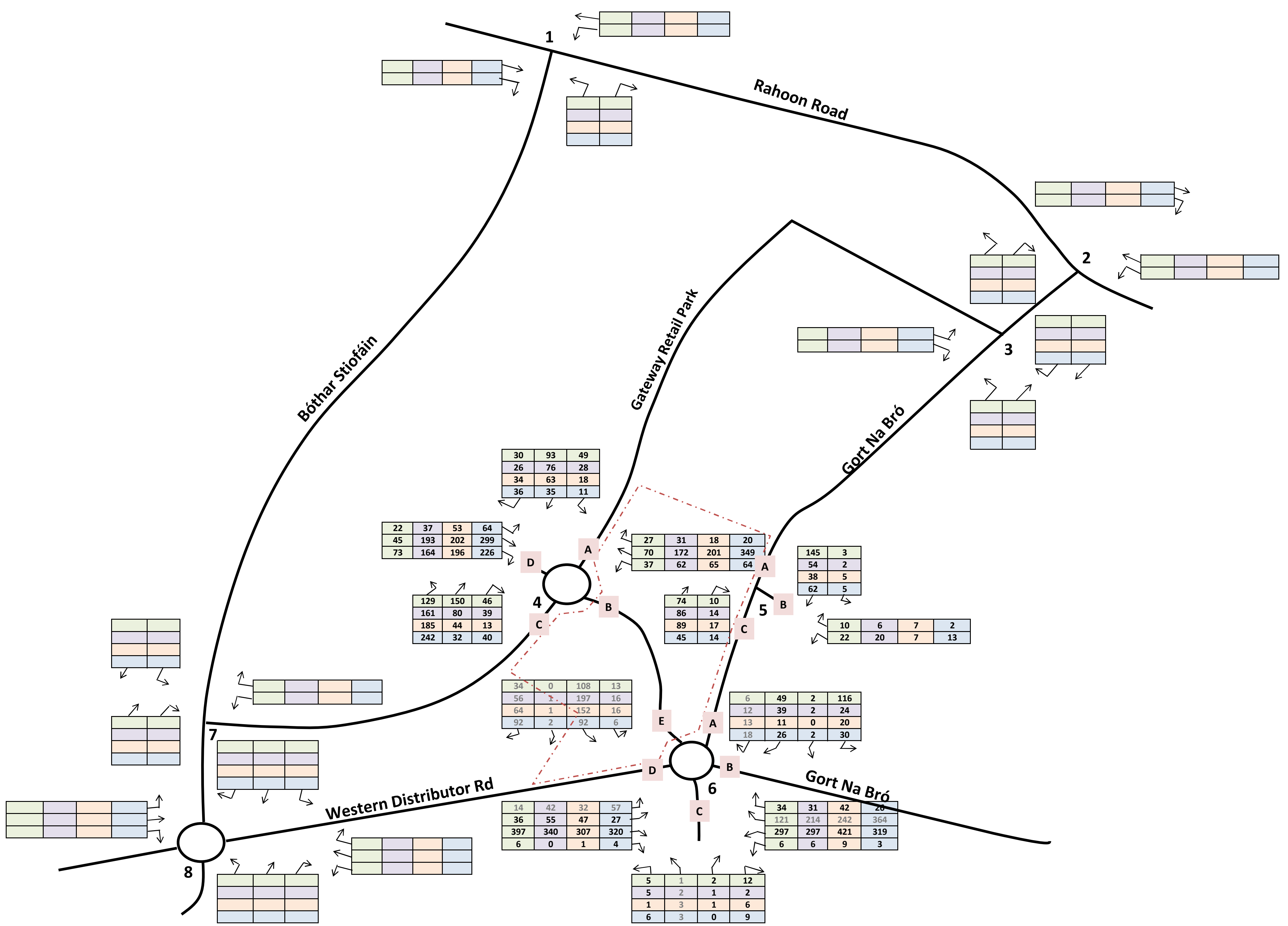
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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:	1968 - 19170 (units: sqm)
Survey date date range:	01/01/14 - 08/05/21
Number of weekdays (Monday-Friday):	1
Number of Saturdays:	13
Number of Sundays:	1
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

Appendix C : Traffic Flow Diagrams



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:
Knocknacarra District Centre, Galway

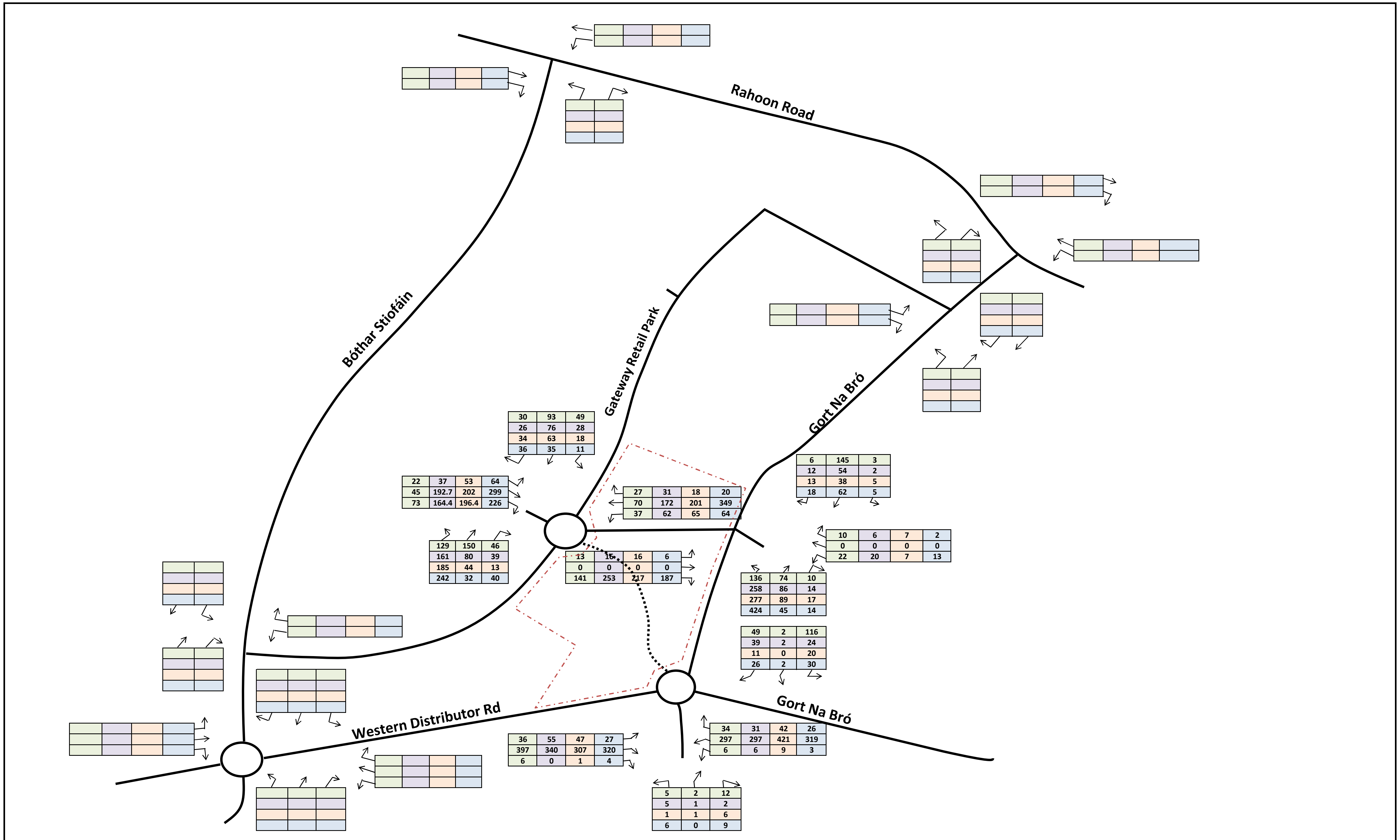
Drawing Title :
Baseline Traffic Flow 2022 - Current Layout

Key:
AM Peak Hour (08:15 - 09:15)
Interpeak (13:45 - 14:45)
PM Peak Hour (16:45-17:45)
Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
1	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000
Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500
Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:

Knocknacarra District Centre, Galway

Drawing Title :

Baseline Traffic Flow 2022 - Proposed Layout

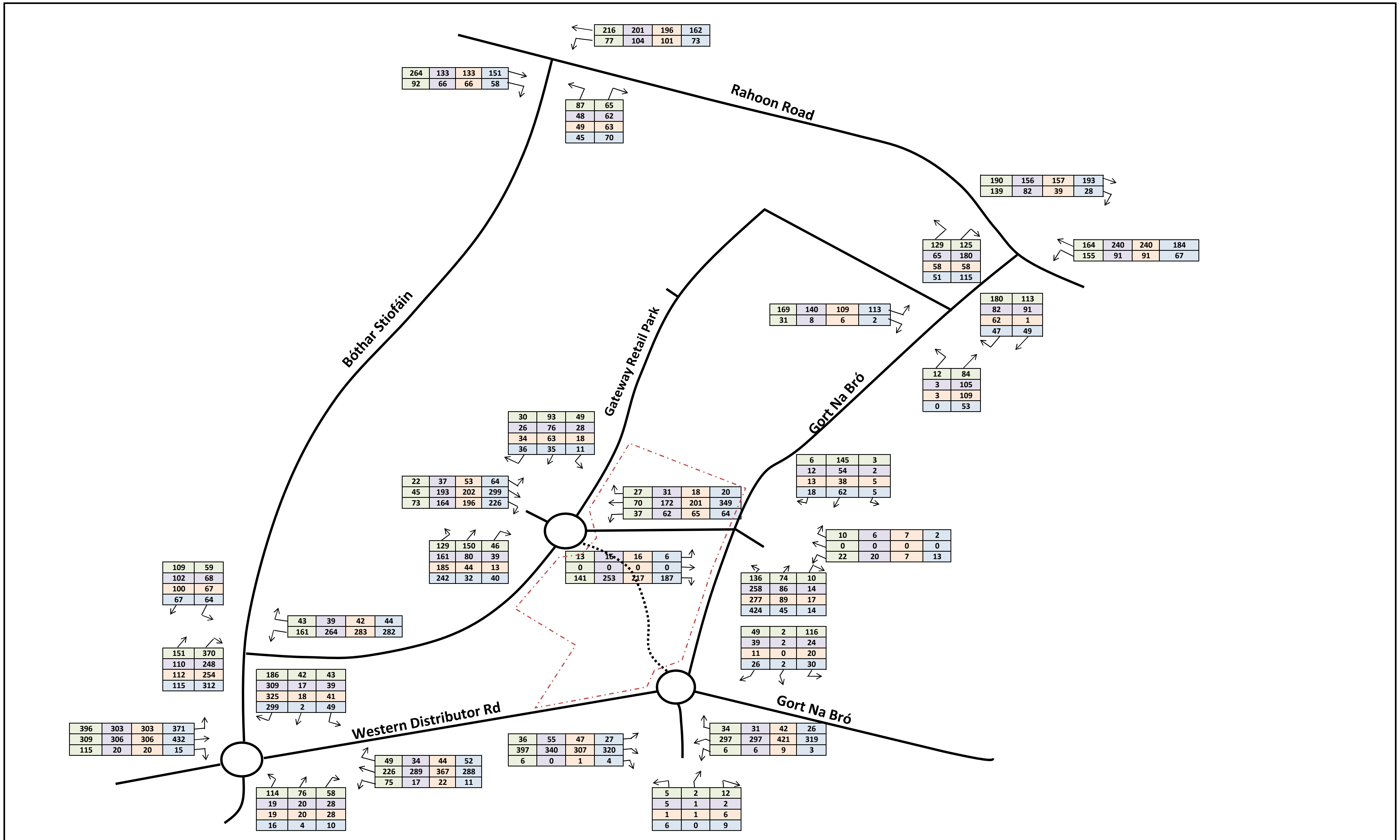
Key:

- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45 - 14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
2	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000
Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500
Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:
Knocknacarra District Centre, Galway

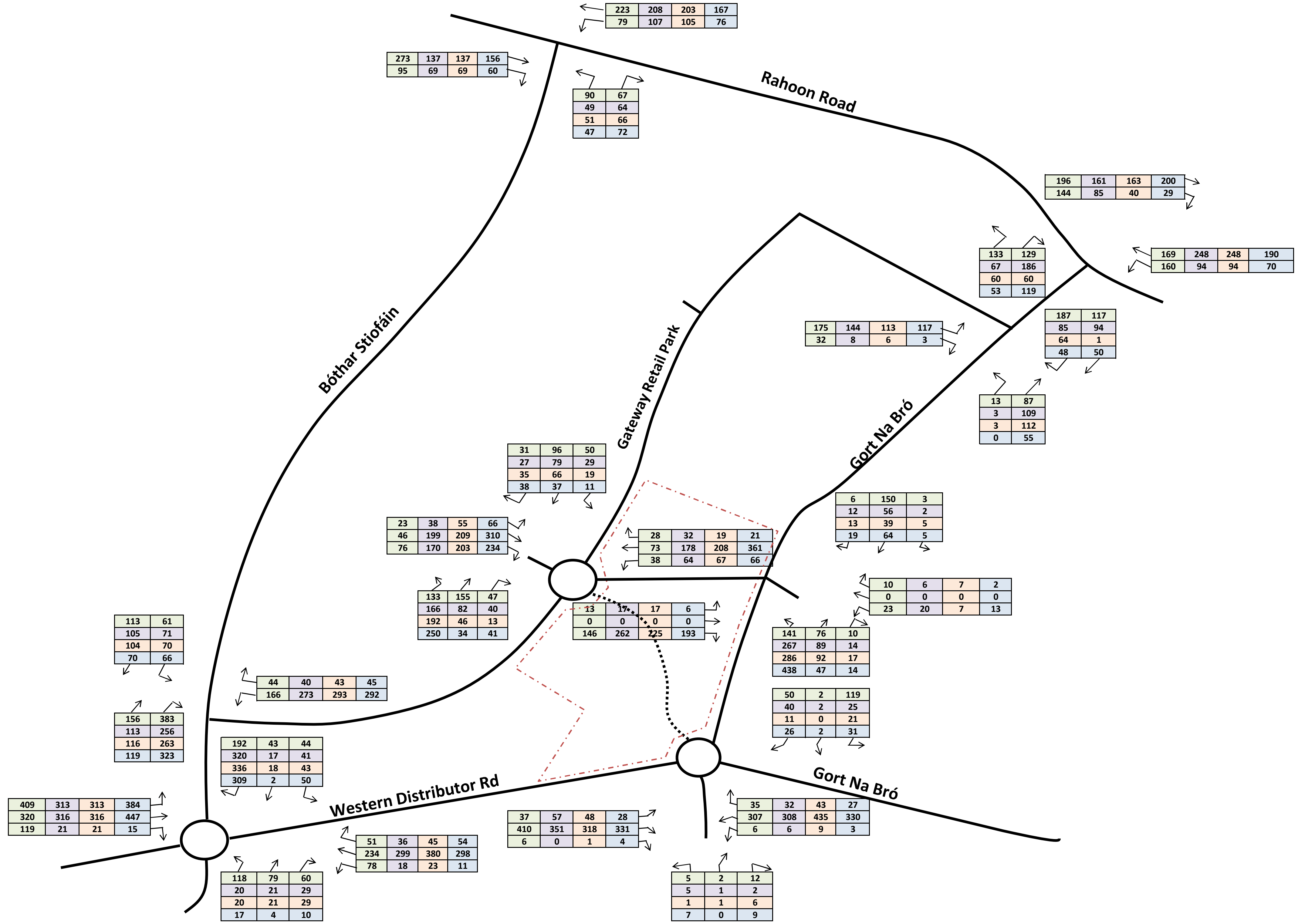
Drawing Title :
Base 2022

Key:
- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45 - 14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC		14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
3	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:
Knocknacarra District Centre, Galway

Drawing Title :
Do Nothing 2024

Key:

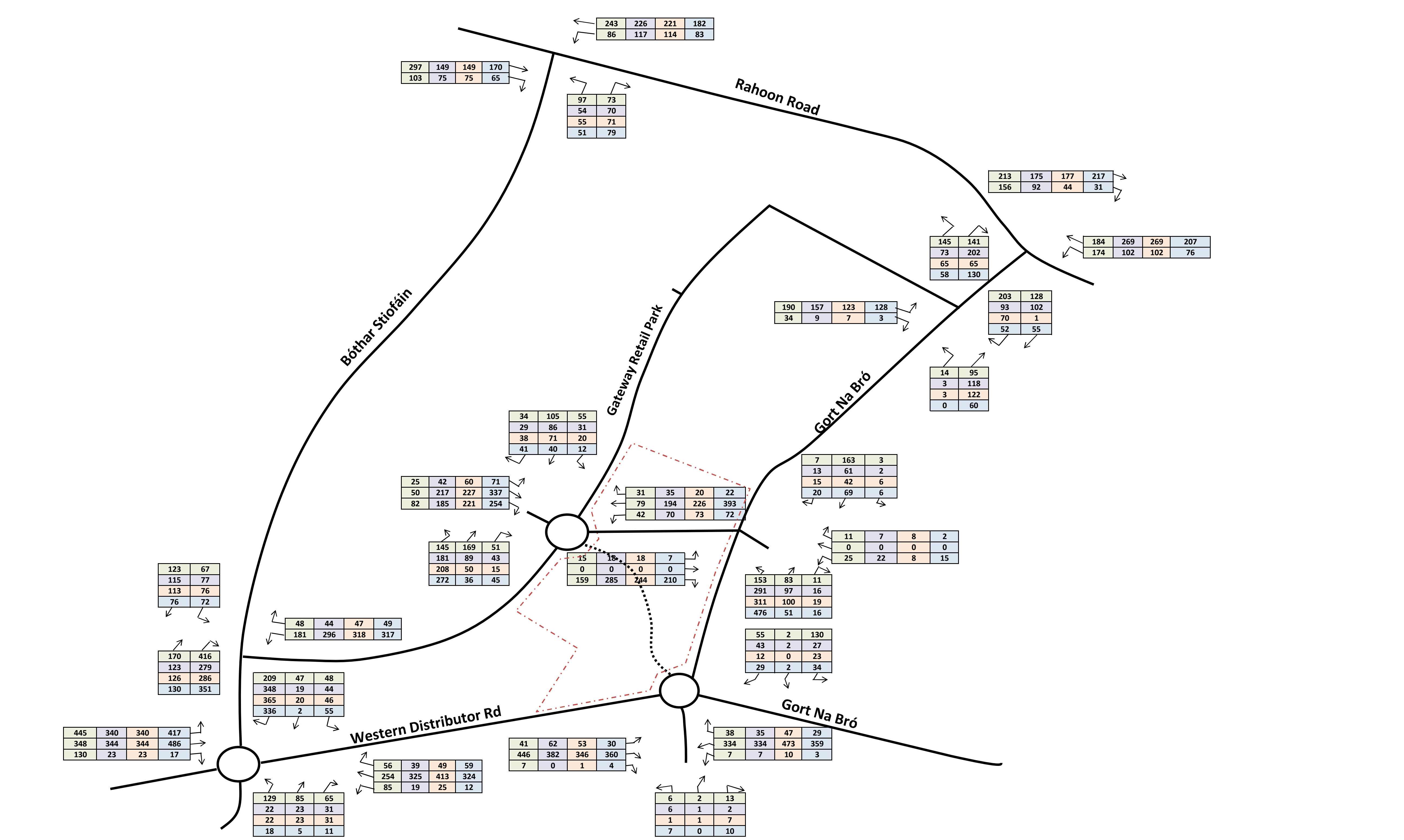
Growth Factor 2024 1.0341

- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45-14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
4	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:
Knocknacarra District Centre, Galway

Drawing Title :
Do Nothing 2029

Key:

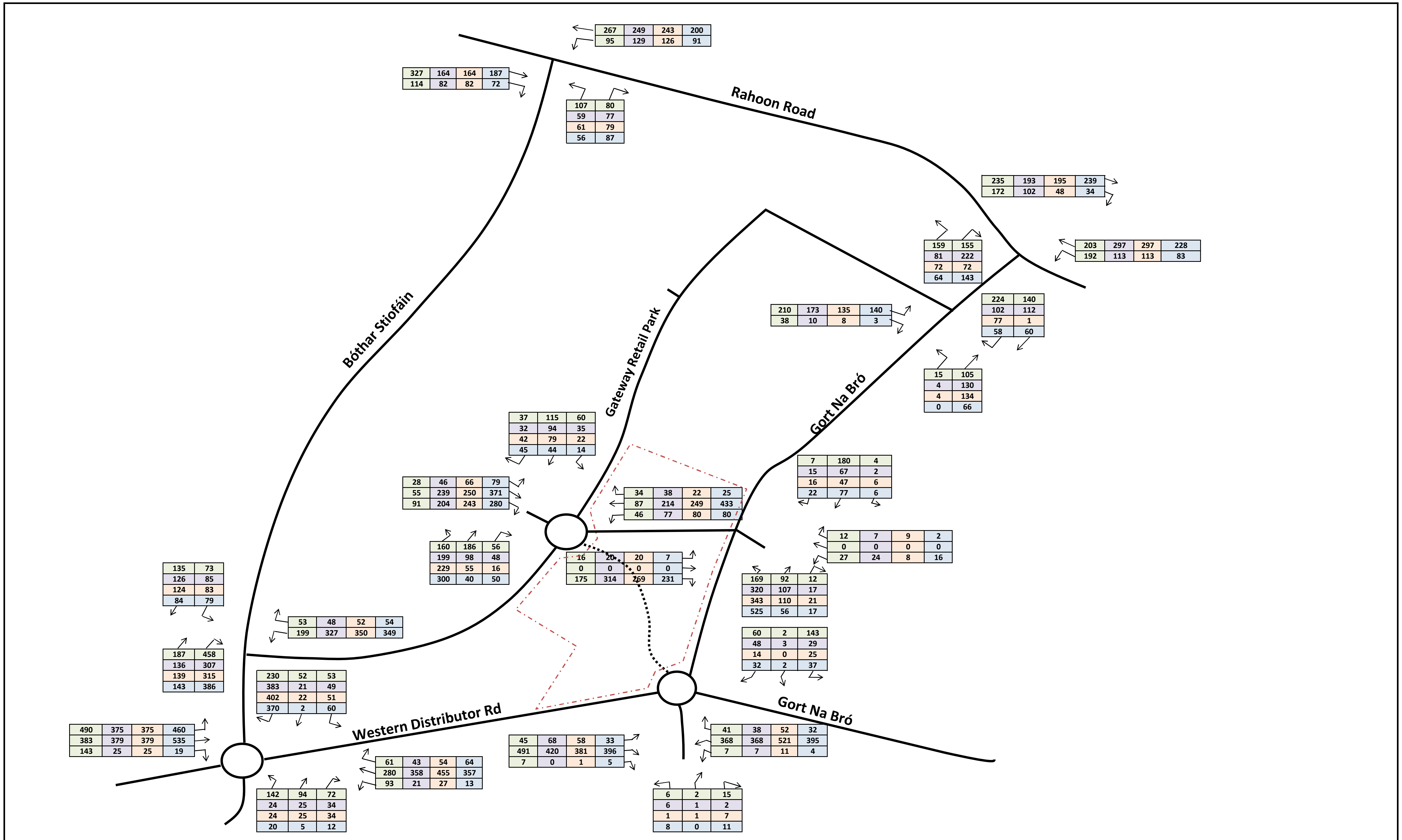
Growth Factor 2029 1.1245

- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45-14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
5	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:

Knocknacarra District Centre, Galway

Drawing Title :

Do Nothing 2039

Key:

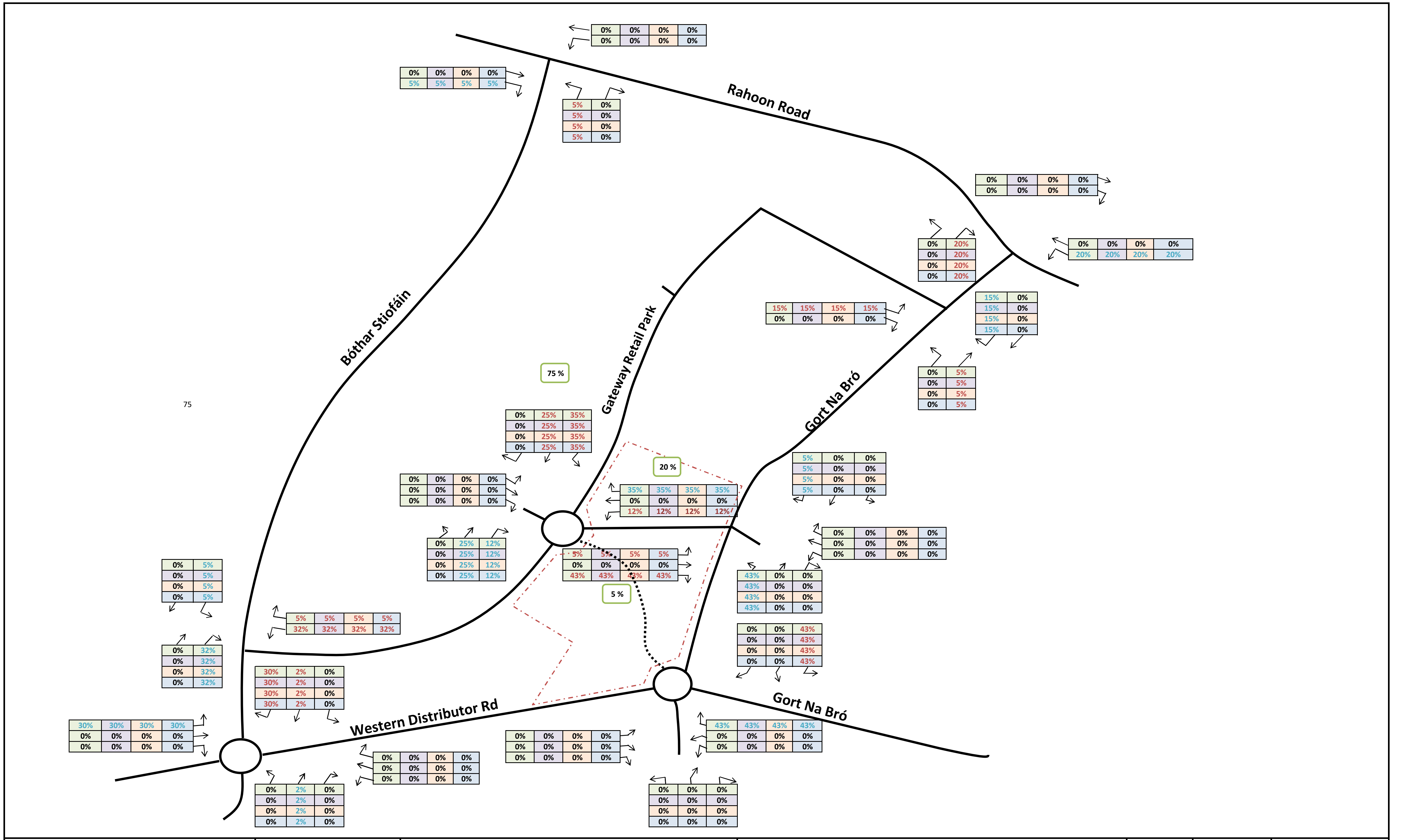
Growth Factor 2039 1.2384

- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45-14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
6	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:

Knocknacarra District Centre, Galway

Drawing Title :

Proposed Development Trips Distribution

Key:

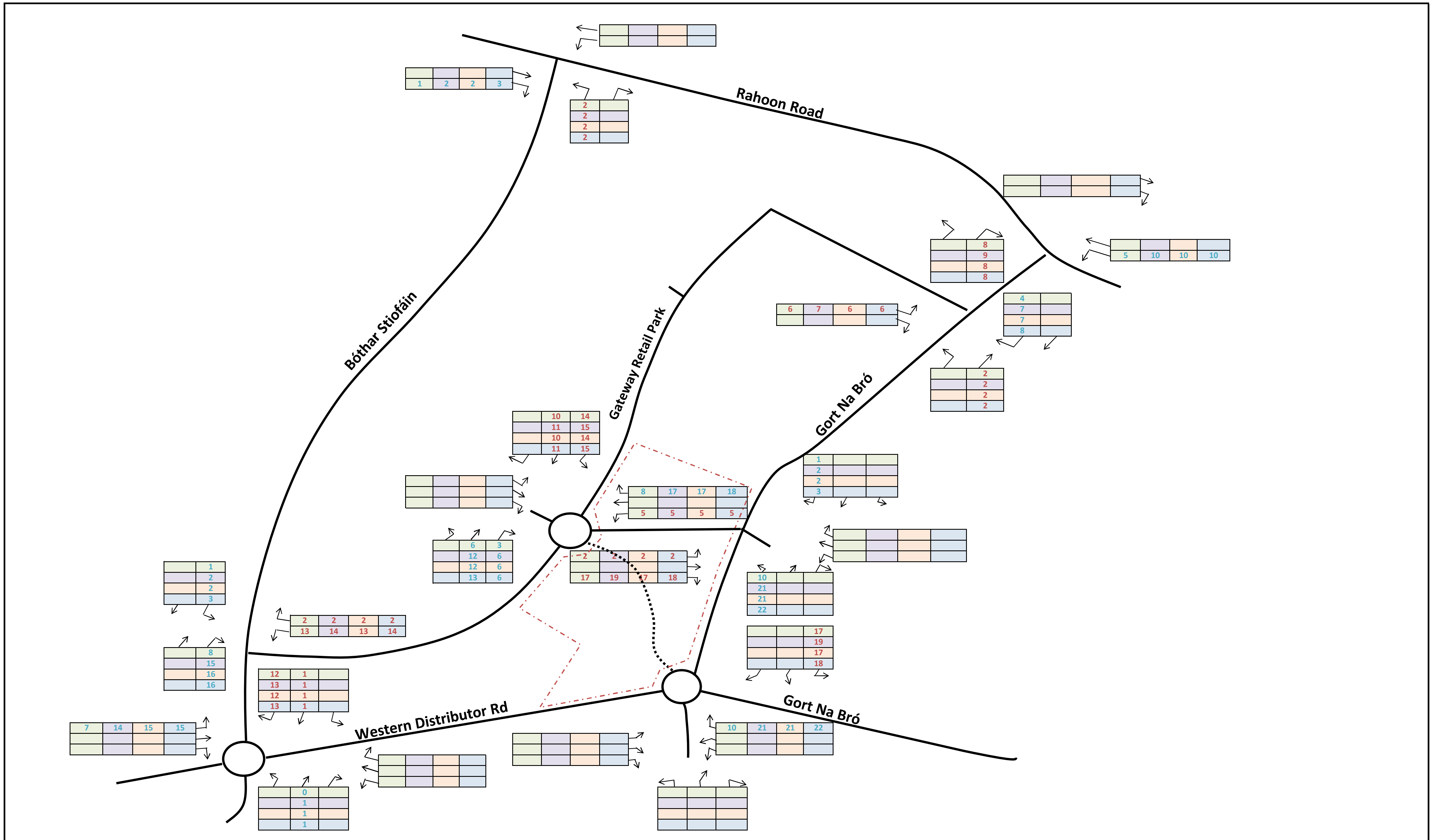
Arrivals
Departures

AM Peak Hour (08:15 - 09:15)
Interpeak (13:45-14:45)
PM Peak Hour (16:45-17:45)
Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC		14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
7	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St. Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:

Knocknacarra District Centre, Galway

Drawing Title :

Proposed Development Trips Distribution

Key:

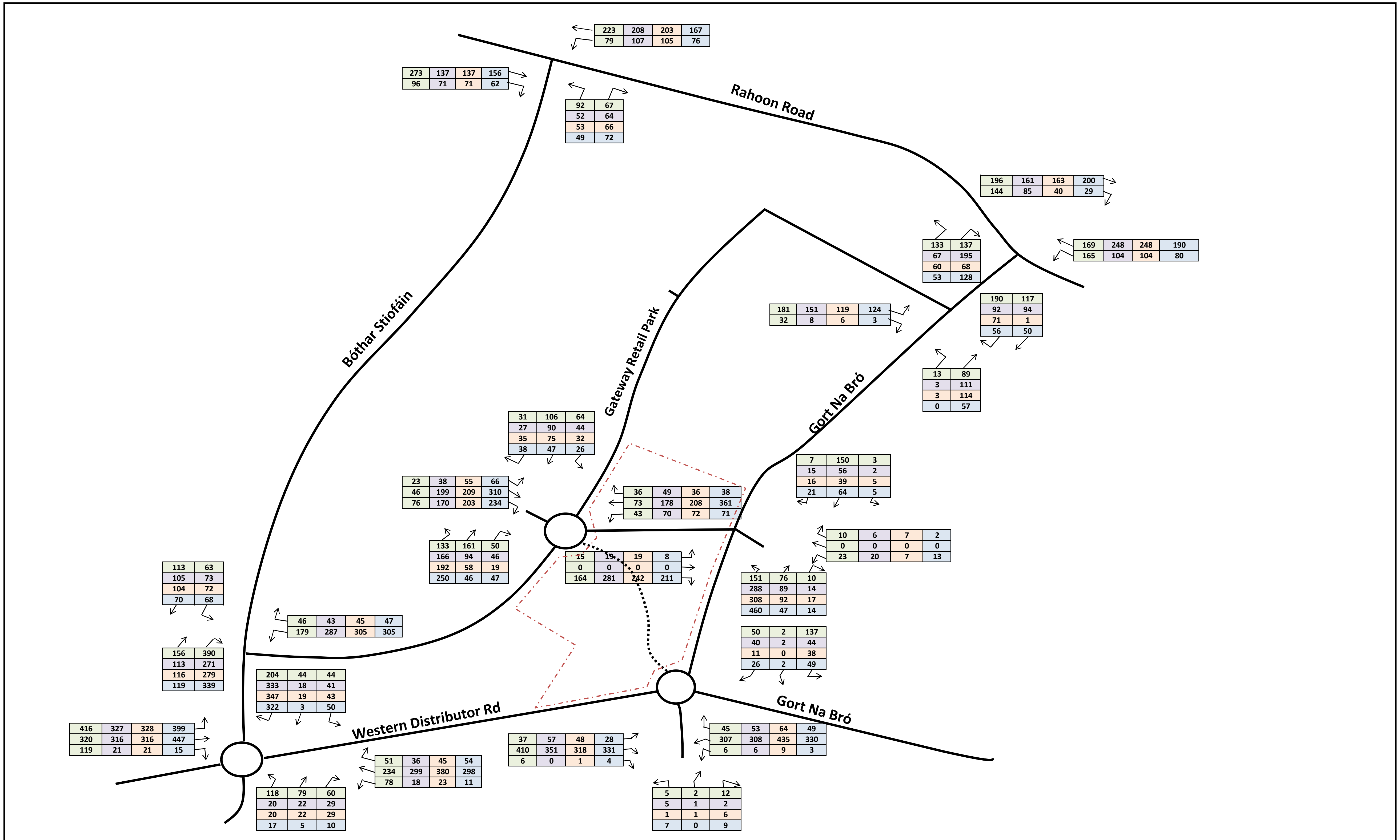
Unit Type	No. of Units	AM		Interpeak		PM		Weekend	
		Arrival	Departure	Arrival	Departure	Arrival	Departure	Arrival	Departure
Private Apartments	227	14	35	21	18	34	19	27	16
Retail	1009.7 sq	10	5	26	26	15	20	24	26

- **AM Peak Hour (08:15 - 09:15)**
- **Interpeak (13:45-14:45)**
- **PM Peak Hour (16:45-17:45)**
- **Weekend Peak (15:15 - 16:15)**

Drawn By:	Approved by:	Date:
EC		14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
8	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:
Knocknacarra District Centre, Galway

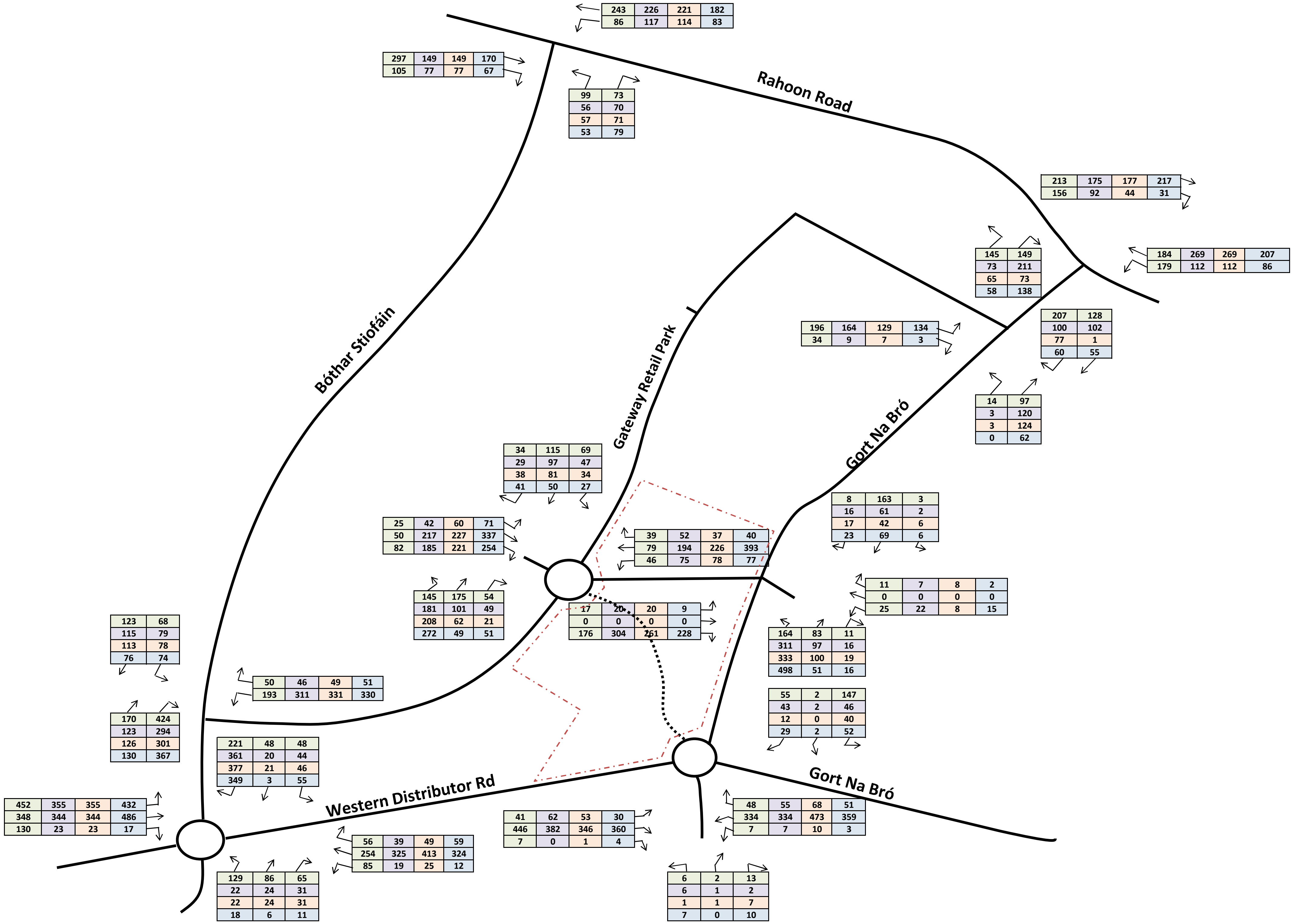
Drawing Title :
Do Something 2024

Key:
- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45-14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
9	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:

Knocknacarra District Centre, Galway

Drawing Title :

Do Something 2029

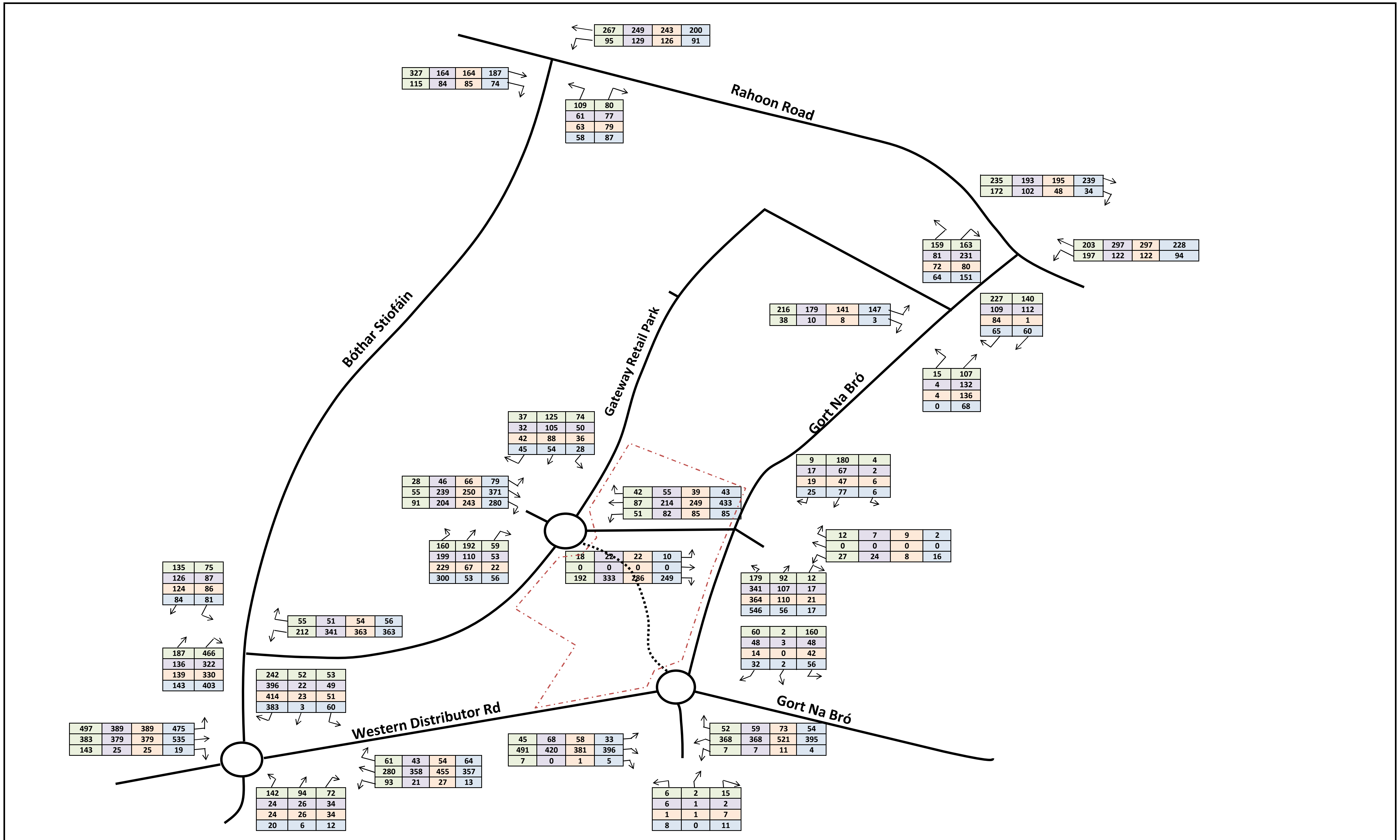
Key:

- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45-14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
10	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper Ormond Quay, Dublin 7 D07 W704
Phone: +353 1 400 4000

Waterford Office:
Maritana Gate, Suite 8b The Atrium, Canada St, Waterford
Phone: +353 51 309 500

Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:

Knocknacarra District Centre, Galway

Drawing Title :

Do Something 2039

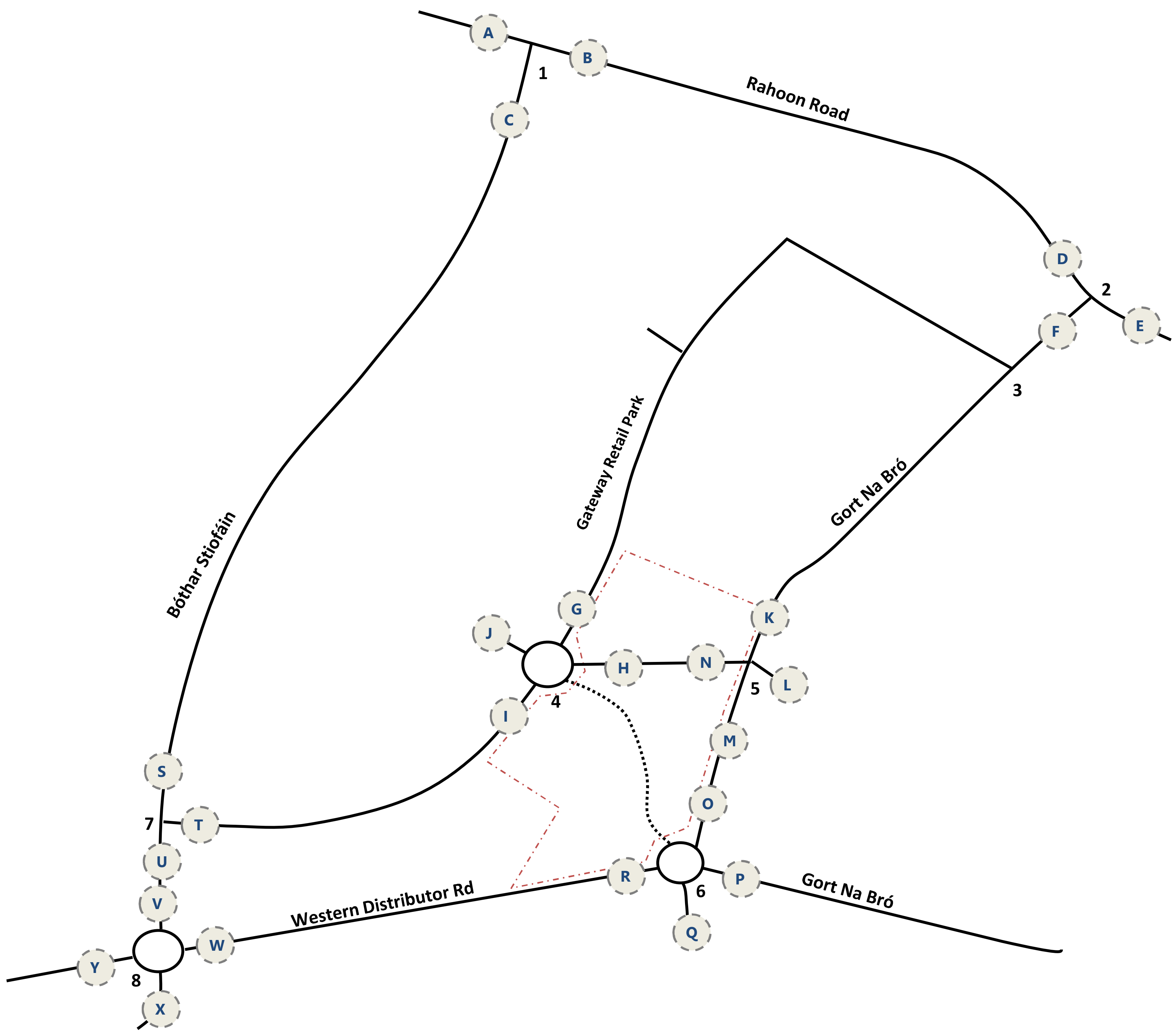
Key:

- AM Peak Hour (08:15 - 09:15)
- Interpeak (13:45-14:45)
- PM Peak Hour (16:45-17:45)
- Weekend Peak (15:15 - 16:15)

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
11	-



DBFL Consulting Engineers

Dublin Office:
Dublin Office: Ormond House, Upper
Phone: +353 1 400 4000
Waterford Office:
Maritana Gate, Suite 8b The Atrium,
Phone: +353 51 309 500
Cork Office:
14 South Mall, Cork
Phone: +353 021 202 4538
Email: info@dbfl.ie
Website: www.dbfl.ie

Project:
Knocknacarra District Centre, Galway

Drawing Title :
AADT Map

Key:

AADT Map Locations	
	AADT Location

Drawn By:	Approved by:	Date:
EC	AD	14/12/2022

G:\2018\p180191\Calcs\Excel\Traffic\180191 Traffic Model

Figure:	Rev:
12	-

DN 2024					
Link	AM Peak Two-Way Flow	PM Peak Two-Way Flow	AM & PM Peak Two-way Flow	AADT	Annual AADT
A	681	459	1140	6,633	2,421,201
B	642	510	1153	6,706	2,447,856
C	331	290	620	3,609	1,317,388
D	642	510	1153	6,706	2,447,856
E	655	564	1219	7,095	2,589,814
F	566	254	820	4,774	1,742,343
G	384	239	623	3,624	1,322,793
H	282	535	817	4,753	1,735,027
I	546	587	1133	6,592	2,405,977
J	382	901	1283	7,467	2,725,529
K	260	173	433	2,518	918,905
L	47	37	84	486	177,456
M	547	666	1213	7,057	2,575,746
N	307	541	848	4,934	1,800,914
O	246	125	371	2,160	788,449
P	890	833	1723	10,024	3,658,710
Q	34	19	53	307	112,008
R	817	815	1631	9,493	3,465,002
S	375	334	709	4,124	1,505,145
T	654	668	1322	7,695	2,808,524
U	818	775	1593	9,271	3,383,844
V	818	775	1593	9,271	3,383,844
W	786	835	1621	9,433	3,443,122
X	497	131	628	3,656	1,334,419
Y	1392	1386	2778	16,162	5,899,079
TOTAL	13598	12963	26561	154,551	56,410,950

DS 2024					
Link	AM Peak Two-Way Flow	PM Peak Two-Way Flow	AM & PM Peak Two-way Flow	AADT	Annual AADT
A	684	467	1151	6,700	2,445,417
B	642	510	1153	6,706	2,447,856
C	334	294	628	3,654	1,333,609
D	642	510	1153	6,706	2,447,856
E	668	582	1250	7,273	2,654,698
F	579	272	851	4,951	1,807,226
G	423	292	714	4,157	1,517,444
H	312	576	889	5,171	1,887,503
I	570	620	1189	6,921	2,526,011
J	382	901	1283	7,467	2,725,529
K	263	178	440	2,562	935,126
L	47	37	84	486	177,456
M	574	704	1278	7,439	2,715,245
N	338	584	921	5,361	1,956,634
O	274	163	501	2,915	1,063,895
P	917	806	1724	10,031	3,661,394
Q	34	19	53	307	112,008
R	817	815	1631	9,493	3,465,002
S	378	337	715	4,163	1,519,531
T	678	701	1379	8,023	2,928,559
U	838	804	1642	9,555	3,487,657
V	838	804	1593	9,271	3,383,844
W	786	835	1621	9,433	3,443,122
X	498	133	631	3,674	1,340,907
Y	1411	1412	2823	16,429	5,996,405
TOTAL	13927	13357	27300	158,849	57,979,933

Appendix D : PICADY Output Files

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction4.j9
Path: G:\2018\p180191\Calcs\Modelling\ARCADY
Report generation date: 14/12/2022 10:47:13

Summary of junction performance

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	DN 2024 - DN 2024																			
Arm 1	A1 D1	0.1	3.44	0.13	A	A1 D2	0.4	4.43	0.28	A	A1 D3	0.4	4.22	0.26	A	A1 D19	0.8	6.18	0.44	A
Arm 2		0.8	7.68	0.44	A		0.6	7.21	0.36	A		0.7	7.66	0.40	A		1.1	11.56	0.51	B
Arm 3		0.2	4.08	0.15	A		0.8	5.82	0.45	A		0.7	5.64	0.41	A		1.6	8.80	0.60	A
Arm 4		0.3	4.84	0.21	A		0.2	5.32	0.16	A		0.2	5.39	0.18	A		0.2	6.25	0.13	A

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS

	DN 2029 - DN 2029																			
Arm 1	A2 D4	0.2	3.53	0.14	A	A2 D5	0.5	4.68	0.31	A	A2 D6	0.4	4.44	0.29	A	A2 D20	1.0	6.80	0.48	A
Arm 2		0.9	8.38	0.48	A		0.6	7.75	0.39	A		0.8	8.32	0.44	A		1.4	13.44	0.57	B
Arm 3		0.2	4.21	0.17	A		1.0	6.33	0.50	A		0.8	6.10	0.45	A		2.0	10.19	0.65	B
Arm 4		0.3	5.02	0.23	A		0.2	5.56	0.18	A		0.3	5.64	0.20	A		0.2	6.60	0.15	A

	AM					**PM**					**Interpeak**					**Weekend**				
	Set ID	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**
	DN 2039 - DN 2039																			
Arm 1	A3 D7	0.2	3.63	0.16	A	A3 D8	0.5	5.04	0.35	A	A3 D9	0.5	4.74	0.32	A	A3 D21	1.3	7.84	0.54	A
Arm 2		1.1	9.41	0.54	A		0.8	8.55	0.44	A		1.0	9.34	0.50	A		2.0	17.08	0.65	C
Arm 3		0.2	4.38	0.19	A		1.2	7.09	0.55	A		1.0	6.79	0.50	A		2.8	12.89	0.72	B
Arm 4		0.3	5.23	0.25	A		0.3	5.91	0.21	A		0.3	6.02	0.23	A		0.2	7.12	0.17	A

	AM					**PM**					**Interpeak**					**Weekend**				
	Set ID	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**
	DS 2024 - DS 2024																			
Arm 1	A4 D10	0.2	3.51	0.14	A	A4 D11	0.4	4.59	0.31	A	A4 D12	0.4	4.39	0.29	A	A4 D22	0.9	6.49	0.46	A
Arm 2		0.8	7.91	0.45	A		0.6	7.64	0.39	A		0.8	8.14	0.43	A		1.3	12.59	0.55	B
Arm 3		0.2	4.13	0.15	A		0.9	6.03	0.46	A		0.7	5.83	0.42	A		1.7	9.23	0.61	A
Arm 4		0.3	5.03	0.24	A		0.2	5.54	0.19	A		0.3	5.65	0.22	A		0.2	6.57	0.17	A

	AM					**PM**					**Interpeak**					**Weekend**				
	Set ID	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**
	DS 2029 - DS 2029																			
Arm 1	A5 D13	0.2	3.60	0.15	A	A5 D14	0.5	4.87	0.34	A	A5 D15	0.5	4.62	0.31	A	A5 D23	1.1	6.88	0.49	A
Arm 2		1.0	8.65	0.50	A		0.7	8.25	0.42	A		0.9	8.89	0.47	A		1.6	13.91	0.59	B
Arm 3		0.2	4.26	0.17	A		1.0	6.57	0.51	A		0.9	6.33	0.46	A		2.2	10.80	0.67	B
Arm 4		0.3	5.22	0.26	A		0.3	5.82	0.21	A		0.3	5.95	0.24	A		0.2	6.44	0.12	A

	AM					**PM**					**Interpeak**					**Weekend**				
	Set ID	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**	**Set ID**	**Queue (PCU)**	**Delay (s)**	**RFC**	**LOS**
	DS 2039 - DS 2039																			
Arm 1	A6 D16	0.2	3.71	0.17	A	A6 D17	0.6	5.26	0.38	A	A6 D18	0.6	5.44	0.35	A	A6 D24	1.4	8.36	0.57	A
Arm 2		1.2	9.76	0.55	A		0.9	9.16	0.47	A		1.2	11.05	0.53	B		2.4	19.53	0.69	C
Arm 3		0.2	4.44	0.19	A		1.3	7.40	0.56	A		1.2	7.77	0.51	A		3.0	13.89	0.74	B
Arm 4		0.4	5.45	0.28	A		0.3	6.20	0.24	A		0.4	6.98	0.27	A		0.3	7.52	0.21	A

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

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	11/07/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	HEADOFFICE\cuenae
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	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				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	DN 2024	AM	ONE HOUR	08:00	09:30	15	✓
D2	DN 2024	PM	ONE HOUR	16:30	18:00	15	✓
D3	DN 2024	Interpeak	ONE HOUR	13:30	15:00	15	✓
D4	DN 2029	AM	ONE HOUR	08:00	09:30	15	✓
D5	DN 2029	PM	ONE HOUR	16:30	18:00	15	✓
D6	DN 2029	Interpeak	ONE HOUR	13:30	15:00	15	✓
D7	DN 2039	AM	ONE HOUR	08:00	09:30	15	✓
D8	DN 2039	PM	ONE HOUR	16:30	18:00	15	✓
D9	DN 2039	Interpeak	ONE HOUR	13:30	15:00	15	✓
D10	DS 2024	AM	ONE HOUR	08:00	09:30	15	✓
D11	DS 2024	PM	ONE HOUR	16:30	18:00	15	✓
D12	DS 2024	Interpeak	ONE HOUR	13:30	15:00	15	✓
D13	DS 2029	AM	ONE HOUR	08:00	09:30	15	✓
D14	DS 2029	PM	ONE HOUR	16:30	18:00	15	✓
D15	DS 2029	Interpeak	ONE HOUR	13:30	15:00	15	✓
D16	DS 2039	AM	ONE HOUR	08:00	09:30	15	✓
D17	DS 2039	PM	ONE HOUR	16:30	18:00	15	✓
D18	DS 2039	Interpeak	ONE HOUR	13:30	15:00	15	✓
D19	DN 2024	Weekend	ONE HOUR	15:00	16:30	15	✓
D20	DN 2029	Weekend	ONE HOUR	15:00	16:30	15	✓
D21	DN 2039	Weekend	ONE HOUR	15:00	16:30	15	✓
D22	DS 2024	Weekend	ONE HOUR	15:00	16:30	15	✓
D23	DS 2029	Weekend	ONE HOUR	15:00	16:30	15	✓
D24	DS 2039	Weekend	ONE HOUR	15:00	16:30	15	✓

DN 2024 - DN 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3, D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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	DN 2024	AM	ONE HOUR	08:00	09:30	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	✓	139	100.000
2		ONE HOUR	✓	335	100.000
3		ONE HOUR	✓	145	100.000
4		ONE HOUR	✓	177	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	38	73	28
	2	47	0	133	155
	3	46	76	0	23
	4	50	96	31	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.13	3.44	0.1	A	128	191
2	0.44	7.68	0.8	A	307	461
3	0.15	4.08	0.2	A	133	200
4	0.21	4.84	0.3	A	162	244

Main Results for each time segment

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	105	26	152	1238	0.085	104	107	0.0	0.1	3.174	A
2	252	63	99	857	0.294	251	157	0.0	0.4	5.918	A
3	109	27	172	1085	0.101	109	177	0.0	0.1	3.684	A
4	133	33	127	965	0.138	133	154	0.0	0.2	4.321	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	125	31	182	1222	0.102	125	128	0.1	0.1	3.282	A
2	301	75	119	849	0.355	301	189	0.4	0.5	6.561	A
3	130	33	206	1066	0.122	130	213	0.1	0.1	3.845	A
4	159	40	152	954	0.167	159	185	0.2	0.2	4.528	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	153	38	223	1199	0.128	153	157	0.1	0.1	3.441	A
2	369	92	145	837	0.440	368	231	0.5	0.8	7.653	A
3	160	40	253	1041	0.153	159	260	0.1	0.2	4.083	A
4	195	49	186	938	0.208	195	226	0.2	0.3	4.841	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	153	38	224	1199	0.128	153	157	0.1	0.1	3.442	A
2	369	92	145	837	0.441	369	231	0.8	0.8	7.684	A
3	160	40	253	1041	0.153	160	261	0.2	0.2	4.085	A
4	195	49	186	938	0.208	195	227	0.3	0.3	4.844	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	125	31	183	1221	0.102	125	129	0.1	0.1	3.283	A
2	301	75	119	849	0.355	302	189	0.8	0.6	6.595	A
3	130	33	207	1066	0.122	131	214	0.2	0.1	3.850	A
4	159	40	152	953	0.167	159	186	0.3	0.2	4.534	A

09:15 - 09:30

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	105	26	153	1238	0.085	105	108	0.1	0.1	3.176	A
2	252	63	99	857	0.294	253	158	0.6	0.4	5.961	A
3	109	27	173	1084	0.101	109	179	0.1	0.1	3.691	A
4	133	33	127	965	0.138	133	155	0.2	0.2	4.332	A

DN 2024 - DN 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3, D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.72	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D2	DN 2024	PM	ONE HOUR	16:30	18:00	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	✓	294	100.000
2		ONE HOUR	✓	251	100.000
3		ONE HOUR	✓	467	100.000
4		ONE HOUR	✓	120	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	67	208	19
	2	13	0	192	46
	3	209	203	0	55
	4	19	66	35	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.28	4.43	0.4	A	270	405
2	0.36	7.21	0.6	A	230	345
3	0.45	5.82	0.8	A	429	643
4	0.16	5.32	0.2	A	110	165

Main Results for each time segment

16:30 - 16:45

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	221	55	228	1196	0.185	220	181	0.0	0.2	3.685	A
2	189	47	196	815	0.232	188	252	0.0	0.3	5.728	A
3	352	88	58	1147	0.306	350	326	0.0	0.4	4.505	A
4	90	23	318	877	0.103	90	90	0.0	0.1	4.570	A

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	264	66	273	1171	0.226	264	216	0.2	0.3	3.967	A
2	226	56	235	798	0.283	225	302	0.3	0.4	6.277	A
3	420	105	70	1141	0.368	419	391	0.4	0.6	4.981	A
4	108	27	382	848	0.127	108	108	0.1	0.1	4.861	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	324	81	334	1137	0.285	323	265	0.3	0.4	4.420	A
2	276	69	288	776	0.356	276	369	0.4	0.5	7.194	A
3	514	129	86	1132	0.454	513	478	0.6	0.8	5.805	A
4	132	33	467	809	0.163	132	132	0.1	0.2	5.314	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	324	81	335	1137	0.285	324	265	0.4	0.4	4.426	A
2	276	69	288	775	0.356	276	370	0.5	0.6	7.213	A
3	514	129	86	1132	0.454	514	479	0.8	0.8	5.824	A
4	132	33	468	809	0.163	132	132	0.2	0.2	5.320	A

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	264	66	274	1171	0.226	265	217	0.4	0.3	3.976	A
2	226	56	236	798	0.283	226	303	0.6	0.4	6.301	A
3	420	105	70	1141	0.368	421	392	0.8	0.6	5.007	A
4	108	27	383	848	0.127	108	108	0.2	0.1	4.870	A

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	221	55	229	1195	0.185	222	182	0.3	0.2	3.696	A
2	189	47	197	815	0.232	189	253	0.4	0.3	5.761	A
3	352	88	59	1147	0.307	352	328	0.6	0.4	4.534	A
4	90	23	320	876	0.103	90	90	0.1	0.1	4.583	A

DN 2024 - DN 2024, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3, D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D3	DN 2024	Interpeak	ONE HOUR	13:30	15:00	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	✓	274	100.000
2		ONE HOUR	✓	288	100.000
3		ONE HOUR	✓	407	100.000
4		ONE HOUR	✓	135	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	64	178	32
	2	40	0	166	82
	3	199	170	0	38
	4	29	79	27	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.26	4.22	0.4	A	251	377
2	0.40	7.66	0.7	A	264	396
3	0.41	5.64	0.7	A	373	560
4	0.18	5.39	0.2	A	124	186

Main Results for each time segment

13:30 - 13:45

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	206	52	207	1208	0.171	205	201	0.0	0.2	3.587	A
2	217	54	178	823	0.263	215	235	0.0	0.4	5.909	A
3	306	77	115	1116	0.275	305	278	0.0	0.4	4.430	A
4	102	25	306	883	0.115	101	114	0.0	0.1	4.602	A

13:45 - 14:00

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	246	62	248	1185	0.208	246	241	0.2	0.3	3.833	A
2	259	65	213	808	0.320	258	281	0.4	0.5	6.544	A
3	366	91	138	1104	0.332	365	333	0.4	0.5	4.873	A
4	121	30	367	855	0.142	121	136	0.1	0.2	4.907	A

14:00 - 14:15

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	302	75	303	1154	0.261	301	295	0.3	0.4	4.218	A
2	317	79	261	787	0.403	316	344	0.5	0.7	7.629	A
3	448	112	169	1087	0.412	447	408	0.5	0.7	5.623	A
4	149	37	449	817	0.182	148	167	0.2	0.2	5.382	A

14:15 - 14:30

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	302	75	304	1154	0.261	302	295	0.4	0.4	4.223	A
2	317	79	261	787	0.403	317	345	0.7	0.7	7.655	A
3	448	112	170	1086	0.412	448	408	0.7	0.7	5.638	A
4	149	37	450	817	0.182	149	167	0.2	0.2	5.387	A

14:30 - 14:45

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	246	62	249	1185	0.208	247	241	0.4	0.3	3.841	A
2	259	65	213	808	0.320	260	282	0.7	0.5	6.575	A
3	366	91	139	1103	0.332	367	334	0.7	0.5	4.892	A
4	121	30	369	854	0.142	122	137	0.2	0.2	4.914	A

14:45 - 15:00

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	206	52	208	1207	0.171	207	202	0.3	0.2	3.597	A
2	217	54	179	823	0.263	217	236	0.5	0.4	5.950	A
3	306	77	116	1116	0.275	307	280	0.5	0.4	4.453	A
4	102	25	308	882	0.115	102	115	0.2	0.1	4.617	A

DN 2024 - DN 2024, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3, D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.46	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D19	DN 2024	Weekend	ONE HOUR	15:00	16:30	15	✓

Default vehicle mix	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	✓	448	100.000
2		ONE HOUR	✓	325	100.000
3		ONE HOUR	✓	610	100.000
4		ONE HOUR	✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	66	361	21
	2	41	0	250	34
	3	310	234	0	66
	4	11	37	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.44	6.18	0.8	A	411	617
2	0.51	11.56	1.1	B	298	447
3	0.60	8.80	1.6	A	560	840
4	0.13	6.25	0.2	A	79	118

Main Results for each time segment

15:00 - 15:15

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	337	84	231	1194	0.282	336	271	0.0	0.4	4.601	A
2	245	61	315	764	0.320	243	252	0.0	0.5	7.566	A
3	459	115	72	1140	0.403	456	485	0.0	0.7	5.769	A
4	65	16	438	823	0.079	64	90	0.0	0.1	5.220	A

15:15 - 15:30

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	403	101	277	1169	0.345	402	325	0.4	0.6	5.162	A
2	292	73	377	737	0.396	291	302	0.5	0.7	8.870	A
3	548	137	86	1132	0.484	547	582	0.7	1.0	6.757	A
4	77	19	525	783	0.099	77	109	0.1	0.1	5.613	A

15:30 - 15:45

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	493	123	339	1134	0.435	492	397	0.6	0.8	6.155	A
2	358	89	461	700	0.511	356	370	0.7	1.1	11.445	B
3	672	168	105	1122	0.599	669	712	1.0	1.6	8.709	A
4	95	24	642	729	0.130	95	133	0.1	0.2	6.239	A

15:45 - 16:00

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	493	123	340	1134	0.435	493	399	0.8	0.8	6.180	A
2	358	89	462	700	0.511	358	371	1.1	1.1	11.563	B
3	672	168	106	1121	0.599	672	714	1.6	1.6	8.800	A
4	95	24	644	728	0.130	95	133	0.2	0.2	6.252	A

16:00 - 16:15

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	403	101	279	1168	0.345	404	327	0.8	0.6	5.190	A
2	292	73	379	736	0.397	294	304	1.1	0.7	8.980	A
3	548	137	87	1132	0.485	551	586	1.6	1.0	6.841	A
4	77	19	528	781	0.099	77	109	0.2	0.1	5.630	A

16:15 - 16:30

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	337	84	233	1193	0.283	338	273	0.6	0.4	4.633	A
2	245	61	317	763	0.321	246	254	0.7	0.5	7.665	A
3	459	115	72	1139	0.403	460	490	1.0	0.8	5.843	A
4	65	16	442	821	0.079	65	91	0.1	0.1	5.240	A

DN 2029 - DN 2029, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D4	DN 2029	AM	ONE HOUR	08:00	09:30	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	✓	152	100.000
2		ONE HOUR	✓	365	100.000
3		ONE HOUR	✓	157	100.000
4		ONE HOUR	✓	194	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	42	79	31
	2	51	0	145	169
	3	50	82	0	25
	4	55	105	34	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.14	3.53	0.2	A	139	209
2	0.48	8.38	0.9	A	335	502
3	0.17	4.21	0.2	A	144	216
4	0.23	5.02	0.3	A	178	267

Main Results for each time segment

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	114	29	166	1231	0.093	114	117	0.0	0.1	3.224	A
2	275	69	108	853	0.322	273	172	0.0	0.5	6.181	A
3	118	30	188	1077	0.110	118	193	0.0	0.1	3.752	A
4	146	37	137	960	0.152	145	168	0.0	0.2	4.413	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	137	34	198	1213	0.113	137	140	0.1	0.1	3.345	A
2	328	82	129	844	0.389	327	206	0.5	0.6	6.958	A
3	141	35	225	1056	0.134	141	232	0.1	0.2	3.934	A
4	174	44	164	948	0.184	174	202	0.2	0.2	4.651	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	167	42	243	1188	0.141	167	171	0.1	0.2	3.526	A
2	402	100	158	832	0.483	401	252	0.6	0.9	8.330	A
3	173	43	276	1029	0.168	173	283	0.2	0.2	4.205	A
4	214	53	201	931	0.229	213	247	0.2	0.3	5.013	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	167	42	243	1188	0.141	167	172	0.2	0.2	3.527	A
2	402	100	159	832	0.483	402	252	0.9	0.9	8.376	A
3	173	43	276	1028	0.168	173	284	0.2	0.2	4.208	A
4	214	53	201	931	0.229	214	248	0.3	0.3	5.018	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	137	34	199	1212	0.113	137	141	0.2	0.1	3.349	A
2	328	82	130	844	0.389	329	206	0.9	0.6	7.009	A
3	141	35	226	1055	0.134	141	233	0.2	0.2	3.938	A
4	174	44	165	948	0.184	175	203	0.3	0.2	4.658	A

09:15 - 09:30

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	114	29	167	1230	0.093	115	118	0.1	0.1	3.228	A
2	275	69	109	853	0.322	275	173	0.6	0.5	6.237	A
3	118	30	189	1076	0.110	118	195	0.2	0.1	3.762	A
4	146	37	138	960	0.152	146	170	0.2	0.2	4.424	A

DN 2029 - DN 2029, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D5	DN 2029	PM	ONE HOUR	16:30	18:00	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	✓	319	100.000
2		ONE HOUR	✓	273	100.000
3		ONE HOUR	✓	508	100.000
4		ONE HOUR	✓	129	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	73	226	20
	2	15	0	208	50
	3	227	221	0	60
	4	20	71	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.31	4.68	0.5	A	293	439
2	0.39	7.75	0.6	A	251	376
3	0.50	6.33	1.0	A	466	699
4	0.18	5.56	0.2	A	118	178

Main Results for each time segment

16:30 - 16:45

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	240	60	247	1186	0.203	239	196	0.0	0.3	3.801	A
2	206	51	213	808	0.254	204	273	0.0	0.3	5.948	A
3	382	96	64	1144	0.334	380	353	0.0	0.5	4.700	A
4	97	24	347	864	0.112	97	97	0.0	0.1	4.686	A

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	287	72	296	1158	0.248	286	235	0.3	0.3	4.128	A
2	245	61	255	790	0.311	245	328	0.3	0.4	6.601	A
3	457	114	76	1137	0.402	456	424	0.5	0.7	5.277	A
4	116	29	416	833	0.139	116	117	0.1	0.2	5.020	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	351	88	363	1121	0.313	351	288	0.3	0.5	4.667	A
2	301	75	312	765	0.393	300	401	0.4	0.6	7.724	A
3	559	140	93	1128	0.496	558	519	0.7	1.0	6.301	A
4	142	36	509	790	0.180	142	143	0.2	0.2	5.552	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	351	88	363	1121	0.313	351	288	0.5	0.5	4.675	A
2	301	75	313	765	0.393	301	402	0.6	0.6	7.753	A
3	559	140	94	1128	0.496	559	520	1.0	1.0	6.330	A
4	142	36	510	790	0.180	142	143	0.2	0.2	5.559	A

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	287	72	297	1158	0.248	287	236	0.5	0.3	4.138	A
2	245	61	256	790	0.311	246	329	0.6	0.5	6.636	A
3	457	114	77	1137	0.402	458	425	1.0	0.7	5.308	A
4	116	29	417	832	0.139	116	117	0.2	0.2	5.030	A

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	240	60	249	1185	0.203	240	198	0.3	0.3	3.816	A
2	206	51	214	808	0.255	206	275	0.5	0.3	5.988	A
3	382	96	64	1144	0.334	383	356	0.7	0.5	4.737	A
4	97	24	349	863	0.113	97	98	0.2	0.1	4.702	A

DN 2029 - DN 2029, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.21	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D6	DN 2029	Interpeak	ONE HOUR	13:30	15:00	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	✓	299	100.000
2		ONE HOUR	✓	313	100.000
3		ONE HOUR	✓	444	100.000
4		ONE HOUR	✓	146	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	70	194	35
	2	43	0	181	89
	3	217	185	0	42
	4	31	86	29	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.29	4.44	0.4	A	274	412
2	0.44	8.32	0.8	A	287	431
3	0.45	6.10	0.8	A	407	611
4	0.20	5.64	0.3	A	134	201

Main Results for each time segment

13:30 - 13:45

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	225	56	225	1198	0.188	224	218	0.0	0.2	3.693	A
2	236	59	193	816	0.289	234	255	0.0	0.4	6.165	A
3	334	84	125	1111	0.301	333	303	0.0	0.4	4.615	A
4	110	27	333	870	0.126	109	124	0.0	0.1	4.727	A

13:45 - 14:00

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	269	67	269	1173	0.229	269	261	0.2	0.3	3.978	A
2	281	70	232	800	0.352	281	306	0.4	0.5	6.928	A
3	399	100	150	1097	0.364	399	363	0.4	0.6	5.148	A
4	131	33	399	840	0.156	131	149	0.1	0.2	5.076	A

14:00 - 14:15

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	329	82	330	1140	0.289	329	320	0.3	0.4	4.437	A
2	345	86	284	777	0.443	344	375	0.5	0.8	8.280	A
3	489	122	183	1079	0.453	488	444	0.6	0.8	6.081	A
4	161	40	489	799	0.201	160	182	0.2	0.2	5.634	A

14:15 - 14:30

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	329	82	330	1139	0.289	329	320	0.4	0.4	4.442	A
2	345	86	284	777	0.443	345	375	0.8	0.8	8.319	A
3	489	122	184	1079	0.453	489	445	0.8	0.8	6.102	A
4	161	40	490	799	0.201	161	183	0.2	0.3	5.643	A

14:30 - 14:45

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	269	67	270	1173	0.229	269	262	0.4	0.3	3.986	A
2	281	70	232	800	0.352	282	307	0.8	0.5	6.974	A
3	399	100	151	1097	0.364	400	364	0.8	0.6	5.174	A
4	131	33	401	839	0.156	132	150	0.3	0.2	5.089	A

14:45 - 15:00

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	225	56	226	1197	0.188	225	219	0.3	0.2	3.707	A
2	236	59	194	816	0.289	236	257	0.5	0.4	6.214	A
3	334	84	126	1110	0.301	335	305	0.6	0.4	4.647	A
4	110	27	336	869	0.126	110	125	0.2	0.1	4.743	A

DN 2029 - DN 2029, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	9.66	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D20	DN 2029	Weekend	ONE HOUR	15:00	16:30	15	✓

Default vehicle mix	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	✓	487	100.000
2		ONE HOUR	✓	353	100.000
3		ONE HOUR	✓	662	100.000
4		ONE HOUR	✓	93	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	72	393	22
	2	45	0	272	36
	3	337	254	0	71
	4	12	40	41	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.48	6.80	1.0	A	447	670
2	0.57	13.44	1.4	B	324	486
3	0.65	10.19	2.0	B	607	911
4	0.15	6.60	0.2	A	85	128

Main Results for each time segment

15:00 - 15:15

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	367	92	251	1184	0.310	365	295	0.0	0.5	4.823	A
2	266	66	341	752	0.353	263	274	0.0	0.6	8.060	A
3	498	125	77	1137	0.438	495	528	0.0	0.8	6.136	A
4	70	18	475	805	0.087	70	96	0.0	0.1	5.381	A

15:15 - 15:30

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	438	109	301	1156	0.379	437	353	0.5	0.7	5.502	A
2	317	79	409	723	0.439	316	328	0.6	0.8	9.712	A
3	595	149	92	1129	0.527	594	633	0.8	1.2	7.385	A
4	84	21	570	762	0.110	83	116	0.1	0.1	5.838	A

15:30 - 15:45

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	536	134	367	1119	0.479	535	432	0.7	1.0	6.766	A
2	389	97	501	683	0.569	386	401	0.8	1.4	13.230	B
3	729	182	113	1117	0.652	726	774	1.2	2.0	10.025	B
4	102	26	697	704	0.146	102	141	0.1	0.2	6.582	A

15:45 - 16:00

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	536	134	369	1118	0.480	536	434	1.0	1.0	6.804	A
2	389	97	502	683	0.569	389	403	1.4	1.4	13.440	B
3	729	182	113	1117	0.652	729	777	2.0	2.0	10.186	B
4	102	26	700	702	0.146	102	142	0.2	0.2	6.600	A

16:00 - 16:15

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	438	109	303	1155	0.379	439	356	1.0	0.7	5.544	A
2	317	79	411	722	0.439	320	331	1.4	0.9	9.885	A
3	595	149	93	1128	0.528	598	638	2.0	1.2	7.515	A
4	84	21	575	760	0.110	84	117	0.2	0.1	5.862	A

16:15 - 16:30

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	367	92	253	1182	0.310	367	298	0.7	0.5	4.864	A
2	266	66	344	751	0.354	267	276	0.9	0.6	8.192	A
3	498	125	78	1137	0.439	500	533	1.2	0.9	6.234	A
4	70	18	480	803	0.087	70	97	0.1	0.1	5.405	A

DN 2039 - DN 2039, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.56	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D7	DN 2039	AM	ONE HOUR	08:00	09:30	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	✓	167	100.000
2		ONE HOUR	✓	402	100.000
3		ONE HOUR	✓	174	100.000
4		ONE HOUR	✓	212	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	46	87	34
	2	56	0	160	186
	3	55	91	0	28
	4	60	115	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.16	3.63	0.2	A	153	230
2	0.54	9.41	1.1	A	369	553
3	0.19	4.38	0.2	A	160	239
4	0.25	5.23	0.3	A	195	292

Main Results for each time segment

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	126	31	182	1222	0.103	125	128	0.0	0.1	3.281	A
2	303	76	118	849	0.357	300	189	0.0	0.5	6.538	A
3	131	33	206	1066	0.123	130	213	0.0	0.1	3.843	A
4	160	40	151	954	0.167	159	186	0.0	0.2	4.523	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	150	38	218	1202	0.125	150	154	0.1	0.1	3.422	A
2	361	90	142	839	0.431	361	226	0.5	0.7	7.516	A
3	156	39	248	1044	0.150	156	255	0.1	0.2	4.056	A
4	191	48	181	940	0.203	190	223	0.2	0.3	4.800	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	184	46	267	1174	0.157	184	188	0.1	0.2	3.633	A
2	443	111	174	825	0.537	441	277	0.7	1.1	9.339	A
3	192	48	303	1014	0.189	191	312	0.2	0.2	4.377	A
4	233	58	222	921	0.253	233	272	0.3	0.3	5.227	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	184	46	268	1174	0.157	184	188	0.2	0.2	3.634	A
2	443	111	174	825	0.537	443	277	1.1	1.1	9.412	A
3	192	48	304	1013	0.189	192	313	0.2	0.2	4.381	A
4	233	58	222	921	0.253	233	273	0.3	0.3	5.233	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	150	38	219	1201	0.125	150	154	0.2	0.1	3.427	A
2	361	90	142	839	0.431	363	227	1.1	0.8	7.590	A
3	156	39	249	1043	0.150	157	256	0.2	0.2	4.061	A
4	191	48	182	940	0.203	191	224	0.3	0.3	4.810	A

09:15 - 09:30

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	126	31	183	1221	0.103	126	129	0.1	0.1	3.286	A
2	303	76	119	849	0.357	303	190	0.8	0.6	6.612	A
3	131	33	208	1065	0.123	131	214	0.2	0.1	3.855	A
4	160	40	152	953	0.167	160	187	0.3	0.2	4.537	A

DN 2039 - DN 2039, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.76	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D8	DN 2039	PM	ONE HOUR	16:30	18:00	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	✓	351	100.000
2		ONE HOUR	✓	300	100.000
3		ONE HOUR	✓	559	100.000
4		ONE HOUR	✓	143	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	80	249	22
	2	16	0	229	55
	3	250	243	0	66
	4	22	79	42	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.35	5.04	0.5	A	322	483
2	0.44	8.55	0.8	A	275	413
3	0.55	7.09	1.2	A	513	769
4	0.21	5.91	0.3	A	131	197

Main Results for each time segment

16:30 - 16:45

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	264	66	273	1171	0.226	263	216	0.0	0.3	3.958	A
2	226	56	235	799	0.283	224	301	0.0	0.4	6.252	A
3	421	105	70	1141	0.369	419	389	0.0	0.6	4.966	A
4	108	27	381	849	0.127	107	107	0.0	0.1	4.855	A

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	316	79	327	1141	0.276	315	258	0.3	0.4	4.355	A
2	270	67	281	779	0.346	269	361	0.4	0.5	7.059	A
3	503	126	83	1133	0.443	502	467	0.6	0.8	5.691	A
4	129	32	457	814	0.158	128	128	0.1	0.2	5.250	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	386	97	400	1101	0.351	386	316	0.4	0.5	5.030	A
2	330	83	344	751	0.440	329	442	0.5	0.8	8.510	A
3	615	154	102	1123	0.548	614	571	0.8	1.2	7.044	A
4	157	39	559	767	0.205	157	157	0.2	0.3	5.900	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	386	97	401	1100	0.351	386	317	0.5	0.5	5.042	A
2	330	83	345	751	0.440	330	443	0.8	0.8	8.554	A
3	615	154	102	1123	0.548	615	573	1.2	1.2	7.090	A
4	157	39	560	766	0.205	157	157	0.3	0.3	5.911	A

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	316	79	328	1141	0.277	316	260	0.5	0.4	4.369	A
2	270	67	282	778	0.347	271	362	0.8	0.5	7.108	A
3	503	126	84	1133	0.443	504	469	1.2	0.8	5.738	A
4	129	32	459	813	0.158	129	129	0.3	0.2	5.264	A

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	264	66	275	1170	0.226	265	217	0.4	0.3	3.977	A
2	226	56	236	798	0.283	226	303	0.5	0.4	6.305	A
3	421	105	70	1141	0.369	422	392	0.8	0.6	5.014	A
4	108	27	384	847	0.127	108	108	0.2	0.1	4.869	A

DN 2039 - DN 2039, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.85	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D9	DN 2039	Interpeak	ONE HOUR	13:30	15:00	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	✓	329	100.000
2		ONE HOUR	✓	345	100.000
3		ONE HOUR	✓	489	100.000
4		ONE HOUR	✓	161	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	77	214	38
	2	48	0	199	98
	3	239	204	0	46
	4	35	94	32	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	4.74	0.5	A	302	453
2	0.50	9.34	1.0	A	317	475
3	0.50	6.79	1.0	A	449	673
4	0.23	6.02	0.3	A	148	222

Main Results for each time segment

13:30 - 13:45

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	248	62	247	1186	0.209	247	241	0.0	0.3	3.831	A
2	260	65	213	808	0.321	258	281	0.0	0.5	6.521	A
3	368	92	138	1104	0.333	366	333	0.0	0.5	4.867	A
4	121	30	368	855	0.142	121	136	0.0	0.2	4.899	A

13:45 - 14:00

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	296	74	296	1158	0.255	295	289	0.3	0.3	4.171	A
2	310	78	255	790	0.393	309	337	0.5	0.6	7.483	A
3	440	110	165	1089	0.404	439	399	0.5	0.7	5.532	A
4	145	36	441	821	0.176	145	163	0.2	0.2	5.319	A

14:00 - 14:15

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	362	91	363	1122	0.323	362	354	0.3	0.5	4.735	A
2	380	95	312	765	0.496	379	412	0.6	1.0	9.281	A
3	538	135	202	1069	0.504	537	489	0.7	1.0	6.754	A
4	177	44	539	776	0.228	177	200	0.2	0.3	6.006	A

14:15 - 14:30

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	362	91	363	1121	0.323	362	355	0.5	0.5	4.743	A
2	380	95	313	765	0.497	380	413	1.0	1.0	9.345	A
3	538	135	203	1068	0.504	538	490	1.0	1.0	6.791	A
4	177	44	541	775	0.229	177	200	0.3	0.3	6.017	A

14:30 - 14:45

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	296	74	297	1158	0.255	296	290	0.5	0.3	4.183	A
2	310	78	256	789	0.393	311	338	1.0	0.7	7.549	A
3	440	110	166	1088	0.404	441	401	1.0	0.7	5.570	A
4	145	36	443	820	0.176	145	164	0.3	0.2	5.335	A

14:45 - 15:00

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	248	62	249	1185	0.209	248	243	0.3	0.3	3.846	A
2	260	65	214	808	0.322	260	283	0.7	0.5	6.588	A
3	368	92	139	1103	0.334	369	336	0.7	0.5	4.906	A
4	121	30	370	853	0.142	121	137	0.2	0.2	4.918	A

DN 2039 - DN 2039, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.94	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D21	DN 2039	Weekend	ONE HOUR	15:00	16:30	15	✓

Default vehicle mix	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	✓	538	100.000
2		ONE HOUR	✓	390	100.000
3		ONE HOUR	✓	730	100.000
4		ONE HOUR	✓	103	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	80	433	25
	2	50	0	300	40
	3	371	280	0	79
	4	14	44	45	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	7.84	1.3	A	494	741
2	0.65	17.08	2.0	C	358	537
3	0.72	12.89	2.8	B	670	1005
4	0.17	7.12	0.2	A	95	142

Main Results for each time segment

15:00 - 15:15

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	405	101	276	1170	0.346	403	325	0.0	0.6	5.148	A
2	294	73	377	737	0.398	291	302	0.0	0.7	8.814	A
3	550	137	86	1132	0.485	545	581	0.0	1.0	6.705	A
4	78	19	524	783	0.099	77	108	0.0	0.1	5.605	A

15:15 - 15:30

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	484	121	331	1139	0.425	483	390	0.6	0.8	6.024	A
2	351	88	451	705	0.497	349	362	0.7	1.1	11.090	B
3	656	164	103	1123	0.584	654	698	1.0	1.5	8.416	A
4	93	23	628	735	0.126	92	129	0.1	0.2	6.159	A

15:30 - 15:45

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	592	148	404	1098	0.539	591	476	0.8	1.3	7.767	A
2	429	107	552	661	0.649	426	443	1.1	1.9	16.575	C
3	804	201	126	1110	0.724	799	852	1.5	2.8	12.509	B
4	113	28	767	672	0.169	113	158	0.2	0.2	7.087	A

15:45 - 16:00

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	592	148	406	1097	0.540	592	479	1.3	1.3	7.837	A
2	429	107	554	661	0.650	429	445	1.9	2.0	17.076	C
3	804	201	127	1110	0.724	803	856	2.8	2.8	12.891	B
4	113	28	772	670	0.169	113	158	0.2	0.2	7.119	A

16:00 - 16:15

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	484	121	334	1137	0.425	485	394	1.3	0.8	6.092	A
2	351	88	454	704	0.498	354	365	2.0	1.1	11.435	B
3	656	164	104	1122	0.585	661	704	2.8	1.6	8.682	A
4	93	23	635	732	0.126	93	130	0.2	0.2	6.196	A

16:15 - 16:30

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	405	101	279	1168	0.347	406	329	0.8	0.6	5.204	A
2	294	73	380	736	0.399	295	305	1.1	0.7	9.013	A
3	550	137	87	1132	0.486	552	588	1.6	1.1	6.856	A
4	78	19	530	780	0.099	78	109	0.2	0.1	5.636	A

DS 2024 - DS 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D10	DS 2024	AM	ONE HOUR	08:00	09:30	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	✓	152	100.000
2		ONE HOUR	✓	344	100.000
3		ONE HOUR	✓	145	100.000
4		ONE HOUR	✓	201	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	43	73	36
	2	50	0	133	161
	3	46	76	0	23
	4	64	106	31	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.14	3.51	0.2	A	139	209
2	0.45	7.91	0.8	A	316	473
3	0.15	4.13	0.2	A	133	200
4	0.24	5.03	0.3	A	184	277

Main Results for each time segment

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	114	29	160	1234	0.093	114	120	0.0	0.1	3.214	A
2	259	65	105	855	0.303	257	169	0.0	0.4	6.008	A
3	109	27	185	1078	0.101	109	177	0.0	0.1	3.711	A
4	151	38	129	964	0.157	151	165	0.0	0.2	4.421	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	137	34	191	1217	0.112	137	144	0.1	0.1	3.332	A
2	309	77	126	846	0.366	309	202	0.4	0.6	6.696	A
3	130	33	222	1058	0.123	130	213	0.1	0.1	3.880	A
4	181	45	154	952	0.190	181	197	0.2	0.2	4.662	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	167	42	234	1193	0.140	167	176	0.1	0.2	3.510	A
2	379	95	154	834	0.454	378	247	0.6	0.8	7.881	A
3	160	40	271	1031	0.155	159	260	0.1	0.2	4.129	A
4	221	55	189	937	0.236	221	242	0.2	0.3	5.028	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	167	42	235	1193	0.140	167	176	0.2	0.2	3.510	A
2	379	95	154	833	0.454	379	248	0.8	0.8	7.915	A
3	160	40	272	1031	0.155	160	261	0.2	0.2	4.133	A
4	221	55	189	936	0.236	221	242	0.3	0.3	5.033	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	137	34	192	1216	0.112	137	144	0.2	0.1	3.337	A
2	309	77	126	846	0.366	310	203	0.8	0.6	6.735	A
3	130	33	223	1057	0.123	131	214	0.2	0.1	3.884	A
4	181	45	155	952	0.190	181	198	0.3	0.2	4.670	A

09:15 - 09:30

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	114	29	161	1234	0.093	115	121	0.1	0.1	3.216	A
2	259	65	105	855	0.303	260	170	0.6	0.4	6.056	A
3	109	27	186	1077	0.101	109	179	0.1	0.1	3.721	A
4	151	38	130	964	0.157	152	166	0.2	0.2	4.432	A

DS 2024 - DS 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	5.95	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D11	DS 2024	PM	ONE HOUR	16:30	18:00	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	✓	316	100.000
2		ONE HOUR	✓	269	100.000
3		ONE HOUR	✓	467	100.000
4		ONE HOUR	✓	142	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	72	208	36
	2	19	0	192	58
	3	209	203	0	55
	4	32	75	35	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.31	4.59	0.4	A	290	435
2	0.39	7.64	0.6	A	247	370
3	0.46	6.03	0.9	A	429	643
4	0.19	5.54	0.2	A	130	195

Main Results for each time segment

16:30 - 16:45

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	238	59	234	1193	0.199	237	195	0.0	0.2	3.763	A
2	203	51	209	810	0.250	201	262	0.0	0.3	5.903	A
3	352	88	85	1133	0.310	350	326	0.0	0.4	4.587	A
4	107	27	323	875	0.122	106	112	0.0	0.1	4.679	A

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	284	71	281	1167	0.243	284	233	0.2	0.3	4.076	A
2	242	60	251	792	0.305	241	314	0.3	0.4	6.541	A
3	420	105	101	1124	0.374	419	391	0.4	0.6	5.106	A
4	128	32	387	846	0.151	128	134	0.1	0.2	5.010	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	348	87	344	1132	0.307	347	286	0.3	0.4	4.586	A
2	296	74	307	767	0.386	295	385	0.4	0.6	7.614	A
3	514	129	124	1111	0.463	513	478	0.6	0.9	6.007	A
4	156	39	474	806	0.194	156	164	0.2	0.2	5.538	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	348	87	345	1131	0.307	348	286	0.4	0.4	4.594	A
2	296	74	307	767	0.386	296	385	0.6	0.6	7.641	A
3	514	129	124	1111	0.463	514	479	0.9	0.9	6.030	A
4	156	39	475	806	0.194	156	164	0.2	0.2	5.543	A

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	284	71	282	1166	0.244	285	234	0.4	0.3	4.086	A
2	242	60	251	791	0.306	243	315	0.6	0.4	6.568	A
3	420	105	102	1123	0.374	421	392	0.9	0.6	5.132	A
4	128	32	388	845	0.151	128	134	0.2	0.2	5.020	A

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	238	59	236	1192	0.200	238	196	0.3	0.3	3.775	A
2	203	51	210	809	0.250	203	264	0.4	0.3	5.942	A
3	352	88	85	1133	0.310	352	328	0.6	0.5	4.616	A
4	107	27	325	874	0.122	107	112	0.2	0.1	4.694	A

DS 2024 - DS 2024, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D12	DS 2024	Interpeak	ONE HOUR	13:30	15:00	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	✓	297	100.000
2		ONE HOUR	✓	306	100.000
3		ONE HOUR	✓	407	100.000
4		ONE HOUR	✓	161	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	70	178	49
	2	46	0	166	94
	3	199	170	0	38
	4	44	90	27	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.29	4.39	0.4	A	273	409
2	0.43	8.14	0.8	A	281	421
3	0.42	5.83	0.7	A	373	560
4	0.22	5.65	0.3	A	148	222

Main Results for each time segment

13:30 - 13:45

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	224	56	215	1203	0.186	223	216	0.0	0.2	3.667	A
2	230	58	190	818	0.282	229	247	0.0	0.4	6.096	A
3	306	77	141	1102	0.278	305	278	0.0	0.4	4.509	A
4	121	30	311	881	0.138	121	135	0.0	0.2	4.731	A

13:45 - 14:00

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	267	67	258	1180	0.226	267	259	0.2	0.3	3.942	A
2	275	69	228	801	0.343	275	296	0.4	0.5	6.825	A
3	366	91	170	1086	0.337	365	333	0.4	0.5	4.989	A
4	145	36	373	852	0.170	145	162	0.2	0.2	5.084	A

14:00 - 14:15

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	327	82	315	1148	0.285	327	318	0.3	0.4	4.382	A
2	337	84	279	779	0.432	336	363	0.5	0.8	8.103	A
3	448	112	208	1066	0.420	447	408	0.5	0.7	5.812	A
4	177	44	456	814	0.218	177	199	0.2	0.3	5.647	A

14:15 - 14:30

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	327	82	316	1147	0.285	327	318	0.4	0.4	4.387	A
2	337	84	280	779	0.432	337	363	0.8	0.8	8.138	A
3	448	112	208	1065	0.421	448	408	0.7	0.7	5.830	A
4	177	44	457	814	0.218	177	199	0.3	0.3	5.655	A

14:30 - 14:45

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	267	67	259	1179	0.226	267	260	0.4	0.3	3.949	A
2	275	69	229	801	0.343	276	297	0.8	0.5	6.868	A
3	366	91	170	1086	0.337	367	334	0.7	0.5	5.010	A
4	145	36	374	852	0.170	145	163	0.3	0.2	5.095	A

14:45 - 15:00

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	224	56	216	1203	0.186	224	218	0.3	0.2	3.678	A
2	230	58	191	817	0.282	231	249	0.5	0.4	6.146	A
3	306	77	143	1101	0.278	307	280	0.5	0.4	4.534	A
4	121	30	313	880	0.138	121	137	0.2	0.2	4.749	A

DS 2024 - DS 2024, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.95	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D22	DS 2024	Weekend	ONE HOUR	15:00	16:30	15	✓

Default vehicle mix	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	✓	470	100.000
2		ONE HOUR	✓	343	100.000
3		ONE HOUR	✓	610	100.000
4		ONE HOUR	✓	111	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	71	361	38
	2	47	0	250	46
	3	310	234	0	66
	4	26	47	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.46	6.49	0.9	A	431	647
2	0.55	12.59	1.3	B	315	472
3	0.61	9.23	1.7	A	560	840
4	0.17	6.57	0.2	A	102	153

Main Results for each time segment

15:00 - 15:15

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	354	88	239	1190	0.297	352	286	0.0	0.5	4.713	A
2	258	65	327	759	0.340	256	263	0.0	0.6	7.846	A
3	459	115	98	1126	0.408	456	485	0.0	0.7	5.890	A
4	84	21	442	821	0.102	83	112	0.0	0.1	5.365	A

15:15 - 15:30

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	423	106	286	1164	0.363	422	344	0.5	0.6	5.332	A
2	308	77	392	730	0.422	307	316	0.6	0.8	9.341	A
3	548	137	117	1115	0.492	547	582	0.7	1.0	6.959	A
4	100	25	530	780	0.128	100	135	0.1	0.2	5.816	A

15:30 - 15:45

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	517	129	350	1128	0.459	516	420	0.6	0.9	6.455	A
2	378	94	480	692	0.545	376	386	0.8	1.3	12.421	B
3	672	168	144	1101	0.610	669	712	1.0	1.7	9.121	A
4	122	31	648	726	0.168	122	165	0.2	0.2	6.551	A

15:45 - 16:00

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	517	129	351	1128	0.459	517	422	0.9	0.9	6.487	A
2	378	94	481	692	0.546	378	388	1.3	1.3	12.587	B
3	672	168	144	1100	0.610	672	714	1.7	1.7	9.231	A
4	122	31	651	725	0.169	122	165	0.2	0.2	6.569	A

16:00 - 16:15

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	423	106	288	1163	0.363	424	346	0.9	0.6	5.366	A
2	308	77	394	730	0.423	310	318	1.3	0.8	9.484	A
3	548	137	118	1114	0.492	551	586	1.7	1.1	7.056	A
4	100	25	534	779	0.128	100	135	0.2	0.2	5.837	A

16:15 - 16:30

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	354	88	241	1189	0.298	354	289	0.6	0.5	4.750	A
2	258	65	330	758	0.341	259	266	0.8	0.6	7.963	A
3	459	115	99	1125	0.408	460	490	1.1	0.8	5.969	A
4	84	21	446	819	0.102	84	113	0.2	0.1	5.388	A

DS 2029 - DS 2029, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.17	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D13	DS 2029	AM	ONE HOUR	08:00	09:30	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	✓	164	100.000
2		ONE HOUR	✓	374	100.000
3		ONE HOUR	✓	157	100.000
4		ONE HOUR	✓	218	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	46	79	39
	2	54	0	145	175
	3	50	82	0	25
	4	69	115	34	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.15	3.60	0.2	A	150	226
2	0.50	8.65	1.0	A	343	515
3	0.17	4.26	0.2	A	144	216
4	0.26	5.22	0.3	A	200	300

Main Results for each time segment

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	123	31	173	1227	0.101	123	130	0.0	0.1	3.260	A
2	282	70	114	851	0.331	280	182	0.0	0.5	6.281	A
3	118	30	200	1070	0.111	118	193	0.0	0.1	3.779	A
4	164	41	139	959	0.171	163	179	0.0	0.2	4.517	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	147	37	207	1208	0.122	147	155	0.1	0.1	3.394	A
2	336	84	137	841	0.400	336	218	0.5	0.7	7.112	A
3	141	35	240	1048	0.135	141	232	0.1	0.2	3.970	A
4	196	49	167	947	0.207	196	214	0.2	0.3	4.793	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	181	45	254	1182	0.153	180	190	0.1	0.2	3.594	A
2	412	103	167	828	0.497	411	267	0.7	1.0	8.600	A
3	173	43	294	1018	0.170	173	283	0.2	0.2	4.255	A
4	240	60	204	930	0.258	240	262	0.3	0.3	5.216	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	181	45	254	1182	0.153	181	190	0.2	0.2	3.595	A
2	412	103	167	828	0.497	412	268	1.0	1.0	8.652	A
3	173	43	295	1018	0.170	173	284	0.2	0.2	4.259	A
4	240	60	205	929	0.258	240	263	0.3	0.3	5.221	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	147	37	208	1207	0.122	148	156	0.2	0.1	3.396	A
2	336	84	137	841	0.400	337	219	1.0	0.7	7.166	A
3	141	35	242	1047	0.135	141	233	0.2	0.2	3.976	A
4	196	49	168	946	0.207	196	215	0.3	0.3	4.800	A

09:15 - 09:30

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	123	31	174	1226	0.101	124	130	0.1	0.1	3.267	A
2	282	70	115	851	0.331	282	183	0.7	0.5	6.343	A
3	118	30	202	1069	0.111	118	195	0.2	0.1	3.790	A
4	164	41	140	959	0.171	164	180	0.3	0.2	4.531	A

DS 2029 - DS 2029, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.41	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D14	DS 2029	PM	ONE HOUR	16:30	18:00	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	✓	341	100.000
2		ONE HOUR	✓	291	100.000
3		ONE HOUR	✓	508	100.000
4		ONE HOUR	✓	153	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	78	226	37
	2	21	0	208	62
	3	227	221	0	60
	4	34	81	38	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.34	4.87	0.5	A	313	469
2	0.42	8.25	0.7	A	267	401
3	0.51	6.57	1.0	A	466	699
4	0.21	5.82	0.3	A	140	211

Main Results for each time segment

16:30 - 16:45

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	257	64	255	1181	0.217	256	211	0.0	0.3	3.883	A
2	219	55	226	803	0.273	218	285	0.0	0.4	6.140	A
3	382	96	90	1130	0.338	380	353	0.0	0.5	4.790	A
4	115	29	351	862	0.134	115	119	0.0	0.2	4.810	A

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	307	77	305	1153	0.266	306	253	0.3	0.4	4.247	A
2	262	65	270	783	0.334	261	341	0.4	0.5	6.890	A
3	457	114	108	1120	0.408	456	424	0.5	0.7	5.414	A
4	138	34	421	830	0.166	137	143	0.2	0.2	5.194	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	375	94	374	1115	0.337	375	310	0.4	0.5	4.854	A
2	320	80	331	757	0.423	319	418	0.5	0.7	8.211	A
3	559	140	132	1107	0.505	558	519	0.7	1.0	6.540	A
4	168	42	515	787	0.214	168	175	0.2	0.3	5.814	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	375	94	374	1115	0.337	375	310	0.5	0.5	4.867	A
2	320	80	331	757	0.423	320	418	0.7	0.7	8.247	A
3	559	140	132	1107	0.505	559	520	1.0	1.0	6.573	A
4	168	42	516	787	0.214	168	175	0.3	0.3	5.824	A

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	307	77	306	1153	0.266	307	254	0.5	0.4	4.260	A
2	262	65	271	783	0.334	262	342	0.7	0.5	6.929	A
3	457	114	108	1120	0.408	458	425	1.0	0.7	5.447	A
4	138	34	423	829	0.166	138	143	0.3	0.2	5.209	A

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	257	64	256	1180	0.217	257	213	0.4	0.3	3.901	A
2	219	55	227	802	0.273	220	287	0.5	0.4	6.188	A
3	382	96	91	1130	0.339	383	356	0.7	0.5	4.829	A
4	115	29	354	861	0.134	115	120	0.2	0.2	4.828	A

DS 2029 - DS 2029, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.51	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D15	DS 2029	Interpeak	ONE HOUR	13:30	15:00	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	✓	321	100.000
2		ONE HOUR	✓	331	100.000
3		ONE HOUR	✓	444	100.000
4		ONE HOUR	✓	173	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	75	194	52
	2	49	0	181	101
	3	217	185	0	42
	4	47	97	29	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.31	4.62	0.5	A	295	442
2	0.47	8.89	0.9	A	304	456
3	0.46	6.33	0.9	A	407	611
4	0.24	5.95	0.3	A	159	238

Main Results for each time segment

13:30 - 13:45

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	242	60	233	1193	0.202	241	234	0.0	0.3	3.775	A
2	249	62	206	811	0.307	247	267	0.0	0.4	6.369	A
3	334	84	151	1097	0.305	333	302	0.0	0.4	4.702	A
4	130	33	338	868	0.150	130	146	0.0	0.2	4.868	A

13:45 - 14:00

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	289	72	279	1168	0.247	288	281	0.3	0.3	4.092	A
2	298	74	247	793	0.375	297	321	0.4	0.6	7.243	A
3	399	100	181	1080	0.370	399	363	0.4	0.6	5.278	A
4	156	39	405	838	0.186	155	175	0.2	0.2	5.275	A

14:00 - 14:15

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	353	88	342	1133	0.312	353	344	0.3	0.5	4.611	A
2	364	91	302	769	0.474	363	392	0.6	0.9	8.840	A
3	489	122	222	1058	0.462	488	444	0.6	0.8	6.302	A
4	190	48	495	796	0.239	190	214	0.2	0.3	5.938	A

14:15 - 14:30

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	353	88	342	1133	0.312	353	345	0.5	0.5	4.619	A
2	364	91	303	769	0.474	364	393	0.9	0.9	8.893	A
3	489	122	222	1058	0.462	489	445	0.8	0.9	6.328	A
4	190	48	497	796	0.239	190	215	0.3	0.3	5.948	A

14:30 - 14:45

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	289	72	280	1167	0.247	289	282	0.5	0.3	4.101	A
2	298	74	248	793	0.375	299	322	0.9	0.6	7.298	A
3	399	100	182	1080	0.370	400	364	0.9	0.6	5.306	A
4	156	39	407	837	0.186	156	176	0.3	0.2	5.288	A

14:45 - 15:00

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	242	60	235	1193	0.203	242	236	0.3	0.3	3.787	A
2	249	62	207	810	0.307	250	269	0.6	0.4	6.427	A
3	334	84	152	1096	0.305	335	305	0.6	0.4	4.734	A
4	130	33	340	867	0.150	130	147	0.2	0.2	4.886	A

DS 2029 - DS 2029, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.07	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D23	DS 2029	Weekend	ONE HOUR	15:00	16:30	15	✓

Default vehicle mix	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	✓	510	100.000
2		ONE HOUR	✓	372	100.000
3		ONE HOUR	✓	662	100.000
4		ONE HOUR	✓	77	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	77	393	40
	2	51	0	272	49
	3	337	254	0	71
	4	27	50	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.49	6.88	1.1	A	468	702
2	0.59	13.91	1.6	B	341	512
3	0.67	10.80	2.2	B	607	911
4	0.12	6.44	0.2	A	71	106

Main Results for each time segment

15:00 - 15:15

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	384	96	227	1197	0.321	382	310	0.0	0.5	4.850	A
2	280	70	324	760	0.369	278	285	0.0	0.6	8.169	A
3	498	125	105	1122	0.444	495	497	0.0	0.9	6.282	A
4	58	14	480	803	0.072	58	120	0.0	0.1	5.308	A

15:15 - 15:30

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	458	115	273	1171	0.391	458	372	0.5	0.7	5.543	A
2	334	84	389	732	0.457	333	342	0.6	0.9	9.905	A
3	595	149	126	1111	0.536	594	596	0.9	1.2	7.638	A
4	69	17	576	759	0.091	69	143	0.1	0.1	5.737	A

15:30 - 15:45

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	562	140	333	1138	0.494	560	455	0.7	1.1	6.839	A
2	410	102	476	694	0.590	407	418	0.9	1.5	13.663	B
3	729	182	153	1095	0.665	725	729	1.2	2.1	10.603	B
4	85	21	703	701	0.121	85	175	0.1	0.2	6.425	A

15:45 - 16:00

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	562	140	335	1137	0.494	561	457	1.1	1.1	6.880	A
2	410	102	477	694	0.590	409	419	1.5	1.6	13.908	B
3	729	182	154	1095	0.666	729	732	2.1	2.2	10.803	B
4	85	21	707	699	0.121	85	176	0.2	0.2	6.443	A

16:00 - 16:15

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	458	115	275	1170	0.392	460	375	1.1	0.7	5.587	A
2	334	84	390	731	0.457	337	344	1.6	0.9	10.104	B
3	595	149	127	1110	0.536	599	601	2.2	1.3	7.796	A
4	69	17	581	757	0.091	69	145	0.2	0.1	5.758	A

16:15 - 16:30

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	384	96	230	1195	0.321	385	313	0.7	0.5	4.891	A
2	280	70	327	759	0.369	281	288	0.9	0.7	8.311	A
3	498	125	106	1121	0.444	500	502	1.3	0.9	6.389	A
4	58	14	485	801	0.072	58	121	0.1	0.1	5.330	A

DS 2039 - DS 2039, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.73	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D16	DS 2039	AM	ONE HOUR	08:00	09:30	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	✓	180	100.000
2		ONE HOUR	✓	411	100.000
3		ONE HOUR	✓	174	100.000
4		ONE HOUR	✓	236	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	51	87	42
	2	59	0	160	192
	3	55	91	0	28
	4	74	125	37	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.17	3.71	0.2	A	165	248
2	0.55	9.76	1.2	A	377	566
3	0.19	4.44	0.2	A	160	239
4	0.28	5.45	0.4	A	217	325

Main Results for each time segment

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	136	34	190	1217	0.111	135	141	0.0	0.1	3.323	A
2	309	77	124	846	0.366	307	200	0.0	0.6	6.649	A
3	131	33	219	1059	0.124	130	213	0.0	0.1	3.872	A
4	178	44	154	953	0.186	177	196	0.0	0.2	4.635	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	162	40	227	1197	0.135	162	169	0.1	0.2	3.478	A
2	369	92	149	836	0.442	369	240	0.6	0.8	7.695	A
3	156	39	263	1036	0.151	156	255	0.1	0.2	4.094	A
4	212	53	184	939	0.226	212	235	0.2	0.3	4.951	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	198	50	278	1168	0.170	198	207	0.2	0.2	3.709	A
2	453	113	183	821	0.551	451	294	0.8	1.2	9.677	A
3	192	48	322	1004	0.191	191	312	0.2	0.2	4.431	A
4	260	65	225	920	0.282	259	288	0.3	0.4	5.446	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	198	50	279	1168	0.170	198	207	0.2	0.2	3.710	A
2	453	113	183	821	0.551	452	294	1.2	1.2	9.763	A
3	192	48	323	1003	0.191	192	313	0.2	0.2	4.436	A
4	260	65	226	920	0.283	260	288	0.4	0.4	5.454	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	162	40	228	1196	0.135	162	169	0.2	0.2	3.480	A
2	369	92	149	836	0.442	371	240	1.2	0.8	7.780	A
3	156	39	264	1035	0.151	157	256	0.2	0.2	4.102	A
4	212	53	185	939	0.226	213	236	0.4	0.3	4.960	A

09:15 - 09:30

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	136	34	191	1217	0.111	136	142	0.2	0.1	3.329	A
2	309	77	125	846	0.366	310	201	0.8	0.6	6.732	A
3	131	33	221	1058	0.124	131	214	0.2	0.1	3.884	A
4	178	44	155	952	0.187	178	198	0.3	0.2	4.649	A

DS 2039 - DS 2039, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D17	DS 2039	PM	ONE HOUR	16:30	18:00	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	✓	373	100.000
2		ONE HOUR	✓	318	100.000
3		ONE HOUR	✓	559	100.000
4		ONE HOUR	✓	166	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	85	249	39
	2	22	0	229	67
	3	250	243	0	66
	4	36	88	42	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.38	5.26	0.6	A	342	513
2	0.47	9.16	0.9	A	292	438
3	0.56	7.40	1.3	A	513	769
4	0.24	6.20	0.3	A	152	228

Main Results for each time segment

16:30 - 16:45

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	281	70	279	1168	0.240	280	231	0.0	0.3	4.047	A
2	239	60	247	793	0.302	238	312	0.0	0.4	6.462	A
3	421	105	96	1127	0.374	418	389	0.0	0.6	5.067	A
4	125	31	386	847	0.148	124	129	0.0	0.2	4.981	A

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	335	84	335	1137	0.295	335	276	0.3	0.4	4.487	A
2	286	71	296	772	0.370	285	373	0.4	0.6	7.387	A
3	503	126	115	1116	0.450	502	467	0.6	0.8	5.848	A
4	149	37	462	811	0.184	149	154	0.2	0.2	5.434	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	411	103	410	1095	0.375	410	338	0.4	0.6	5.246	A
2	350	88	363	743	0.471	349	457	0.6	0.9	9.103	A
3	615	154	141	1102	0.558	614	571	0.8	1.2	7.341	A
4	183	46	565	764	0.239	182	189	0.2	0.3	6.185	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	411	103	411	1095	0.375	411	339	0.6	0.6	5.261	A
2	350	88	363	743	0.471	350	458	0.9	0.9	9.162	A
3	615	154	141	1102	0.558	615	572	1.2	1.3	7.396	A
4	183	46	567	763	0.239	183	189	0.3	0.3	6.200	A

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	335	84	336	1136	0.295	336	278	0.6	0.4	4.505	A
2	286	71	297	772	0.371	287	375	0.9	0.6	7.446	A
3	503	126	115	1116	0.450	504	469	1.3	0.8	5.900	A
4	149	37	465	810	0.184	150	155	0.3	0.2	5.451	A

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	281	70	281	1167	0.241	281	232	0.4	0.3	4.067	A
2	239	60	249	793	0.302	240	314	0.6	0.4	6.523	A
3	421	105	97	1126	0.374	422	392	0.8	0.6	5.115	A
4	125	31	389	845	0.148	125	130	0.2	0.2	5.003	A

DS 2039 - DS 2039, Interpeak

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.93	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D18	DS 2039	Interpeak	ONE HOUR	13:30	15:00	15	✓

Default vehicle mix	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	✓	351	100.000
2		ONE HOUR	✓	362	100.000
3		ONE HOUR	✓	489	100.000
4		ONE HOUR	✓	187	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	82	214	55
	2	53	0	199	110
	3	239	204	0	46
	4	50	105	32	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.35	5.44	0.6	A	322	483
2	0.53	11.05	1.2	B	332	498
3	0.51	7.77	1.2	A	449	673
4	0.27	6.98	0.4	A	172	257

Main Results for each time segment

13:30 - 13:45

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	264	66	255	1181	0.224	263	256	0.0	0.3	4.308	A
2	273	68	225	803	0.340	270	293	0.0	0.6	7.408	A
3	368	92	163	1090	0.338	366	333	0.0	0.6	5.452	A
4	141	35	371	853	0.165	140	158	0.0	0.2	5.545	A

13:45 - 14:00

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	316	79	306	1153	0.274	315	307	0.3	0.4	4.725	A
2	325	81	270	783	0.416	325	351	0.6	0.8	8.617	A
3	440	110	196	1072	0.410	439	399	0.6	0.8	6.243	A
4	168	42	445	819	0.205	168	189	0.2	0.3	6.076	A

14:00 - 14:15

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	386	97	374	1115	0.347	386	375	0.4	0.6	5.427	A
2	399	100	331	757	0.527	397	429	0.8	1.2	10.943	B
3	538	135	239	1048	0.514	537	489	0.8	1.1	7.716	A
4	206	51	544	774	0.266	205	232	0.3	0.4	6.963	A

14:15 - 14:30

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	386	97	375	1114	0.347	386	377	0.6	0.6	5.439	A
2	399	100	331	757	0.527	399	430	1.2	1.2	11.048	B
3	538	135	240	1048	0.514	538	490	1.1	1.2	7.768	A
4	206	51	546	773	0.266	206	232	0.4	0.4	6.983	A

14:30 - 14:45

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	316	79	308	1152	0.274	316	309	0.6	0.4	4.740	A
2	325	81	271	783	0.416	327	353	1.2	0.8	8.721	A
3	440	110	197	1072	0.410	441	401	1.2	0.8	6.295	A
4	168	42	448	818	0.205	169	190	0.4	0.3	6.102	A

14:45 - 15:00

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	264	66	257	1180	0.224	265	258	0.4	0.3	4.329	A
2	273	68	227	802	0.340	273	295	0.8	0.6	7.504	A
3	368	92	165	1089	0.338	369	336	0.8	0.6	5.506	A
4	141	35	374	852	0.165	141	159	0.3	0.2	5.574	A

DS 2039 - DS 2039, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	13.01	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.50	5.20	2.7	4.5	14.2	12.0	
2	3.50	4.30	1.4	3.0	16.3	12.0	
3	4.00	4.20	0.2	8.0	15.4	20.0	
4	4.30	4.30	0.0	3.0	15.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.555	1323
2	0.433	900
3	0.546	1179
4	0.458	1023

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
D24	DS 2039	Weekend	ONE HOUR	15:00	16:30	15	✓

Default vehicle mix	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	✓	561	100.000
2		ONE HOUR	✓	409	100.000
3		ONE HOUR	✓	730	100.000
4		ONE HOUR	✓	127	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	85	433	43
	2	56	0	300	53
	3	371	280	0	79
	4	28	54	45	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.57	8.36	1.4	A	515	772
2	0.69	19.53	2.4	C	375	563
3	0.74	13.89	3.0	B	670	1005
4	0.21	7.52	0.3	A	117	175

Main Results for each time segment

15:00 - 15:15

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	106	283	1166	0.362	420	340	0.0	0.6	5.294	A
2	308	77	390	731	0.421	305	313	0.0	0.8	9.216	A
3	550	137	113	1117	0.492	545	581	0.0	1.0	6.878	A
4	96	24	528	781	0.122	95	131	0.0	0.2	5.766	A

15:15 - 15:30

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	504	126	340	1134	0.445	503	408	0.6	0.9	6.266	A
2	368	92	467	698	0.527	366	376	0.8	1.2	11.872	B
3	656	164	136	1105	0.594	654	697	1.0	1.6	8.747	A
4	114	29	633	733	0.156	114	157	0.2	0.2	6.397	A

15:30 - 15:45

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	618	154	415	1092	0.565	616	497	0.9	1.4	8.264	A
2	450	113	572	653	0.690	446	459	1.2	2.3	18.741	C
3	804	201	166	1088	0.738	798	852	1.6	2.9	13.394	B
4	140	35	773	669	0.209	139	191	0.2	0.3	7.475	A

15:45 - 16:00

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	618	154	417	1091	0.566	618	501	1.4	1.4	8.358	A
2	450	113	574	652	0.691	450	461	2.3	2.4	19.531	C
3	804	201	167	1088	0.739	803	856	2.9	3.0	13.886	B
4	140	35	778	667	0.210	140	193	0.3	0.3	7.517	A

16:00 - 16:15

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	504	126	343	1132	0.445	506	413	1.4	0.9	6.347	A
2	368	92	470	697	0.528	372	379	2.4	1.3	12.363	B
3	656	164	138	1104	0.595	662	704	3.0	1.7	9.067	A
4	114	29	641	729	0.157	115	159	0.3	0.2	6.446	A

16:15 - 16:30

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	422	106	286	1164	0.363	423	344	0.9	0.6	5.355	A
2	308	77	393	730	0.422	310	317	1.3	0.8	9.462	A
3	550	137	115	1116	0.492	552	588	1.7	1.1	7.043	A
4	96	24	535	778	0.123	96	132	0.2	0.2	5.804	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction6.j9
Path: G:\2018\p180191\Calcs\Modelling\ARCADY
Report generation date: 14/12/2022 10:55:56

Summary of junction performance

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	DN 2024 - DN 2024																			
Arm 1	A1 D1	0.5	4.69	0.33	A	A1 D2	0.8	5.62	0.46	A	A1 D3	0.5	4.62	0.33	A	A1 D19	0.5	4.68	0.34	A
Arm 2		0.0	4.09	0.02	A		0.0	4.30	0.01	A		0.0	4.01	0.01	A		0.0	4.05	0.02	A
Arm 3		1.9	13.64	0.65	B		1.1	10.06	0.53	B		1.4	11.28	0.58	B		1.1	9.78	0.52	A
Arm 4		0.3	5.54	0.22	A		0.0	4.21	0.04	A		0.1	4.49	0.08	A		0.1	4.41	0.07	A

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS

	DN 2029 - DN 2029																			
Arm 1	A2 D4	0.6	4.94	0.36	A	A2 D5	1.0	6.07	0.50	A	A2 D6	0.6	4.84	0.36	A	A2 D20	0.6	4.91	0.37	A
Arm 2		0.0	4.20	0.03	A		0.0	4.44	0.01	A		0.0	4.09	0.01	A		0.0	4.15	0.02	A
Arm 3		2.4	16.54	0.72	C		1.4	11.26	0.58	B		1.7	12.93	0.64	B		1.3	10.82	0.57	B
Arm 4		0.3	5.88	0.25	A		0.0	4.28	0.04	A		0.1	4.61	0.09	A		0.1	4.53	0.08	A

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	DN 2039 - DN 2039																			
Arm 1	A3 D7	0.7	5.25	0.40	A	A3 D8	1.2	6.76	0.55	A	A3 D9	0.6	5.15	0.39	A	A3 D21	0.7	5.24	0.41	A
Arm 2		0.0	4.33	0.03	A		0.0	4.62	0.01	A		0.0	4.21	0.01	A		0.0	4.28	0.02	A
Arm 3		3.5	22.09	0.79	C		1.7	13.15	0.64	B		2.3	15.72	0.70	C		1.6	12.53	0.62	B
Arm 4		0.4	6.33	0.28	A		0.1	4.42	0.05	A		0.1	4.78	0.10	A		0.1	4.69	0.09	A

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	DS 2024 - DS 2024																			
Arm 1	A4 D10	0.5	4.76	0.34	A	A4 D11	0.9	5.83	0.48	A	A4 D12	0.5	4.77	0.35	A	A4 D22	0.6	4.83	0.36	A
Arm 2		0.0	4.12	0.02	A		0.0	4.37	0.01	A		0.0	4.06	0.01	A		0.0	4.11	0.02	A
Arm 3		1.9	13.85	0.66	B		1.1	10.31	0.54	B		1.4	11.60	0.59	B		1.1	10.03	0.53	B
Arm 4		0.3	5.72	0.25	A		0.1	4.30	0.06	A		0.1	4.61	0.11	A		0.1	4.52	0.10	A

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	DS 2029 - DS 2029																			
Arm 1	A5 D13	0.6	5.01	0.37	A	A5 D14	1.1	6.32	0.52	A	A5 D15	0.6	4.87	0.37	A	A5 D23	0.6	5.08	0.39	A
Arm 2		0.0	4.23	0.03	A		0.0	4.51	0.01	A		0.0	4.07	0.01	A		0.0	4.21	0.02	A
Arm 3		2.5	16.86	0.72	C		1.4	11.57	0.59	B		1.8	13.32	0.64	B		1.3	11.12	0.57	B
Arm 4		0.4	6.06	0.27	A		0.1	4.40	0.07	A		0.1	4.49	0.07	A		0.1	4.65	0.11	A

	AM					PM					Interpeak					Weekend				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	DS 2039 - DS 2039																			
Arm 1	A6 D16	0.7	5.34	0.41	A	A6 D17	1.3	7.07	0.57	A	A6 D18	0.8	5.85	0.41	A	A6 D24	0.8	5.98	0.43	A
Arm 2		0.0	4.36	0.03	A		0.0	4.69	0.01	A		0.0	4.70	0.01	A		0.0	4.78	0.02	A
Arm 3		3.6	22.71	0.79	C		1.8	13.58	0.65	B		2.6	17.94	0.71	C		1.9	14.23	0.63	B
Arm 4		0.4	6.54	0.31	A		0.1	4.52	0.07	A		0.2	5.41	0.13	A		0.1	5.30	0.12	A

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

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

File summary

File Description

Title	(untitled)
Location	
Site number	
Date	11/07/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	HEADOFFICE\cuenae
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	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				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	DN 2024	AM	ONE HOUR	08:00	09:30	15	✓
D2	DN 2024	PM	ONE HOUR	16:30	18:00	15	✓
D3	DN 2024	Interpeak	ONE HOUR	13:30	15:00	15	✓
D4	DN 2029	AM	ONE HOUR	08:00	09:30	15	✓
D5	DN 2029	PM	ONE HOUR	16:30	18:00	15	✓
D6	DN 2029	Interpeak	ONE HOUR	13:30	15:00	15	✓
D7	DN 2039	AM	ONE HOUR	08:00	09:30	15	✓
D8	DN 2039	PM	ONE HOUR	16:30	18:00	15	✓
D9	DN 2039	Interpeak	ONE HOUR	13:30	15:00	15	✓
D10	DS 2024	AM	ONE HOUR	08:00	09:30	15	✓
D11	DS 2024	PM	ONE HOUR	16:30	18:00	15	✓
D12	DS 2024	Interpeak	ONE HOUR	13:30	15:00	15	✓
D13	DS 2029	AM	ONE HOUR	08:00	09:30	15	✓
D14	DS 2029	PM	ONE HOUR	16:30	18:00	15	✓
D15	DS 2029	Interpeak	ONE HOUR	13:30	15:00	15	✓
D16	DS 2039	AM	ONE HOUR	08:00	09:30	15	✓
D17	DS 2039	PM	ONE HOUR	16:30	18:00	15	✓
D18	DS 2039	Interpeak	ONE HOUR	13:30	15:00	15	✓
D19	DN 2024	Weekend	ONE HOUR	13:30	15:00	15	✓
D20	DN 2029	Weekend	ONE HOUR	13:30	15:00	15	✓
D21	DN 2039	Weekend	ONE HOUR	13:30	15:00	15	✓
D22	DS 2024	Weekend	ONE HOUR	13:30	15:00	15	✓
D23	DS 2029	Weekend	ONE HOUR	13:30	15:00	15	✓
D24	DS 2039	Weekend	ONE HOUR	13:30	15:00	15	✓

DN 2024 - DN 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3,D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.92	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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	DN 2024	AM	ONE HOUR	08:00	09:30	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	✓	348	100.000
2		ONE HOUR	✓	19	100.000
3		ONE HOUR	✓	453	100.000
4		ONE HOUR	✓	171	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	6	307	35
	2	12	0	5	2
	3	410	6	0	37
	4	119	2	50	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.33	4.69	0.5	A	319	479
2	0.02	4.09	0.0	A	17	26
3	0.65	13.64	1.9	B	416	624
4	0.22	5.54	0.3	A	157	235

Main Results for each time segment

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	262	65	43	1161	0.226	261	404	0.0	0.3	3.995	A
2	14	4	294	972	0.015	14	10	0.0	0.0	3.759	A
3	341	85	37	769	0.444	338	271	0.0	0.8	8.300	A
4	129	32	319	908	0.142	128	55	0.0	0.2	4.611	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	313	78	52	1156	0.271	313	485	0.3	0.4	4.266	A
2	17	4	352	942	0.018	17	13	0.0	0.0	3.894	A
3	407	102	44	766	0.532	406	325	0.8	1.1	9.964	A
4	154	38	384	878	0.175	154	66	0.2	0.2	4.965	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	383	96	64	1150	0.333	383	593	0.4	0.5	4.687	A
2	21	5	431	901	0.023	21	15	0.0	0.0	4.091	A
3	499	125	54	762	0.654	496	398	1.1	1.8	13.371	B
4	188	47	469	839	0.224	188	81	0.2	0.3	5.527	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	383	96	64	1150	0.333	383	596	0.5	0.5	4.693	A
2	21	5	432	900	0.023	21	15	0.0	0.0	4.093	A
3	499	125	54	762	0.654	499	399	1.8	1.9	13.636	B
4	188	47	471	838	0.225	188	81	0.3	0.3	5.541	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	313	78	52	1156	0.271	313	489	0.5	0.4	4.273	A
2	17	4	353	941	0.018	17	13	0.0	0.0	3.897	A
3	407	102	44	766	0.532	410	326	1.9	1.2	10.192	B
4	154	38	387	877	0.175	154	67	0.3	0.2	4.985	A

09:15 - 09:30

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	262	65	44	1161	0.226	262	409	0.4	0.3	4.009	A
2	14	4	295	971	0.015	14	11	0.0	0.0	3.765	A
3	341	85	37	769	0.444	342	273	1.2	0.8	8.475	A
4	129	32	324	906	0.142	129	56	0.2	0.2	4.632	A

DN 2024 - DN 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3,D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.38	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D2	DN 2024	PM	ONE HOUR	16:30	18:00	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	✓	487	100.000
2		ONE HOUR	✓	8	100.000
3		ONE HOUR	✓	367	100.000
4		ONE HOUR	✓	32	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	9	435	43
	2	6	0	1	1
	3	318	1	0	48
	4	21	0	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.46	5.62	0.8	A	447	670
2	0.01	4.30	0.0	A	7	11
3	0.53	10.06	1.1	B	337	505
4	0.04	4.21	0.0	A	29	44

Main Results for each time segment

16:30 - 16:45

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	367	92	9	1179	0.311	365	258	0.0	0.4	4.411	A
2	6	2	366	934	0.006	6	7	0.0	0.0	3.878	A
3	276	69	37	768	0.360	274	335	0.0	0.6	7.252	A
4	24	6	243	943	0.026	24	69	0.0	0.0	3.915	A

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	438	109	11	1178	0.372	437	309	0.4	0.6	4.856	A
2	7	2	439	896	0.008	7	9	0.0	0.0	4.047	A
3	330	82	45	766	0.431	329	401	0.6	0.7	8.233	A
4	29	7	291	921	0.031	29	83	0.0	0.0	4.034	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	536	134	13	1177	0.456	535	379	0.6	0.8	5.602	A
2	9	2	537	846	0.010	9	11	0.0	0.0	4.301	A
3	404	101	55	762	0.530	403	491	0.7	1.1	9.981	A
4	35	9	357	891	0.040	35	101	0.0	0.0	4.207	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	536	134	13	1177	0.456	536	380	0.8	0.8	5.618	A
2	9	2	538	845	0.010	9	11	0.0	0.0	4.304	A
3	404	101	55	762	0.530	404	492	1.1	1.1	10.058	B
4	35	9	358	890	0.040	35	101	0.0	0.0	4.210	A

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	438	109	11	1178	0.372	439	311	0.8	0.6	4.874	A
2	7	2	441	896	0.008	7	9	0.0	0.0	4.051	A
3	330	82	45	766	0.431	331	403	1.1	0.8	8.318	A
4	29	7	293	920	0.031	29	83	0.0	0.0	4.039	A

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	367	92	9	1179	0.311	367	260	0.6	0.5	4.436	A
2	6	2	369	933	0.006	6	8	0.0	0.0	3.885	A
3	276	69	38	768	0.360	277	337	0.8	0.6	7.343	A
4	24	6	245	942	0.026	24	69	0.0	0.0	3.922	A

DN 2024 - DN 2024, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3,D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.88	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D3	DN 2024	Interpeak	ONE HOUR	13:30	15:00	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	✓	346	100.000
2		ONE HOUR	✓	8	100.000
3		ONE HOUR	✓	408	100.000
4		ONE HOUR	✓	67	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	6	308	32
	2	2	0	5	1
	3	351	0	0	57
	4	25	2	40	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.33	4.62	0.5	A	317	476
2	0.01	4.01	0.0	A	7	11
3	0.58	11.28	1.4	B	374	562
4	0.08	4.49	0.1	A	61	92

Main Results for each time segment

13:30 - 13:45

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	260	65	31	1167	0.223	259	282	0.0	0.3	3.960	A
2	6	2	285	976	0.006	6	6	0.0	0.0	3.709	A
3	307	77	26	773	0.398	305	265	0.0	0.7	7.651	A
4	50	13	264	934	0.054	50	67	0.0	0.1	4.073	A

13:45 - 14:00

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	311	78	38	1164	0.267	311	339	0.3	0.4	4.219	A
2	7	2	341	947	0.008	7	7	0.0	0.0	3.829	A
3	367	92	31	771	0.476	366	317	0.7	0.9	8.870	A
4	60	15	317	909	0.066	60	81	0.1	0.1	4.239	A

14:00 - 14:15

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	381	95	46	1159	0.329	380	415	0.4	0.5	4.618	A
2	9	2	418	907	0.010	9	9	0.0	0.0	4.005	A
3	449	112	38	768	0.585	447	388	0.9	1.4	11.158	B
4	74	18	387	877	0.084	74	99	0.1	0.1	4.483	A

14:15 - 14:30

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	381	95	46	1159	0.329	381	416	0.5	0.5	4.624	A
2	9	2	418	907	0.010	9	9	0.0	0.0	4.006	A
3	449	112	39	768	0.585	449	389	1.4	1.4	11.284	B
4	74	18	389	876	0.084	74	99	0.1	0.1	4.487	A

14:30 - 14:45

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	311	78	38	1164	0.267	312	341	0.5	0.4	4.225	A
2	7	2	342	947	0.008	7	7	0.0	0.0	3.831	A
3	367	92	32	771	0.476	369	318	1.4	0.9	8.998	A
4	60	15	319	908	0.066	60	81	0.1	0.1	4.245	A

14:45 - 15:00

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	260	65	32	1167	0.223	261	285	0.4	0.3	3.974	A
2	6	2	286	975	0.006	6	6	0.0	0.0	3.715	A
3	307	77	26	773	0.398	308	266	0.9	0.7	7.770	A
4	50	13	267	932	0.054	50	68	0.1	0.1	4.081	A

DN 2024 - DN 2024, Weekend

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	DN 2024	✓	✓	D1,D2,D3,D19	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	6.97	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D19	DN 2024	Weekend	ONE HOUR	13:30	15:00	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	✓	360	100.000
2		ONE HOUR	✓	16	100.000
3		ONE HOUR	✓	363	100.000
4		ONE HOUR	✓	59	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	3	330	27
	2	9	0	7	0
	3	331	4	0	28
	4	31	2	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.34	4.68	0.5	A	330	496
2	0.02	4.05	0.0	A	15	22
3	0.52	9.78	1.1	A	333	500
4	0.07	4.41	0.1	A	54	81

Main Results for each time segment

13:30 - 13:45

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	271	68	24	1171	0.231	270	277	0.0	0.3	3.989	A
2	12	3	287	975	0.012	12	7	0.0	0.0	3.737	A
3	273	68	27	772	0.354	271	272	0.0	0.5	7.154	A
4	44	11	257	937	0.047	44	41	0.0	0.0	4.031	A

13:45 - 14:00

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	324	81	29	1169	0.277	323	333	0.3	0.4	4.259	A
2	14	4	344	946	0.015	14	8	0.0	0.0	3.865	A
3	326	82	32	770	0.424	326	326	0.5	0.7	8.081	A
4	53	13	309	913	0.058	53	49	0.0	0.1	4.185	A

14:00 - 14:15

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	396	99	35	1165	0.340	396	407	0.4	0.5	4.676	A
2	18	4	421	906	0.019	18	10	0.0	0.0	4.053	A
3	400	100	40	768	0.521	398	399	0.7	1.1	9.711	A
4	65	16	377	881	0.074	65	60	0.1	0.1	4.410	A

14:15 - 14:30

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	396	99	35	1165	0.340	396	408	0.5	0.5	4.681	A
2	18	4	422	905	0.019	18	10	0.0	0.0	4.054	A
3	400	100	40	768	0.521	400	400	1.1	1.1	9.781	A
4	65	16	379	881	0.074	65	61	0.1	0.1	4.413	A

14:30 - 14:45

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	324	81	29	1169	0.277	324	335	0.5	0.4	4.266	A
2	14	4	345	945	0.015	14	8	0.0	0.0	3.867	A
3	326	82	32	770	0.424	328	327	1.1	0.7	8.157	A
4	53	13	310	912	0.058	53	50	0.1	0.1	4.192	A

14:45 - 15:00

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	271	68	24	1171	0.231	271	280	0.4	0.3	4.002	A
2	12	3	289	974	0.012	12	7	0.0	0.0	3.743	A
3	273	68	27	772	0.354	274	274	0.7	0.6	7.236	A
4	44	11	260	936	0.047	44	41	0.1	0.1	4.041	A

DN 2029 - DN 2029, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.39	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D4	DN 2029	AM	ONE HOUR	08:00	09:30	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	✓	379	100.000
2		ONE HOUR	✓	21	100.000
3		ONE HOUR	✓	494	100.000
4		ONE HOUR	✓	187	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	334	38
	2	13	0	6	2
	3	446	7	0	41
	4	130	2	55	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.36	4.94	0.6	A	348	522
2	0.03	4.20	0.0	A	19	29
3	0.72	16.54	2.4	C	453	680
4	0.25	5.88	0.3	A	172	257

Main Results for each time segment

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	285	71	48	1159	0.246	284	440	0.0	0.3	4.111	A
2	16	4	320	958	0.017	16	12	0.0	0.0	3.819	A
3	372	93	40	768	0.485	368	296	0.0	0.9	8.933	A
4	141	35	347	895	0.157	140	61	0.0	0.2	4.765	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	341	85	57	1153	0.295	340	528	0.3	0.4	4.425	A
2	19	5	383	925	0.020	19	14	0.0	0.0	3.971	A
3	444	111	48	765	0.581	442	355	0.9	1.3	11.111	B
4	168	42	417	863	0.195	168	73	0.2	0.2	5.180	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	417	104	70	1147	0.364	417	645	0.4	0.6	4.927	A
2	23	6	469	881	0.026	23	18	0.0	0.0	4.197	A
3	544	136	58	761	0.715	540	434	1.3	2.4	16.002	C
4	206	51	509	820	0.251	206	89	0.2	0.3	5.853	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	417	104	70	1147	0.364	417	648	0.6	0.6	4.935	A
2	23	6	470	880	0.026	23	18	0.0	0.0	4.199	A
3	544	136	58	761	0.715	544	435	2.4	2.4	16.540	C
4	206	51	513	818	0.252	206	89	0.3	0.3	5.876	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	341	85	58	1153	0.295	341	533	0.6	0.4	4.436	A
2	19	5	385	925	0.020	19	14	0.0	0.0	3.974	A
3	444	111	48	765	0.581	448	356	2.4	1.4	11.517	B
4	168	42	423	860	0.195	168	73	0.3	0.2	5.206	A

09:15 - 09:30

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	285	71	48	1158	0.246	286	445	0.4	0.3	4.127	A
2	16	4	322	957	0.017	16	12	0.0	0.0	3.826	A
3	372	93	40	767	0.485	374	298	1.4	1.0	9.187	A
4	141	35	353	893	0.158	141	61	0.2	0.2	4.790	A

DN 2029 - DN 2029, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.12	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D5	DN 2029	PM	ONE HOUR	16:30	18:00	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	✓	530	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	400	100.000
4		ONE HOUR	✓	35	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	10	473	47
	2	1	0	1	7
	3	346	1	0	53
	4	23	0	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.50	6.07	1.0	A	486	730
2	0.01	4.44	0.0	A	8	12
3	0.58	11.26	1.4	B	367	551
4	0.04	4.28	0.0	A	32	48

Main Results for each time segment

16:30 - 16:45

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	399	100	10	1179	0.339	397	276	0.0	0.5	4.593	A
2	7	2	398	917	0.007	7	8	0.0	0.0	3.952	A
3	301	75	41	767	0.393	299	364	0.0	0.6	7.646	A
4	26	7	260	936	0.028	26	80	0.0	0.0	3.959	A

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	476	119	12	1178	0.405	476	332	0.5	0.7	5.125	A
2	8	2	478	877	0.009	8	10	0.0	0.0	4.145	A
3	360	90	49	764	0.471	359	436	0.6	0.9	8.861	A
4	31	8	312	911	0.035	31	96	0.0	0.0	4.090	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	584	146	14	1176	0.496	582	406	0.7	1.0	6.048	A
2	10	2	585	821	0.012	10	12	0.0	0.0	4.437	A
3	440	110	60	760	0.580	439	534	0.9	1.3	11.138	B
4	39	10	382	879	0.044	38	117	0.0	0.0	4.281	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	584	146	14	1176	0.496	584	407	1.0	1.0	6.072	A
2	10	2	586	821	0.012	10	12	0.0	0.0	4.440	A
3	440	110	61	760	0.580	440	535	1.3	1.4	11.263	B
4	39	10	383	879	0.044	39	118	0.0	0.0	4.285	A

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	476	119	12	1178	0.405	478	334	1.0	0.7	5.150	A
2	8	2	479	876	0.009	8	10	0.0	0.0	4.149	A
3	360	90	50	764	0.471	361	438	1.4	0.9	8.986	A
4	31	8	314	910	0.035	32	97	0.0	0.0	4.096	A

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	399	100	10	1179	0.339	400	279	0.7	0.5	4.626	A
2	7	2	401	916	0.007	7	8	0.0	0.0	3.958	A
3	301	75	41	767	0.393	302	367	0.9	0.7	7.763	A
4	26	7	263	934	0.028	26	81	0.0	0.0	3.965	A

DN 2029 - DN 2029, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.80	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D6	DN 2029	Interpeak	ONE HOUR	13:30	15:00	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	✓	376	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	444	100.000
4		ONE HOUR	✓	72	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	334	35
	2	2	0	6	1
	3	382	0	0	62
	4	27	2	43	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.36	4.84	0.6	A	345	518
2	0.01	4.09	0.0	A	8	12
3	0.64	12.93	1.7	B	407	611
4	0.09	4.61	0.1	A	66	99

Main Results for each time segment

13:30 - 13:45

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	283	71	34	1166	0.243	282	307	0.0	0.3	4.065	A
2	7	2	309	964	0.007	7	7	0.0	0.0	3.760	A
3	334	84	28	772	0.433	331	287	0.0	0.8	8.119	A
4	54	14	287	923	0.059	54	73	0.0	0.1	4.140	A

13:45 - 14:00

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	338	85	40	1162	0.291	338	368	0.3	0.4	4.362	A
2	8	2	370	932	0.009	8	8	0.0	0.0	3.895	A
3	399	100	34	770	0.519	398	344	0.8	1.1	9.652	A
4	65	16	344	897	0.072	65	88	0.1	0.1	4.327	A

14:00 - 14:15

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	414	103	49	1158	0.358	413	450	0.4	0.6	4.832	A
2	10	2	453	889	0.011	10	10	0.0	0.0	4.093	A
3	489	122	42	767	0.638	486	421	1.1	1.7	12.715	B
4	79	20	421	861	0.092	79	107	0.1	0.1	4.603	A

14:15 - 14:30

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	414	103	50	1158	0.358	414	452	0.6	0.6	4.840	A
2	10	2	454	889	0.011	10	10	0.0	0.0	4.095	A
3	489	122	42	767	0.638	489	422	1.7	1.7	12.933	B
4	79	20	423	860	0.092	79	108	0.1	0.1	4.609	A

14:30 - 14:45

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	338	85	41	1162	0.291	339	372	0.6	0.4	4.372	A
2	8	2	371	932	0.009	8	8	0.0	0.0	3.899	A
3	399	100	34	770	0.519	402	345	1.7	1.1	9.851	A
4	65	16	347	895	0.072	65	89	0.1	0.1	4.336	A

14:45 - 15:00

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	283	71	34	1166	0.243	283	311	0.4	0.3	4.080	A
2	7	2	311	963	0.007	7	7	0.0	0.0	3.766	A
3	334	84	29	772	0.433	336	289	1.1	0.8	8.279	A
4	54	14	290	922	0.059	54	74	0.1	0.1	4.151	A

DN 2029 - DN 2029, Weekend

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A2	DN 2029	✓	✓	D4,D5,D6,D20	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.55	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D20	DN 2029	Weekend	ONE HOUR	13:30	15:00	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	✓	391	100.000
2		ONE HOUR	✓	17	100.000
3		ONE HOUR	✓	394	100.000
4		ONE HOUR	✓	65	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	3	359	29
	2	10	0	7	0
	3	360	4	0	30
	4	34	2	29	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.37	4.91	0.6	A	359	538
2	0.02	4.15	0.0	A	16	23
3	0.57	10.82	1.3	B	362	542
4	0.08	4.53	0.1	A	60	89

Main Results for each time segment

13:30 - 13:45

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	294	74	26	1170	0.252	293	302	0.0	0.3	4.099	A
2	13	3	313	962	0.013	13	7	0.0	0.0	3.791	A
3	297	74	29	771	0.385	294	296	0.0	0.6	7.508	A
4	49	12	279	927	0.053	49	44	0.0	0.1	4.100	A

13:45 - 14:00

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	352	88	31	1167	0.301	351	362	0.3	0.4	4.409	A
2	15	4	374	930	0.016	15	8	0.0	0.0	3.935	A
3	354	89	35	769	0.460	353	355	0.6	0.8	8.635	A
4	58	15	335	901	0.065	58	53	0.1	0.1	4.274	A

14:00 - 14:15

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	430	108	38	1164	0.370	430	443	0.4	0.6	4.903	A
2	19	5	458	886	0.021	19	10	0.0	0.0	4.148	A
3	434	108	43	766	0.566	432	434	0.8	1.3	10.712	B
4	72	18	410	866	0.083	71	65	0.1	0.1	4.531	A

14:15 - 14:30

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	430	108	39	1163	0.370	430	445	0.6	0.6	4.911	A
2	19	5	459	886	0.021	19	10	0.0	0.0	4.150	A
3	434	108	43	766	0.566	434	435	1.3	1.3	10.819	B
4	72	18	412	865	0.083	72	65	0.1	0.1	4.535	A

14:30 - 14:45

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	352	88	32	1167	0.301	352	365	0.6	0.4	4.421	A
2	15	4	376	929	0.016	15	8	0.0	0.0	3.939	A
3	354	89	35	769	0.460	356	356	1.3	0.9	8.743	A
4	58	15	338	899	0.065	59	53	0.1	0.1	4.280	A

14:45 - 15:00

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	294	74	26	1170	0.252	295	305	0.4	0.3	4.116	A
2	13	3	314	961	0.013	13	7	0.0	0.0	3.798	A
3	297	74	29	771	0.385	298	298	0.9	0.6	7.615	A
4	49	12	282	925	0.053	49	45	0.1	0.1	4.109	A

DN 2039 - DN 2039, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	13.12	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D7	DN 2039	AM	ONE HOUR	08:00	09:30	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	✓	416	100.000
2		ONE HOUR	✓	23	100.000
3		ONE HOUR	✓	543	100.000
4		ONE HOUR	✓	205	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	368	41
	2	15	0	6	2
	3	491	7	0	45
	4	143	2	60	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.40	5.25	0.7	A	382	573
2	0.03	4.33	0.0	A	21	32
3	0.79	22.09	3.5	C	498	747
4	0.28	6.33	0.4	A	188	282

Main Results for each time segment

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	313	78	52	1157	0.271	312	484	0.0	0.4	4.255	A
2	17	4	351	942	0.018	17	12	0.0	0.0	3.893	A
3	409	102	43	766	0.534	404	325	0.0	1.1	9.834	A
4	154	39	382	879	0.176	153	66	0.0	0.2	4.957	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	374	93	62	1151	0.325	374	581	0.4	0.5	4.628	A
2	21	5	421	906	0.023	21	14	0.0	0.0	4.067	A
3	488	122	52	763	0.640	486	390	1.1	1.7	12.873	B
4	184	46	459	843	0.219	184	79	0.2	0.3	5.457	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	458	115	76	1144	0.400	457	708	0.5	0.7	5.239	A
2	25	6	516	857	0.030	25	18	0.0	0.0	4.328	A
3	598	149	64	759	0.788	591	477	1.7	3.4	20.701	C
4	226	56	559	797	0.283	225	96	0.3	0.4	6.288	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	458	115	76	1144	0.401	458	714	0.7	0.7	5.250	A
2	25	6	516	856	0.030	25	18	0.0	0.0	4.330	A
3	598	149	64	759	0.788	597	478	3.4	3.5	22.094	C
4	226	56	564	795	0.284	226	97	0.4	0.4	6.326	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	374	93	62	1151	0.325	375	590	0.7	0.5	4.641	A
2	21	5	422	905	0.023	21	14	0.0	0.0	4.072	A
3	488	122	52	763	0.640	495	391	3.5	1.8	13.749	B
4	184	46	467	840	0.220	185	80	0.4	0.3	5.503	A

09:15 - 09:30

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	313	78	52	1156	0.271	314	491	0.5	0.4	4.274	A
2	17	4	354	941	0.018	17	12	0.0	0.0	3.900	A
3	409	102	44	766	0.534	411	327	1.8	1.2	10.229	B
4	154	39	389	876	0.176	155	67	0.3	0.2	4.994	A

DN 2039 - DN 2039, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	9.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D8	DN 2039	PM	ONE HOUR	16:30	18:00	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	✓	584	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	440	100.000
4		ONE HOUR	✓	39	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	11	521	52
	2	7	0	1	1
	3	381	1	0	58
	4	25	0	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.55	6.76	1.2	A	536	804
2	0.01	4.62	0.0	A	8	12
3	0.64	13.15	1.7	B	404	606
4	0.05	4.42	0.1	A	36	54

Main Results for each time segment

16:30 - 16:45

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	440	110	11	1178	0.373	437	308	0.0	0.6	4.845	A
2	7	2	440	896	0.008	7	9	0.0	0.0	4.047	A
3	331	83	45	766	0.433	328	401	0.0	0.8	8.178	A
4	29	7	290	921	0.032	29	83	0.0	0.0	4.034	A

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	525	131	13	1177	0.446	524	370	0.6	0.8	5.510	A
2	8	2	527	851	0.010	8	11	0.0	0.0	4.270	A
3	396	99	54	762	0.519	394	481	0.8	1.1	9.751	A
4	35	9	349	894	0.039	35	100	0.0	0.0	4.188	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	643	161	16	1175	0.547	641	452	0.8	1.2	6.724	A
2	10	2	645	790	0.013	10	13	0.0	0.0	4.614	A
3	484	121	66	758	0.639	482	589	1.1	1.7	12.921	B
4	43	11	426	859	0.050	43	122	0.0	0.1	4.412	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	643	161	17	1175	0.547	643	455	1.2	1.2	6.764	A
2	10	2	646	789	0.013	10	13	0.0	0.0	4.618	A
3	484	121	66	758	0.639	484	590	1.7	1.7	13.150	B
4	43	11	428	858	0.050	43	122	0.1	0.1	4.418	A

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	525	131	14	1177	0.446	527	374	1.2	0.8	5.549	A
2	8	2	529	850	0.010	8	11	0.0	0.0	4.278	A
3	396	99	54	762	0.519	398	483	1.7	1.1	9.956	A
4	35	9	352	893	0.039	35	100	0.1	0.0	4.196	A

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	440	110	11	1178	0.373	441	312	0.8	0.6	4.887	A
2	7	2	443	895	0.008	7	9	0.0	0.0	4.056	A
3	331	83	45	765	0.433	333	404	1.1	0.8	8.342	A
4	29	7	294	920	0.032	29	84	0.0	0.0	4.043	A

DN 2039 - DN 2039, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.32	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D9	DN 2039	Interpeak	ONE HOUR	13:30	15:00	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	✓	413	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	488	100.000
4		ONE HOUR	✓	80	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	368	38
	2	2	0	6	1
	3	420	0	0	68
	4	29	3	48	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.39	5.15	0.6	A	379	568
2	0.01	4.21	0.0	A	8	12
3	0.70	15.72	2.3	C	448	672
4	0.10	4.78	0.1	A	73	110

Main Results for each time segment

13:30 - 13:45

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	311	78	38	1164	0.267	309	336	0.0	0.4	4.208	A
2	7	2	340	948	0.007	7	7	0.0	0.0	3.825	A
3	367	92	31	771	0.477	364	316	0.0	0.9	8.770	A
4	60	15	315	910	0.066	60	80	0.0	0.1	4.233	A

13:45 - 14:00

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	371	93	46	1160	0.320	371	404	0.4	0.5	4.562	A
2	8	2	408	913	0.009	8	9	0.0	0.0	3.979	A
3	439	110	37	769	0.571	437	379	0.9	1.3	10.804	B
4	72	18	378	881	0.082	72	96	0.1	0.1	4.449	A

14:00 - 14:15

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	455	114	56	1154	0.394	454	493	0.5	0.6	5.136	A
2	10	2	499	865	0.011	10	11	0.0	0.0	4.207	A
3	537	134	45	766	0.702	534	464	1.3	2.2	15.264	C
4	88	22	461	842	0.105	88	117	0.1	0.1	4.772	A

14:15 - 14:30

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	455	114	56	1154	0.394	455	496	0.6	0.6	5.146	A
2	10	2	500	865	0.011	10	11	0.0	0.0	4.209	A
3	537	134	45	766	0.702	537	465	2.2	2.3	15.716	C
4	88	22	464	841	0.105	88	118	0.1	0.1	4.781	A

14:30 - 14:45

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	371	93	46	1160	0.320	372	409	0.6	0.5	4.574	A
2	8	2	409	912	0.009	8	9	0.0	0.0	3.983	A
3	439	110	37	769	0.571	442	380	2.3	1.4	11.160	B
4	72	18	383	879	0.082	72	97	0.1	0.1	4.464	A

14:45 - 15:00

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	311	78	38	1164	0.267	311	341	0.5	0.4	4.228	A
2	7	2	342	947	0.007	7	8	0.0	0.0	3.829	A
3	367	92	31	771	0.477	369	318	1.4	0.9	9.001	A
4	60	15	319	908	0.066	60	81	0.1	0.1	4.246	A

DN 2039 - DN 2039, Weekend

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A3	DN 2039	✓	✓	D7,D8,D9,D21	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.49	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D21	DN 2039	Weekend	ONE HOUR	13:30	15:00	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	✓	431	100.000
2		ONE HOUR	✓	19	100.000
3		ONE HOUR	✓	434	100.000
4		ONE HOUR	✓	71	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	4	395	32
	2	11	0	8	0
	3	396	5	0	33
	4	37	2	32	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.41	5.24	0.7	A	395	593
2	0.02	4.28	0.0	A	17	26
3	0.62	12.53	1.6	B	398	597
4	0.09	4.69	0.1	A	65	98

Main Results for each time segment

13:30 - 13:45

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	324	81	29	1168	0.278	323	331	0.0	0.4	4.250	A
2	14	4	344	946	0.015	14	8	0.0	0.0	3.864	A
3	327	82	32	770	0.424	324	326	0.0	0.7	8.012	A
4	53	13	307	914	0.059	53	49	0.0	0.1	4.183	A

13:45 - 14:00

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	387	97	35	1165	0.332	387	398	0.4	0.5	4.622	A
2	17	4	412	910	0.019	17	10	0.0	0.0	4.029	A
3	390	98	39	768	0.508	389	391	0.7	1.0	9.471	A
4	64	16	369	885	0.072	64	58	0.1	0.1	4.384	A

14:00 - 14:15

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	475	119	43	1161	0.409	474	487	0.5	0.7	5.232	A
2	21	5	505	863	0.024	21	12	0.0	0.0	4.276	A
3	478	119	47	765	0.625	475	478	1.0	1.6	12.340	B
4	78	20	451	847	0.092	78	71	0.1	0.1	4.682	A

14:15 - 14:30

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	475	119	43	1161	0.409	475	489	0.7	0.7	5.242	A
2	21	5	505	862	0.024	21	12	0.0	0.0	4.279	A
3	478	119	47	765	0.625	478	479	1.6	1.6	12.532	B
4	78	20	454	846	0.092	78	72	0.1	0.1	4.688	A

14:30 - 14:45

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	387	97	35	1165	0.333	388	401	0.7	0.5	4.638	A
2	17	4	413	910	0.019	17	10	0.0	0.0	4.032	A
3	390	98	39	768	0.508	392	392	1.6	1.1	9.649	A
4	64	16	373	883	0.072	64	59	0.1	0.1	4.394	A

14:45 - 15:00

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	324	81	29	1168	0.278	325	335	0.5	0.4	4.270	A
2	14	4	346	945	0.015	14	8	0.0	0.0	3.871	A
3	327	82	32	770	0.424	328	328	1.1	0.7	8.163	A
4	53	13	311	912	0.059	54	49	0.1	0.1	4.196	A

DS 2024 - DS 2024, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.97	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D10	DS 2024	AM	ONE HOUR	08:00	09:30	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	✓	358	100.000
2		ONE HOUR	✓	19	100.000
3		ONE HOUR	✓	453	100.000
4		ONE HOUR	✓	189	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	6	307	45
	2	12	0	5	2
	3	410	6	0	37
	4	137	2	50	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.34	4.76	0.5	A	329	493
2	0.02	4.12	0.0	A	17	26
3	0.66	13.85	1.9	B	416	624
4	0.25	5.72	0.3	A	173	260

Main Results for each time segment

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	270	67	43	1161	0.232	268	417	0.0	0.3	4.028	A
2	14	4	301	968	0.015	14	10	0.0	0.0	3.774	A
3	341	85	44	766	0.445	338	271	0.0	0.8	8.353	A
4	142	36	319	908	0.157	142	63	0.0	0.2	4.693	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	322	80	52	1156	0.278	322	501	0.3	0.4	4.310	A
2	17	4	361	937	0.018	17	13	0.0	0.0	3.913	A
3	407	102	53	763	0.534	406	325	0.8	1.1	10.055	B
4	170	42	384	878	0.193	170	75	0.2	0.2	5.079	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	394	99	64	1150	0.343	394	613	0.4	0.5	4.756	A
2	21	5	442	895	0.023	21	15	0.0	0.0	4.118	A
3	499	125	65	758	0.658	496	398	1.1	1.8	13.572	B
4	208	52	469	839	0.248	208	92	0.2	0.3	5.701	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	394	99	64	1150	0.343	394	615	0.5	0.5	4.762	A
2	21	5	443	895	0.023	21	15	0.0	0.0	4.119	A
3	499	125	65	758	0.658	499	399	1.8	1.9	13.850	B
4	208	52	471	838	0.248	208	92	0.3	0.3	5.716	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	322	80	52	1156	0.278	322	505	0.5	0.4	4.319	A
2	17	4	362	936	0.018	17	13	0.0	0.0	3.916	A
3	407	102	53	763	0.534	410	326	1.9	1.2	10.294	B
4	170	42	387	877	0.194	170	76	0.3	0.2	5.099	A

09:15 - 09:30

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	270	67	44	1161	0.232	270	422	0.4	0.3	4.042	A
2	14	4	303	967	0.015	14	11	0.0	0.0	3.778	A
3	341	85	44	766	0.445	342	273	1.2	0.8	8.535	A
4	142	36	324	906	0.157	143	63	0.2	0.2	4.717	A

DS 2024 - DS 2024, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.50	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D11	DS 2024	PM	ONE HOUR	16:30	18:00	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	✓	508	100.000
2		ONE HOUR	✓	8	100.000
3		ONE HOUR	✓	367	100.000
4		ONE HOUR	✓	49	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	9	435	64
	2	6	0	1	1
	3	318	1	0	48
	4	38	0	11	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.48	5.83	0.9	A	466	699
2	0.01	4.37	0.0	A	7	11
3	0.54	10.31	1.1	B	337	505
4	0.06	4.30	0.1	A	45	67

Main Results for each time segment

16:30 - 16:45

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	382	96	9	1179	0.324	381	270	0.0	0.5	4.497	A
2	6	2	382	926	0.007	6	7	0.0	0.0	3.912	A
3	276	69	53	763	0.362	274	335	0.0	0.6	7.336	A
4	37	9	243	943	0.039	37	85	0.0	0.0	3.970	A

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	457	114	11	1178	0.388	456	325	0.5	0.6	4.981	A
2	7	2	458	887	0.008	7	9	0.0	0.0	4.092	A
3	330	82	64	759	0.435	329	401	0.6	0.8	8.367	A
4	44	11	291	921	0.048	44	101	0.0	0.1	4.105	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	559	140	13	1177	0.475	558	397	0.6	0.9	5.810	A
2	9	2	560	834	0.011	9	11	0.0	0.0	4.364	A
3	404	101	78	753	0.536	403	491	0.8	1.1	10.221	B
4	54	13	357	891	0.061	54	124	0.1	0.1	4.301	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	559	140	13	1177	0.475	559	399	0.9	0.9	5.828	A
2	9	2	561	833	0.011	9	11	0.0	0.0	4.366	A
3	404	101	78	753	0.536	404	492	1.1	1.1	10.307	B
4	54	13	358	890	0.061	54	124	0.1	0.1	4.304	A

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	457	114	11	1178	0.388	458	327	0.9	0.6	5.003	A
2	7	2	460	886	0.008	7	9	0.0	0.0	4.098	A
3	330	82	64	758	0.435	331	403	1.1	0.8	8.457	A
4	44	11	293	920	0.048	44	102	0.1	0.1	4.109	A

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	382	96	9	1179	0.324	383	273	0.6	0.5	4.527	A
2	6	2	385	925	0.007	6	8	0.0	0.0	3.918	A
3	276	69	54	762	0.362	277	337	0.8	0.6	7.433	A
4	37	9	245	942	0.039	37	85	0.1	0.0	3.977	A

DS 2024 - DS 2024, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.95	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D12	DS 2024	Interpeak	ONE HOUR	13:30	15:00	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	✓	367	100.000
2		ONE HOUR	✓	8	100.000
3		ONE HOUR	✓	408	100.000
4		ONE HOUR	✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	6	308	53
	2	2	0	5	1
	3	351	0	0	57
	4	44	2	40	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.35	4.77	0.5	A	337	505
2	0.01	4.06	0.0	A	7	11
3	0.59	11.60	1.4	B	374	562
4	0.11	4.61	0.1	A	79	118

Main Results for each time segment

13:30 - 13:45

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	276	69	31	1167	0.237	275	296	0.0	0.3	4.029	A
2	6	2	301	968	0.006	6	6	0.0	0.0	3.740	A
3	307	77	42	767	0.401	305	265	0.0	0.7	7.746	A
4	65	16	263	934	0.069	64	83	0.0	0.1	4.140	A

13:45 - 14:00

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	330	82	38	1164	0.283	330	356	0.3	0.4	4.312	A
2	7	2	360	937	0.008	7	7	0.0	0.0	3.870	A
3	367	92	50	764	0.480	366	317	0.7	0.9	9.026	A
4	77	19	316	909	0.085	77	100	0.1	0.1	4.326	A

14:00 - 14:15

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	404	101	46	1159	0.349	404	435	0.4	0.5	4.760	A
2	9	2	441	896	0.010	9	9	0.0	0.0	4.059	A
3	449	112	62	759	0.592	447	388	0.9	1.4	11.456	B
4	95	24	387	877	0.108	95	122	0.1	0.1	4.602	A

14:15 - 14:30

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	404	101	46	1159	0.349	404	437	0.5	0.5	4.765	A
2	9	2	442	895	0.010	9	9	0.0	0.0	4.061	A
3	449	112	62	759	0.592	449	389	1.4	1.4	11.596	B
4	95	24	389	876	0.108	95	122	0.1	0.1	4.607	A

14:30 - 14:45

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	330	82	38	1164	0.283	330	359	0.5	0.4	4.323	A
2	7	2	361	937	0.008	7	7	0.0	0.0	3.873	A
3	367	92	50	764	0.480	369	318	1.4	0.9	9.162	A
4	77	19	319	908	0.085	77	100	0.1	0.1	4.333	A

14:45 - 15:00

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	276	69	32	1167	0.237	277	300	0.4	0.3	4.044	A
2	6	2	302	967	0.006	6	6	0.0	0.0	3.747	A
3	307	77	42	767	0.401	308	266	0.9	0.7	7.873	A
4	65	16	267	932	0.069	65	84	0.1	0.1	4.151	A

DS 2024 - DS 2024, Weekend

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A4	DS 2024	✓	✓	D10,D11,D12,D22	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D22	DS 2024	Weekend	ONE HOUR	13:30	15:00	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	✓	382	100.000
2		ONE HOUR	✓	16	100.000
3		ONE HOUR	✓	363	100.000
4		ONE HOUR	✓	77	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	3	330	49
	2	9	0	7	0
	3	331	4	0	28
	4	49	2	26	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.36	4.83	0.6	A	351	526
2	0.02	4.11	0.0	A	15	22
3	0.53	10.03	1.1	B	333	500
4	0.10	4.52	0.1	A	71	106

Main Results for each time segment

13:30 - 13:45

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	288	72	24	1171	0.246	286	291	0.0	0.3	4.062	A
2	12	3	304	967	0.012	12	7	0.0	0.0	3.770	A
3	273	68	43	766	0.357	271	272	0.0	0.5	7.240	A
4	58	14	257	937	0.062	58	58	0.0	0.1	4.093	A

13:45 - 14:00

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	343	86	29	1169	0.294	343	349	0.3	0.4	4.358	A
2	14	4	364	935	0.015	14	8	0.0	0.0	3.908	A
3	326	82	52	763	0.428	326	326	0.5	0.7	8.216	A
4	69	17	309	913	0.076	69	69	0.1	0.1	4.266	A

14:00 - 14:15

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	421	105	35	1165	0.361	420	427	0.4	0.6	4.826	A
2	18	4	445	893	0.020	18	10	0.0	0.0	4.111	A
3	400	100	64	759	0.527	398	399	0.7	1.1	9.952	A
4	85	21	377	881	0.096	85	85	0.1	0.1	4.520	A

14:15 - 14:30

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	421	105	35	1165	0.361	421	428	0.6	0.6	4.834	A
2	18	4	446	893	0.020	18	10	0.0	0.0	4.112	A
3	400	100	64	759	0.527	400	400	1.1	1.1	10.027	B
4	85	21	379	881	0.096	85	85	0.1	0.1	4.523	A

14:30 - 14:45

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	343	86	29	1169	0.294	344	351	0.6	0.4	4.368	A
2	14	4	365	935	0.015	14	8	0.0	0.0	3.912	A
3	326	82	52	763	0.428	328	327	1.1	0.8	8.298	A
4	69	17	311	912	0.076	69	69	0.1	0.1	4.273	A

14:45 - 15:00

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	288	72	24	1171	0.246	288	294	0.4	0.3	4.079	A
2	12	3	305	966	0.012	12	7	0.0	0.0	3.774	A
3	273	68	44	766	0.357	274	274	0.8	0.6	7.331	A
4	58	14	260	936	0.062	58	58	0.1	0.1	4.103	A

DS 2029 - DS 2029, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	10.47	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D13	DS 2029	AM	ONE HOUR	08:00	09:30	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	✓	389	100.000
2		ONE HOUR	✓	21	100.000
3		ONE HOUR	✓	494	100.000
4		ONE HOUR	✓	204	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	334	48
	2	13	0	6	2
	3	446	7	0	41
	4	147	2	55	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.37	5.01	0.6	A	357	535
2	0.03	4.23	0.0	A	19	29
3	0.72	16.86	2.5	C	453	680
4	0.27	6.06	0.4	A	187	281

Main Results for each time segment

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	293	73	48	1159	0.253	292	452	0.0	0.3	4.147	A
2	16	4	327	954	0.017	16	12	0.0	0.0	3.835	A
3	372	93	47	765	0.486	368	296	0.0	0.9	8.997	A
4	154	38	347	895	0.172	153	68	0.0	0.2	4.845	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	350	87	57	1153	0.303	349	543	0.3	0.4	4.475	A
2	19	5	392	921	0.021	19	14	0.0	0.0	3.992	A
3	444	111	57	761	0.583	442	355	0.9	1.4	11.226	B
4	183	46	417	863	0.213	183	82	0.2	0.3	5.297	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	428	107	70	1147	0.374	428	663	0.4	0.6	5.003	A
2	23	6	480	875	0.026	23	18	0.0	0.0	4.225	A
3	544	136	69	757	0.719	540	434	1.4	2.4	16.284	C
4	225	56	509	820	0.274	224	100	0.3	0.4	6.037	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	428	107	70	1147	0.374	428	667	0.6	0.6	5.011	A
2	23	6	481	875	0.026	23	18	0.0	0.0	4.227	A
3	544	136	69	756	0.719	544	435	2.4	2.5	16.855	C
4	225	56	513	818	0.274	225	100	0.4	0.4	6.061	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	350	87	58	1153	0.303	350	549	0.6	0.4	4.488	A
2	19	5	394	920	0.021	19	14	0.0	0.0	3.994	A
3	444	111	57	761	0.583	448	356	2.5	1.4	11.653	B
4	183	46	423	860	0.213	184	82	0.4	0.3	5.325	A

09:15 - 09:30

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	293	73	48	1158	0.253	293	458	0.4	0.3	4.164	A
2	16	4	329	953	0.017	16	12	0.0	0.0	3.840	A
3	372	93	47	765	0.486	374	298	1.4	1.0	9.257	A
4	154	38	353	893	0.172	154	69	0.3	0.2	4.873	A

DS 2029 - DS 2029, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D14	DS 2029	PM	ONE HOUR	16:30	18:00	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	✓	551	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	400	100.000
4		ONE HOUR	✓	52	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	10	473	68
	2	7	0	1	1
	3	346	1	0	53
	4	40	0	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS	Average Demand (PCU/hr)	Total Junction Arrivals (PCU)
1	0.52	6.32	1.1	A	506	758
2	0.01	4.51	0.0	A	8	12
3	0.59	11.57	1.4	B	367	551
4	0.07	4.40	0.1	A	48	72

Main Results for each time segment

16:30 - 16:45

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	415	104	10	1179	0.352	413	293	0.0	0.5	4.686	A
2	7	2	414	909	0.007	7	8	0.0	0.0	3.988	A
3	301	75	57	761	0.396	299	364	0.0	0.6	7.735	A
4	39	10	264	934	0.042	39	91	0.0	0.0	4.024	A

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	495	124	12	1178	0.421	495	352	0.5	0.7	5.264	A
2	8	2	496	867	0.009	8	10	0.0	0.0	4.192	A
3	360	90	68	757	0.475	359	436	0.6	0.9	9.016	A
4	47	12	317	909	0.051	47	109	0.0	0.1	4.175	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	607	152	14	1176	0.516	605	431	0.7	1.1	6.289	A
2	10	2	608	809	0.012	10	12	0.0	0.0	4.503	A
3	440	110	84	751	0.586	438	534	0.9	1.4	11.438	B
4	57	14	388	876	0.065	57	134	0.1	0.1	4.395	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	607	152	14	1176	0.516	607	433	1.1	1.1	6.318	A
2	10	2	609	809	0.012	10	12	0.0	0.0	4.506	A
3	440	110	84	751	0.586	440	535	1.4	1.4	11.574	B
4	57	14	390	875	0.065	57	134	0.1	0.1	4.399	A

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	495	124	12	1178	0.421	497	355	1.1	0.7	5.295	A
2	8	2	498	866	0.009	8	10	0.0	0.0	4.197	A
3	360	90	68	757	0.475	361	438	1.4	0.9	9.150	A
4	47	12	320	908	0.052	47	110	0.1	0.1	4.182	A

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	415	104	10	1179	0.352	416	297	0.7	0.5	4.723	A
2	7	2	417	908	0.007	7	8	0.0	0.0	3.994	A
3	301	75	57	761	0.396	302	367	0.9	0.7	7.865	A
4	39	10	267	932	0.042	39	92	0.1	0.0	4.031	A

DS 2029 - DS 2029, Interpeak

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	8.99	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D15	DS 2029	Interpeak	ONE HOUR	13:30	15:00	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	✓	396	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	444	100.000
4		ONE HOUR	✓	54	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	334	55
	2	2	0	6	1
	3	382	0	0	62
	4	40	2	12	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.37	4.87	0.6	A	363	545
2	0.01	4.07	0.0	A	8	12
3	0.64	13.32	1.8	B	407	611
4	0.07	4.49	0.1	A	50	74

Main Results for each time segment

13:30 - 13:45

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	298	75	10	1178	0.253	297	316	0.0	0.3	4.078	A
2	7	2	301	968	0.007	7	7	0.0	0.0	3.743	A
3	334	84	43	766	0.436	331	264	0.0	0.8	8.221	A
4	41	10	286	923	0.044	40	88	0.0	0.0	4.077	A

13:45 - 14:00

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	356	89	13	1177	0.302	356	380	0.3	0.4	4.379	A
2	8	2	360	937	0.009	8	8	0.0	0.0	3.873	A
3	399	100	52	763	0.523	398	316	0.8	1.1	9.828	A
4	49	12	344	897	0.054	49	106	0.0	0.1	4.244	A

14:00 - 14:15

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	436	109	15	1176	0.371	435	464	0.4	0.6	4.858	A
2	10	2	441	896	0.011	10	10	0.0	0.0	4.064	A
3	489	122	64	759	0.644	486	387	1.1	1.7	13.084	B
4	59	15	420	861	0.069	59	129	0.1	0.1	4.489	A

14:15 - 14:30

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	436	109	15	1176	0.371	436	467	0.6	0.6	4.866	A
2	10	2	441	895	0.011	10	10	0.0	0.0	4.066	A
3	489	122	64	759	0.644	489	388	1.7	1.8	13.325	B
4	59	15	423	860	0.069	59	130	0.1	0.1	4.495	A

14:30 - 14:45

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	356	89	13	1177	0.302	357	383	0.6	0.4	4.389	A
2	8	2	361	937	0.009	8	8	0.0	0.0	3.876	A
3	399	100	52	763	0.523	402	317	1.8	1.1	10.042	B
4	49	12	347	895	0.054	49	107	0.1	0.1	4.254	A

14:45 - 15:00

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	298	75	11	1178	0.253	299	320	0.4	0.3	4.094	A
2	7	2	302	967	0.007	7	7	0.0	0.0	3.747	A
3	334	84	44	766	0.436	336	265	1.1	0.8	8.389	A
4	41	10	290	921	0.044	41	89	0.1	0.0	4.087	A

DS 2029 - DS 2029, Weekend

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A5	DS 2029	✓	✓	D13,D14,D15,D23	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	7.65	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D23	DS 2029	Weekend	ONE HOUR	13:30	15:00	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	✓	413	100.000
2		ONE HOUR	✓	17	100.000
3		ONE HOUR	✓	394	100.000
4		ONE HOUR	✓	83	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	3	359	51
	2	10	0	7	0
	3	360	4	0	30
	4	52	2	29	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.39	5.08	0.6	A	379	568
2	0.02	4.21	0.0	A	16	23
3	0.57	11.12	1.3	B	362	542
4	0.11	4.65	0.1	A	76	114

Main Results for each time segment

13:30 - 13:45

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	311	78	26	1170	0.266	309	315	0.0	0.4	4.177	A
2	13	3	329	953	0.013	13	7	0.0	0.0	3.826	A
3	297	74	46	765	0.388	294	296	0.0	0.6	7.601	A
4	62	16	279	927	0.067	62	61	0.0	0.1	4.164	A

13:45 - 14:00

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	371	93	31	1167	0.318	371	378	0.4	0.5	4.518	A
2	15	4	394	920	0.017	15	8	0.0	0.0	3.980	A
3	354	89	55	762	0.465	353	355	0.6	0.9	8.789	A
4	75	19	335	901	0.083	75	73	0.1	0.1	4.358	A

14:00 - 14:15

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	455	114	38	1164	0.391	454	463	0.5	0.6	5.068	A
2	19	5	483	874	0.021	19	10	0.0	0.0	4.209	A
3	434	108	67	757	0.573	432	434	0.9	1.3	11.003	B
4	91	23	410	866	0.106	91	89	0.1	0.1	4.646	A

14:15 - 14:30

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	455	114	39	1163	0.391	455	465	0.6	0.6	5.078	A
2	19	5	483	874	0.021	19	10	0.0	0.0	4.210	A
3	434	108	67	757	0.573	434	435	1.3	1.3	11.119	B
4	91	23	412	865	0.106	91	89	0.1	0.1	4.651	A

14:30 - 14:45

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	371	93	32	1167	0.318	372	381	0.6	0.5	4.530	A
2	15	4	395	919	0.017	15	8	0.0	0.0	3.984	A
3	354	89	55	762	0.465	356	356	1.3	0.9	8.908	A
4	75	19	338	899	0.083	75	73	0.1	0.1	4.366	A

14:45 - 15:00

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	311	78	26	1170	0.266	311	319	0.5	0.4	4.196	A
2	13	3	331	952	0.013	13	7	0.0	0.0	3.833	A
3	297	74	46	765	0.388	298	298	0.9	0.6	7.714	A
4	62	16	282	925	0.068	63	61	0.1	0.1	4.173	A

DS 2039 - DS 2039, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	13.30	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D16	DS 2039	AM	ONE HOUR	08:00	09:30	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	✓	427	100.000
2		ONE HOUR	✓	23	100.000
3		ONE HOUR	✓	543	100.000
4		ONE HOUR	✓	222	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	368	52
	2	15	0	6	2
	3	491	7	0	45
	4	160	2	60	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.41	5.34	0.7	A	392	588
2	0.03	4.36	0.0	A	21	32
3	0.79	22.71	3.6	C	498	747
4	0.31	6.54	0.4	A	204	306

Main Results for each time segment

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	321	80	52	1157	0.278	320	497	0.0	0.4	4.295	A
2	17	4	360	938	0.018	17	12	0.0	0.0	3.911	A
3	409	102	52	763	0.536	404	325	0.0	1.1	9.915	A
4	167	42	382	879	0.190	166	74	0.0	0.2	5.044	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	384	96	62	1151	0.333	383	596	0.4	0.5	4.686	A
2	21	5	431	901	0.023	21	14	0.0	0.0	4.090	A
3	488	122	62	759	0.643	486	390	1.1	1.7	13.040	B
4	200	50	459	843	0.237	199	89	0.2	0.3	5.586	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	470	118	76	1144	0.411	469	727	0.5	0.7	5.334	A
2	25	6	528	851	0.030	25	18	0.0	0.0	4.361	A
3	598	149	76	754	0.793	591	477	1.7	3.5	21.198	C
4	244	61	558	797	0.307	244	108	0.3	0.4	6.499	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	470	118	76	1144	0.411	470	733	0.7	0.7	5.344	A
2	25	6	528	850	0.030	25	18	0.0	0.0	4.363	A
3	598	149	76	754	0.793	597	478	3.5	3.6	22.705	C
4	244	61	564	795	0.308	244	109	0.4	0.4	6.541	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	384	96	62	1151	0.334	385	605	0.7	0.5	4.704	A
2	21	5	432	900	0.023	21	14	0.0	0.0	4.094	A
3	488	122	62	759	0.643	495	391	3.6	1.9	13.975	B
4	200	50	468	839	0.238	200	90	0.4	0.3	5.634	A

09:15 - 09:30

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	321	80	52	1156	0.278	322	504	0.5	0.4	4.316	A
2	17	4	362	936	0.018	17	12	0.0	0.0	3.916	A
3	409	102	52	763	0.536	412	327	1.9	1.2	10.326	B
4	167	42	389	876	0.191	167	75	0.3	0.2	5.085	A

DS 2039 - DS 2039, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	9.50	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D17	DS 2039	PM	ONE HOUR	16:30	18:00	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	✓	605	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	440	100.000
4		ONE HOUR	✓	56	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	11	521	73
	2	7	0	1	1
	3	381	1	0	58
	4	42	0	14	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
	4	0	0	0	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	0.57	7.07	1.3	A	555	833
2	0.01	4.69	0.0	A	8	12
3	0.65	13.58	1.8	B	404	606
4	0.07	4.52	0.1	A	51	77

Main Results for each time segment

16:30 - 16:45

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	455	114	11	1178	0.387	453	321	0.0	0.6	4.949	A
2	7	2	455	888	0.008	7	9	0.0	0.0	4.084	A
3	331	83	61	760	0.436	328	401	0.0	0.8	8.286	A
4	42	11	290	922	0.046	42	99	0.0	0.0	4.092	A

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	544	136	13	1177	0.462	543	385	0.6	0.8	5.672	A
2	8	2	546	841	0.010	8	11	0.0	0.0	4.320	A
3	396	99	73	755	0.524	394	481	0.8	1.1	9.938	A
4	50	13	349	894	0.056	50	118	0.0	0.1	4.264	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	666	167	16	1175	0.567	664	471	0.8	1.3	7.024	A
2	10	2	668	778	0.013	10	13	0.0	0.0	4.685	A
3	484	121	89	749	0.647	482	589	1.1	1.8	13.320	B
4	62	15	426	859	0.072	62	145	0.1	0.1	4.516	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	666	167	17	1175	0.567	666	473	1.3	1.3	7.071	A
2	10	2	669	777	0.013	10	13	0.0	0.0	4.690	A
3	484	121	89	749	0.647	484	590	1.8	1.8	13.577	B
4	62	15	428	858	0.072	62	145	0.1	0.1	4.522	A

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	544	136	14	1177	0.462	546	389	1.3	0.9	5.721	A
2	8	2	548	840	0.010	8	11	0.0	0.0	4.329	A
3	396	99	73	755	0.524	398	483	1.8	1.1	10.161	B
4	50	13	352	893	0.056	50	119	0.1	0.1	4.274	A

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	455	114	11	1178	0.387	456	325	0.9	0.6	4.995	A
2	7	2	459	886	0.008	7	9	0.0	0.0	4.094	A
3	331	83	61	760	0.436	333	404	1.1	0.8	8.458	A
4	42	11	294	920	0.046	42	100	0.1	0.0	4.103	A

DS 2039 - DS 2039, Interpeak

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	11.53	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D18	DS 2039	Interpeak	ONE HOUR	13:30	15:00	15	✓

Default vehicle mix	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	✓	434	100.000
2		ONE HOUR	✓	9	100.000
3		ONE HOUR	✓	488	100.000
4		ONE HOUR	✓	99	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	368	59
	2	2	0	6	1
	3	420	0	0	68
	4	48	3	48	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.41	5.85	0.8	A	398	597
2	0.01	4.70	0.0	A	8	12
3	0.71	17.94	2.6	C	448	672
4	0.13	5.41	0.2	A	91	136

Main Results for each time segment

13:30 - 13:45

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	327	82	38	1164	0.281	325	350	0.0	0.4	4.712	A
2	7	2	356	940	0.007	7	7	0.0	0.0	4.244	A
3	367	92	46	765	0.480	363	316	0.0	1.0	9.767	A
4	75	19	314	910	0.082	74	96	0.0	0.1	4.733	A

13:45 - 14:00

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	98	46	1160	0.336	390	421	0.4	0.6	5.139	A
2	8	2	426	903	0.009	8	9	0.0	0.0	4.424	A
3	439	110	56	762	0.576	437	379	1.0	1.5	12.125	B
4	89	22	378	881	0.101	89	115	0.1	0.1	4.999	A

14:00 - 14:15

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	478	119	56	1154	0.414	477	514	0.6	0.8	5.840	A
2	10	2	522	854	0.012	10	11	0.0	0.0	4.693	A
3	537	134	68	757	0.710	533	464	1.5	2.5	17.340	C
4	109	27	461	843	0.129	109	140	0.1	0.2	5.396	A

14:15 - 14:30

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	478	119	56	1154	0.414	478	517	0.8	0.8	5.854	A
2	10	2	523	853	0.012	10	11	0.0	0.0	4.696	A
3	537	134	68	757	0.710	537	465	2.5	2.6	17.939	C
4	109	27	464	841	0.130	109	141	0.2	0.2	5.409	A

14:30 - 14:45

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	390	98	46	1160	0.336	391	426	0.8	0.6	5.159	A
2	8	2	428	902	0.009	8	9	0.0	0.0	4.428	A
3	439	110	56	762	0.576	443	380	2.6	1.5	12.594	B
4	89	22	383	879	0.101	89	116	0.2	0.1	5.018	A

14:45 - 15:00

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	327	82	38	1164	0.281	327	356	0.6	0.4	4.739	A
2	7	2	358	938	0.007	7	8	0.0	0.0	4.252	A
3	367	92	47	765	0.480	369	318	1.5	1.0	10.065	B
4	75	19	319	908	0.082	75	97	0.1	0.1	4.752	A

DS 2039 - DS 2039, Weekend

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Include in report	Use specific Demand Set(s)	Specific Demand Set(s)	Network flow scaling factor (%)	Network capacity scaling factor (%)
A6	DS 2039	✓	✓	D16,D17,D18,D24	100.000	100.000

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout		1, 2, 3, 4	9.49	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	untitled	
2	untitled	
3	untitled	
4	untitled	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	4.10	4.30	3.2	5.0	24.0	12.0	
2	3.40	5.00	3.5	5.0	24.0	12.0	
3	3.20	3.40	0.5	3.0	50.0	12.0	
4	3.70	6.50	3.2	3.0	24.0	12.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.530	1184
2	0.517	1124
3	0.373	782
4	0.463	1056

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
D24	DS 2039	Weekend	ONE HOUR	13:30	15:00	15	✓

Default vehicle mix	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	✓	453	100.000
2		ONE HOUR	✓	19	100.000
3		ONE HOUR	✓	434	100.000
4		ONE HOUR	✓	90	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		1	2	3	4
From	1	0	4	395	54
	2	11	0	8	0
	3	396	5	0	33
	4	56	2	32	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		1	2	3	4
From	1	10	10	10	10
	2	10	10	10	10
	3	10	10	10	10
	4	10	10	10	10

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	0.43	5.98	0.8	A	416	624
2	0.02	4.78	0.0	A	17	26
3	0.63	14.23	1.9	B	398	597
4	0.12	5.30	0.1	A	83	124

Main Results for each time segment

13:30 - 13:45

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	341	85	29	1168	0.292	339	345	0.0	0.5	4.765	A
2	14	4	360	937	0.015	14	8	0.0	0.0	4.290	A
3	327	82	49	764	0.428	324	326	0.0	0.8	8.923	A
4	68	17	307	914	0.074	67	65	0.0	0.1	4.677	A

13:45 - 14:00

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	407	102	35	1165	0.349	407	415	0.5	0.6	5.216	A
2	17	4	432	900	0.019	17	10	0.0	0.0	4.483	A
3	390	98	58	761	0.513	389	391	0.8	1.1	10.614	B
4	81	20	369	885	0.091	81	78	0.1	0.1	4.924	A

14:00 - 14:15

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	499	125	43	1161	0.430	498	507	0.6	0.8	5.961	A
2	21	5	529	850	0.025	21	12	0.0	0.0	4.775	A
3	478	119	71	756	0.632	475	478	1.1	1.8	13.970	B
4	99	25	451	847	0.117	99	95	0.1	0.1	5.293	A

14:15 - 14:30

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	499	125	43	1161	0.430	499	510	0.8	0.8	5.977	A
2	21	5	530	850	0.025	21	12	0.0	0.0	4.778	A
3	478	119	72	756	0.632	478	479	1.8	1.9	14.228	B
4	99	25	453	846	0.117	99	96	0.1	0.1	5.301	A

14:30 - 14:45

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	407	102	35	1165	0.349	408	419	0.8	0.6	5.236	A
2	17	4	433	899	0.019	17	10	0.0	0.0	4.489	A
3	390	98	59	760	0.513	393	392	1.9	1.2	10.849	B
4	81	20	373	883	0.092	81	79	0.1	0.1	4.936	A

14:45 - 15:00

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	341	85	29	1168	0.292	342	350	0.6	0.5	4.794	A
2	14	4	363	936	0.015	14	8	0.0	0.0	4.297	A
3	327	82	49	764	0.428	328	328	1.2	0.8	9.113	A
4	68	17	311	912	0.074	68	66	0.1	0.1	4.693	A

Appendix E : TRANSYT Output Files

TRANSYT 15

Filename: junction5.t15
Path: G:\2018\p180191\Calcs\Modelling\TRANSYT
Report generation date: 14/12/2022 11:06:47

File summary

File description

File title	(untitled)
Location	
Site number	
UTCRegion	
Driving side	Left
Date	15/07/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	HEADOFFICE\jimenezem
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

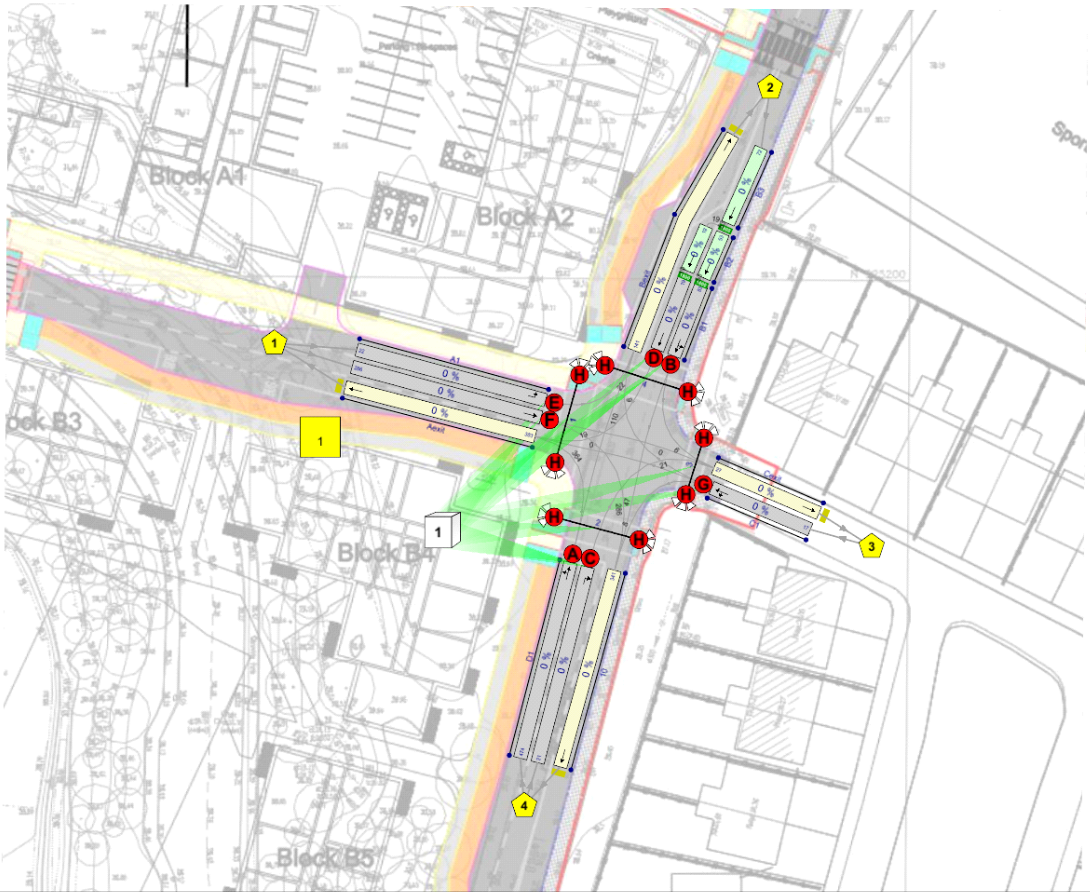
Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams



[redacted]

A1 - DN 2024 AM
D1 - DN 2024 AM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	14/12/2022 11:04:59	14/12/2022 11:05:00	08:15	110	85.37	5.57	51.94	B1/1	0	0	B1/1	B3/1	B1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2024 AM		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2024 AM				08:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	147	147
Bexit	1	99	99
Cexit	1	13	13
A1	1	13	13
	2	146	146
B1	1	153	153
	2	6	6
C1	1	33	33
D1	1	217	217
	2	10	10
B2	1	153	153
	2	6	6
B3	1	159	159
10	1	319	319

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	**1**	**1**	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**1**	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**1**	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	**1**	**1**	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	**1**	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	**1**	**1**	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	**1**	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	**1**	**1**	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**2**	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	**1**	**2**	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	**1**	**2**	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	**1**	**2**	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**3**	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**3**	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**3**	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	**1**	**3**	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	**(ALL)**	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	**(ALL)**	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	13	0	146
	2	6	0	3	150
	3	0	10	0	23
	4	141	76	10	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	10
	2		4	2	D1/1, Bexit/1	Normal	76
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	150
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	3
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	6
	6		4	1	D1/1, Aexit/1	Normal	141
	7		1	2	A1/1, Bexit/1	Normal	13
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	146
	10		3	2	C1/1, Bexit/1	Normal	10
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	23

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	18, 42, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	18	7	1	7
	2	✓	2	D,B	25	42	17	1	7
	3	✓	3	E,F,A	48	71	23	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

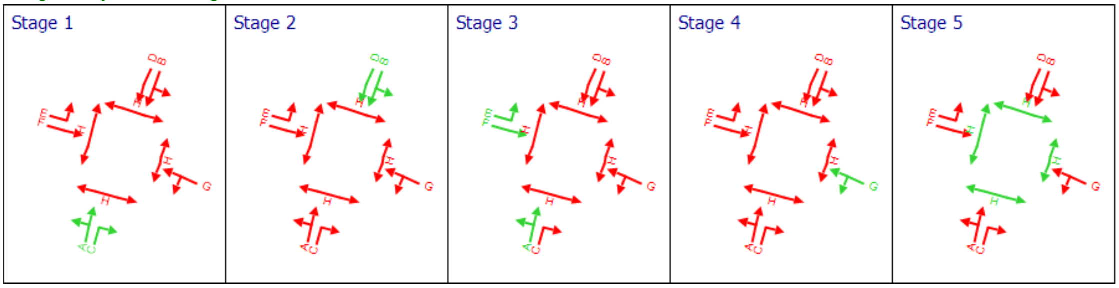
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	48	71	23
		2	✓	11	18	7
	B	1	✓	25	42	17
	C	1	✓	11	18	7
	D	1	✓	24	42	18
	E	1	✓	42	71	29
	F	1	✓	47	71	24
	G	1	✓	79	86	7
	H	1	✓	97	104	7

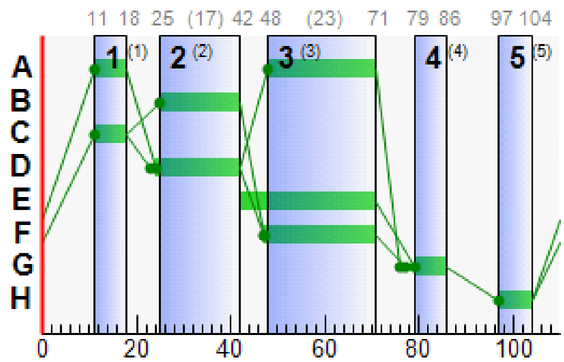
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	42	71	29			
A1	2		1	F	47	71	24			
B1	1		1	B	25	42	17			
B1	2		1	D	24	42	18			
C1	1		1	G	79	86	7			
D1	1		1	A	48	71	23	11	18	7
D1	2		1	C	11	18	7			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	Aexit	1	0	Unrestricted	147	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	99	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	13	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	3	3299	13	1800	29	29.55	0.29	2.07	1.52	0.12	1.63
		2	36	152	146	1800	24	38.19	3.83	27.36	21.99	1.55	23.54
	B1	1	52	73	153	1800	17	48.59	4.53	113.19	29.32	1.83	31.16
		2	2	4564	6	1800	18	38.17	0.15	3.80	0.90	0.06	0.96
	C1	1	25	257	33	1800	7	52.80	0.99	14.09	6.87	0.40	7.27
	D1	1	41	117	217	1800	30	19.19	3.46	34.61	16.42	2.21	18.63
		2	8	1078	10	1800	7	48.89	0.29	2.86	1.93	0.12	2.04
	B2	1	9	959	153	1800	110	0.09	0.00	0.13	0.06	0.00	0.06
		2	0	26900	6	1800	110	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	9	919	159	1800	110	0.10	0.00	0.11	0.06	0.00	0.06
	10	1	0	Unrestricted	319	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
08:15-09:15	Aexit	1	147	147	0		Unrestricted	Unrestricted	0		Unrestricted	0.67	110
	Bexit	1	99	99	0		Unrestricted	Unrestricted	0		Unrestricted	0.47	110
	Cexit	1	13	13	0		Unrestricted	Unrestricted	0		Unrestricted	1.19	110
	A1	1	13	13	0		1800	491	3		3299	0.00	29
		2	146	146	0		1800	409	36		152	0.00	24
	B1	1	153	153	0		1800	295	52		73	0.00	17
		2	6	6	0		1800	311	2		4564	0.00	18
	C1	1	33	33	0		1800	131	25		257	0.00	7
	D1	1	217	217	0		1800	524	41		117	0.00	30
		2	10	10	0		1800	131	8		1078	0.00	7
	B2	1	153	153	0		1800	1800	9		959	0.00	110
		2	6	6	0		1800	1800	0		26900	0.00	110
	B3	1	159	159	0		1800	1800	9		919	0.00	110
	10	1	319	319	0		Unrestricted	Unrestricted	0		Unrestricted	0.70	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	29.55	0.11	1.52	71.74	9.33	0.12
		2	9.72	38.19	1.55	21.99	84.72	123.69	1.55
	B1	1	3.00	48.59	2.07	29.32	95.65	146.34	1.83
		2	3.00	38.17	0.06	0.90	81.76	4.91	0.06
	C1	1	5.28	52.80	0.48	6.87	96.71	31.91	0.40
	D1	1	7.20	19.19	1.16	16.42	81.23	176.26	2.21
		2	7.20	48.89	0.14	1.93	92.68	9.27	0.12
	B2	1	2.16	0.09	0.00	0.06	0.00	0.00	0.00
		2	2.16	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.10	0.00	0.06	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:15-09:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	33.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	32.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	104.00	
	A1	1	0.00	0.29	14.00	2.07	0.00	29.00	
		2	0.00	3.83	14.00	27.36	0.00	0.00	
	B1	1	0.00	4.53	4.00	113.19	0.00	0.00	
		2	0.00	0.15	4.00	3.80	0.00	18.00	
	C1	1	0.00	0.99	7.00	14.09	0.00	6.00	
	D1	1	0.00	3.46	10.00	34.61	0.00	0.00	
		2	0.00	0.29	10.00	2.86	0.00	7.00	
	B2	1	0.00	0.00	3.00	0.13	0.00	13.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.11	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	26.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	14/12/2022 11:04:59	14/12/2022 11:05:00	08:15	110	85.37	5.57	51.94	B1/1	0	0	B1/1	B3/1	B1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	52	0	1474	902	13.60	79.08	6.29	85.37

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:15-09:15	1474	1474	0		52		73	958

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	23.52	13.60	5.57	79.08	34.04	501.70	6.29

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:15-09:15	113.19	0.00	378.00

A2 - DN 2024 Interpeak
D2 - DN 2024 Interpeak*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	14/12/2022 11:05:00	14/12/2022 11:05:01	13:45	110	112.22	7.32	69.61	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2024 Interpeak		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2024 Interpeak				13:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	279	279
Bexit	1	112	112
Cexit	1	16	16
A1	1	17	17
	2	262	262
B1	1	58	58
	2	12	12
C1	1	26	26
D1	1	356	356
	2	14	14
B2	1	58	58
	2	12	12
B3	1	70	70
10	1	338	338

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	17	0	262
	2	12	0	2	56
	3	0	6	0	20
	4	267	89	14	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	14
	2		4	2	D1/1, Bexit/1	Normal	89
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	56
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	2
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	12
	6		4	1	D1/1, Aexit/1	Normal	267
	7		1	2	A1/1, Bexit/1	Normal	17
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	262
	10		3	2	C1/1, Bexit/1	Normal	6
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	20

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	30, 44, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	30	19	1	7
	2	✓	2	D,B	37	44	7	1	7
	3	✓	3	E,F,A	50	71	21	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

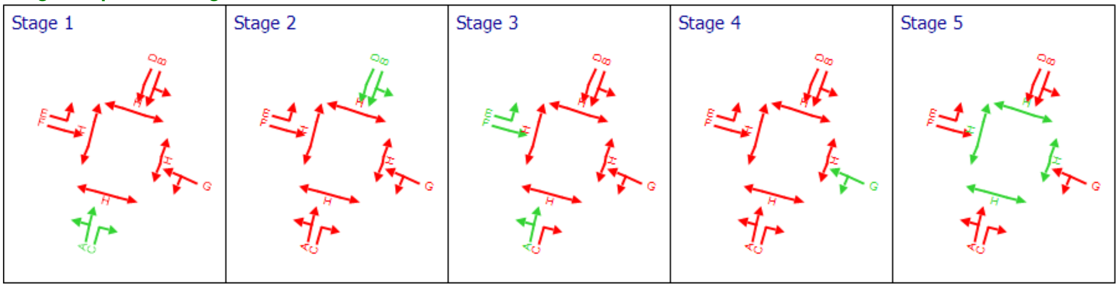
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	50	71	21
		2	✓	11	30	19
	B	1	✓	37	44	7
	C	1	✓	11	30	19
	D	1	✓	36	44	8
	E	1	✓	44	71	27
	F	1	✓	49	71	22
	G	1	✓	79	86	7
	H	1	✓	97	104	7

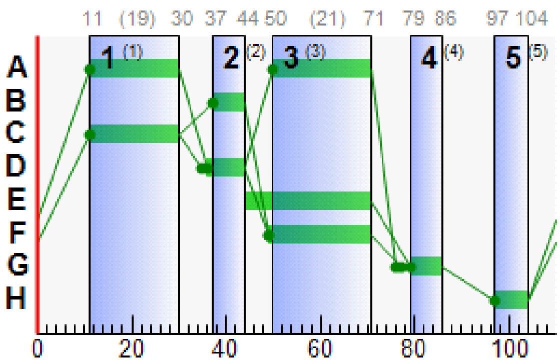
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	44	71	27			
A1	2		1	F	49	71	22			
B1	1		1	B	37	44	7			
B1	2		1	D	36	44	8			
C1	1		1	G	79	86	7			
D1	1		1	A	50	71	21	11	30	19
D1	2		1	C	11	30	19			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	Aexit	1	0	Unrestricted	279	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	112	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	16	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	2326	17	1800	27	31.09	0.39	2.77	2.08	0.16	2.24
		2	70	29	262	1800	22	50.95	8.13	58.06	52.66	3.29	55.95
	B1	1	44	103	58	1800	7	59.65	1.86	46.62	13.65	0.76	14.40
		2	8	1005	12	1800	8	47.91	0.34	8.51	2.27	0.14	2.41
	C1	1	20	353	26	1800	7	51.45	0.77	10.98	5.28	0.31	5.59
	D1	1	52	74	356	1800	40	18.46	6.31	63.09	25.92	3.49	29.41
		2	4	2004	14	1800	19	37.47	0.35	3.51	2.07	0.14	2.21
	B2	1	3	2693	58	1800	110	0.03	0.00	0.02	0.01	0.00	0.01
		2	1	13400	12	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2214	70	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	338	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
13:45-14:45	Aexit	1	279	279	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	112	112	0		Unrestricted	Unrestricted	0		Unrestricted	0.50	110
	Cexit	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	1.14	110
	A1	1	17	17	0		1800	458	4		2326	0.00	27
		2	262	262	0		1800	376	70		29	0.00	22
	B1	1	58	58	0		1800	131	44		103	0.00	7
		2	12	12	0		1800	147	8		1005	0.00	8
	C1	1	26	26	0		1800	131	20		353	0.00	7
	D1	1	356	356	0		1800	687	52		74	0.00	40
		2	14	14	0		1800	327	4		2004	0.00	19
	B2	1	58	58	0		1800	1800	3		2693	0.00	110
		2	12	12	0		1800	1800	1		13400	0.00	110
	B3	1	70	70	0		1800	1800	4		2214	0.00	110
	10	1	338	338	0		Unrestricted	Unrestricted	0		Unrestricted	0.84	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	31.09	0.15	2.08	73.61	12.51	0.16
		2	9.72	50.95	3.71	52.66	100.15	262.39	3.29
	B1	1	3.00	59.65	0.96	13.65	103.92	60.28	0.76
		2	3.00	47.91	0.16	2.27	91.73	11.01	0.14
	C1	1	5.28	51.45	0.37	5.28	95.62	24.86	0.31
	D1	1	7.20	18.46	1.83	25.92	78.19	278.35	3.49
		2	7.20	37.47	0.15	2.07	80.97	11.34	0.14
	B2	1	2.16	0.03	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
13:45-14:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	25.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	31.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	101.00	
	A1	1	0.00	0.39	14.00	2.77	0.00	27.00	
		2	0.00	8.13	14.00	58.06	0.00	0.00	
	B1	1	0.00	1.86	4.00	46.62	0.00	4.00	
		2	0.00	0.34	4.00	8.51	0.00	8.00	
	C1	1	0.00	0.77	7.00	10.98	0.00	6.00	
	D1	1	0.00	6.31	10.00	63.09	0.00	0.00	
		2	0.00	0.35	10.00	3.51	0.00	19.00	
	B2	1	0.00	0.00	3.00	0.02	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	32.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	14/12/2022 11:05:00	14/12/2022 11:05:01	13:45	110	112.22	7.32	69.61	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	70	0	1630	900	16.17	103.94	8.28	112.22

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
13:45-14:45	1630	1630	0		70		29	956

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	27.23	16.17	7.32	103.94	40.54	660.74	8.28

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
13:45-14:45	63.09	0.00	473.00

A3 - DN 2024 PM
D3 - DN 2024 PM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
3	14/12/2022 11:05:01	14/12/2022 11:05:01	16:45	110	100.79	6.55	65.48	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2024 PM		D3	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2024 PM				16:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	299	299
Bexit	1	116	116
Cexit	1	22	22
A1	1	17	17
	2	225	225
B1	1	44	44
	2	13	13
C1	1	14	14
D1	1	378	378
	2	17	17
B2	1	44	44
	2	13	13
B3	1	57	57
10	1	271	271

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	17	0	225
	2	13	0	5	39
	3	0	7	0	7
	4	286	92	17	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	17
	2		4	2	D1/1, Bexit/1	Normal	92
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	39
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	5
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	13
	6		4	1	D1/1, Aexit/1	Normal	286
	7		1	2	A1/1, Bexit/1	Normal	17
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	225
	10		3	2	C1/1, Bexit/1	Normal	7
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	7

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

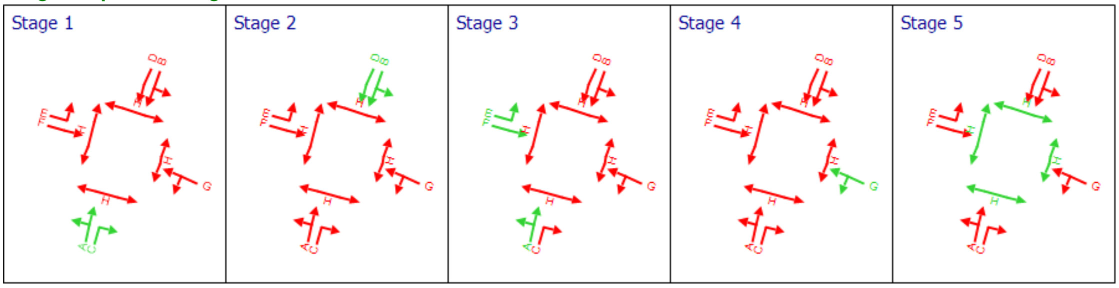
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

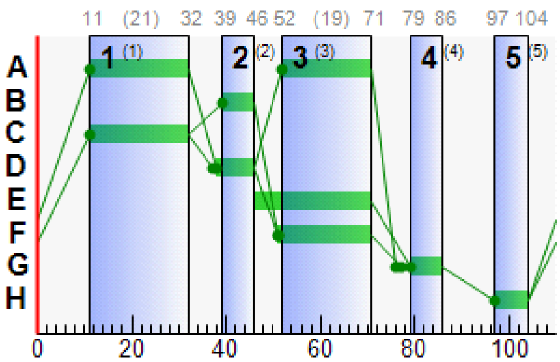
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	Aexit	1	0	Unrestricted	299	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	116	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	22	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	2152	17	1800	25	32.63	0.40	2.84	2.19	0.16	2.35
		2	65	37	225	1800	20	50.88	6.92	49.43	45.16	2.80	47.96
	B1	1	34	168	44	1800	7	55.42	1.36	33.88	9.62	0.55	10.17
		2	9	920	13	1800	8	48.01	0.37	9.22	2.46	0.15	2.61
	C1	1	11	742	14	1800	7	49.40	0.40	5.76	2.73	0.16	2.89
	D1	1	55	64	378	1800	40	19.08	6.84	68.44	28.44	3.78	32.23
		2	5	1806	17	1800	21	35.85	0.42	4.17	2.40	0.17	2.57
	B2	1	2	3582	44	1800	110	0.03	0.00	0.01	0.00	0.00	0.00
		2	1	12362	13	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3	2742	57	1800	110	0.03	0.00	0.01	0.01	0.00	0.01
	10	1	0	Unrestricted	271	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
16:45-17:45	Aexit	1	299	299	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	116	116	0		Unrestricted	Unrestricted	0		Unrestricted	0.49	110
	Cexit	1	22	22	0		Unrestricted	Unrestricted	0		Unrestricted	1.05	110
	A1	1	17	17	0		1800	425	4		2152	0.00	25
		2	225	225	0		1800	344	65		37	0.00	20
	B1	1	44	44	0		1800	131	34		168	0.00	7
		2	13	13	0		1800	147	9		920	0.00	8
	C1	1	14	14	0		1800	131	11		742	0.00	7
	D1	1	378	378	0		1800	687	55		64	0.00	40
		2	17	17	0		1800	360	5		1806	0.00	21
	B2	1	44	44	0		1800	1800	2		3582	0.00	110
		2	13	13	0		1800	1800	1		12362	0.00	110
	B3	1	57	57	0		1800	1800	3		2742	0.00	110
	10	1	271	271	0		Unrestricted	Unrestricted	0		Unrestricted	0.90	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.63	0.15	2.19	75.45	12.83	0.16
		2	9.72	50.88	3.18	45.16	99.33	223.49	2.80
	B1	1	3.00	55.42	0.68	9.62	99.64	43.84	0.55
		2	3.00	48.01	0.17	2.46	91.81	11.94	0.15
	C1	1	5.28	49.40	0.19	2.73	93.14	13.04	0.16
	D1	1	7.20	19.08	2.00	28.44	79.81	301.69	3.78
		2	7.20	35.85	0.17	2.40	79.15	13.46	0.17
	B2	1	2.16	0.03	0.00	0.00	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.03	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
16:45-17:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	23.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	29.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	99.00	
	A1	1	0.00	0.40	14.00	2.84	0.00	25.00	
		2	0.00	6.92	14.00	49.43	0.00	0.00	
	B1	1	0.00	1.36	4.00	33.88	0.00	5.00	
		2	0.00	0.37	4.00	9.22	0.00	8.00	
	C1	1	0.00	0.40	7.00	5.76	0.00	7.00	
	D1	1	0.00	6.84	10.00	68.44	0.00	0.00	
		2	0.00	0.42	10.00	4.17	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.01	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.01	0.00	110.00	
	10	1	0.00	0.00	76.54	0.00	0.00	38.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
3	14/12/2022 11:05:01	14/12/2022 11:05:01	16:45	110	100.79	6.55	65.48	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	65	0	1530	898	15.41	93.01	7.78	100.79

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
16:45-17:45	1530	1530	0		65		37	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	27.40	15.41	6.55	93.01	40.54	620.28	7.78

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
16:45-17:45	68.44	0.00	585.00

A4 - DN 2029 AM
D4 - DN 2029 AM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
4	14/12/2022 11:05:02	14/12/2022 11:05:02	08:15	110	95.17	6.21	53.39	B1/1	0	0	B1/1	B3/1	B1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2029 AM		D4	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2029 AM				08:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	160	160
Bexit	1	109	109
Cexit	1	14	14
A1	1	15	15
	2	159	159
B1	1	166	166
	2	7	7
C1	1	36	36
D1	1	236	236
	2	11	11
B2	1	166	166
	2	7	7
B3	1	173	173
10	1	347	347

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	15	0	159
	2	7	0	3	163
	3	0	11	0	25
	4	153	83	11	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	11
	2		4	2	D1/1, Bexit/1	Normal	83
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	163
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	3
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	7
	6		4	1	D1/1, Aexit/1	Normal	153
	7		1	2	A1/1, Bexit/1	Normal	15
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	159
	10		3	2	C1/1, Bexit/1	Normal	11
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	25

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	18, 43, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	18	7	1	7
	2	✓	2	D,B	25	43	18	1	7
	3	✓	3	E,F,A	49	71	22	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

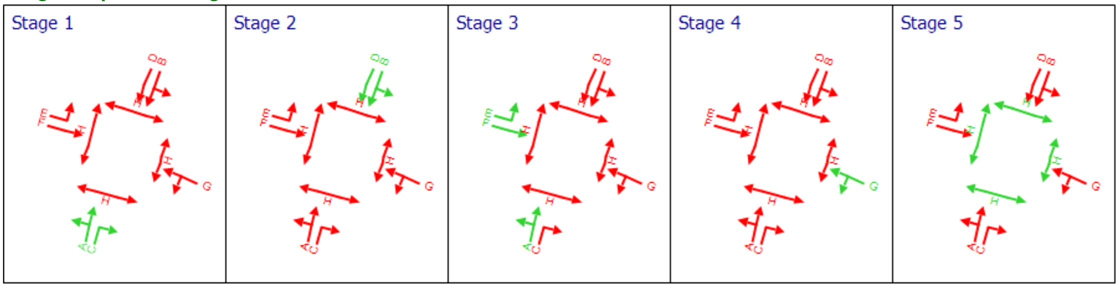
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	49	71	22
		2	✓	11	18	7
	B	1	✓	25	43	18
	C	1	✓	11	18	7
	D	1	✓	24	43	19
	E	1	✓	43	71	28
	F	1	✓	48	71	23
	G	1	✓	79	86	7
	H	1	✓	97	104	7

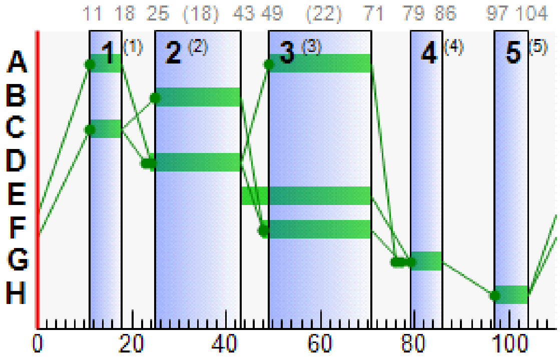
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	43	71	28			
A1	2		1	F	48	71	23			
B1	1		1	B	25	43	18			
B1	2		1	D	24	43	19			
C1	1		1	G	79	86	7			
D1	1		1	A	49	71	22	11	18	7
D1	2		1	C	11	18	7			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	Aexit	1	0	Unrestricted	160	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	109	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	14	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	3	2747	15	1800	28	30.31	0.34	2.41	1.79	0.14	1.93
		2	40	122	159	1800	23	39.99	4.29	30.63	25.08	1.74	26.82
	B1	1	53	69	166	1800	18	48.03	4.91	122.84	31.45	1.99	33.44
		2	2	4108	7	1800	19	37.35	0.18	4.38	1.03	0.07	1.10
	C1	1	28	227	36	1800	7	53.45	1.09	15.60	7.59	0.44	8.03
	D1	1	47	93	236	1800	29	20.36	3.87	38.72	18.95	2.51	21.46
		2	8	971	11	1800	7	49.01	0.32	3.16	2.13	0.13	2.25
	B2	1	9	876	166	1800	110	0.10	0.00	0.16	0.07	0.00	0.07
		2	0	23043	7	1800	110	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	10	836	173	1800	110	0.11	0.01	0.13	0.07	0.00	0.07
	10	1	0	Unrestricted	347	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
08:15-09:15	Aexit	1	160	160	0		Unrestricted	Unrestricted	0		Unrestricted	0.67	110
	Bexit	1	109	109	0		Unrestricted	Unrestricted	0		Unrestricted	0.47	110
	Cexit	1	14	14	0		Unrestricted	Unrestricted	0		Unrestricted	1.19	110
	A1	1	15	15	0		1800	475	3		2747	0.00	28
		2	159	159	0		1800	393	40		122	0.00	23
	B1	1	166	166	0		1800	311	53		69	0.00	18
		2	7	7	0		1800	327	2		4108	0.00	19
	C1	1	36	36	0		1800	131	28		227	0.00	7
	D1	1	236	236	0		1800	507	47		93	0.00	29
		2	11	11	0		1800	131	8		971	0.00	7
	B2	1	166	166	0		1800	1800	9		876	0.00	110
		2	7	7	0		1800	1800	0		23043	0.00	110
	B3	1	173	173	0		1800	1800	10		836	0.00	110
	10	1	347	347	0		Unrestricted	Unrestricted	0		Unrestricted	0.69	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	30.31	0.13	1.79	72.67	10.90	0.14
		2	9.72	39.99	1.77	25.08	87.04	138.39	1.74
	B1	1	3.00	48.03	2.21	31.45	95.48	158.50	1.99
		2	3.00	37.35	0.07	1.03	80.85	5.66	0.07
	C1	1	5.28	53.45	0.53	7.59	98.02	35.29	0.44
	D1	1	7.20	20.36	1.33	18.95	84.83	200.20	2.51
		2	7.20	49.01	0.15	2.13	92.79	10.21	0.13
	B2	1	2.16	0.10	0.00	0.07	0.00	0.00	0.00
		2	2.16	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.11	0.01	0.07	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:15-09:15	Bexit	1	0.00	0.00	79.85	0.00	0.00	30.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	103.00	
	A1	1	0.00	0.34	14.00	2.41	0.00	28.00	
		2	0.00	4.29	14.00	30.63	0.00	0.00	
	B1	1	0.00	4.91	4.00	122.84	0.00	0.00	
		2	0.00	0.18	4.00	4.38	0.00	19.00	
	C1	1	0.00	1.09	7.00	15.60	0.00	5.00	
	D1	1	0.00	3.87	10.00	38.72	0.00	0.00	
		2	0.00	0.32	10.00	3.16	0.00	7.00	
	B2	1	0.00	0.00	3.00	0.16	0.00	20.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.01	4.00	0.13	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	25.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
4	14/12/2022 11:05:02	14/12/2022 11:05:02	08:15	110	95.17	6.21	53.39	B1/1	0	0	B1/1	B3/1	B1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	53	0	1606	901	13.92	88.16	7.01	95.17

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:15-09:15	1606	1606	0		53		69	957

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	23.53	13.92	6.21	88.16	34.82	559.14	7.01

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:15-09:15	122.84	0.00	379.00

A5 - DN 2029 Interpeak
D5 - DN 2029 Interpeak*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
5	14/12/2022 11:05:03	14/12/2022 11:05:03	13:45	110	134.66	8.81	79.17	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2029 Interpeak		D5	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2029 Interpeak				13:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	304	304
Bexit	1	122	122
Cexit	1	18	18
A1	1	18	18
	2	285	285
B1	1	63	63
	2	13	13
C1	1	29	29
D1	1	388	388
	2	16	16
B2	1	63	63
	2	13	13
B3	1	76	76
10	1	368	368

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	18	0	285
	2	13	0	2	61
	3	0	7	0	22
	4	291	97	16	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	16
	2		4	2	D1/1, Bexit/1	Normal	97
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	61
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	2
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	13
	6		4	1	D1/1, Aexit/1	Normal	291
	7		1	2	A1/1, Bexit/1	Normal	18
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	285
	10		3	2	C1/1, Bexit/1	Normal	7
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	22

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	31, 45, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	31	20	1	7
	2	✓	2	D,B	38	45	7	1	7
	3	✓	3	E,F,A	51	71	20	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

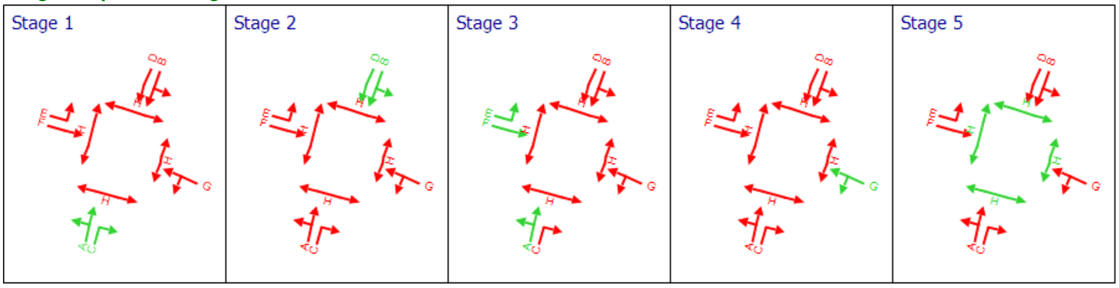
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	51	71	20
		2	✓	11	31	20
	B	1	✓	38	45	7
	C	1	✓	11	31	20
	D	1	✓	37	45	8
	E	1	✓	45	71	26
	F	1	✓	50	71	21
	G	1	✓	79	86	7
	H	1	✓	97	104	7

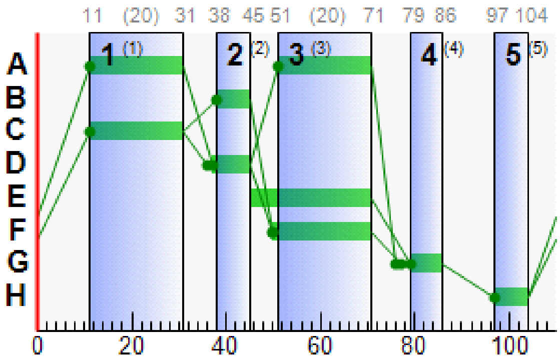
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	45	71	26			
A1	2		1	F	50	71	21			
B1	1		1	B	38	45	7			
B1	2		1	D	37	45	8			
C1	1		1	G	79	86	7			
D1	1		1	A	51	71	20	11	31	20
D1	2		1	C	11	31	20			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	Aexit	1	0	Unrestricted	304	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	122	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	18	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	2109	18	1800	26	31.86	0.42	2.97	2.26	0.17	2.43
		2	79	14	285	1800	21	59.77	9.65	68.96	67.19	3.89	71.09
	B1	1	48	87	63	1800	7	61.53	2.06	51.41	15.29	0.83	16.12
		2	9	920	13	1800	8	48.01	0.37	9.22	2.46	0.15	2.61
	C1	1	22	306	29	1800	7	52.02	0.86	12.30	5.95	0.35	6.30
	D1	1	56	59	388	1800	40	19.39	7.05	70.46	29.67	3.95	33.61
		2	5	1833	16	1800	20	36.66	0.40	3.97	2.31	0.16	2.47
	B2	1	4	2471	63	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
		2	1	12362	13	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2032	76	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	368	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
13:45-14:45	Aexit	1	304	304	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	122	122	0		Unrestricted	Unrestricted	0		Unrestricted	0.50	110
	Cexit	1	18	18	0		Unrestricted	Unrestricted	0		Unrestricted	1.14	110
	A1	1	18	18	0		1800	442	4		2109	0.00	26
		2	285	285	0		1800	360	79		14	0.00	21
	B1	1	63	63	0		1800	131	48		87	0.00	7
		2	13	13	0		1800	147	9		920	0.00	8
	C1	1	29	29	0		1800	131	22		306	0.00	7
	D1	1	388	388	0		1800	687	56		59	0.00	40
		2	16	16	0		1800	344	5		1833	0.00	20
	B2	1	63	63	0		1800	1800	4		2471	0.00	110
		2	13	13	0		1800	1800	1		12362	0.00	110
	B3	1	76	76	0		1800	1800	4		2032	0.00	110
	10	1	368	368	0		Unrestricted	Unrestricted	0		Unrestricted	0.83	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	31.86	0.16	2.26	74.54	13.42	0.17
		2	9.72	59.77	4.73	67.19	108.96	310.52	3.89
	B1	1	3.00	61.53	1.08	15.29	105.43	66.42	0.83
		2	3.00	48.01	0.17	2.46	91.81	11.94	0.15
	C1	1	5.28	52.02	0.42	5.95	96.07	27.86	0.35
	D1	1	7.20	19.39	2.09	29.67	81.11	314.69	3.95
		2	7.20	36.66	0.16	2.31	80.07	12.81	0.16
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
13:45-14:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	23.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	29.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	100.00	
	A1	1	0.00	0.42	14.00	2.97	0.00	26.00	
		2	0.00	9.65	14.00	68.96	0.00	0.00	
	B1	1	0.00	2.06	4.00	51.41	0.00	0.00	
		2	0.00	0.37	4.00	9.22	0.00	8.00	
	C1	1	0.00	0.86	7.00	12.30	0.00	6.00	
	D1	1	0.00	7.05	10.00	70.46	0.00	0.00	
		2	0.00	0.40	10.00	3.97	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.02	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	30.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
5	14/12/2022 11:05:03	14/12/2022 11:05:03	13:45	110	134.66	8.81	79.17	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	79	0	1776	899	17.87	125.16	9.50	134.66

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
13:45-14:45	1776	1776	0		79		14	955

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	27.23	17.87	8.81	125.16	42.66	757.66	9.50

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
13:45-14:45	70.46	0.00	352.00

A6 - DN 2029 PM
D6 - DN 2029 PM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
6	14/12/2022 11:05:03	14/12/2022 11:05:04	16:45	110	115.17	7.49	71.01	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2029 PM		D6	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2029 PM				16:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	326	326
Bexit	1	126	126
Cexit	1	25	25
A1	1	18	18
	2	244	244
B1	1	48	48
	2	15	15
C1	1	16	16
D1	1	411	411
	2	19	19
B2	1	48	48
	2	15	15
B3	1	63	63
10	1	294	294

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	18	0	244
	2	15	0	6	42
	3	0	8	0	8
	4	311	100	19	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	19
	2		4	2	D1/1, Bexit/1	Normal	100
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	42
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	15
	6		4	1	D1/1, Aexit/1	Normal	311
	7		1	2	A1/1, Bexit/1	Normal	18
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	244
	10		3	2	C1/1, Bexit/1	Normal	8
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	8

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

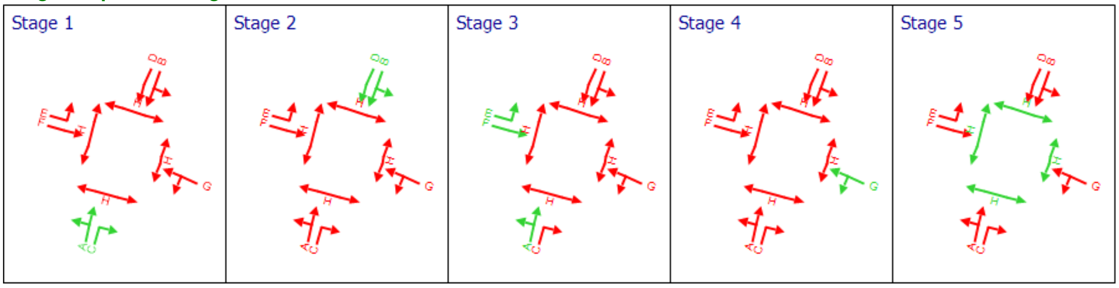
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

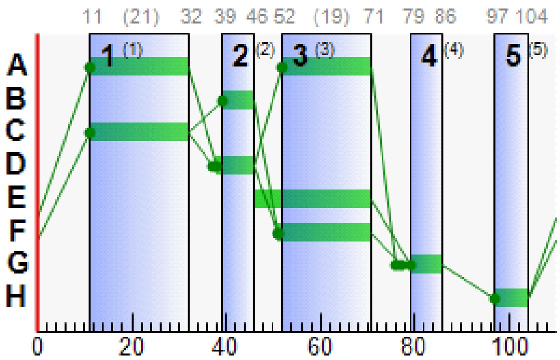
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	Aexit	1	0	Unrestricted	326	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	126	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	25	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	2027	18	1800	25	32.64	0.42	3.01	2.32	0.17	2.49
		2	71	27	244	1800	20	54.09	7.76	55.40	52.06	3.14	55.20
	B1	1	37	145	48	1800	7	56.48	1.49	37.29	10.69	0.60	11.30
		2	10	784	15	1800	8	48.21	0.43	10.66	2.85	0.17	3.03
	C1	1	12	636	16	1800	7	49.66	0.46	6.60	3.13	0.19	3.32
	D1	1	60	50	411	1800	40	20.14	7.63	76.34	32.66	4.29	36.94
		2	5	1605	19	1800	21	35.88	0.47	4.66	2.69	0.19	2.88
	B2	1	3	3275	48	1800	110	0.03	0.00	0.01	0.01	0.00	0.01
		2	1	10700	15	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2471	63	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	294	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
16:45-17:45	Aexit	1	326	326	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	126	126	0		Unrestricted	Unrestricted	0		Unrestricted	0.49	110
	Cexit	1	25	25	0		Unrestricted	Unrestricted	0		Unrestricted	1.04	110
	A1	1	18	18	0		1800	425	4		2027	0.00	25
		2	244	244	0		1800	344	71		27	0.00	20
	B1	1	48	48	0		1800	131	37		145	0.00	7
		2	15	15	0		1800	147	10		784	0.00	8
	C1	1	16	16	0		1800	131	12		636	0.00	7
	D1	1	411	411	0		1800	687	60		50	0.00	40
		2	19	19	0		1800	360	5		1605	0.00	21
	B2	1	48	48	0		1800	1800	3		3275	0.00	110
		2	15	15	0		1800	1800	1		10700	0.00	110
	B3	1	63	63	0		1800	1800	4		2471	0.00	110
	10	1	294	294	0		Unrestricted	Unrestricted	0		Unrestricted	0.90	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.64	0.16	2.32	75.46	13.58	0.17
		2	9.72	54.09	3.67	52.06	102.61	250.38	3.14
	B1	1	3.00	56.48	0.75	10.69	100.50	48.24	0.60
		2	3.00	48.21	0.20	2.85	92.00	13.80	0.17
	C1	1	5.28	49.66	0.22	3.13	93.38	14.94	0.19
	D1	1	7.20	20.14	2.30	32.66	83.17	341.83	4.29
		2	7.20	35.88	0.19	2.69	79.18	15.04	0.19
	B2	1	2.16	0.03	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
16:45-17:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	22.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	28.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	95.00	
	A1	1	0.00	0.42	14.00	3.01	0.00	25.00	
		2	0.00	7.76	14.00	55.40	0.00	0.00	
	B1	1	0.00	1.49	4.00	37.29	0.00	5.00	
		2	0.00	0.43	4.00	10.66	0.00	8.00	
	C1	1	0.00	0.46	7.00	6.60	0.00	7.00	
	D1	1	0.00	7.63	10.00	76.34	0.00	0.00	
		2	0.00	0.47	10.00	4.66	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.01	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	36.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
6	14/12/2022 11:05:03	14/12/2022 11:05:04	16:45	110	115.17	7.49	71.01	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	71	0	1668	898	16.17	106.42	8.75	115.17

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
16:45-17:45	1668	1668	0		71		27	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	27.36	16.17	7.49	106.42	41.84	697.81	8.75

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
16:45-17:45	76.34	0.00	467.00

A7 - DN 2039 AM
D7 - DN 2039 AM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
7	14/12/2022 11:05:04	14/12/2022 11:05:05	08:15	110	108.79	7.11	59.18	B1/1	0	0	B1/1	B3/1	B1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2039 AM		D7	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2039 AM				08:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	176	176
Bexit	1	120	120
Cexit	1	16	16
A1	1	16	16
	2	175	175
B1	1	184	184
	2	7	7
C1	1	39	39
D1	1	261	261
	2	12	12
B2	1	184	184
	2	7	7
B3	1	191	191
10	1	382	382

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	**1**	**1**	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**1**	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**1**	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	**1**	**1**	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	**1**	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	**1**	**1**	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	**1**	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	**1**	**1**	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**2**	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	**1**	**2**	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	**1**	**2**	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	**1**	**2**	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**3**	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**3**	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**3**	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	**1**	**3**	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	**(ALL)**	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	**(ALL)**	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	16	0	175
	2	7	0	4	180
	3	0	12	0	27
	4	169	92	12	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	12
	2		4	2	D1/1, Bexit/1	Normal	92
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	180
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	4
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	7
	6		4	1	D1/1, Aexit/1	Normal	169
	7		1	2	A1/1, Bexit/1	Normal	16
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	175
	10		3	2	C1/1, Bexit/1	Normal	12
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	27

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	18, 43, 71, 86, 104

Intergreen Matrix for Controller Stream 1

	To								
From		A	B	C	D	E	F	G	H
	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

	To					
From		1	2	3	4	5
	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	18	7	1	7
	2	✓	2	D,B	25	43	18	1	7
	3	✓	3	E,F,A	49	71	22	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

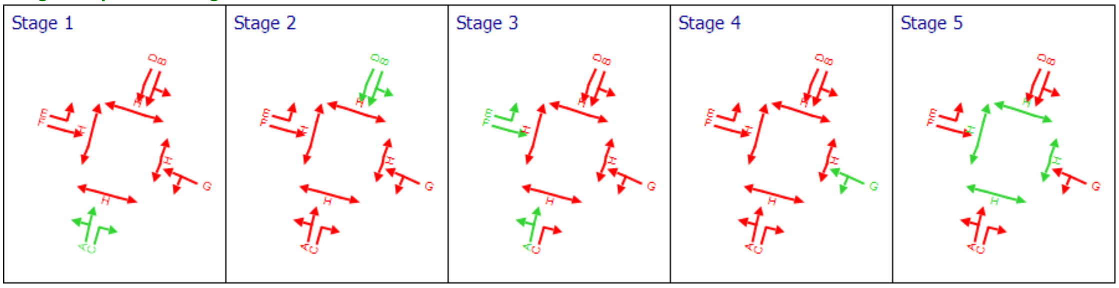
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	49	71	22
		2	✓	11	18	7
	B	1	✓	25	43	18
	C	1	✓	11	18	7
	D	1	✓	24	43	19
	E	1	✓	43	71	28
	F	1	✓	48	71	23
	G	1	✓	79	86	7
	H	1	✓	97	104	7

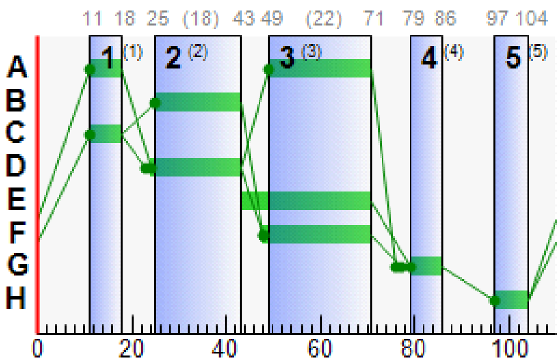
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	43	71	28			
A1	2		1	F	48	71	23			
B1	1		1	B	25	43	18			
B1	2		1	D	24	43	19			
C1	1		1	G	79	86	7			
D1	1		1	A	49	71	22	11	18	7
D1	2		1	C	11	18	7			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	Aexit	1	0	Unrestricted	176	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	120	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	16	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	3	2569	16	1800	28	30.32	0.36	2.58	1.91	0.15	2.06
		2	45	102	175	1800	23	40.91	4.80	34.26	28.24	1.94	30.18
	B1	1	59	52	184	1800	18	50.20	5.58	139.61	36.43	2.26	38.69
		2	2	4108	7	1800	19	37.35	0.18	4.38	1.03	0.07	1.10
	C1	1	30	202	39	1800	7	54.17	1.19	16.99	8.33	0.48	8.82
	D1	1	51	75	261	1800	29	21.88	4.40	44.03	22.52	2.78	25.30
		2	9	882	12	1800	7	49.14	0.34	3.45	2.33	0.14	2.47
	B2	1	10	780	184	1800	110	0.11	0.01	0.19	0.08	0.00	0.08
		2	0	23043	7	1800	110	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	11	748	191	1800	110	0.12	0.01	0.16	0.09	0.00	0.09
	10	1	0	Unrestricted	382	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
08:15-09:15	Aexit	1	176	176	0		Unrestricted	Unrestricted	0		Unrestricted	0.67	110
	Bexit	1	120	120	0		Unrestricted	Unrestricted	0		Unrestricted	0.47	110
	Cexit	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	1.16	110
	A1	1	16	16	0		1800	475	3		2569	0.00	28
		2	175	175	0		1800	393	45		102	0.00	23
	B1	1	184	184	0		1800	311	59		52	0.00	18
		2	7	7	0		1800	327	2		4108	0.00	19
	C1	1	39	39	0		1800	131	30		202	0.00	7
	D1	1	261	261	0		1800	507	51		75	0.00	29
		2	12	12	0		1800	131	9		882	0.00	7
	B2	1	184	184	0		1800	1800	10		780	0.00	110
		2	7	7	0		1800	1800	0		23043	0.00	110
	B3	1	191	191	0		1800	1800	11		748	0.00	110
	10	1	382	382	0		Unrestricted	Unrestricted	0		Unrestricted	0.69	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	30.32	0.13	1.91	72.68	11.63	0.15
		2	9.72	40.91	1.99	28.24	88.37	154.64	1.94
	B1	1	3.00	50.20	2.57	36.43	97.95	180.24	2.26
		2	3.00	37.35	0.07	1.03	80.85	5.66	0.07
	C1	1	5.28	54.17	0.59	8.33	98.66	38.48	0.48
	D1	1	7.20	21.88	1.59	22.52	84.95	221.73	2.78
		2	7.20	49.14	0.16	2.33	92.91	11.15	0.14
	B2	1	2.16	0.11	0.01	0.08	0.00	0.00	0.00
		2	2.16	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.12	0.01	0.09	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:15-09:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	30.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	26.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	102.00	
	A1	1	0.00	0.36	14.00	2.58	0.00	28.00	
		2	0.00	4.80	14.00	34.26	0.00	0.00	
	B1	1	0.00	5.58	4.00	139.61	0.00	0.00	
		2	0.00	0.18	4.00	4.38	0.00	19.00	
	C1	1	0.00	1.19	7.00	16.99	0.00	5.00	
	D1	1	0.00	4.40	10.00	44.03	0.00	0.00	
		2	0.00	0.34	10.00	3.45	0.00	7.00	
	B2	1	0.00	0.01	3.00	0.19	0.00	32.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.01	4.00	0.16	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	23.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
7	14/12/2022 11:05:04	14/12/2022 11:05:05	08:15	110	108.79	7.11	59.18	B1/1	0	0	B1/1	B3/1	B1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	59	0	1770	901	14.46	100.97	7.82	108.79

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:15-09:15	1770	1770	0		59		52	957

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	23.52	14.46	7.11	100.97	35.23	623.52	7.82

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:15-09:15	139.61	0.00	382.00

A8 - DN 2039 Interpeak
D8 - DN 2039 Interpeak*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
8	14/12/2022 11:05:05	14/12/2022 11:05:06	13:45	110	167.29	11.00	87.22	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2039 Interpeak		D8	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2039 Interpeak				13:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	335	335
Bexit	1	134	134
Cexit	1	19	19
A1	1	20	20
	2	314	314
B1	1	69	69
	2	15	15
C1	1	31	31
D1	1	427	427
	2	17	17
B2	1	69	69
	2	15	15
B3	1	84	84
10	1	405	405

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	**1**	**1**	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**1**	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**1**	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	**1**	**1**	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	**1**	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	**1**	**1**	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	**1**	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	**1**	**1**	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**2**	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	**1**	**2**	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	**1**	**2**	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	**1**	**2**	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**3**	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**3**	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**3**	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	**1**	**3**	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	**(ALL)**	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	**(ALL)**	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	20	0	314
	2	15	0	2	67
	3	0	7	0	24
	4	320	107	17	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	17
	2		4	2	D1/1, Bexit/1	Normal	107
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	67
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	2
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	15
	6		4	1	D1/1, Aexit/1	Normal	320
	7		1	2	A1/1, Bexit/1	Normal	20
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	314
	10		3	2	C1/1, Bexit/1	Normal	7
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	24

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	31, 45, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	31	20	1	7
	2	✓	2	D,B	38	45	7	1	7
	3	✓	3	E,F,A	51	71	20	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

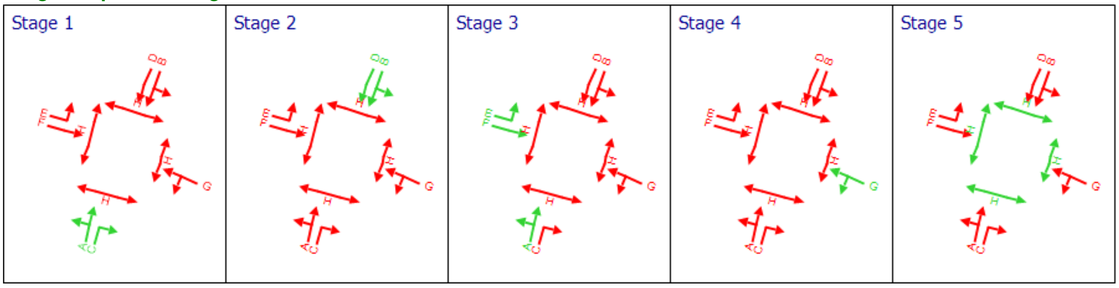
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	51	71	20
		2	✓	11	31	20
	B	1	✓	38	45	7
	C	1	✓	11	31	20
	D	1	✓	37	45	8
	E	1	✓	45	71	26
	F	1	✓	50	71	21
	G	1	✓	79	86	7
	H	1	✓	97	104	7

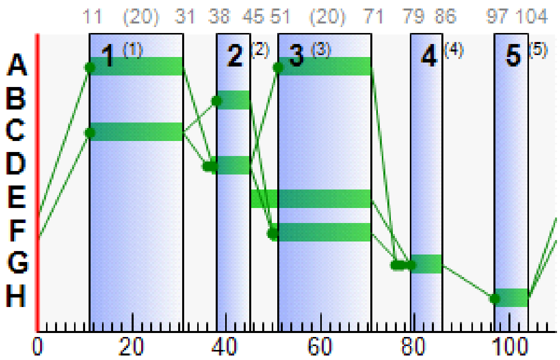
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	45	71	26			
A1	2		1	F	50	71	21			
B1	1		1	B	38	45	7			
B1	2		1	D	37	45	8			
C1	1		1	G	79	86	7			
D1	1		1	A	51	71	20	11	31	20
D1	2		1	C	11	31	20			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	Aexit	1	0	Unrestricted	335	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	134	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	19	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	5	1888	20	1800	26	31.88	0.46	3.30	2.52	0.19	2.70
		2	87	3	314	1800	21	72.32	11.83	84.53	89.57	4.74	94.31
	B1	1	53	71	69	1800	7	64.12	2.32	57.95	17.45	0.94	18.39
		2	10	784	15	1800	8	48.21	0.43	10.66	2.85	0.17	3.03
	C1	1	24	280	31	1800	7	52.41	0.92	13.19	6.41	0.37	6.78
	D1	1	62	45	427	1800	40	20.72	8.10	80.96	34.90	4.53	39.43
		2	5	1719	17	1800	20	36.68	0.42	4.22	2.46	0.17	2.63
	B2	1	4	2248	69	1800	110	0.04	0.00	0.03	0.01	0.00	0.01
		2	1	10700	15	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	5	1829	84	1800	110	0.05	0.00	0.03	0.02	0.00	0.02
	10	1	0	Unrestricted	405	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
13:45-14:45	Aexit	1	335	335	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	134	134	0		Unrestricted	Unrestricted	0		Unrestricted	0.50	110
	Cexit	1	19	19	0		Unrestricted	Unrestricted	0		Unrestricted	1.14	110
	A1	1	20	20	0		1800	442	5		1888	0.00	26
		2	314	314	0		1800	360	87		3	0.00	21
	B1	1	69	69	0		1800	131	53		71	0.00	7
		2	15	15	0		1800	147	10		784	0.00	8
	C1	1	31	31	0		1800	131	24		280	0.00	7
	D1	1	427	427	0		1800	687	62		45	0.00	40
		2	17	17	0		1800	344	5		1719	0.00	20
	B2	1	69	69	0		1800	1800	4		2248	0.00	110
		2	15	15	0		1800	1800	1		10700	0.00	110
	B3	1	84	84	0		1800	1800	5		1829	0.00	110
	10	1	405	405	0		Unrestricted	Unrestricted	0		Unrestricted	0.82	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	31.88	0.18	2.52	74.55	14.91	0.19
		2	9.72	72.32	6.31	89.57	120.33	377.83	4.74
	B1	1	3.00	64.12	1.23	17.45	108.10	74.59	0.94
		2	3.00	48.21	0.20	2.85	92.00	13.80	0.17
	C1	1	5.28	52.41	0.45	6.41	96.38	29.88	0.37
	D1	1	7.20	20.72	2.46	34.90	84.59	361.18	4.53
		2	7.20	36.68	0.17	2.46	80.08	13.61	0.17
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.05	0.00	0.02	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
13:45-14:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	22.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	27.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	99.00	
	A1	1	0.00	0.46	14.00	3.30	0.00	26.00	
		2	0.00	11.83	14.00	84.53	0.00	0.00	
	B1	1	0.00	2.32	4.00	57.95	0.00	0.00	
		2	0.00	0.43	4.00	10.66	0.00	8.00	
	C1	1	0.00	0.92	7.00	13.19	0.00	6.00	
	D1	1	0.00	8.10	10.00	80.96	0.00	0.00	
		2	0.00	0.42	10.00	4.22	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.03	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.03	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	28.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
8	14/12/2022 11:05:05	14/12/2022 11:05:06	13:45	110	167.29	11.00	87.22	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	87	0	1954	899	20.26	156.19	11.11	167.29

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
13:45-14:45	1954	1954	0		87		3	955

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	27.23	20.26	11.00	156.19	45.33	885.80	11.11

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
13:45-14:45	84.53	0.00	346.00

A9 - DN 2039 PM
D9 - DN 2039 PM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
	14/12/2022	14/12/2022											

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2039 PM		D9	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2039 PM				16:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	359	359
Bexit	1	139	139
Cexit	1	27	27
A1	1	20	20
	2	269	269
B1	1	53	53
	2	16	16
C1	1	17	17
D1	1	453	453
	2	21	21
B2	1	53	53
	2	16	16
B3	1	69	69
10	1	324	324

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	20	0	269
	2	16	0	6	47
	3	0	9	0	8
	4	343	110	21	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	21
	2		4	2	D1/1, Bexit/1	Normal	110
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	47
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	16
	6		4	1	D1/1, Aexit/1	Normal	343
	7		1	2	A1/1, Bexit/1	Normal	20
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	269
	10		3	2	C1/1, Bexit/1	Normal	9
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	8

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

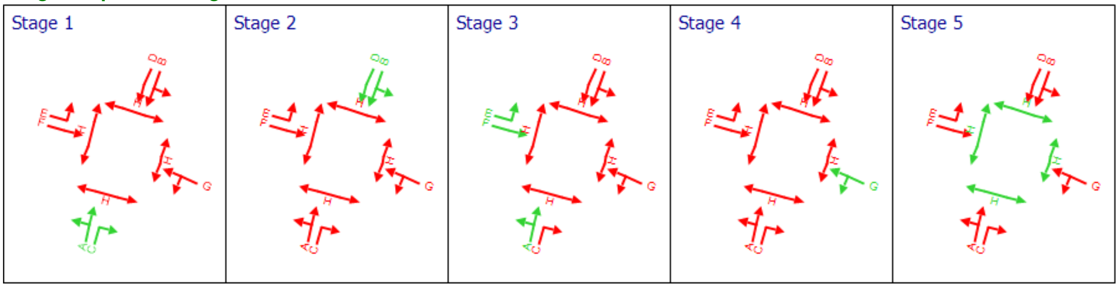
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

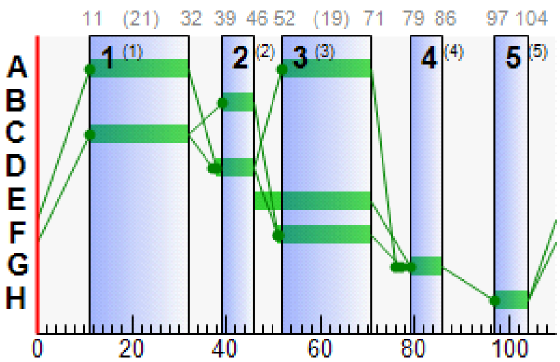
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	Aexit	1	0	Unrestricted	359	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	139	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	27	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	5	1815	20	1800	25	32.66	0.47	3.34	2.58	0.19	2.77
		2	78	15	269	1800	20	60.20	9.11	65.04	63.88	3.67	67.55
	B1	1	40	122	53	1800	7	57.96	1.68	42.04	12.12	0.68	12.80
		2	11	728	16	1800	8	48.31	0.46	11.39	3.05	0.18	3.23
	C1	1	13	593	17	1800	7	49.80	0.49	7.02	3.34	0.20	3.54
	D1	1	66	37	453	1800	40	21.79	8.81	88.09	38.94	4.98	43.92
		2	6	1443	21	1800	21	35.94	0.52	5.21	2.98	0.21	3.19
	B2	1	3	2957	53	1800	110	0.03	0.00	0.01	0.01	0.00	0.01
		2	1	10025	16	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2248	69	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	324	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
16:45-17:45	Aexit	1	359	359	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	110
	Bexit	1	139	139	0		Unrestricted	Unrestricted	0		Unrestricted	0.49	110
	Cexit	1	27	27	0		Unrestricted	Unrestricted	0		Unrestricted	1.05	110
	A1	1	20	20	0		1800	425	5		1815	0.00	25
		2	269	269	0		1800	344	78		15	0.00	20
	B1	1	53	53	0		1800	131	40		122	0.00	7
		2	16	16	0		1800	147	11		728	0.00	8
	C1	1	17	17	0		1800	131	13		593	0.00	7
	D1	1	453	453	0		1800	687	66		37	0.00	40
		2	21	21	0		1800	360	6		1443	0.00	21
	B2	1	53	53	0		1800	1800	3		2957	0.00	110
		2	16	16	0		1800	1800	1		10025	0.00	110
	B3	1	69	69	0		1800	1800	4		2248	0.00	110
	10	1	324	324	0		Unrestricted	Unrestricted	0		Unrestricted	0.89	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.66	0.18	2.58	75.48	15.10	0.19
		2	9.72	60.20	4.50	63.88	108.94	293.05	3.67
	B1	1	3.00	57.96	0.85	12.12	102.43	54.29	0.68
		2	3.00	48.31	0.21	3.05	92.09	14.73	0.18
	C1	1	5.28	49.80	0.24	3.34	93.50	15.90	0.20
	D1	1	7.20	21.79	2.74	38.94	87.61	396.89	4.98
		2	7.20	35.94	0.21	2.98	79.96	16.79	0.21
	B2	1	2.16	0.03	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
16:45-17:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	21.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	26.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	93.00	
	A1	1	0.00	0.47	14.00	3.34	0.00	25.00	
		2	0.00	9.11	14.00	65.04	0.00	0.00	
	B1	1	0.00	1.68	4.00	42.04	0.00	4.00	
		2	0.00	0.46	4.00	11.39	0.00	8.00	
	C1	1	0.00	0.49	7.00	7.02	0.00	7.00	
	D1	1	0.00	8.81	10.00	88.09	0.00	0.00	
		2	0.00	0.52	10.00	5.21	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.01	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	34.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
9	14/12/2022 11:05:06	14/12/2022 11:05:07	16:45	110	137.01	8.94	78.28	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	78	0	1836	898	17.52	126.90	10.12	137.01

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
16:45-17:45	1836	1836	0		78		15	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	27.38	17.52	8.94	126.90	43.94	806.74	10.12

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
16:45-17:45	88.09	0.00	458.00

A10 - DS 2024 AM
D10 - DS 2024 AM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
10	14/12/2022 11:05:07	14/12/2022 11:05:08	08:15	110	90.45	5.90	51.94	B1/1	0	0	B1/1	B3/1	B1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2024 AM		D10	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2024 AM				08:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	158	158
Bexit	1	101	101
Cexit	1	13	13
A1	1	15	15
	2	164	164
B1	1	153	153
	2	7	7
C1	1	33	33
D1	1	227	227
	2	10	10
B2	1	153	153
	2	7	7
B3	1	160	160
10	1	337	337

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	15	0	164
	2	7	0	3	150
	3	0	10	0	23
	4	151	76	10	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	10
	2		4	2	D1/1, Bexit/1	Normal	76
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	150
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	3
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	7
	6		4	1	D1/1, Aexit/1	Normal	151
	7		1	2	A1/1, Bexit/1	Normal	15
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	164
	10		3	2	C1/1, Bexit/1	Normal	10
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	23

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	18, 42, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	18	7	1	7
	2	✓	2	D,B	25	42	17	1	7
	3	✓	3	E,F,A	48	71	23	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

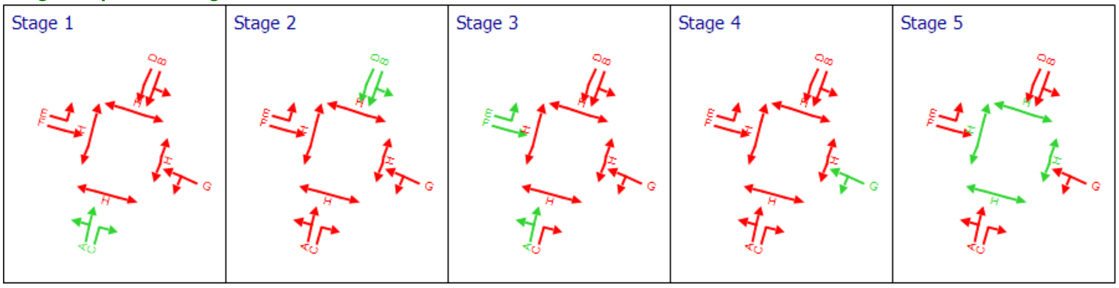
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	48	71	23
		2	✓	11	18	7
	B	1	✓	25	42	17
	C	1	✓	11	18	7
	D	1	✓	24	42	18
	E	1	✓	42	71	29
	F	1	✓	47	71	24
	G	1	✓	79	86	7
	H	1	✓	97	104	7

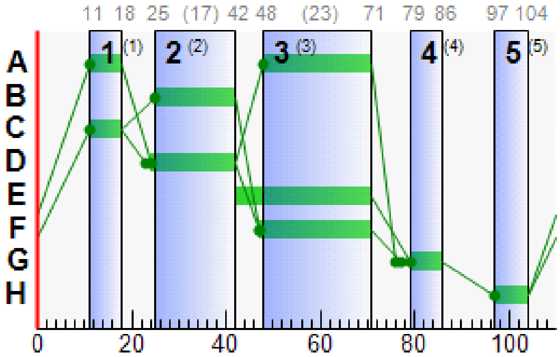
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	42	71	29			
A1	2		1	F	47	71	24			
B1	1		1	B	25	42	17			
B1	2		1	D	24	42	18			
C1	1		1	G	79	86	7			
D1	1		1	A	48	71	23	11	18	7
D1	2		1	C	11	18	7			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	Aexit	1	0	Unrestricted	158	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	101	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	13	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	3	2845	15	1800	29	29.57	0.33	2.38	1.75	0.13	1.88
		2	40	125	164	1800	24	39.08	4.37	31.22	25.28	1.77	27.05
	B1	1	52	73	153	1800	17	48.59	4.53	113.19	29.32	1.83	31.16
		2	2	3897	7	1800	18	38.19	0.18	4.43	1.05	0.07	1.13
	C1	1	25	257	33	1800	7	52.80	0.99	14.09	6.87	0.40	7.27
	D1	1	43	108	227	1800	30	19.49	3.70	36.96	17.45	2.35	19.80
		2	8	1078	10	1800	7	48.89	0.29	2.86	1.93	0.12	2.04
	B2	1	9	959	153	1800	110	0.09	0.00	0.13	0.06	0.00	0.06
		2	0	23043	7	1800	110	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	9	913	160	1800	110	0.10	0.00	0.11	0.06	0.00	0.06
	10	1	0	Unrestricted	337	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
08:15-09:15	Aexit	1	158	158	0		Unrestricted	Unrestricted	0		Unrestricted	0.67	110
	Bexit	1	101	101	0		Unrestricted	Unrestricted	0		Unrestricted	0.47	110
	Cexit	1	13	13	0		Unrestricted	Unrestricted	0		Unrestricted	1.19	110
	A1	1	15	15	0		1800	491	3		2845	0.00	29
		2	164	164	0		1800	409	40		125	0.00	24
	B1	1	153	153	0		1800	295	52		73	0.00	17
		2	7	7	0		1800	311	2		3897	0.00	18
	C1	1	33	33	0		1800	131	25		257	0.00	7
	D1	1	227	227	0		1800	524	43		108	0.00	30
		2	10	10	0		1800	131	8		1078	0.00	7
	B2	1	153	153	0		1800	1800	9		959	0.00	110
		2	7	7	0		1800	1800	0		23043	0.00	110
	B3	1	160	160	0		1800	1800	9		913	0.00	110
	10	1	337	337	0		Unrestricted	Unrestricted	0		Unrestricted	0.70	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	29.57	0.12	1.75	71.76	10.76	0.13
		2	9.72	39.08	1.78	25.28	86.06	141.14	1.77
	B1	1	3.00	48.59	2.07	29.32	95.65	146.34	1.83
		2	3.00	38.19	0.07	1.05	81.77	5.72	0.07
	C1	1	5.28	52.80	0.48	6.87	96.71	31.91	0.40
	D1	1	7.20	19.49	1.23	17.45	82.42	187.09	2.35
		2	7.20	48.89	0.14	1.93	92.68	9.27	0.12
	B2	1	2.16	0.09	0.00	0.06	0.00	0.00	0.00
		2	2.16	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.10	0.00	0.06	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:15-09:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	32.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	31.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	104.00	
	A1	1	0.00	0.33	14.00	2.38	0.00	29.00	
		2	0.00	4.37	14.00	31.22	0.00	0.00	
	B1	1	0.00	4.53	4.00	113.19	0.00	0.00	
		2	0.00	0.18	4.00	4.43	0.00	18.00	
	C1	1	0.00	0.99	7.00	14.09	0.00	6.00	
	D1	1	0.00	3.70	10.00	36.96	0.00	0.00	
		2	0.00	0.29	10.00	2.86	0.00	7.00	
	B2	1	0.00	0.00	3.00	0.13	0.00	13.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.11	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	25.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
10	14/12/2022 11:05:07	14/12/2022 11:05:08	08:15	110	90.45	5.90	51.94	B1/1	0	0	B1/1	B3/1	B1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	52	0	1538	902	13.81	83.78	6.67	90.45

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:15-09:15	1538	1538	0		52		73	958

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	23.76	13.81	5.90	83.78	34.61	532.23	6.67

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:15-09:15	113.19	0.00	375.00

A11 - DS 2024 Interpeak
D11 - DS 2024 Interpeak*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
11	14/12/2022 11:05:08	14/12/2022 11:05:08	13:45	110	128.62	8.41	78.06	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2024 Interpeak		D11	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2024 Interpeak				13:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	303	303
Bexit	1	114	114
Cexit	1	16	16
A1	1	19	19
	2	281	281
B1	1	58	58
	2	15	15
C1	1	26	26
D1	1	377	377
	2	14	14
B2	1	58	58
	2	15	15
B3	1	73	73
10	1	357	357

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	19	0	281
	2	15	0	2	56
	3	0	6	0	20
	4	288	89	14	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	14
	2		4	2	D1/1, Bexit/1	Normal	89
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	56
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	2
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	15
	6		4	1	D1/1, Aexit/1	Normal	288
	7		1	2	A1/1, Bexit/1	Normal	19
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	281
	10		3	2	C1/1, Bexit/1	Normal	6
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	20

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	31, 45, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	31	20	1	7
	2	✓	2	D,B	38	45	7	1	7
	3	✓	3	E,F,A	51	71	20	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

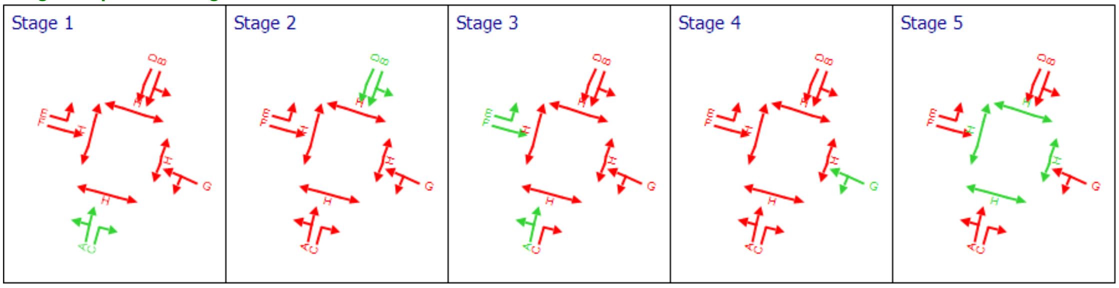
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	51	71	20
		2	✓	11	31	20
	B	1	✓	38	45	7
	C	1	✓	11	31	20
	D	1	✓	37	45	8
	E	1	✓	45	71	26
	F	1	✓	50	71	21
	G	1	✓	79	86	7
	H	1	✓	97	104	7

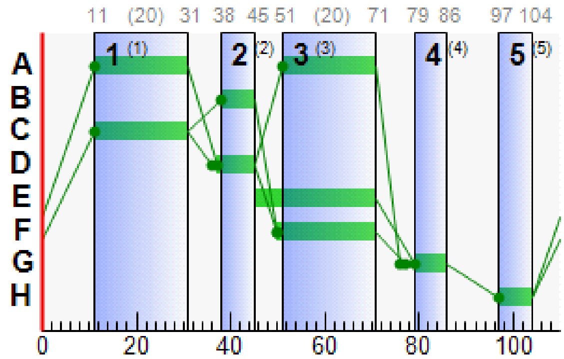
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	45	71	26			
A1	2		1	F	50	71	21			
B1	1		1	B	38	45	7			
B1	2		1	D	37	45	8			
C1	1		1	G	79	86	7			
D1	1		1	A	51	71	20	11	31	20
D1	2		1	C	11	31	20			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	Aexit	1	0	Unrestricted	303	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	114	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	16	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	1993	19	1800	26	31.87	0.44	3.14	2.39	0.18	2.57
		2	78	15	281	1800	21	58.61	9.44	67.40	64.96	3.80	68.76
	B1	1	44	103	58	1800	7	59.65	1.86	46.62	13.65	0.76	14.40
		2	10	784	15	1800	8	48.21	0.43	10.66	2.85	0.17	3.03
	C1	1	20	353	26	1800	7	51.45	0.77	10.98	5.28	0.31	5.59
	D1	1	55	64	377	1800	40	19.05	6.72	67.19	28.32	3.77	32.09
		2	4	2109	14	1800	20	36.63	0.35	3.47	2.02	0.14	2.16
	B2	1	3	2693	58	1800	110	0.03	0.00	0.02	0.01	0.00	0.01
		2	1	10700	15	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2119	73	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	357	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
13:45-14:45	Aexit	1	303	303	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	114	114	0		Unrestricted	Unrestricted	0		Unrestricted	0.50	110
	Cexit	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	1.13	110
	A1	1	19	19	0		1800	442	4		1993	0.00	26
		2	281	281	0		1800	360	78		15	0.00	21
	B1	1	58	58	0		1800	131	44		103	0.00	7
		2	15	15	0		1800	147	10		784	0.00	8
	C1	1	26	26	0		1800	131	20		353	0.00	7
	D1	1	377	377	0		1800	687	55		64	0.00	40
		2	14	14	0		1800	344	4		2109	0.00	20
	B2	1	58	58	0		1800	1800	3		2693	0.00	110
		2	15	15	0		1800	1800	1		10700	0.00	110
	B3	1	73	73	0		1800	1800	4		2119	0.00	110
	10	1	357	357	0		Unrestricted	Unrestricted	0		Unrestricted	0.84	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	31.87	0.17	2.39	74.55	14.16	0.18
		2	9.72	58.61	4.57	64.96	107.90	303.19	3.80
	B1	1	3.00	59.65	0.96	13.65	103.92	60.28	0.76
		2	3.00	48.21	0.20	2.85	92.00	13.80	0.17
	C1	1	5.28	51.45	0.37	5.28	95.62	24.86	0.31
	D1	1	7.20	19.05	1.99	28.32	79.69	300.42	3.77
		2	7.20	36.63	0.14	2.02	80.04	11.21	0.14
	B2	1	2.16	0.03	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
13:45-14:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	23.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	31.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	102.00	
	A1	1	0.00	0.44	14.00	3.14	0.00	26.00	
		2	0.00	9.44	14.00	67.40	0.00	0.00	
	B1	1	0.00	1.86	4.00	46.62	0.00	4.00	
		2	0.00	0.43	4.00	10.66	0.00	8.00	
	C1	1	0.00	0.77	7.00	10.98	0.00	6.00	
	D1	1	0.00	6.72	10.00	67.19	0.00	0.00	
		2	0.00	0.35	10.00	3.47	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.02	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	31.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
11	14/12/2022 11:05:08	14/12/2022 11:05:08	13:45	110	128.62	8.41	78.06	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	78	0	1726	899	17.55	119.49	9.13	128.62

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
13:45-14:45	1726	1726	0		78		15	955

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	27.26	17.55	8.41	119.49	42.17	727.91	9.13

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
13:45-14:45	67.40	0.00	471.00

A12 - DS 2024 PM
D12 - DS 2024 PM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
12	14/12/2022 11:05:09	14/12/2022 11:05:10	16:45	110	111.18	7.23	70.42	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2024 PM		D12	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2024 PM				16:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	324	324
Bexit	1	118	118
Cexit	1	22	22
A1	1	19	19
	2	242	242
B1	1	44	44
	2	16	16
C1	1	14	14
D1	1	400	400
	2	17	17
B2	1	44	44
	2	16	16
B3	1	60	60
10	1	288	288

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	19	0	242
	2	16	0	5	39
	3	0	7	0	7
	4	308	92	17	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	17
	2		4	2	D1/1, Bexit/1	Normal	92
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	39
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	5
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	16
	6		4	1	D1/1, Aexit/1	Normal	308
	7		1	2	A1/1, Bexit/1	Normal	19
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	242
	10		3	2	C1/1, Bexit/1	Normal	7
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	7

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

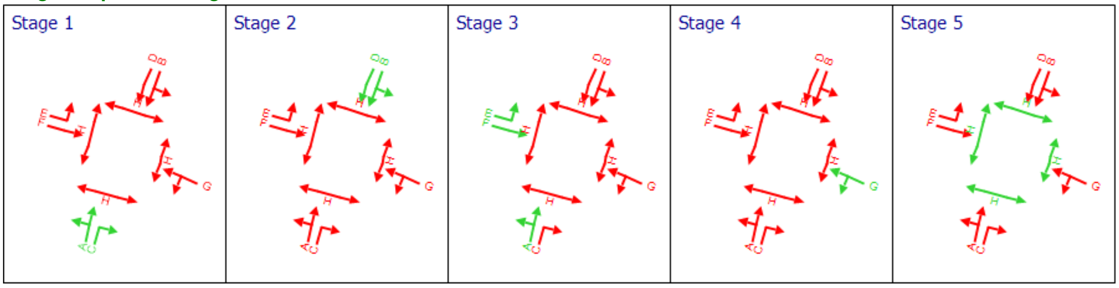
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

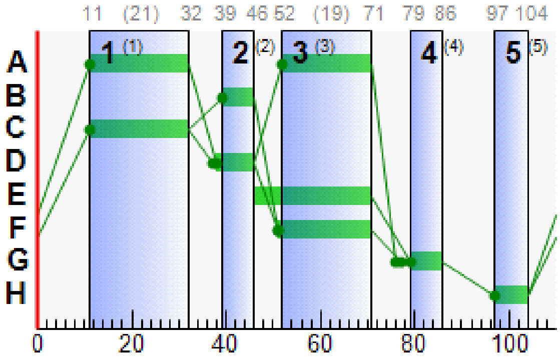
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	Aexit	1	0	Unrestricted	324	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	118	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	22	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	1915	19	1800	25	32.65	0.44	3.17	2.45	0.18	2.63
		2	70	28	242	1800	20	53.71	7.67	54.79	51.27	3.10	54.38
	B1	1	34	168	44	1800	7	55.42	1.36	33.88	9.62	0.55	10.17
		2	11	728	16	1800	8	48.31	0.46	11.39	3.05	0.18	3.23
	C1	1	11	742	14	1800	7	49.40	0.40	5.76	2.73	0.16	2.89
	D1	1	58	55	400	1800	40	19.77	7.29	72.91	31.19	4.11	35.30
		2	5	1806	17	1800	21	35.85	0.42	4.17	2.40	0.17	2.57
	B2	1	2	3582	44	1800	110	0.03	0.00	0.01	0.00	0.00	0.00
		2	1	10025	16	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3	2600	60	1800	110	0.03	0.00	0.01	0.01	0.00	0.01
	10	1	0	Unrestricted	288	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
16:45-17:45	Aexit	1	324	324	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	118	118	0		Unrestricted	Unrestricted	0		Unrestricted	0.49	110
	Cexit	1	22	22	0		Unrestricted	Unrestricted	0		Unrestricted	1.05	110
	A1	1	19	19	0		1800	425	4		1915	0.00	25
		2	242	242	0		1800	344	70		28	0.00	20
	B1	1	44	44	0		1800	131	34		168	0.00	7
		2	16	16	0		1800	147	11		728	0.00	8
	C1	1	14	14	0		1800	131	11		742	0.00	7
	D1	1	400	400	0		1800	687	58		55	0.00	40
		2	17	17	0		1800	360	5		1806	0.00	21
	B2	1	44	44	0		1800	1800	2		3582	0.00	110
		2	16	16	0		1800	1800	1		10025	0.00	110
	B3	1	60	60	0		1800	1800	3		2600	0.00	110
	10	1	288	288	0		Unrestricted	Unrestricted	0		Unrestricted	0.91	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.65	0.17	2.45	75.47	14.34	0.18
		2	9.72	53.71	3.61	51.27	102.31	247.59	3.10
	B1	1	3.00	55.42	0.68	9.62	99.64	43.84	0.55
		2	3.00	48.31	0.21	3.05	92.09	14.73	0.18
	C1	1	5.28	49.40	0.19	2.73	93.14	13.04	0.16
	D1	1	7.20	19.77	2.20	31.19	81.95	327.80	4.11
		2	7.20	35.85	0.17	2.40	79.15	13.46	0.17
	B2	1	2.16	0.03	0.00	0.00	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.03	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
16:45-17:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	22.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	30.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	99.00	
	A1	1	0.00	0.44	14.00	3.17	0.00	25.00	
		2	0.00	7.67	14.00	54.79	0.00	0.00	
	B1	1	0.00	1.36	4.00	33.88	0.00	5.00	
		2	0.00	0.46	4.00	11.39	0.00	8.00	
	C1	1	0.00	0.40	7.00	5.76	0.00	7.00	
	D1	1	0.00	7.29	10.00	72.91	0.00	0.00	
		2	0.00	0.42	10.00	4.17	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.01	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.01	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	36.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
12	14/12/2022 11:05:09	14/12/2022 11:05:10	16:45	110	111.18	7.23	70.42	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	70	0	1624	898	16.04	102.72	8.46	111.18

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
16:45-17:45	1624	1624	0		70		28	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	27.42	16.04	7.23	102.72	41.55	674.79	8.46

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
16:45-17:45	72.91	0.00	473.00

A13 - DS 2029 AM
D13 - DS 2029 AM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
13	14/12/2022 11:05:10	14/12/2022 11:05:10	08:15	110	100.46	6.56	56.36	B1/1	0	0	B1/1	B3/1	B1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2029 AM		D13	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2029 AM				08:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	172	172
Bexit	1	111	111
Cexit	1	14	14
A1	1	17	17
	2	176	176
B1	1	166	166
	2	8	8
C1	1	36	36
D1	1	247	247
	2	11	11
B2	1	166	166
	2	8	8
B3	1	174	174
10	1	364	364

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	**1**	**1**	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**1**	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**1**	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	**1**	**1**	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	**1**	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	**1**	**1**	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	**1**	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	**1**	**1**	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**2**	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	**1**	**2**	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	**1**	**2**	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	**1**	**2**	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**3**	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**3**	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**3**	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	**1**	**3**	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	**(ALL)**	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	**(ALL)**	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	17	0	176
	2	8	0	3	163
	3	0	11	0	25
	4	164	83	11	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	11
	2		4	2	D1/1, Bexit/1	Normal	83
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	163
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	3
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	8
	6		4	1	D1/1, Aexit/1	Normal	164
	7		1	2	A1/1, Bexit/1	Normal	17
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	176
	10		3	2	C1/1, Bexit/1	Normal	11
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	25

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	18, 42, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	18	7	1	7
	2	✓	2	D,B	25	42	17	1	7
	3	✓	3	E,F,A	48	71	23	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

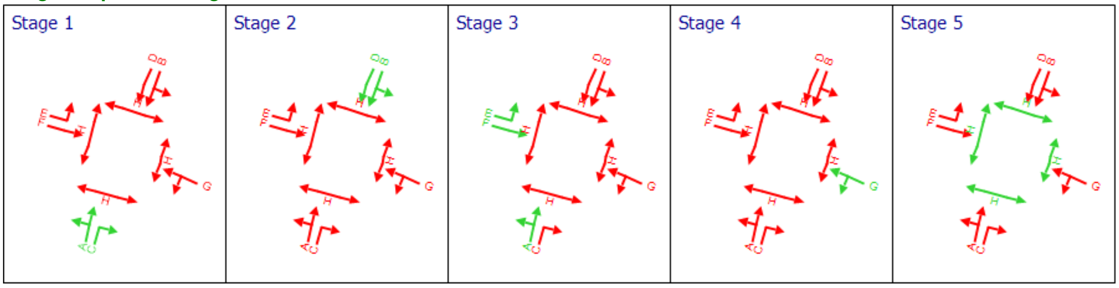
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	48	71	23
		2	✓	11	18	7
	B	1	✓	25	42	17
	C	1	✓	11	18	7
	D	1	✓	24	42	18
	E	1	✓	42	71	29
	F	1	✓	47	71	24
	G	1	✓	79	86	7
	H	1	✓	97	104	7

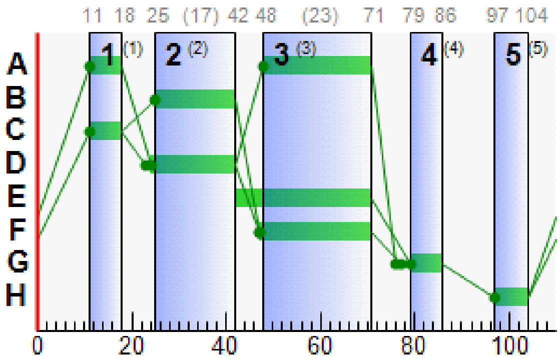
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	42	71	29			
A1	2		1	F	47	71	24			
B1	1		1	B	25	42	17			
B1	2		1	D	24	42	18			
C1	1		1	G	79	86	7			
D1	1		1	A	48	71	23	11	18	7
D1	2		1	C	11	18	7			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	Aexit	1	0	Unrestricted	172	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	111	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	14	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	3	2499	17	1800	29	29.59	0.38	2.70	1.98	0.15	2.14
		2	43	109	176	1800	24	39.71	4.76	33.98	27.57	1.92	29.49
	B1	1	56	60	166	1800	17	50.17	5.02	125.40	32.85	2.03	34.88
		2	3	3398	8	1800	18	38.21	0.20	5.06	1.21	0.08	1.29
	C1	1	28	227	36	1800	7	53.45	1.09	15.60	7.59	0.44	8.03
	D1	1	47	91	247	1800	30	20.15	4.05	40.52	19.63	2.60	22.23
		2	8	971	11	1800	7	49.01	0.32	3.16	2.13	0.13	2.25
	B2	1	9	876	166	1800	110	0.10	0.00	0.16	0.07	0.00	0.07
		2	0	20150	8	1800	110	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	10	831	174	1800	110	0.11	0.01	0.13	0.07	0.00	0.07
	10	1	0	Unrestricted	364	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
08:15-09:15	Aexit	1	172	172	0		Unrestricted	Unrestricted	0		Unrestricted	0.66	110
	Bexit	1	111	111	0		Unrestricted	Unrestricted	0		Unrestricted	0.47	110
	Cexit	1	14	14	0		Unrestricted	Unrestricted	0		Unrestricted	1.19	110
	A1	1	17	17	0		1800	491	3		2499	0.00	29
		2	176	176	0		1800	409	43		109	0.00	24
	B1	1	166	166	0		1800	295	56		60	0.00	17
		2	8	8	0		1800	311	3		3398	0.00	18
	C1	1	36	36	0		1800	131	28		227	0.00	7
	D1	1	247	247	0		1800	524	47		91	0.00	30
		2	11	11	0		1800	131	8		971	0.00	7
	B2	1	166	166	0		1800	1800	9		876	0.00	110
		2	8	8	0		1800	1800	0		20150	0.00	110
	B3	1	174	174	0		1800	1800	10		831	0.00	110
	10	1	364	364	0		Unrestricted	Unrestricted	0		Unrestricted	0.70	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	29.59	0.14	1.98	71.77	12.20	0.15
		2	9.72	39.71	1.94	27.57	87.09	153.28	1.92
	B1	1	3.00	50.17	2.31	32.85	97.55	161.93	2.03
		2	3.00	38.21	0.08	1.21	81.79	6.54	0.08
	C1	1	5.28	53.45	0.53	7.59	98.02	35.29	0.44
	D1	1	7.20	20.15	1.38	19.63	84.05	207.61	2.60
		2	7.20	49.01	0.15	2.13	92.79	10.21	0.13
	B2	1	2.16	0.10	0.00	0.07	0.00	0.00	0.00
		2	2.16	0.00	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.11	0.01	0.07	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:15-09:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	31.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	28.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	103.00	
	A1	1	0.00	0.38	14.00	2.70	0.00	29.00	
		2	0.00	4.76	14.00	33.98	0.00	0.00	
	B1	1	0.00	5.02	4.00	125.40	0.00	0.00	
		2	0.00	0.20	4.00	5.06	0.00	18.00	
	C1	1	0.00	1.09	7.00	15.60	0.00	5.00	
	D1	1	0.00	4.05	10.00	40.52	0.00	0.00	
		2	0.00	0.32	10.00	3.16	0.00	7.00	
	B2	1	0.00	0.00	3.00	0.16	0.00	23.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.01	4.00	0.13	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	24.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
13	14/12/2022 11:05:10	14/12/2022 11:05:10	08:15	110	100.46	6.56	56.36	B1/1	0	0	B1/1	B3/1	B1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	56	0	1670	902	14.13	93.09	7.36	100.46

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:15-09:15	1670	1670	0		56		60	958

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	23.75	14.13	6.56	93.09	35.15	587.06	7.36

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:15-09:15	125.40	0.00	378.00

A14 - DS 2029 Interpeak
D14 - DS 2029 Interpeak*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
14	14/12/2022 11:05:11	14/12/2022 11:05:11	13:45	110	152.02	9.98	84.44	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2029 Interpeak		D14	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2029 Interpeak				13:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	327	327
Bexit	1	124	124
Cexit	1	18	18
A1	1	20	20
	2	304	304
B1	1	63	63
	2	16	16
C1	1	29	29
D1	1	408	408
	2	16	16
B2	1	63	63
	2	16	16
B3	1	79	79
10	1	387	387

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	20	0	304
	2	16	0	2	61
	3	0	7	0	22
	4	311	97	16	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	16
	2		4	2	D1/1, Bexit/1	Normal	97
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	61
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	2
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	16
	6		4	1	D1/1, Aexit/1	Normal	311
	7		1	2	A1/1, Bexit/1	Normal	20
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	304
	10		3	2	C1/1, Bexit/1	Normal	7
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	22

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	31, 45, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	31	20	1	7
	2	✓	2	D,B	38	45	7	1	7
	3	✓	3	E,F,A	51	71	20	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

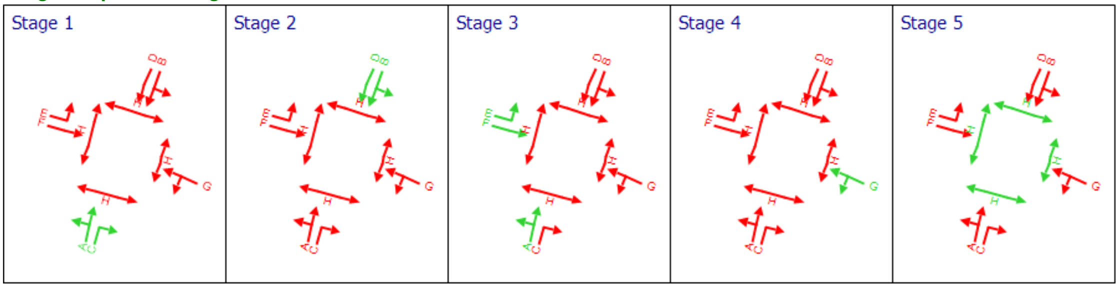
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	51	71	20
		2	✓	11	31	20
	B	1	✓	38	45	7
	C	1	✓	11	31	20
	D	1	✓	37	45	8
	E	1	✓	45	71	26
	F	1	✓	50	71	21
	G	1	✓	79	86	7
	H	1	✓	97	104	7

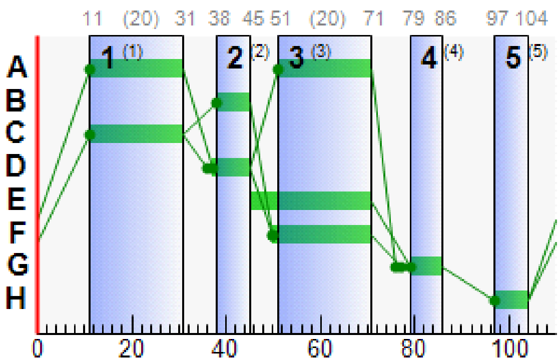
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	45	71	26			
A1	2		1	F	50	71	21			
B1	1		1	B	38	45	7			
B1	2		1	D	37	45	8			
C1	1		1	G	79	86	7			
D1	1		1	A	51	71	20	11	31	20
D1	2		1	C	11	31	20			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	Aexit	1	0	Unrestricted	327	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	124	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	18	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	5	1888	20	1800	26	31.88	0.46	3.30	2.52	0.19	2.70
		2	84	7	304	1800	21	66.94	10.94	78.16	80.27	4.40	84.67
	B1	1	48	87	63	1800	7	61.53	2.06	51.41	15.29	0.83	16.12
		2	11	728	16	1800	8	48.31	0.46	11.39	3.05	0.18	3.23
	C1	1	22	306	29	1800	7	52.02	0.86	12.30	5.95	0.35	6.30
	D1	1	59	52	408	1800	40	20.04	7.57	75.70	32.25	4.24	36.49
		2	5	1833	16	1800	20	36.66	0.40	3.97	2.31	0.16	2.47
	B2	1	4	2471	63	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
		2	1	10025	16	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	1951	79	1800	110	0.05	0.00	0.03	0.01	0.00	0.01
	10	1	0	Unrestricted	387	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
13:45-14:45	Aexit	1	327	327	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	124	124	0		Unrestricted	Unrestricted	0		Unrestricted	0.50	110
	Cexit	1	18	18	0		Unrestricted	Unrestricted	0		Unrestricted	1.14	110
	A1	1	20	20	0		1800	442	5		1888	0.00	26
		2	304	304	0		1800	360	84		7	0.00	21
	B1	1	63	63	0		1800	131	48		87	0.00	7
		2	16	16	0		1800	147	11		728	0.00	8
	C1	1	29	29	0		1800	131	22		306	0.00	7
	D1	1	408	408	0		1800	687	59		52	0.00	40
		2	16	16	0		1800	344	5		1833	0.00	20
	B2	1	63	63	0		1800	1800	4		2471	0.00	110
		2	16	16	0		1800	1800	1		10025	0.00	110
	B3	1	79	79	0		1800	1800	4		1951	0.00	110
	10	1	387	387	0		Unrestricted	Unrestricted	0		Unrestricted	0.83	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	31.88	0.18	2.52	74.55	14.91	0.19
		2	9.72	66.94	5.65	80.27	115.43	350.91	4.40
	B1	1	3.00	61.53	1.08	15.29	105.43	66.42	0.83
		2	3.00	48.31	0.21	3.05	92.09	14.73	0.18
	C1	1	5.28	52.02	0.42	5.95	96.07	27.86	0.35
	D1	1	7.20	20.04	2.27	32.25	82.94	338.40	4.24
		2	7.20	36.66	0.16	2.31	80.07	12.81	0.16
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.05	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
13:45-14:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	22.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	28.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	100.00	
	A1	1	0.00	0.46	14.00	3.30	0.00	26.00	
		2	0.00	10.94	14.00	78.16	0.00	0.00	
	B1	1	0.00	2.06	4.00	51.41	0.00	0.00	
		2	0.00	0.46	4.00	11.39	0.00	8.00	
	C1	1	0.00	0.86	7.00	12.30	0.00	6.00	
	D1	1	0.00	7.57	10.00	75.70	0.00	0.00	
		2	0.00	0.40	10.00	3.97	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.02	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.03	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	29.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
14	14/12/2022 11:05:11	14/12/2022 11:05:11	13:45	110	152.02	9.98	84.44	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	84	0	1870	899	19.21	141.66	10.36	152.02

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
13:45-14:45	1870	1870	0		84		7	955

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	27.26	19.21	9.98	141.66	44.17	826.04	10.36

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
13:45-14:45	78.16	0.00	349.00

A15 - DS 2029 PM
D15 - DS 2029 PM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
15	14/12/2022 11:05:11	14/12/2022 11:05:12	16:45	110	127.27	8.29	75.95	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2029 PM		D15	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2029 PM				16:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	350	350
Bexit	1	128	128
Cexit	1	25	25
A1	1	20	20
	2	261	261
B1	1	48	48
	2	17	17
C1	1	16	16
D1	1	433	433
	2	19	19
B2	1	48	48
	2	17	17
B3	1	65	65
10	1	311	311

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	20	0	261
	2	17	0	6	42
	3	0	8	0	8
	4	333	100	19	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	19
	2		4	2	D1/1, Bexit/1	Normal	100
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	42
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	17
	6		4	1	D1/1, Aexit/1	Normal	333
	7		1	2	A1/1, Bexit/1	Normal	20
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	261
	10		3	2	C1/1, Bexit/1	Normal	8
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	8

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

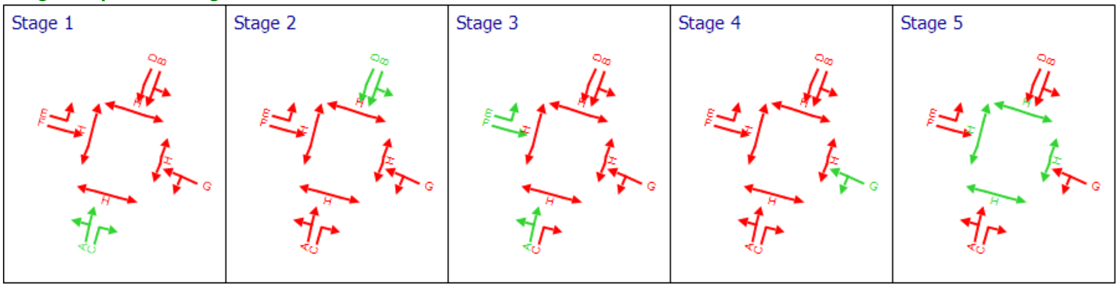
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

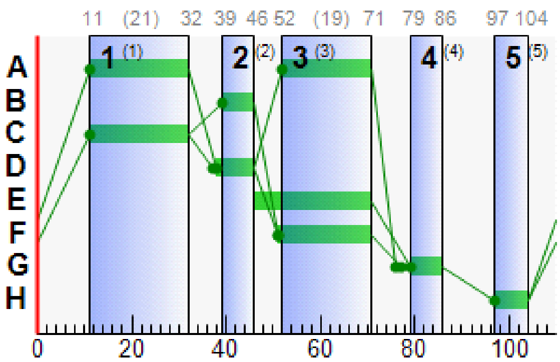
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	Aexit	1	0	Unrestricted	350	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	128	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	25	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	5	1815	20	1800	25	32.66	0.47	3.34	2.58	0.19	2.77
		2	76	18	261	1800	20	57.93	8.69	62.05	59.64	3.49	63.13
	B1	1	37	145	48	1800	7	56.48	1.49	37.29	10.69	0.60	11.30
		2	12	680	17	1800	8	48.42	0.48	12.11	3.25	0.20	3.44
	C1	1	12	636	16	1800	7	49.66	0.46	6.60	3.13	0.19	3.32
	D1	1	63	43	433	1800	40	20.95	8.23	82.29	35.79	4.62	40.41
		2	5	1605	19	1800	21	35.88	0.47	4.66	2.69	0.19	2.88
	B2	1	3	3275	48	1800	110	0.03	0.00	0.01	0.01	0.00	0.01
		2	1	9429	17	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2392	65	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	311	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
16:45-17:45	Aexit	1	350	350	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	128	128	0		Unrestricted	Unrestricted	0		Unrestricted	0.49	110
	Cexit	1	25	25	0		Unrestricted	Unrestricted	0		Unrestricted	1.04	110
	A1	1	20	20	0		1800	425	5		1815	0.00	25
		2	261	261	0		1800	344	76		18	0.00	20
	B1	1	48	48	0		1800	131	37		145	0.00	7
		2	17	17	0		1800	147	12		680	0.00	8
	C1	1	16	16	0		1800	131	12		636	0.00	7
	D1	1	433	433	0		1800	687	63		43	0.00	40
		2	19	19	0		1800	360	5		1605	0.00	21
	B2	1	48	48	0		1800	1800	3		3275	0.00	110
		2	17	17	0		1800	1800	1		9429	0.00	110
	B3	1	65	65	0		1800	1800	4		2392	0.00	110
	10	1	311	311	0		Unrestricted	Unrestricted	0		Unrestricted	0.90	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.66	0.18	2.58	75.48	15.10	0.19
		2	9.72	57.93	4.20	59.64	106.68	278.44	3.49
	B1	1	3.00	56.48	0.75	10.69	100.50	48.24	0.60
		2	3.00	48.42	0.23	3.25	92.19	15.67	0.20
	C1	1	5.28	49.66	0.22	3.13	93.38	14.94	0.19
	D1	1	7.20	20.95	2.52	35.79	85.17	368.80	4.62
		2	7.20	35.88	0.19	2.69	79.18	15.04	0.19
	B2	1	2.16	0.03	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
16:45-17:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	21.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	28.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	95.00	
	A1	1	0.00	0.47	14.00	3.34	0.00	25.00	
		2	0.00	8.69	14.00	62.05	0.00	0.00	
	B1	1	0.00	1.49	4.00	37.29	0.00	5.00	
		2	0.00	0.48	4.00	12.11	0.00	8.00	
	C1	1	0.00	0.46	7.00	6.60	0.00	7.00	
	D1	1	0.00	8.23	10.00	82.29	0.00	0.00	
		2	0.00	0.47	10.00	4.66	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.01	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	35.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
15	14/12/2022 11:05:11	14/12/2022 11:05:12	16:45	110	127.27	8.29	75.95	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
16:45-17:45	76	0	1758	898	16.99	117.78	9.48	127.27

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
16:45-17:45	1758	1758	0		76		18	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
16:45-17:45	27.41	16.99	8.29	117.78	43.02	756.24	9.48

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
16:45-17:45	82.29	0.00	465.00

A16 - DS 2039 AM
D16 - DS 2039 AM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
16	14/12/2022 11:05:12	14/12/2022 11:05:13	08:15	110	115.20	7.53	62.47	B1/1	0	0	B1/1	B3/1	B1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2039 AM		D16	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2039 AM				08:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	188	188
Bexit	1	122	122
Cexit	1	16	16
A1	1	18	18
	2	192	192
B1	1	184	184
	2	9	9
C1	1	39	39
D1	1	271	271
	2	12	12
B2	1	184	184
	2	9	9
B3	1	193	193
10	1	399	399

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	18	0	192
	2	9	0	4	180
	3	0	12	0	27
	4	179	92	12	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	12
	2		4	2	D1/1, Bexit/1	Normal	92
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	180
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	4
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	9
	6		4	1	D1/1, Aexit/1	Normal	179
	7		1	2	A1/1, Bexit/1	Normal	18
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	192
	10		3	2	C1/1, Bexit/1	Normal	12
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	27

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	19, 43, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	19	8	1	7
	2	✓	2	D,B	26	43	17	1	7
	3	✓	3	E,F,A	49	71	22	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

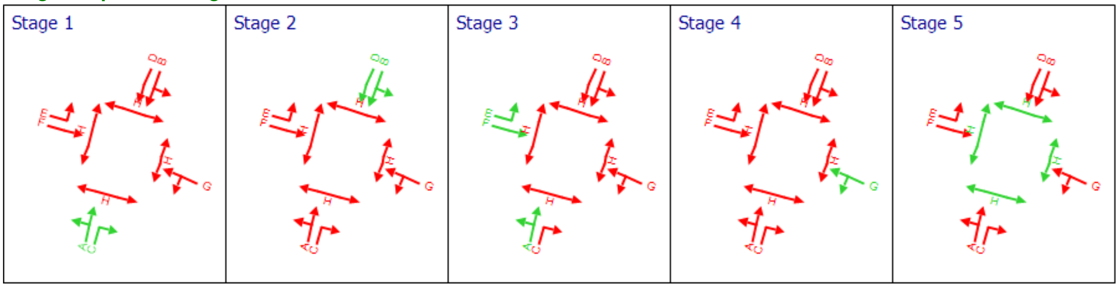
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	49	71	22
		2	✓	11	19	8
	B	1	✓	26	43	17
	C	1	✓	11	19	8
	D	1	✓	25	43	18
	E	1	✓	43	71	28
	F	1	✓	48	71	23
	G	1	✓	79	86	7
	H	1	✓	97	104	7

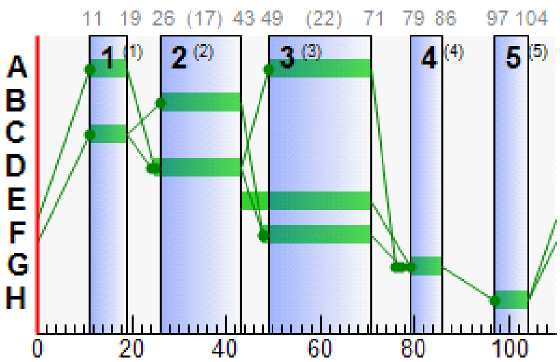
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	43	71	28			
A1	2		1	F	48	71	23			
B1	1		1	B	26	43	17			
B1	2		1	D	25	43	18			
C1	1		1	G	79	86	7			
D1	1		1	A	49	71	22	11	19	8
D1	2		1	C	11	19	8			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	Aexit	1	0	Unrestricted	188	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	122	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	16	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	4	2273	18	1800	28	30.34	0.41	2.90	2.15	0.16	2.32
		2	49	84	192	1800	23	41.99	5.35	38.23	31.80	2.16	33.97
	B1	1	62	44	184	1800	17	52.83	5.72	143.07	38.34	2.32	40.66
		2	3	3009	9	1800	18	38.23	0.23	5.70	1.36	0.09	1.45
	C1	1	30	202	39	1800	7	54.17	1.19	16.99	8.33	0.48	8.82
	D1	1	52	74	271	1800	30	21.02	4.57	45.67	22.47	2.94	25.41
		2	8	1005	12	1800	8	47.91	0.34	3.40	2.27	0.14	2.41
	B2	1	10	780	184	1800	110	0.11	0.01	0.19	0.08	0.00	0.08
		2	1	17900	9	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	11	739	193	1800	110	0.12	0.01	0.16	0.09	0.00	0.09
	10	1	0	Unrestricted	399	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
08:15-09:15	Aexit	1	188	188	0		Unrestricted	Unrestricted	0		Unrestricted	0.66	110
	Bexit	1	122	122	0		Unrestricted	Unrestricted	0		Unrestricted	0.47	110
	Cexit	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	1.15	110
	A1	1	18	18	0		1800	475	4		2273	0.00	28
		2	192	192	0		1800	393	49		84	0.00	23
	B1	1	184	184	0		1800	295	62		44	0.00	17
		2	9	9	0		1800	311	3		3009	0.00	18
	C1	1	39	39	0		1800	131	30		202	0.00	7
	D1	1	271	271	0		1800	524	52		74	0.00	30
		2	12	12	0		1800	147	8		1005	0.00	8
	B2	1	184	184	0		1800	1800	10		780	0.00	110
		2	9	9	0		1800	1800	1		17900	0.00	110
	B3	1	193	193	0		1800	1800	11		739	0.00	110
	10	1	399	399	0		Unrestricted	Unrestricted	0		Unrestricted	0.70	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	30.34	0.15	2.15	72.70	13.09	0.16
		2	9.72	41.99	2.24	31.80	89.88	172.56	2.16
	B1	1	3.00	52.83	2.70	38.34	100.41	184.76	2.32
		2	3.00	38.23	0.10	1.36	81.81	7.36	0.09
	C1	1	5.28	54.17	0.59	8.33	98.66	38.48	0.48
	D1	1	7.20	21.02	1.58	22.47	86.47	234.33	2.94
		2	7.20	47.91	0.16	2.27	91.73	11.01	0.14
	B2	1	2.16	0.11	0.01	0.08	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.12	0.01	0.09	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:15-09:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	29.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	25.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	102.00	
	A1	1	0.00	0.41	14.00	2.90	0.00	28.00	
		2	0.00	5.35	14.00	38.23	0.00	0.00	
	B1	1	0.00	5.72	4.00	143.07	0.00	0.00	
		2	0.00	0.23	4.00	5.70	0.00	18.00	
	C1	1	0.00	1.19	7.00	16.99	0.00	5.00	
	D1	1	0.00	4.57	10.00	45.67	0.00	0.00	
		2	0.00	0.34	10.00	3.40	0.00	8.00	
	B2	1	0.00	0.01	3.00	0.19	0.00	34.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.01	4.00	0.16	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	23.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
16	14/12/2022 11:05:12	14/12/2022 11:05:13	08:15	110	115.20	7.53	62.47	B1/1	0	0	B1/1	B3/1	B1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:15-09:15	62	0	1836	901	14.76	106.90	8.30	115.20

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:15-09:15	1836	1836	0		62		44	957

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:15-09:15	23.69	14.76	7.53	106.90	36.03	661.58	8.30

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:15-09:15	143.07	0.00	382.00

A17 - DS 2039 Interpeak
D17 - DS 2039 Interpeak*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
17	14/12/2022 11:05:13	14/12/2022 11:05:14	13:45	110	198.45	13.11	92.50	A1/2	1	5	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2039 Interpeak		D17	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2039 Interpeak				13:45	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	358	358
Bexit	1	136	136
Cexit	1	19	19
A1	1	22	22
	2	333	333
B1	1	69	69
	2	17	17
C1	1	31	31
D1	1	448	448
	2	17	17
B2	1	69	69
	2	17	17
B3	1	86	86
10	1	424	424

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	22	0	333
	2	17	0	2	67
	3	0	7	0	24
	4	341	107	17	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	17
	2		4	2	D1/1, Bexit/1	Normal	107
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	67
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	2
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	17
	6		4	1	D1/1, Aexit/1	Normal	341
	7		1	2	A1/1, Bexit/1	Normal	22
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	333
	10		3	2	C1/1, Bexit/1	Normal	7
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	24

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	31, 45, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	31	20	1	7
	2	✓	2	D,B	38	45	7	1	7
	3	✓	3	E,F,A	51	71	20	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

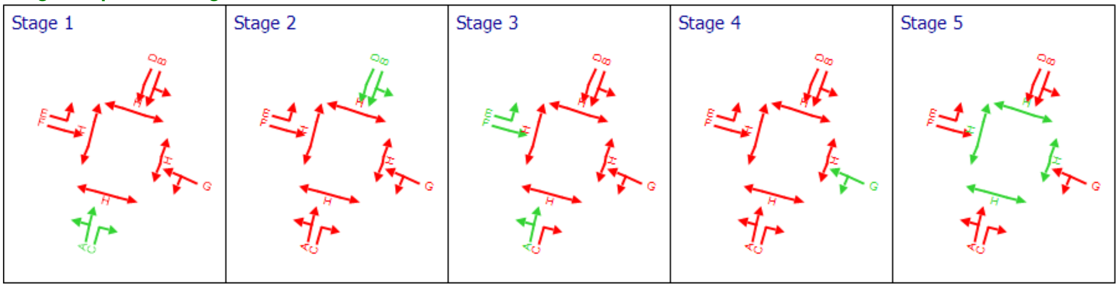
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	51	71	20
		2	✓	11	31	20
	B	1	✓	38	45	7
	C	1	✓	11	31	20
	D	1	✓	37	45	8
	E	1	✓	45	71	26
	F	1	✓	50	71	21
	G	1	✓	79	86	7
	H	1	✓	97	104	7

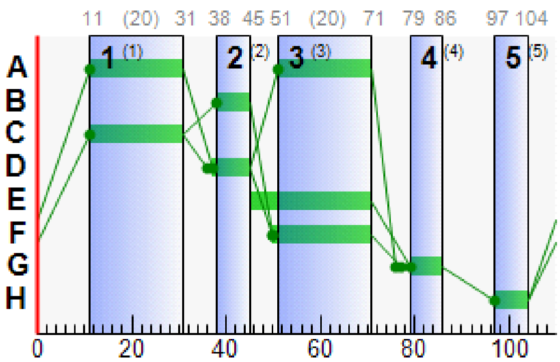
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	45	71	26			
A1	2		1	F	50	71	21			
B1	1		1	B	38	45	7			
B1	2		1	D	37	45	8			
C1	1		1	G	79	86	7			
D1	1		1	A	51	71	20	11	31	20
D1	2		1	C	11	31	20			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	Aexit	1	0	Unrestricted	358	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	136	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	19	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	5	1707	22	1800	26	31.92	0.51	3.68	2.77	0.21	2.98
		2	93	-3	333	1800	21	88.04	14.05	100.33	115.64	5.55	121.19
	B1	1	53	71	69	1800	7	64.12	2.32	57.95	17.45	0.94	18.39
		2	12	680	17	1800	8	48.42	0.48	12.11	3.25	0.20	3.44
	C1	1	24	280	31	1800	7	52.41	0.92	13.19	6.41	0.37	6.78
	D1	1	65	38	448	1800	40	21.57	8.69	86.93	38.12	4.89	43.01
		2	5	1719	17	1800	20	36.68	0.42	4.22	2.46	0.17	2.63
	B2	1	4	2248	69	1800	110	0.04	0.00	0.03	0.01	0.00	0.01
		2	1	9429	17	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	5	1784	86	1800	110	0.05	0.00	0.03	0.02	0.00	0.02
	10	1	0	Unrestricted	424	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
13:45-14:45	Aexit	1	358	358	0		Unrestricted	Unrestricted	0		Unrestricted	0.64	110
	Bexit	1	136	136	0		Unrestricted	Unrestricted	0		Unrestricted	0.50	110
	Cexit	1	19	19	0		Unrestricted	Unrestricted	0		Unrestricted	1.14	110
	A1	1	22	22	0		1800	442	5		1707	0.00	26
		2	333	333	0		1800	360	93	✓	-3	0.00	21
	B1	1	69	69	0		1800	131	53		71	0.00	7
		2	17	17	0		1800	147	12		680	0.00	8
	C1	1	31	31	0		1800	131	24		280	0.00	7
	D1	1	448	448	0		1800	687	65		38	0.00	40
		2	17	17	0		1800	344	5		1719	0.00	20
	B2	1	69	69	0		1800	1800	4		2248	0.00	110
		2	17	17	0		1800	1800	1		9429	0.00	110
	B3	1	86	86	0		1800	1800	5		1784	0.00	110
	10	1	424	424	0		Unrestricted	Unrestricted	0		Unrestricted	0.82	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	31.92	0.20	2.77	75.24	16.55	0.21
		2	9.72	88.04	8.14	115.64	132.99	442.84	5.55
	B1	1	3.00	64.12	1.23	17.45	108.10	74.59	0.94
		2	3.00	48.42	0.23	3.25	92.19	15.67	0.20
	C1	1	5.28	52.41	0.45	6.41	96.38	29.88	0.37
	D1	1	7.20	21.57	2.68	38.12	87.00	389.77	4.89
		2	7.20	36.68	0.17	2.46	80.08	13.61	0.17
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.05	0.00	0.02	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
13:45-14:45	Aexit	1	0.00	0.00	70.99	0.00	0.00	21.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	27.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	99.00	
	A1	1	0.00	0.51	14.00	3.68	0.00	25.00	
		2	0.00	14.05	14.00	100.33	0.00	0.00	
	B1	1	0.00	2.32	4.00	57.95	0.00	0.00	
		2	0.00	0.48	4.00	12.11	0.00	8.00	
	C1	1	0.00	0.92	7.00	13.19	0.00	6.00	
	D1	1	0.00	8.69	10.00	86.93	0.00	0.00	
		2	0.00	0.42	10.00	4.22	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.03	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.03	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	27.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
17	14/12/2022 11:05:13	14/12/2022 11:05:14	13:45	110	198.45	13.11	92.50	A1/2	1	5	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
13:45-14:45	93	-3	2046	899	23.06	186.13	12.32	198.45

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
13:45-14:45	2046	2046	0		93	✓	-3	955

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
13:45-14:45	27.28	23.06	13.11	186.13	48.04	982.92	12.32

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
13:45-14:45	100.33	0.00	343.00

A18 - DS 2039 PM
D18 - DS 2039 PM*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
18	14/12/2022 11:05:15	14/12/2022 11:05:15	15:15	110	153.63	10.05	83.23	A1/2	0	0	A1/2	B3/1	A1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2039 PM		D18	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2039 PM				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	383	383
Bexit	1	141	141
Cexit	1	27	27
A1	1	22	22
	2	286	286
B1	1	53	53
	2	19	19
C1	1	17	17
D1	1	474	474
	2	21	21
B2	1	53	53
	2	19	19
B3	1	72	72
10	1	341	341

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	22	0	286
	2	19	0	6	47
	3	0	9	0	8
	4	364	110	21	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	21
	2		4	2	D1/1, Bexit/1	Normal	110
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	47
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	19
	6		4	1	D1/1, Aexit/1	Normal	364
	7		1	2	A1/1, Bexit/1	Normal	22
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	286
	10		3	2	C1/1, Bexit/1	Normal	9
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	8

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

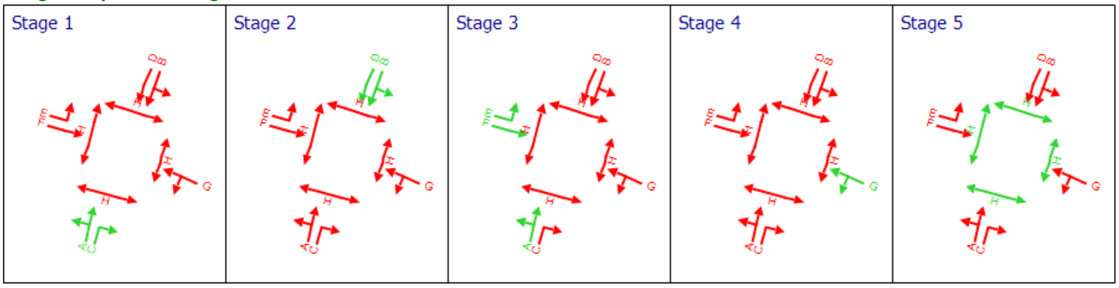
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

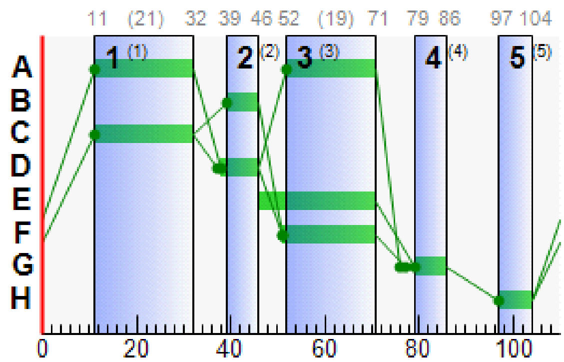
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	383	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	141	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	27	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	5	1640	22	1800	25	32.71	0.52	3.72	2.84	0.21	3.05
		2	83	8	286	1800	20	66.56	10.23	73.06	75.09	4.12	79.21
	B1	1	40	122	53	1800	7	57.96	1.68	42.04	12.12	0.68	12.80
		2	13	598	19	1800	8	48.70	0.55	13.70	3.65	0.22	3.87
	C1	1	13	593	17	1800	7	49.80	0.49	7.02	3.34	0.20	3.54
	D1	1	69	30	474	1800	40	22.79	9.45	94.46	42.61	5.35	47.96
		2	6	1443	21	1800	21	35.94	0.52	5.21	2.98	0.21	3.19
	B2	1	3	2957	53	1800	110	0.03	0.00	0.01	0.01	0.00	0.01
		2	1	8426	19	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	4	2150	72	1800	110	0.04	0.00	0.02	0.01	0.00	0.01
	10	1	0	Unrestricted	341	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	383	383	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	110
	Bexit	1	141	141	0		Unrestricted	Unrestricted	0		Unrestricted	0.49	110
	Cexit	1	27	27	0		Unrestricted	Unrestricted	0		Unrestricted	1.05	110
	A1	1	22	22	0		1800	425	5		1640	0.00	25
		2	286	286	0		1800	344	83		8	0.00	20
	B1	1	53	53	0		1800	131	40		122	0.00	7
		2	19	19	0		1800	147	13		598	0.00	8
	C1	1	17	17	0		1800	131	13		593	0.00	7
	D1	1	474	474	0		1800	687	69		30	0.00	40
		2	21	21	0		1800	360	6		1443	0.00	21
	B2	1	53	53	0		1800	1800	3		2957	0.00	110
		2	19	19	0		1800	1800	1		8426	0.00	110
	B3	1	72	72	0		1800	1800	4		2150	0.00	110
	10	1	341	341	0		Unrestricted	Unrestricted	0		Unrestricted	0.89	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.71	0.20	2.84	76.25	16.77	0.21
		2	9.72	66.56	5.29	75.09	114.75	328.20	4.12
	B1	1	3.00	57.96	0.85	12.12	102.43	54.29	0.68
		2	3.00	48.70	0.26	3.65	93.27	17.72	0.22
	C1	1	5.28	49.80	0.24	3.34	93.50	15.90	0.20
	D1	1	7.20	22.79	3.00	42.61	89.98	426.49	5.35
		2	7.20	35.94	0.21	2.98	79.96	16.79	0.21
	B2	1	2.16	0.03	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.04	0.00	0.01	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	20.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	25.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	93.00	
	A1	1	0.00	0.52	14.00	3.72	0.00	24.00	
		2	0.00	10.23	14.00	73.06	0.00	0.00	
	B1	1	0.00	1.68	4.00	42.04	0.00	4.00	
		2	0.00	0.55	4.00	13.70	0.00	7.00	
	C1	1	0.00	0.49	7.00	7.02	0.00	7.00	
	D1	1	0.00	9.45	10.00	94.46	0.00	0.00	
		2	0.00	0.52	10.00	5.21	0.00	20.00	
	B2	1	0.00	0.00	3.00	0.01	0.00	110.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.02	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	33.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
18	14/12/2022 11:05:15	14/12/2022 11:05:15	15:15	110	153.63	10.05	83.23	A1/2	0	0	A1/2	B3/1	A1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	83	0	1928	898	18.76	142.65	10.99	153.63

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	1928	1928	0		83		8	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	27.39	18.76	10.05	142.65	45.44	876.16	10.99

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	94.46	0.00	453.00

TRANSYT 15

Version: 15.5.2.7994

Filename: junction5_weekend.t15
Path: G:\2018\p180191\Calcs\Modelling\TRANSYT
Report generation date: 24/11/2022 13:11:55

File summary

File description

File title	(untitled)
Location	
Site number	
UTCRegion	
Driving side	Left
Date	15/07/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	HEADOFFICE\jimenezem
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

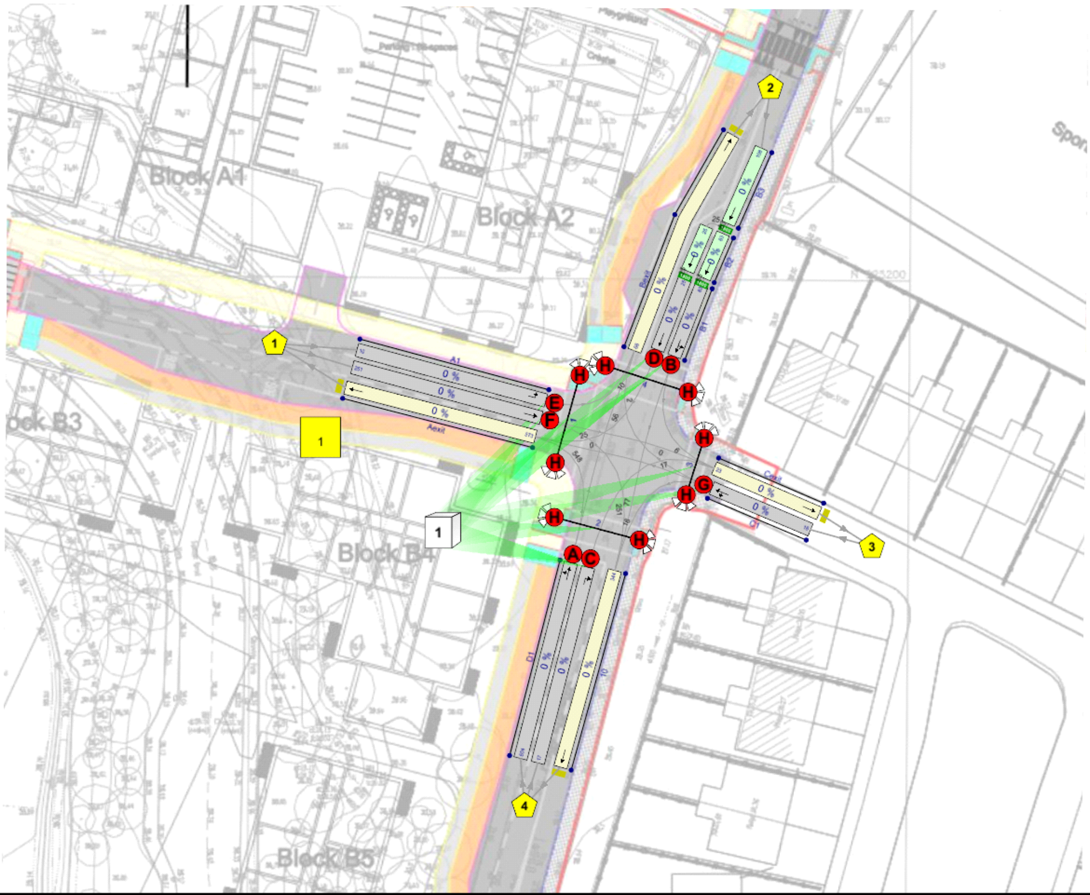
Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams



[redacted]

A1 - DN 2024 Weekend
D1 - DN 2024 Weekend*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	24/11/2022 13:11:24	24/11/2022 13:11:25	15:15	110	116.64	7.55	70.57	D1/1	0	0	D1/1	B3/1	D1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2024 Weekend		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2024 Weekend				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	457	457
Bexit	1	55	55
Cexit	1	19	19
A1	1	6	6
	2	193	193
B1	1	69	69
	2	19	19
C1	1	15	15
D1	1	485	485
	2	14	14
B2	1	69	69
	2	19	19
B3	1	88	88
10	1	270	270

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	6	0	193
	2	19	0	5	64
	3	0	2	0	13
	4	438	47	14	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	14
	2		4	2	D1/1, Bexit/1	Normal	47
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	64
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	5
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	19
	6		4	1	D1/1, Aexit/1	Normal	438
	7		1	2	A1/1, Bexit/1	Normal	6
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	193
	10		3	2	C1/1, Bexit/1	Normal	2
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	13

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

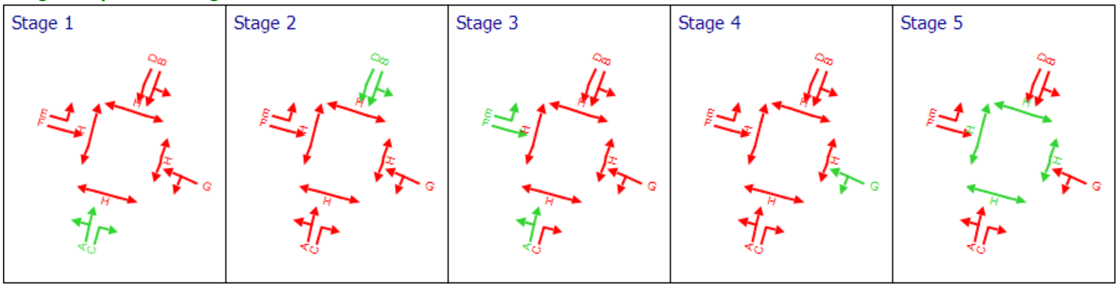
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

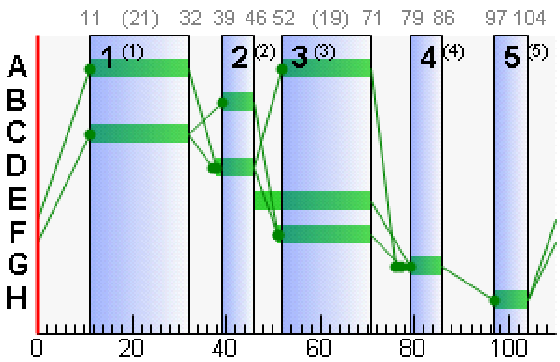
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	457	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	55	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	19	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	1	6282	6	1800	25	32.52	0.14	1.00	0.77	0.06	0.83
		2	56	60	193	1800	20	46.97	5.66	40.45	35.76	2.29	38.05
	B1	1	53	71	69	1800	7	64.12	2.32	57.95	17.45	0.94	18.39
		2	13	598	19	1800	8	48.70	0.55	13.70	3.65	0.22	3.87
	C1	1	11	685	15	1800	7	49.53	0.43	6.18	2.93	0.18	3.11
	D1	1	71	28	485	1800	40	23.37	9.86	98.60	44.71	5.54	50.25
		2	4	2214	14	1800	21	35.80	0.34	3.43	1.98	0.14	2.12
	B2	1	4	2248	69	1800	110	0.04	0.00	0.03	0.01	0.00	0.01
		2	1	8426	19	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	5	1741	88	1800	110	0.05	0.00	0.03	0.02	0.00	0.02
	10	1	0	Unrestricted	270	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	457	457	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	110
	Bexit	1	55	55	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	110
	Cexit	1	19	19	0		Unrestricted	Unrestricted	0		Unrestricted	1.02	110
	A1	1	6	6	0		1800	425	1		6282	0.00	25
		2	193	193	0		1800	344	56		60	0.00	20
	B1	1	69	69	0		1800	131	53		71	0.00	7
		2	19	19	0		1800	147	13		598	0.00	8
	C1	1	15	15	0		1800	131	11		685	0.00	7
	D1	1	485	485	0		1800	687	71		28	0.00	40
		2	14	14	0		1800	360	4		2214	0.00	21
	B2	1	69	69	0		1800	1800	4		2248	0.00	110
		2	19	19	0		1800	1800	1		8426	0.00	110
	B3	1	88	88	0		1800	1800	5		1741	0.00	110
	10	1	270	270	0		Unrestricted	Unrestricted	0		Unrestricted	0.86	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.52	0.05	0.77	75.34	4.52	0.06
		2	9.72	46.97	2.52	35.76	94.82	183.00	2.29
	B1	1	3.00	64.12	1.23	17.45	108.10	74.59	0.94
		2	3.00	48.70	0.26	3.65	93.27	17.72	0.22
	C1	1	5.28	49.53	0.21	2.93	93.26	13.99	0.18
	D1	1	7.20	23.37	3.15	44.71	91.14	442.03	5.54
		2	7.20	35.80	0.14	1.98	79.11	11.08	0.14
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.05	0.00	0.02	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	17.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	59.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	102.00	
	A1	1	0.00	0.14	14.00	1.00	0.00	25.00	
		2	0.00	5.66	14.00	40.45	0.00	0.00	
	B1	1	0.00	2.32	4.00	57.95	0.00	0.00	
		2	0.00	0.55	4.00	13.70	0.00	7.00	
	C1	1	0.00	0.43	7.00	6.18	0.00	7.00	
	D1	1	0.00	9.86	10.00	98.60	0.00	0.00	
		2	0.00	0.34	10.00	3.43	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.03	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.03	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	38.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	24/11/2022 13:11:24	24/11/2022 13:11:25	15:15	110	116.64	7.55	70.57	D1/1	0	0	D1/1	B3/1	D1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	71	0	1778	898	15.30	107.27	9.37	116.64

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	1778	1778	0		71		28	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	26.28	15.30	7.55	107.27	42.01	746.93	9.37

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	98.60	0.00	386.00

A2 - DN 2029 Weekend
D2 - DN 2029 Weekend*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	24/11/2022 13:11:25	24/11/2022 13:11:25	15:15	110	135.84	8.81	76.68	D1/1	0	0	D1/1	B3/1	D1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2029 Weekend		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2029 Weekend				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	496	496
Bexit	1	60	60
Cexit	1	22	22
A1	1	7	7
	2	210	210
B1	1	75	75
	2	20	20
C1	1	17	17
D1	1	527	527
	2	16	16
B2	1	75	75
	2	20	20
B3	1	95	95
10	1	294	294

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	0	210
	2	20	0	6	69
	3	0	2	0	15
	4	476	51	16	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	16
	2		4	2	D1/1, Bexit/1	Normal	51
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	69
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	20
	6		4	1	D1/1, Aexit/1	Normal	476
	7		1	2	A1/1, Bexit/1	Normal	7
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	210
	10		3	2	C1/1, Bexit/1	Normal	2
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	15

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

	To								
From		A	B	C	D	E	F	G	H
	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

	To					
From		1	2	3	4	5
	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

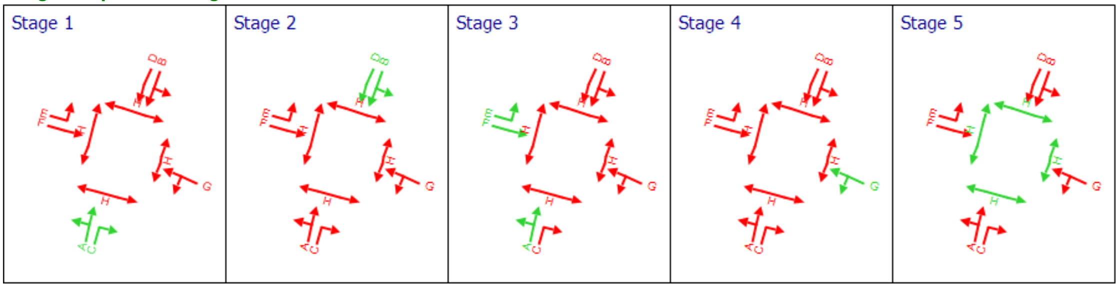
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

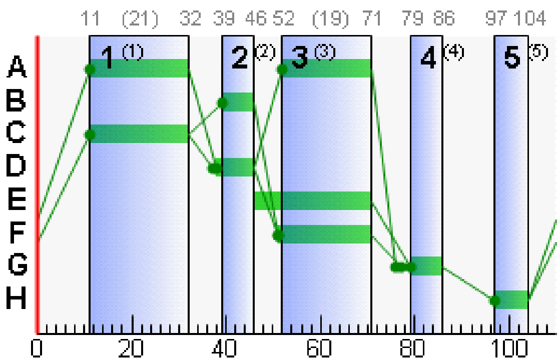
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	496	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	60	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	22	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	2	5370	7	1800	25	32.53	0.16	1.17	0.90	0.07	0.96
		2	61	47	210	1800	20	48.87	6.31	45.04	40.48	2.55	43.03
	B1	1	57	57	75	1800	7	67.22	2.58	64.50	19.88	1.04	20.93
		2	14	563	20	1800	8	48.85	0.58	14.43	3.85	0.23	4.09
	C1	1	13	593	17	1800	7	49.80	0.49	7.02	3.34	0.20	3.54
	D1	1	77	17	527	1800	40	26.16	11.33	113.31	54.38	6.46	60.84
		2	4	1925	16	1800	21	35.83	0.39	3.92	2.26	0.16	2.42
	B2	1	4	2060	75	1800	110	0.04	0.00	0.03	0.01	0.00	0.01
		2	1	8000	20	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	5	1605	95	1800	110	0.06	0.00	0.04	0.02	0.00	0.02
	10	1	0	Unrestricted	294	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	496	496	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	110
	Bexit	1	60	60	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	110
	Cexit	1	22	22	0		Unrestricted	Unrestricted	0		Unrestricted	1.01	110
	A1	1	7	7	0		1800	425	2		5370	0.00	25
		2	210	210	0		1800	344	61		47	0.00	20
	B1	1	75	75	0		1800	131	57		57	0.00	7
		2	20	20	0		1800	147	14		563	0.00	8
	C1	1	17	17	0		1800	131	13		593	0.00	7
	D1	1	527	527	0		1800	687	77		17	0.00	40
		2	16	16	0		1800	360	4		1925	0.00	21
	B2	1	75	75	0		1800	1800	4		2060	0.00	110
		2	20	20	0		1800	1800	1		8000	0.00	110
	B3	1	95	95	0		1800	1800	5		1605	0.00	110
	10	1	294	294	0		Unrestricted	Unrestricted	0		Unrestricted	0.85	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.53	0.06	0.90	75.35	5.27	0.07
		2	9.72	48.87	2.85	40.48	97.02	203.74	2.55
	B1	1	3.00	67.22	1.40	19.88	110.87	83.15	1.04
		2	3.00	48.85	0.27	3.85	93.39	18.68	0.23
	C1	1	5.28	49.80	0.24	3.34	93.50	15.90	0.20
	D1	1	7.20	26.16	3.83	54.38	97.78	515.29	6.46
		2	7.20	35.83	0.16	2.26	79.14	12.66	0.16
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.06	0.00	0.02	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	15.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	52.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	100.00	
	A1	1	0.00	0.16	14.00	1.17	0.00	25.00	
		2	0.00	6.31	14.00	45.04	0.00	0.00	
	B1	1	0.00	2.58	4.00	64.50	0.00	0.00	
		2	0.00	0.58	4.00	14.43	0.00	7.00	
	C1	1	0.00	0.49	7.00	7.02	0.00	7.00	
	D1	1	0.00	11.33	10.00	113.31	0.00	0.00	
		2	0.00	0.39	10.00	3.92	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.03	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.04	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	37.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	24/11/2022 13:11:25	24/11/2022 13:11:25	15:15	110	135.84	8.81	76.68	D1/1	0	0	D1/1	B3/1	D1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	77	0	1934	898	16.40	125.13	10.72	135.84

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	1934	1934	0		77		17	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	26.30	16.40	8.81	125.13	44.19	854.69	10.72

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	113.31	0.00	374.00

A3 - DN 2039 Weekend
D3 - DN 2039 Weekend*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
3	24/11/2022 13:11:25	24/11/2022 13:11:26	15:15	110	169.36	11.07	84.54	D1/1	0	0	D1/1	B3/1	D1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DN 2039 Weekend		D3	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DN 2039 Weekend				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	547	547
Bexit	1	65	65
Cexit	1	23	23
A1	1	7	7
	2	231	231
B1	1	83	83
	2	22	22
C1	1	18	18
D1	1	581	581
	2	17	17
B2	1	83	83
	2	22	22
B3	1	105	105
10	1	324	324

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	7	0	231
	2	22	0	6	77
	3	0	2	0	16
	4	525	56	17	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	17
	2		4	2	D1/1, Bexit/1	Normal	56
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	77
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	22
	6		4	1	D1/1, Aexit/1	Normal	525
	7		1	2	A1/1, Bexit/1	Normal	7
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	231
	10		3	2	C1/1, Bexit/1	Normal	2
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	16

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

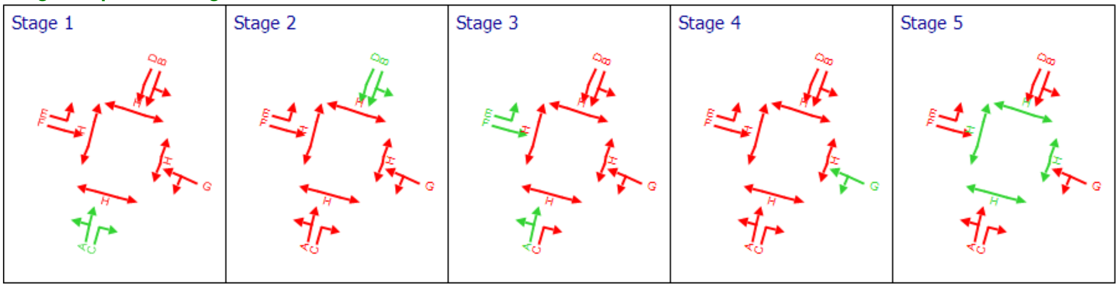
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

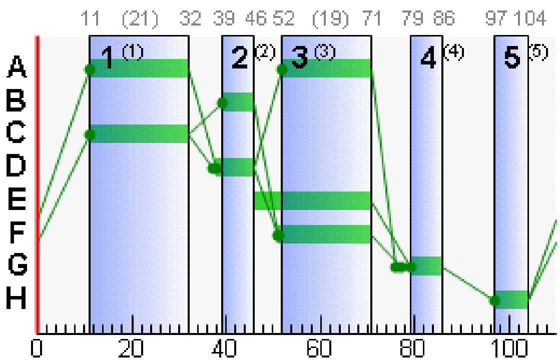
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	547	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	65	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	23	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	2	5370	7	1800	25	32.53	0.16	1.17	0.90	0.07	0.96
		2	67	34	231	1800	20	51.80	7.22	51.56	47.20	2.91	50.11
	B1	1	63	42	83	1800	7	72.31	2.97	74.20	23.67	1.20	24.87
		2	15	502	22	1800	8	49.15	0.64	15.91	4.27	0.26	4.52
	C1	1	14	555	18	1800	7	49.97	0.53	7.51	3.55	0.21	3.76
	D1	1	85	6	581	1800	40	32.81	13.64	136.45	75.20	7.32	82.52
		2	5	1806	17	1800	21	35.85	0.42	4.17	2.40	0.17	2.57
	B2	1	5	1852	83	1800	110	0.05	0.00	0.04	0.02	0.00	0.02
		2	1	7264	22	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	6	1443	105	1800	110	0.06	0.00	0.05	0.03	0.00	0.03
	10	1	0	Unrestricted	324	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	547	547	0		Unrestricted	Unrestricted	0		Unrestricted	0.61	110
	Bexit	1	65	65	0		Unrestricted	Unrestricted	0		Unrestricted	0.51	110
	Cexit	1	23	23	0		Unrestricted	Unrestricted	0		Unrestricted	1.01	110
	A1	1	7	7	0		1800	425	2		5370	0.00	25
		2	231	231	0		1800	344	67		34	0.00	20
	B1	1	83	83	0		1800	131	63		42	0.00	7
		2	22	22	0		1800	147	15		502	0.00	8
	C1	1	18	18	0		1800	131	14		555	0.00	7
	D1	1	581	581	0		1800	687	85		6	0.00	40
		2	17	17	0		1800	360	5		1806	0.00	21
	B2	1	83	83	0		1800	1800	5		1852	0.00	110
		2	22	22	0		1800	1800	1		7264	0.00	110
	B3	1	105	105	0		1800	1800	6		1443	0.00	110
	10	1	324	324	0		Unrestricted	Unrestricted	0		Unrestricted	0.85	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.53	0.06	0.90	75.35	5.27	0.07
		2	9.72	51.80	3.32	47.20	100.40	231.91	2.91
	B1	1	3.00	72.31	1.67	23.67	114.92	95.38	1.20
		2	3.00	49.15	0.30	4.27	93.59	20.59	0.26
	C1	1	5.28	49.97	0.25	3.55	94.37	16.99	0.21
	D1	1	7.20	32.81	5.30	75.20	100.52	584.00	7.32
		2	7.20	35.85	0.17	2.40	79.15	13.46	0.17
	B2	1	2.16	0.05	0.00	0.02	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.06	0.00	0.03	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	13.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	46.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	99.00	
	A1	1	0.00	0.16	14.00	1.17	0.00	25.00	
		2	0.00	7.22	14.00	51.56	0.00	0.00	
	B1	1	0.00	2.97	4.00	74.20	0.00	0.00	
		2	0.00	0.64	4.00	15.91	0.00	7.00	
	C1	1	0.00	0.53	7.00	7.51	0.00	6.00	
	D1	1	0.00	13.64	10.00	136.45	0.00	0.00	
		2	0.00	0.42	10.00	4.17	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.04	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.05	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	35.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
3	24/11/2022 13:11:25	24/11/2022 13:11:26	15:15	110	169.36	11.07	84.54	D1/1	0	0	D1/1	B3/1	D1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	85	0	2128	898	18.73	157.23	12.13	169.36

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	2128	2128	0		85		6	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	26.29	18.73	11.07	157.23	45.47	967.60	12.13

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	136.45	0.00	362.00

A4 - DS 2024 Weekend
D4 - DS 2024 Weekend*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
4	24/11/2022 13:11:26	24/11/2022 13:11:27	15:15	110	128.63	8.34	74.06	D1/1	0	0	D1/1	B3/1	D1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2024 Weekend		D4	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2024 Weekend				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	483	483
Bexit	1	57	57
Cexit	1	19	19
A1	1	8	8
	2	212	212
B1	1	69	69
	2	21	21
C1	1	15	15
D1	1	509	509
	2	14	14
B2	1	69	69
	2	21	21
B3	1	90	90
10	1	289	289

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	8	0	212
	2	21	0	5	64
	3	0	2	0	13
	4	462	47	14	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	14
	2		4	2	D1/1, Bexit/1	Normal	47
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	64
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	5
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	21
	6		4	1	D1/1, Aexit/1	Normal	462
	7		1	2	A1/1, Bexit/1	Normal	8
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	212
	10		3	2	C1/1, Bexit/1	Normal	2
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	13

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

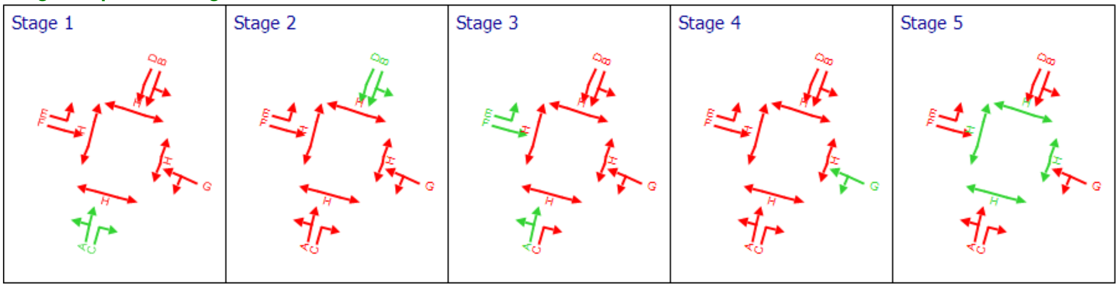
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

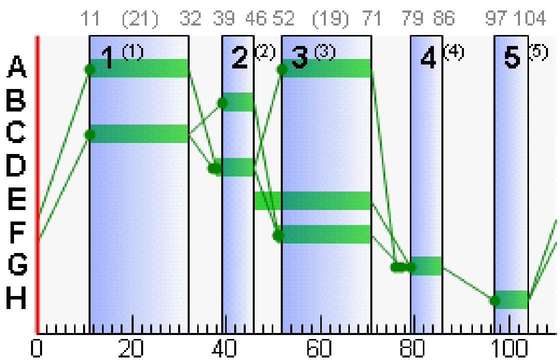
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	483	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	57	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	19	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	2	4686	8	1800	25	32.54	0.19	1.33	1.03	0.08	1.10
		2	62	46	212	1800	20	49.11	6.38	45.55	41.07	2.58	43.65
	B1	1	53	71	69	1800	7	64.12	2.32	57.95	17.45	0.94	18.39
		2	14	531	21	1800	8	49.00	0.61	15.17	4.06	0.25	4.31
	C1	1	11	685	15	1800	7	49.53	0.43	6.18	2.93	0.18	3.11
	D1	1	74	22	509	1800	40	24.84	10.65	106.51	49.87	6.06	55.94
		2	4	2214	14	1800	21	35.80	0.34	3.43	1.98	0.14	2.12
	B2	1	4	2248	69	1800	110	0.04	0.00	0.03	0.01	0.00	0.01
		2	1	7614	21	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	5	1700	90	1800	110	0.05	0.00	0.03	0.02	0.00	0.02
	10	1	0	Unrestricted	289	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	483	483	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	110
	Bexit	1	57	57	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	110
	Cexit	1	19	19	0		Unrestricted	Unrestricted	0		Unrestricted	1.02	110
	A1	1	8	8	0		1800	425	2		4686	0.00	25
		2	212	212	0		1800	344	62		46	0.00	20
	B1	1	69	69	0		1800	131	53		71	0.00	7
		2	21	21	0		1800	147	14		531	0.00	8
	C1	1	15	15	0		1800	131	11		685	0.00	7
	D1	1	509	509	0		1800	687	74		22	0.00	40
		2	14	14	0		1800	360	4		2214	0.00	21
	B2	1	69	69	0		1800	1800	4		2248	0.00	110
		2	21	21	0		1800	1800	1		7614	0.00	110
	B3	1	90	90	0		1800	1800	5		1700	0.00	110
	10	1	289	289	0		Unrestricted	Unrestricted	0		Unrestricted	0.86	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.54	0.07	1.03	75.36	6.03	0.08
		2	9.72	49.11	2.89	41.07	97.21	206.09	2.58
	B1	1	3.00	64.12	1.23	17.45	108.10	74.59	0.94
		2	3.00	49.00	0.29	4.06	93.49	19.63	0.25
	C1	1	5.28	49.53	0.21	2.93	93.26	13.99	0.18
	D1	1	7.20	24.84	3.51	49.87	94.98	483.43	6.06
		2	7.20	35.80	0.14	1.98	79.11	11.08	0.14
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.05	0.00	0.02	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	16.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	55.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	102.00	
	A1	1	0.00	0.19	14.00	1.33	0.00	25.00	
		2	0.00	6.38	14.00	45.55	0.00	0.00	
	B1	1	0.00	2.32	4.00	57.95	0.00	0.00	
		2	0.00	0.61	4.00	15.17	0.00	7.00	
	C1	1	0.00	0.43	7.00	6.18	0.00	7.00	
	D1	1	0.00	10.65	10.00	106.51	0.00	0.00	
		2	0.00	0.34	10.00	3.43	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.03	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	[illegible]	1	0.00	0.00	4.00	0.03	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	37.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
4	24/11/2022 13:11:26	24/11/2022 13:11:27	15:15	110	128.63	8.34	74.06	D1/1	0	0	D1/1	B3/1	D1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	74	0	1876	898	16.00	118.42	10.22	128.63

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	1876	1876	0		74		22	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	26.39	16.00	8.34	118.42	43.43	814.83	10.22

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	106.51	0.00	380.00

A5 - DS 2039 Weekend
D5 - DS 2029 Weekend*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
5	24/11/2022 13:11:27	24/11/2022 13:11:28	15:15	110	150.94	9.80	80.17	D1/1	0	0	D1/1	B3/1	D1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2039 Weekend		D5	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2029 Weekend				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	523	523
Bexit	1	62	62
Cexit	1	22	22
A1	1	9	9
	2	229	229
B1	1	75	75
	2	23	23
C1	1	17	17
D1	1	551	551
	2	16	16
B2	1	75	75
	2	23	23
B3	1	98	98
10	1	313	313

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	1	1	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	1	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	1	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	1	1	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	1	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	1	1	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	1	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	1	1	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	2	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	1	2	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	1	2	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	1	2	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	1	3	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	1	3	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	1	3	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	1	3	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	9	0	229
	2	23	0	6	69
	3	0	2	0	15
	4	500	51	16	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	16
	2		4	2	D1/1, Bexit/1	Normal	51
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	69
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	23
	6		4	1	D1/1, Aexit/1	Normal	500
	7		1	2	A1/1, Bexit/1	Normal	9
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	229
	10		3	2	C1/1, Bexit/1	Normal	2
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	15

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

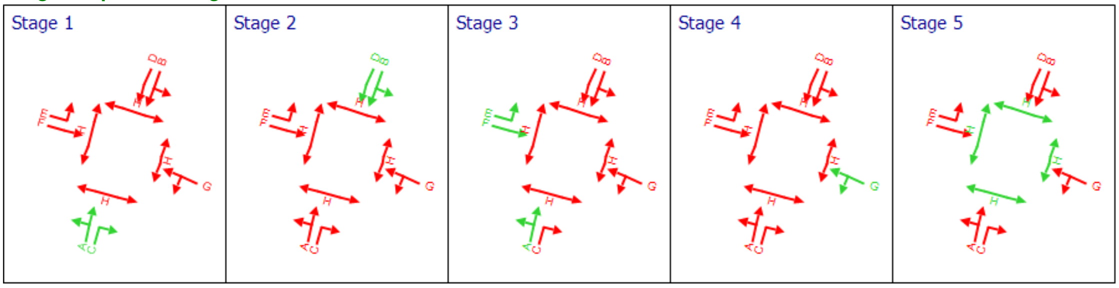
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

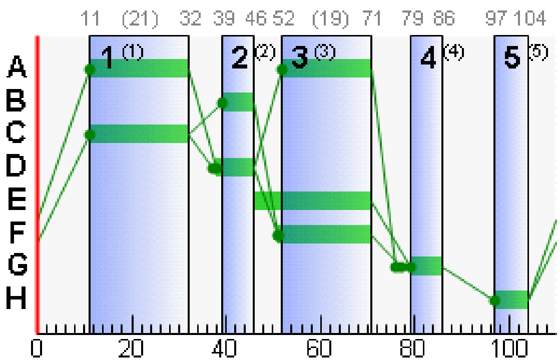
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	523	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	62	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	22	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	2	4155	9	1800	25	32.55	0.21	1.50	1.16	0.09	1.24
		2	67	35	229	1800	20	51.48	7.08	50.54	46.50	2.87	49.37
	B1	1	57	57	75	1800	7	67.22	2.58	64.50	19.88	1.04	20.93
		2	16	476	23	1800	8	49.30	0.67	16.65	4.47	0.27	4.74
	C1	1	13	593	17	1800	7	49.80	0.49	7.02	3.34	0.20	3.54
	D1	1	80	12	551	1800	40	28.33	12.28	122.80	61.58	7.09	68.66
		2	4	1925	16	1800	21	35.83	0.39	3.92	2.26	0.16	2.42
	B2	1	4	2060	75	1800	110	0.04	0.00	0.03	0.01	0.00	0.01
		2	1	6943	23	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	5	1553	98	1800	110	0.06	0.00	0.04	0.02	0.00	0.02
	10	1	0	Unrestricted	313	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	523	523	0		Unrestricted	Unrestricted	0		Unrestricted	0.62	110
	Bexit	1	62	62	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	110
	Cexit	1	22	22	0		Unrestricted	Unrestricted	0		Unrestricted	1.01	110
	A1	1	9	9	0		1800	425	2		4155	0.00	25
		2	229	229	0		1800	344	67		35	0.00	20
	B1	1	75	75	0		1800	131	57		57	0.00	7
		2	23	23	0		1800	147	16		476	0.00	8
	C1	1	17	17	0		1800	131	13		593	0.00	7
	D1	1	551	551	0		1800	687	80		12	0.00	40
		2	16	16	0		1800	360	4		1925	0.00	21
	B2	1	75	75	0		1800	1800	4		2060	0.00	110
		2	23	23	0		1800	1800	1		6943	0.00	110
	B3	1	98	98	0		1800	1800	5		1553	0.00	110
	10	1	313	313	0		Unrestricted	Unrestricted	0		Unrestricted	0.85	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.55	0.08	1.16	75.37	6.78	0.09
		2	9.72	51.48	3.27	46.50	99.81	228.56	2.87
	B1	1	3.00	67.22	1.40	19.88	110.87	83.15	1.04
		2	3.00	49.30	0.31	4.47	93.69	21.55	0.27
	C1	1	5.28	49.80	0.24	3.34	93.50	15.90	0.20
	D1	1	7.20	28.33	4.34	61.58	102.57	565.18	7.09
		2	7.20	35.83	0.16	2.26	79.14	12.66	0.16
	B2	1	2.16	0.04	0.00	0.01	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.06	0.00	0.02	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	15.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	50.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	100.00	
	A1	1	0.00	0.21	14.00	1.50	0.00	25.00	
		2	0.00	7.08	14.00	50.54	0.00	0.00	
	B1	1	0.00	2.58	4.00	64.50	0.00	0.00	
		2	0.00	0.67	4.00	16.65	0.00	7.00	
	C1	1	0.00	0.49	7.00	7.02	0.00	7.00	
	D1	1	0.00	12.28	10.00	122.80	0.00	0.00	
		2	0.00	0.39	10.00	3.92	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.03	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.04	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	35.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
5	24/11/2022 13:11:27	24/11/2022 13:11:28	15:15	110	150.94	9.80	80.17	D1/1	0	0	D1/1	B3/1	D1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	80	0	2036	898	17.34	139.23	11.71	150.94

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	2036	2036	0		80		12	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	26.37	17.34	9.80	139.23	45.86	933.78	11.71

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	122.80	0.00	370.00

A6 - DS 2029 Weekend
D6 - DS 2039 Weekend*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
6	24/11/2022 13:11:28	24/11/2022 13:11:28	15:15	110	193.97	12.73	87.88	D1/1	0	0	D1/1	B3/1	D1/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DS 2029 Weekend		D6	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DS 2039 Weekend				15:15	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
(ALL)			

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
Aexit	1			✓	408.21						Normal	
Bexit	1			✓	459.11						Normal	
Cexit	1			✓	316.84						Normal	
A1	1				81.00	✓	Sum of lanes	1800	✓		Normal	
	2				81.00	✓	Sum of lanes	1800	✓		Normal	
B1	1				25.00	✓	Sum of lanes	1800	✓		Normal	
	2				25.00	✓	Sum of lanes	1800	✓		Normal	
C1	1				44.00	✓	Sum of lanes	1800	✓		Normal	
D1	1				60.00	✓	Sum of lanes	1800	✓		Normal	
	2				60.00	✓	Sum of lanes	1800	✓		Normal	
B2	1				18.00	✓	Sum of lanes	1800			Normal	
	2				18.00	✓	Sum of lanes	1800			Normal	
B3	1				26.00	✓	Sum of lanes	1800			Normal	
10	1			✓	440.08						Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Saturation flow (PCU/hr)
Aexit	1	1	(untitled)			
Bexit	1	1	(untitled)			
Cexit	1	1	(untitled)			
A1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B1	1	1	(untitled)			1800
	2	1	(untitled)			1800
C1	1	1	(untitled)			1800
D1	1	1	(untitled)			1800
	2	1	(untitled)			1800
B2	1	1	(untitled)			1800
	2	1	(untitled)			1800
B3	1	1	(untitled)			1800
10	1	1	(untitled)			

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
Aexit	1	NetworkDefault	100	100	100		0.00		
Bexit	1	NetworkDefault	100	100	100		0.00		
Cexit	1	NetworkDefault	100	100	100		0.00		
A1	1	NetworkDefault	100	100	100		14.00		
	2	NetworkDefault	100	100	100		14.00		
B1	1	NetworkDefault	100	100	100		4.00		
	2	NetworkDefault	100	100	100		4.00		
C1	1	NetworkDefault	100	100	100		7.00		
D1	1	NetworkDefault	100	100	100		10.00		
	2	NetworkDefault	100	100	100		10.00		
B2	1	NetworkDefault	100	100	100		3.00		
	2	NetworkDefault	100	100	100		3.00		
B3	1	NetworkDefault	100	100	100		4.00		
10	1	NetworkDefault	100	100	100		0.00		

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
(ALL)	(ALL)	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	110

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
Aexit	1	573	573
Bexit	1	68	68
Cexit	1	23	23
A1	1	10	10
	2	251	251
B1	1	83	83
	2	25	25
C1	1	18	18
D1	1	604	604
	2	17	17
B2	1	83	83
	2	25	25
B3	1	108	108
10	1	344	344

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A1	1	1	E	
	2	1	F	
B1	1	1	B	
	2	1	D	
C1	1	1	G	
D1	1	1	A	
	2	1	C	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
A1	1	9.72	30.00
	2	9.72	30.00
C1	1	5.28	30.00
D1	1	7.20	30.00
	2	7.20	30.00
B3	1	3.12	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
Aexit	**1**	**1**	B1/2	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**1**	D1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**1**	D1/2	Cexit/1	38.02	30.00	✓	Offside	86.53
B1	**1**	**1**	B2/1	B1/1	3.00	30.00	✓	Straight	Straight Movement
	2	**1**	B2/2	B1/2	3.00	30.00	✓	Straight	Straight Movement
B2	**1**	**1**	B3/1	B2/1	2.16	30.00	✓	Straight	Straight Movement
	2	**1**	B3/1	B2/2	2.16	30.00	✓	Straight	Straight Movement
10	**1**	**1**	B1/1	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**2**	D1/1	Aexit/1	48.99	30.00	✓	Nearside	73.69
Bexit	**1**	**2**	A1/1	Bexit/1	55.09	30.00	✓	Nearside	81.55
Cexit	**1**	**2**	B1/1	Cexit/1	38.02	30.00	✓	Nearside	90.60
10	**1**	**2**	A1/2	10/1	52.81	30.00	✓	Straight	Straight Movement
Aexit	**1**	**3**	C1/1	Aexit/1	48.99	30.00	✓	Straight	Straight Movement
Bexit	**1**	**3**	C1/1	Bexit/1	55.09	30.00	✓	Straight	Straight Movement
Cexit	**1**	**3**	A1/2	Cexit/1	38.02	30.00	✓	Straight	Straight Movement
10	**1**	**3**	C1/1	10/1	52.81	30.00	✓	Nearside	64.44

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
(ALL)	(untitled)				Farside	3.00	2.00	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	H	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	**(ALL)**	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	**(ALL)**	100	100		0.00		

Local OD Matrix - Local Matrix: 1

Local Matrix Options

OD Matrix	Name	Use for point to point table	Auto calculate	Allocation mode	Allow paths past exit locations	Allow looped paths on arms	Allow looped paths on traffic nodes	Copy flows	Matrix to copy flows from	Limit paths by length	Path length limit multiplier	Limit paths by number	Path number limit
1	(untitled)	✓	✓	Path Equalisation			✓			✓	1.25		

Normal Input Flows (PCU/hr)

		To			
		1	2	3	4
From	1	0	10	0	251
	2	25	0	6	77
	3	0	2	0	16
	4	548	56	17	0

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

Pedestrian Input Flows not shown as they are blank.

Locations

OD Matrix	Location	Name	Entries	Exits	Colour
1	1	(untitled)	A1/1, A1/2	Aexit/1	#0000FF
	2	(untitled)	B3/1	Bexit/1	#FF0000
	3	(untitled)	C1/1	Cexit/1	#00FF00
	4	(untitled)	D1/2, D1/1	10/1	#FFFF00

Normal Paths and Flows

OD Matrix	Path	Description	From location	To location	Path items	Allocation type	Normal Calculated Flow (PCU/hr)
1	1		4	3	D1/2, Cexit/1	Normal	17
	2		4	2	D1/1, Bexit/1	Normal	56
	3		2	4	B3/1, B2/1, B1/1, 10/1	Normal	77
	4		2	3	B3/1, B2/1, B1/1, Cexit/1	Normal	6
	5		2	1	B3/1, B2/2, B1/2, Aexit/1	Normal	25
	6		4	1	D1/1, Aexit/1	Normal	548
	7		1	2	A1/1, Bexit/1	Normal	10
	8		1	3	A1/2, Cexit/1	Normal	0
	9		1	4	A1/2, 10/1	Normal	251
	10		3	2	C1/1, Bexit/1	Normal	2
	11		3	1	C1/1, Aexit/1	Normal	0
	12		3	4	C1/1, 10/1	Normal	16

Signal Timings

Network Default: 110s cycle time; 110 steps

Controller Stream

Controller stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	110

Controller Stream - Properties

Controller stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream - Optimisation

Controller stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	7	300	0	0	Traffic	
	B	(untitled)	7	300	0	0	Traffic	
	C	(untitled)	7	300	0	0	Traffic	
	D	(untitled)	7	300	0	0	Traffic	
	E	(untitled)	7	300	0	0	Traffic	
	F	(untitled)	7	300	0	0	Traffic	
	G	(untitled)	7	300	0	0	Traffic	
	H	(untitled)	7	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	D, B	1
	3	E, F, A	11
	4	G	1
	5	H	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	32, 46, 71, 86, 104

Intergreen Matrix for Controller Stream 1

		To							
		A	B	C	D	E	F	G	H
From	A				6			5	9
	B			7			5	5	10
	C		7		5	7	6	6	11
	D	6		5			5	5	10
	E			7				8	8
	F		5	6	5			6	11
	G	5	5	6	5	8	6		11
	H	17	17	17	17	17	17	17	

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	7	7	6	11
	2	7	0	6	5	10
	3	7	6	0	8	11
	4	6	5	8	0	11
	5	17	17	17	17	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A,C	11	32	21	1	7
	2	✓	2	D,B	39	46	7	1	7
	3	✓	3	E,F,A	52	71	19	11	11
	4	✓	4	G	79	86	7	1	7
	5	✓	5	H	97	104	7	1	7

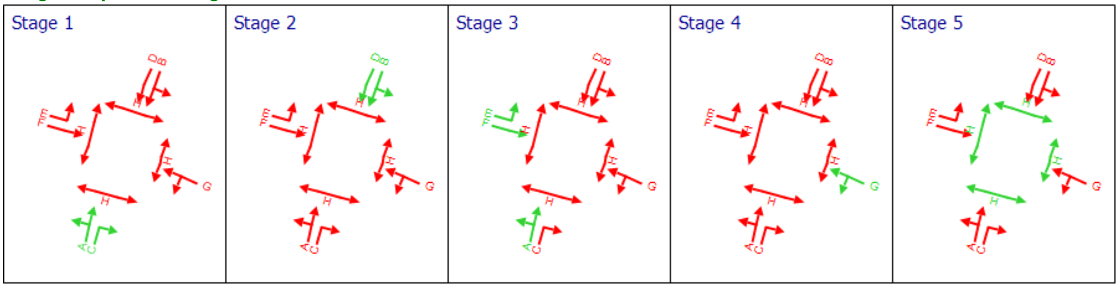
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	52	71	19
		2	✓	11	32	21
	B	1	✓	39	46	7
	C	1	✓	11	32	21
	D	1	✓	38	46	8
	E	1	✓	46	71	25
	F	1	✓	51	71	20
	G	1	✓	79	86	7
	H	1	✓	97	104	7

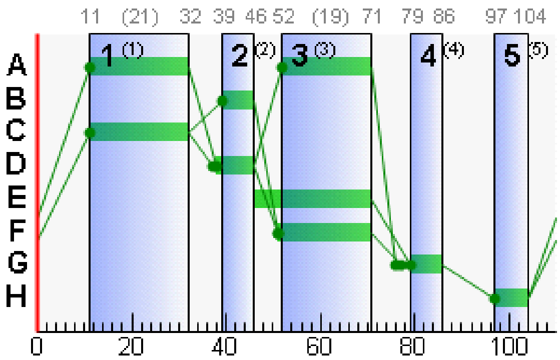
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1			Green Period 2		
					Start	End	Duration	Start	End	Duration
A1	1		1	E	46	71	25			
A1	2		1	F	51	71	20			
B1	1		1	B	39	46	7			
B1	2		1	D	38	46	8			
C1	1		1	G	79	86	7			
D1	1		1	A	52	71	19	11	32	21
D1	2		1	C	11	32	21			

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity	Calculated flow entering (PCU/hr)	Calculated sat flow	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	Aexit	1	0	Unrestricted	573	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	0	Unrestricted	68	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	0	Unrestricted	23	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	2	3729	10	1800	25	32.56	0.23	1.67	1.28	0.09	1.38
		2	73	23	251	1800	20	55.54	8.14	58.12	54.99	3.29	58.27
	B1	1	63	42	83	1800	7	72.31	2.97	74.20	23.67	1.20	24.87
		2	17	430	25	1800	8	49.59	0.73	18.14	4.89	0.29	5.18
	C1	1	14	555	18	1800	7	49.97	0.53	7.51	3.55	0.21	3.76
	D1	1	88	2	604	1800	40	37.72	15.00	150.01	89.87	8.02	97.88
		2	5	1806	17	1800	21	35.85	0.42	4.17	2.40	0.17	2.57
	B2	1	5	1852	83	1800	110	0.05	0.00	0.04	0.02	0.00	0.02
		2	1	6380	25	1800	110	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	6	1400	108	1800	110	0.06	0.00	0.05	0.03	0.00	0.03
	10	1	0	Unrestricted	344	Unrestricted	110	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow	Calculated capacity	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity	Mean modulus of error	Actual green (s (per cycle))
15:15-16:15	Aexit	1	573	573	0		Unrestricted	Unrestricted	0		Unrestricted	0.60	110
	Bexit	1	68	68	0		Unrestricted	Unrestricted	0		Unrestricted	0.51	110
	Cexit	1	23	23	0		Unrestricted	Unrestricted	0		Unrestricted	1.01	110
	A1	1	10	10	0		1800	425	2		3729	0.00	25
		2	251	251	0		1800	344	73		23	0.00	20
	B1	1	83	83	0		1800	131	63		42	0.00	7
		2	25	25	0		1800	147	17		430	0.00	8
	C1	1	18	18	0		1800	131	14		555	0.00	7
	D1	1	604	604	0		1800	687	88		2	0.00	40
		2	17	17	0		1800	360	5		1806	0.00	21
	B2	1	83	83	0		1800	1800	5		1852	0.00	110
		2	25	25	0		1800	1800	1		6380	0.00	110
	B3	1	108	108	0		1800	1800	6		1400	0.00	110
	10	1	344	344	0		Unrestricted	Unrestricted	0		Unrestricted	0.85	110

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	Aexit	1	48.99	0.00	0.00	0.00	0.00	0.00	0.00
	Bexit	1	55.09	0.00	0.00	0.00	0.00	0.00	0.00
	Cexit	1	38.02	0.00	0.00	0.00	0.00	0.00	0.00
	A1	1	9.72	32.56	0.09	1.28	75.38	7.54	0.09
		2	9.72	55.54	3.87	54.99	104.42	262.10	3.29
	B1	1	3.00	72.31	1.67	23.67	114.92	95.38	1.20
		2	3.00	49.59	0.34	4.89	93.90	23.48	0.29
	C1	1	5.28	49.97	0.25	3.55	94.37	16.99	0.21
	D1	1	7.20	37.72	6.33	89.87	105.88	639.52	8.02
		2	7.20	35.85	0.17	2.40	79.15	13.46	0.17
	B2	1	2.16	0.05	0.00	0.02	0.00	0.00	0.00
		2	2.16	0.01	0.00	0.00	0.00	0.00	0.00
	B3	1	3.12	0.06	0.00	0.03	0.00	0.00	0.00
	10	1	52.81	0.00	0.00	0.00	0.00	0.00	0.00

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
15:15-16:15	Aexit	1	0.00	0.00	70.99	0.00	0.00	11.00	
	Bexit	1	0.00	0.00	79.85	0.00	0.00	45.00	
	Cexit	1	0.00	0.00	55.10	0.00	0.00	99.00	
	A1	1	0.00	0.23	14.00	1.67	0.00	25.00	
		2	0.00	8.14	14.00	58.12	0.00	0.00	
	B1	1	0.00	2.97	4.00	74.20	0.00	0.00	
		2	0.00	0.73	4.00	18.14	0.00	7.00	
	C1	1	0.00	0.53	7.00	7.51	0.00	6.00	
	D1	1	0.00	15.00	10.00	150.01	0.00	0.00	
		2	0.00	0.42	10.00	4.17	0.00	21.00	
	B2	1	0.00	0.00	3.00	0.04	0.00	0.00	
		2	0.00	0.00	3.00	0.00	0.00	110.00	
	B3	1	0.00	0.00	4.00	0.05	0.00	0.00	
	10	1	0.00	0.00	76.54	0.00	0.00	33.00	

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
6	24/11/2022 13:11:28	24/11/2022 13:11:28	15:15	110	193.97	12.73	87.88	D1/1	0	0	D1/1	B3/1	D1/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
15:15-16:15	88	0	2232	898	20.52	180.70	13.27	193.97

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
15:15-16:15	2232	2232	0		88		2	954

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
15:15-16:15	26.37	20.52	12.73	180.70	47.42	1058.46	13.27

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
15:15-16:15	150.01	0.00	357.00

DBFL CONSULTING ENGINEERS

Registered Office
Ormond House
Upper Ormond Quay
Dublin 7 Ireland D07 W704

+ 353 1 400 4000
info@dbfl.ie
www.dbfl.ie

Cork Office
14 South Mall
Cork T12 CT91

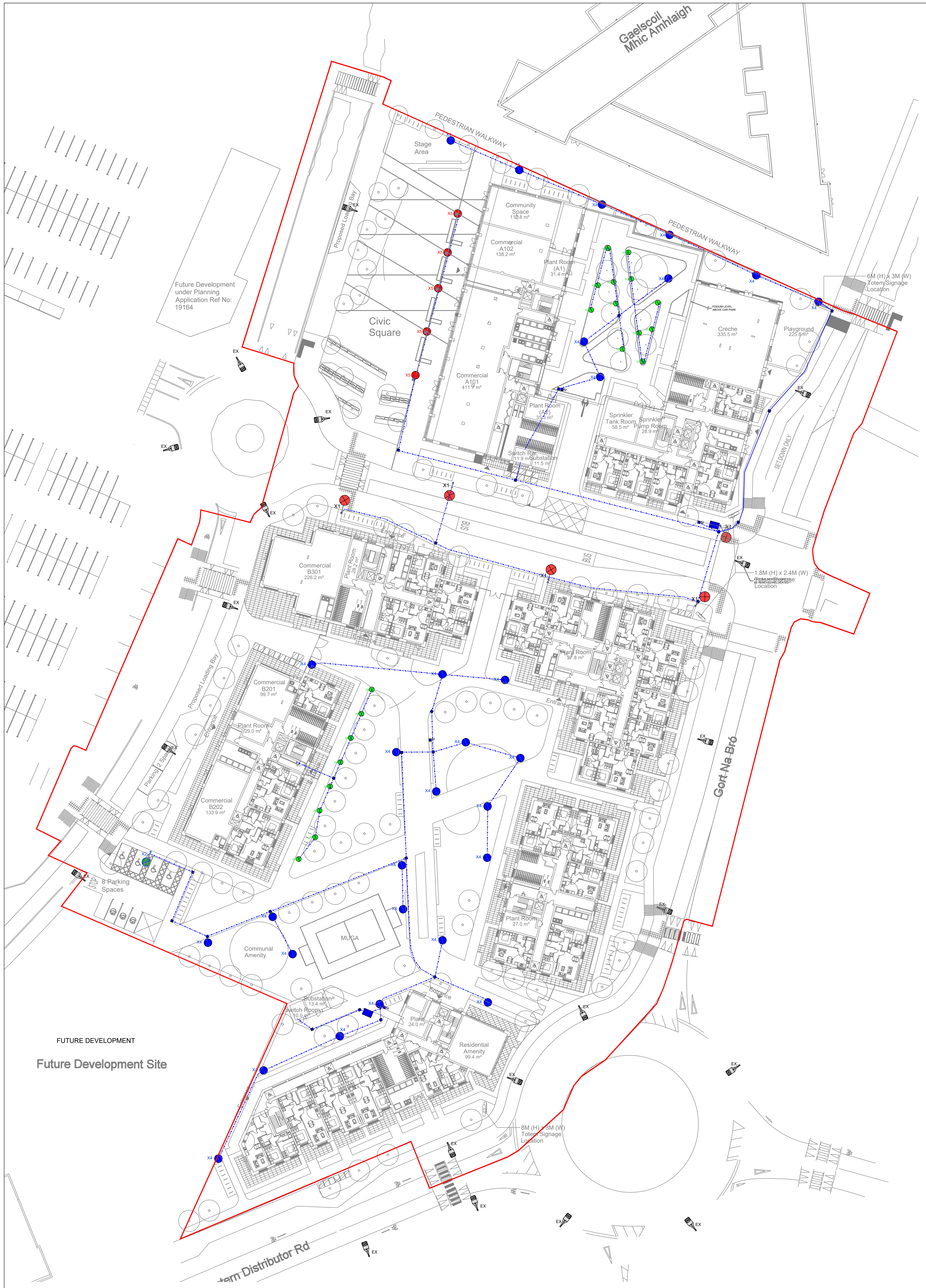
+ 353 21 202 4538
info@dbfl.ie
www.dbfl.ie

Waterford Office
Suite 8b The Atrium
Maritana Gate, Canada St
Waterford X91 W028

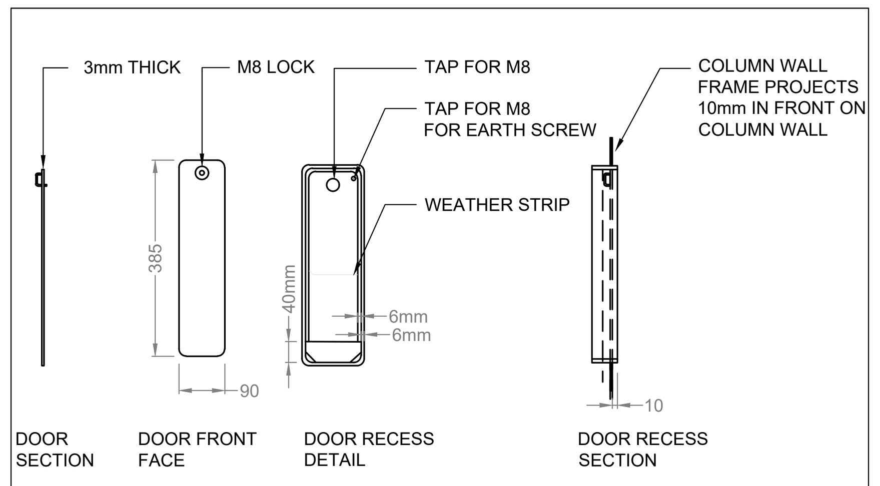
+ 353 51 309 500
info@dbfl.ie
www.dbfl.ie

APPENDIX 13-2

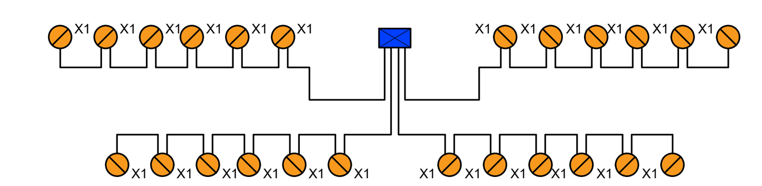
MECHANICAL AND ELECTRICAL BASIS OF DESIGN REPORT



SITE PLAN
SCALE 1:500



LIGHTING COLUMN ACCESS DOOR DETAIL
(SCALE N.T.S.)



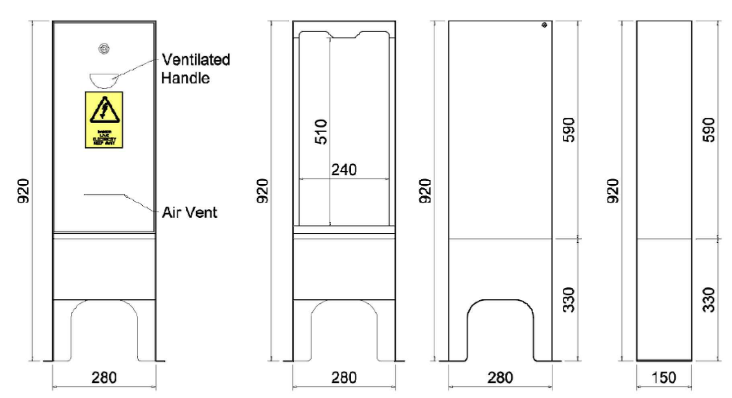
MICRO PILLAR FOR PUBLIC LIGHTING

STREET/EXTERNAL LUMINAIRE

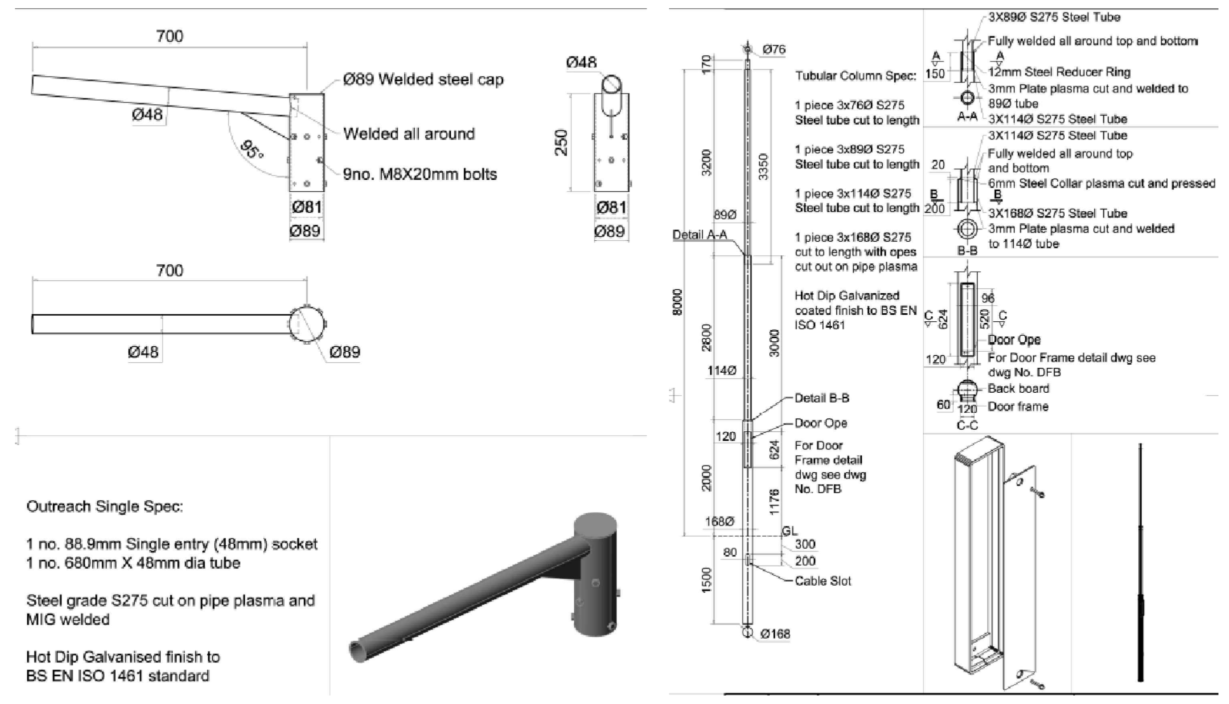
NOTES:
1. A MAXIMUM OF 4No. CIRCUIT PER MICRO PILLAR
2. A MAXIMUM OF 6No. LUMINAIRE FITTINGS PER CIRCUIT
3. MICRO PILLAR MUST BE LOCATED A MINIMUM OF 2.0M AWAY FROM AN ESB NETWORKS MINI PILLAR
4. MICRO PILLAR MUST BE LOCATED A MINIMUM OF 10.0M AWAY FROM AN ESB NETWORKS STATION.

MICRO PILLAR CIRCUITRY DETAIL
(SCALE N.T.S.)

LUMINAIRE X1 / X2
LUMINAIRE X4
LUMINAIRE X5
LUMINAIRE X6



MICRO PILLAR DETAIL
SCALE N.T.S



Outreach Single Spec:

1 no. 88.9mm Single entry (48mm) socket
1 no. 680mm X 48mm dia tube

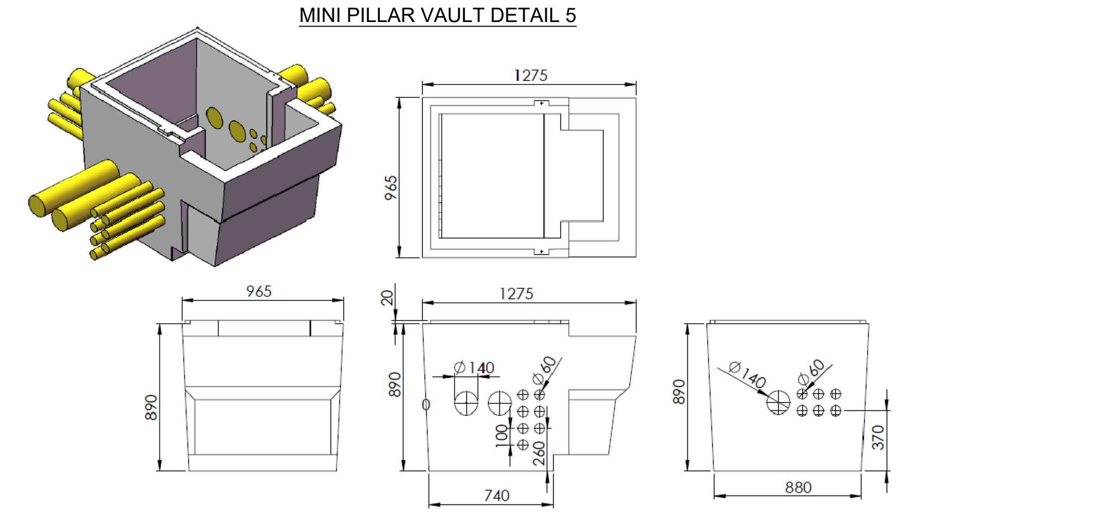
Steel grade S275 cut on pipe plasma and MIG welded

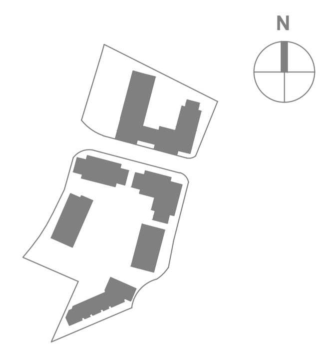
Hot Dip Galvanised finish to BS EN ISO 1461 standard

PUBLIC LIGHTING COLUMN DETAIL SCHEDULE			
COLUMN MOUNTING HEIGHT:	10M	8M	6M
ROOT DEPTH -	1.5M	1.2M	1.0M
CABLE ENTRY DEPTH -	0.3M	0.3M	0.3M
ROOTING CONCRETE DEPTH -	0.8M	0.7M	0.5M
HEIGHT OF COLUMN DOOR -	1.5M	1.5M	1.5M

Mounting Height	Minimum Root Depth **	Std. Setback of column face from front of Kerb	Max. Bracket Length (post-top mounting may be used where appropriate)
6 metre	1.0 metre	1.5 metre	1.0 metre
8 metre	1.2 metre	2.0 metre	1.5 metre
10 metre	1.5 metre	2.5 metre	2.0 metre
12 metre	1.7 metre	3.0metre	2.5 metre

MINI PILLAR VAULT DETAIL 5





NOTES

1. ALL EXTERIOR LIGHTING SHALL COMPLY WITH CODE OF PRACTICE FOR THE DESIGN OF ROAD LIGHTING BS5489-1:2013, EN13201-2015
2. THE EXTERNAL LIGHTING LAYOUT HAS BEEN DESIGNED IN ACCORDANCE WITH BS 5489-1:2013 AND EN 13201-2015 STANDARDS
3. DUCTING SHALL COMPLY WITH BSEN 50086-1-2-3-4 LATEST EDITION & SHALL BE SINGLE WALL, COLORED RED & MANUFACTURED FROM HIGH DENSITY POLYPROPYLENE. THE NOMINAL EXTERNAL DIAMETER OF THE DUCT SHALL BE 107mm WITH A MINIMAL WALL THICKNESS OF 5mm. EACH LENGTH OF DUCT SHALL BE STAMPED WITH THE WORDS "PUBLIC LIGHTING", OR ALTERNATIVELY, "STREET LIGHTING", IN 18mm BLACK LETTERING AT 0 DEGREES, AT ONE METRE INTERVALS. DUCT SHALL BE LAID WITH THIS LEGEND FACING UPWARDS. DUCT SHALL BE LAID IN A STRAIGHT LINE CLOSE TO THE LINE OF THE COLUMN LOCATIONS & SHALL CONTAIN A CONTINUOUS DRAW WIRE OF 8KN STRENGTH. ALL DUCTS SHALL BE PROVEN WITH BRUSH AND MANDRILL, POLYPROPYLENE ROPED AND PLUGGED AND COMPLAINT WITH ET101 REQUIREMENTS RED DUCT DUCT SHALL BE USED FOR EXTERIORS LIGHTING CABLES.
4. A MINIMUM DEPTH OF 450mm COVER IS REQUIRED IN URBAN PATHWAYS & A MINIMUM OF 600mm COVER IS REQUIRED FOR GRASS MARGINS, PEDESTRIAN WAYS, LANEWAYS & GATEWAY ENTRANCES & A MINIMUM DEPTH OF 750mm IS REQUIRED AT ROAD CROSSINGS OR IN CARRIAGEWAYS.
5. ALL CABLE DRAW INSPECTION PITS SHALL BE OF DUCTILE IRON GALVANISED STEEL FRAME WITH FRAME OPENING OF 615mm x 615mm TO CONFORM TO EN124B125 MARKED 'PUBLIC LIGHTING' OR TRAFFIC WITH M16 STAINLESS STEEL LOCKING BOLT. ALL CABLE DRAW INSPECTION PITS FOR USE ON CARRIAGEWAYS SHALL BE OF THE SAME DIMENSION AS ABOVE WITH HIGH STRENGTH ENGINEERING OR SITU CONCRETE. COVERS AND FRAMES SHALL BE APPROVED BY LICENSED BODY NSAI OR BRITISH STANDARDS INSTITUTE OF QUALITY ASSURANCE SERVICES.
6. ALL EQUIPMENT TO BE SUITABLY IP RATED FOR THE ENVIRONMENT THEY ARE BEING INSTALLED.
7. ESB NETWORKS DUCT ROUTES TO MINI PILLAR TO BE CONFIRMED WHEN ESB NETWORK SUB-STATION LOCATION IS FINALISED.
8. LIGHT COLUMN SETBACK SHALL BE 0.8M FROM KERB IN ACCORDANCE WITH BS5489-1

SCHEDULE OF SYMBOLS

X1	LUMINAIRE X1 TRAFFIK R POLE MOUNTED AT 8M AFFL LED ED
X2	LUMINAIRE X1 TRAFFIK R POLE MOUNTED AT 6M AFFL LED ED
X4	LUMINAIRE X4 AVENIDA LENS LED POLE MOUNTED AT 3M AFFL LED ED
X5	LUMINAIRE X5 TARGET LATGE POLE MOUNTED AT 3M AFFL LED ED
X6	LUMINAIRE X6 AMENIDA BOLLARD LED SURFACE MOUNTED LED ED
EX	EXISTING PUBLIC LIGHTING POLE
	MINI PILLAR
M	MICRO PILLAR
	PUBLIC LIGHTING POLE JUNCTION BOX

REV	ISSUE	DRN	ENG	APP	DATE
P6	ISSUED FOR PLANNING	KDL	KDL	NP	13/12/22
P5	UPDATED TO LATEST ARCHITECT LAYOUT	KDL	KDL	NP	28/11/22
P4	UPDATED TO LATEST ARCHITECT LAYOUT	KDL	KDL	NP	22/11/22
P3	REVISED LAYOUT AS PER COMMENTS	KDL	KDL	NP	24/08/22
P2	REVISED LIGHTING AS PER LANDSCAPING	KDL	KDL	NP	11/08/22
P1	PRELIMINARY ISSUE	KDL	KDL	NP	10/08/22

Penston MEP Consulting
ISO 9001:2015 QUALITY
ISO 45001 :2018 HEALTH & SAFETY
1st Floor, Block A,
Citywest Shopping Centre, D24
01 2530710
info@pmep.ie
www.pmep.ie

CLIENT
GLENVEAGH HOMES

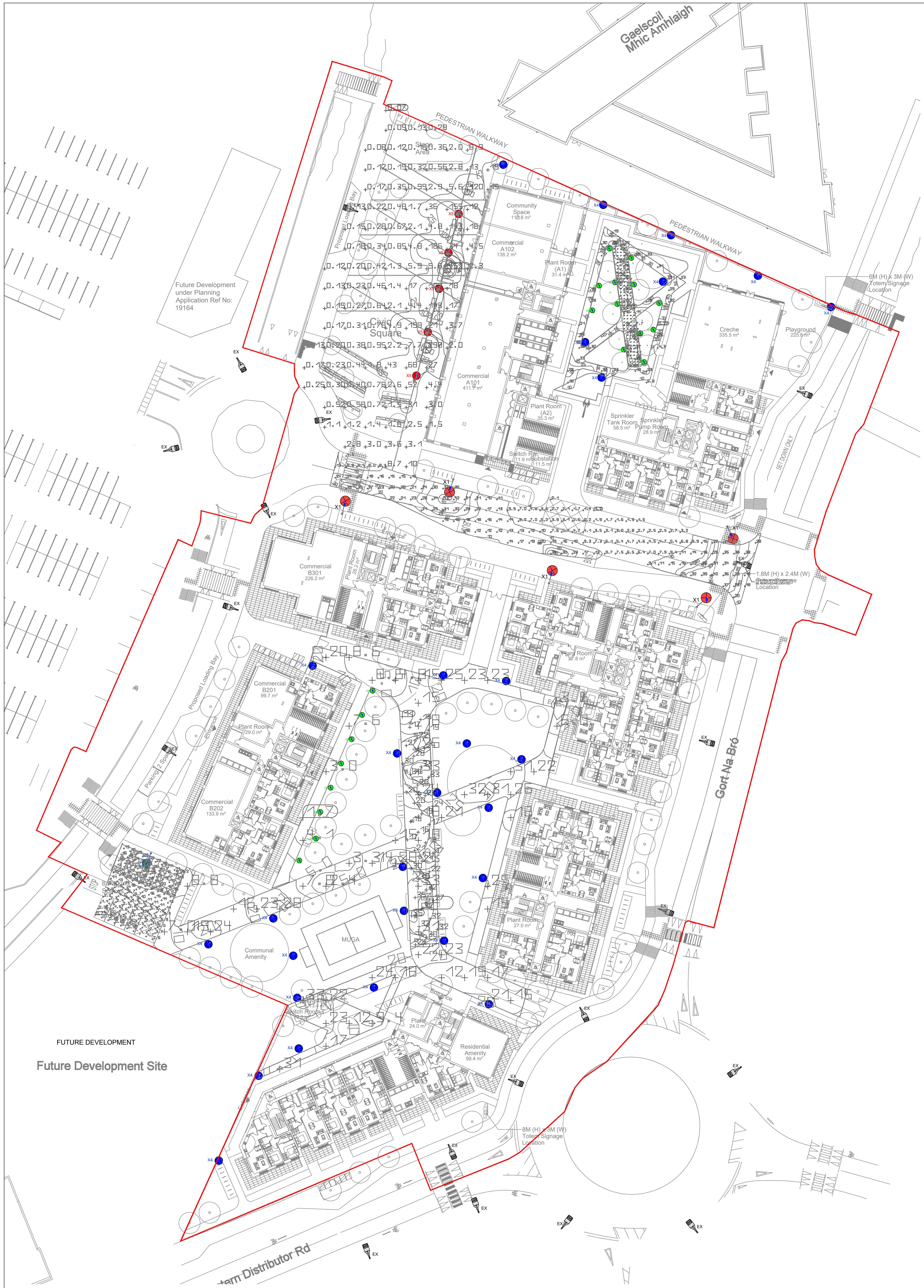
ARCHITECT
REDDY ARCHITECTURE DARTRY RD DUBLIN 6

PROJECT
KNOCKNACARRA DISTRICT CENTRE LRD
KNOCKNACARRA
GALWAY

DISCIPLINE
ELECTRICAL SERVICES INSTALLATION

DRAWING TITLE
SITE LIGHTING LAYOUT

DRAWING No.	SCALE	REV
G025-PMEP-00-00-DR-E-01	1:500@A1 1:1000@A3	P6



SITE PLAN
SCALE 1:500

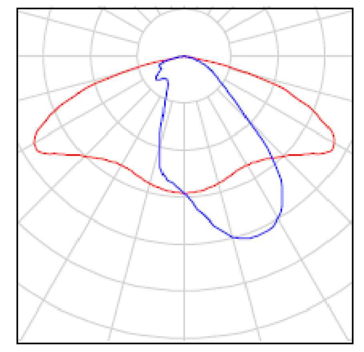
Luminaire list (Site 1)								
Index	Manufacturer	Article name	Item number	Fitting	Luminous flux	Maintenance factor	Connected load	Quantity
1	Garrabridge	TYPE X4 AVENIDA LENS LED ED 6050lm/730 IP66 grafit II klasa O24	130275.5L142.071	1xLED 3000K	6050 lm	0.80	49 W	29
2	Garrabridge	TYPE X6 AVENIDA BOLLARD LED 500 ED 1200lm/730 IP66 grafit II klasa	160015.5L052.11	1xLED 3000K	1200 lm	0.80	13.5 W	20
3	Garrabridge	TARGET Large Su Palo 16 LED (34W – 4000K) Medium 220–240V 0/50/60Hz	8720663	1xLED	3065 lm	0.80	34 W	15
4	Garrabridge	TYPE X2 TRAFFIK R LED ED 7200lm/730 IP66 O42 szary I kl.	130292.5L111.081	1xLED 3000K	7200 lm	0.80	50 W	1
5	GARRABRIDGE	TYPE X1 TRAFFIK R LED ED 9300lm/730 IP66 O42 szary I kl.	130292.5L161.081	1xLED 3000K	9300 lm	0.80	68 W	5

#	Name	Parameter	Min	Max	Average	Min/average	Min/max
1	Podium Garden main Pathway	Perpendicular illuminance	4.85 lx	64.0 lx	23.7 lx	0.20	0.076
2	Residential Courtyard main Pathway	Perpendicular illuminance	11.3 lx	36.3 lx	24.8 lx	0.46	0.31
3	39 Space Car Park	Perpendicular illuminance	0.71 lx	32.5 lx	11.7 lx	0.061	0.022
4	Residential Courtyard	Perpendicular illuminance	1.68 lx	33.7 lx	18.4 lx	0.091	0.050
5	Podium Garden Pathways	Perpendicular illuminance	0.27 lx	58.4 lx	25.8 lx	0.010	0.005
6	Link Roadway	Perpendicular illuminance	1.22 lx	42.7 lx	16.0 lx	0.076	0.029
7	Civic Square Pathway	Perpendicular illuminance	0.070 lx	451 lx	22.4 lx	0.003	0.000
8	Civic Square	Perpendicular illuminance	0.070 lx	452 lx	21.2 lx	0.003	0.000

GARRABRIDGE - 130292.5L161.081 TYPE X1 TRAFFIK R LED ED 9300lm/730 IP66 O42 szary I kl.
Luminous emittance 1
Fitting: 1xLED 3000K
Light output ratio: 100%
Lamp luminous flux: 9300 lm
Luminaire luminous flux: 9300 lm
Power: 68.0 W
Luminous efficacy: 136.8 lm/W

Colourimetric data
1x: CCT 3000 K, CRI 70

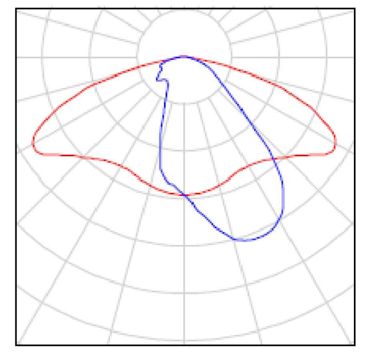
See our luminaire catalog for an image of the luminaire.



Garrabridge - 130292.5L111.081 TYPE X2 TRAFFIK R LED ED 7200lm/730 IP66 O42 szary I kl.
Luminous emittance 1
Fitting: 1xLED 3000K
Light output ratio: 100%
Lamp luminous flux: 7200 lm
Luminaire luminous flux: 7200 lm
Power: 50.0 W
Luminous efficacy: 144.0 lm/W

Colourimetric data
1x: CCT 3000 K, CRI 70

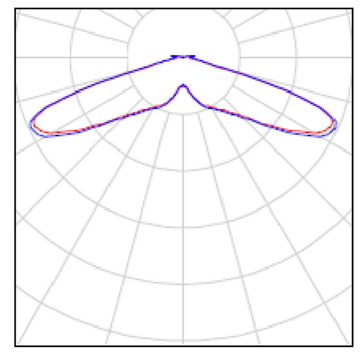
See our luminaire catalog for an image of the luminaire.



Garrabridge - 130275.5L142.071 TYPE X4 AVENIDA LENS LED ED 6050lm/730 IP66 grafit II klasa O24
Luminous emittance 1
Fitting: 1xLED 3000K
Light output ratio: 100%
Lamp luminous flux: 6050 lm
Luminaire luminous flux: 6050 lm
Power: 49.0 W
Luminous efficacy: 123.5 lm/W

Colourimetric data
1x: CCT 3000 K, CRI 70

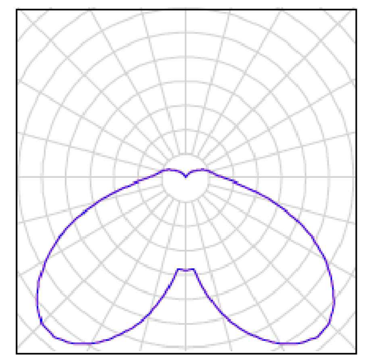
See our luminaire catalog for an image of the luminaire.



Garrabridge - 160015.5L052.11 TYPE X6 AVENIDA BOLLARD LED 500 ED 1200lm/730 IP66 grafit II klasa
Luminous emittance 1
Fitting: 1xLED 3000K
Light output ratio: 100%
Lamp luminous flux: 1200 lm
Luminaire luminous flux: 1200 lm
Power: 13.5 W
Luminous efficacy: 88.9 lm/W

Colourimetric data
1x: CCT 3000 K, CRI 70

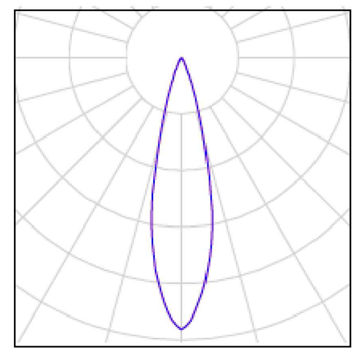
See our luminaire catalog for an image of the luminaire.



Garrabridge - 8720663 TARGET Large Su Palo 16 LED (34W - 4000K) Medium 220-240V 0/50/60Hz
Luminous emittance 1
Fitting: 1xLED
Light output ratio: 100%
Lamp luminous flux: 3065 lm
Luminaire luminous flux: 3065 lm
Power: 34.0 W
Luminous efficacy: 90.1 lm/W

Colourimetric data
1xLED: CCT 3000 K, CRI 84

See our luminaire catalog for an image of the luminaire.

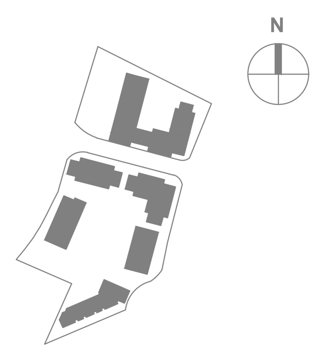


LUMINAIRE X1 / X2

LUMINAIRE X4

LUMINAIRE X5

LUMINAIRE X6



0 5 10 20 30 50 (m)
SCALE 1:500

NOTES

1. ALL EXTERIOR LIGHTING SHALL COMPLY WITH CODE OF PRACTICE FOR THE DESIGN OF ROAD LIGHTING BS5489-1:2013, EN13201-2015
2. THE EXTERNAL LIGHTING LAYOUT HAS BEEN DESIGNED IN ACCORDANCE WITH BS 5489-1:2013 AND EN 13201-2015 STANDARDS
3. DUCTING SHALL COMPLY WITH BSEN 50086-1-2-3-4 LATEST EDITION & SHALL BE SINGLE WALL, COLORED RED & MANUFACTURED FROM HIGH DENSITY POLYPROPYLENE. THE NOMINAL EXTERNAL DIAMETER OF THE DUCT SHALL BE 107mm WITH A MINIMAL WALL THICKNESS OF 5mm. EACH LENGTH OF DUCT SHALL BE STAMPED WITH THE WORDS "PUBLIC LIGHTING", OR ALTERNATIVELY, "STREET LIGHTING", IN 18mm BLACK LETTERING AT 0 DEGREES, AT ONE METRE INTERVALS. DUCT SHALL BE LAID WITH THIS LEGEND FACING UPWARDS. DUCT SHALL BE LAID IN A STRAIGHT LINE CLOSE TO THE LINE OF THE COLUMN LOCATIONS & SHALL CONTAIN A CONTINUOUS DRAW WIRE OF 8KN STRENGTH. ALL DUCTS SHALL BE PROVEN WITH BRUSH AND MANDRILL, POLYPROPYLENE ROPED AND PLUGGED AND COMPLAINT WITH ET101 REQUIREMENTS RED DUCT DUCT SHALL BE USED FOR EXTERIORS LIGHTING CABLES.
4. A MINIMUM DEPTH OF 450mm COVER IS REQUIRED IN URBAN PATHWAYS & A MINIMUM OF 600mm COVER IS REQUIRED FOR GRASS MARGINS, PEDESTRIAN WAYS, LANEWAYS & GATEWAY ENTRANCES & A MINIMUM DEPTH OF 750mm IS REQUIRED AT ROAD CROSSINGS OR IN CARRIAGEWAYS.
5. ALL CABLE DRAW INSPECTION PITS SHALL BE OF DUCTILE IRON GALVANISED STEEL FRAME WITH FRAME OPENING OF 615mm x 615mm TO CONFORM TO EN124B125 MARKED 'PUBLIC LIGHTING' OR TRAFFIC WITH M16 STAINLESS STEEL LOCKING BOLT. ALL CABLE DRAW INSPECTION PITS FOR USE ON CARRIAGEWAYS SHALL BE OF THE SAME DIMENSION AS ABOVE WITH HIGH STRENGTH ENGINEERING OR SITU CONCRETE. COVERS AND FRAMES SHALL BE APPROVED BY LICENSED BODY NSAI OR BRITISH STANDARDS INSTITUTE OF QUALITY ASSURANCE SERVICES.
6. ALL EQUIPMENT TO BE SUITABLY IP RATED FOR THE ENVIRONMENT THEY ARE BEING INSTALLED.
7. ESB NETWORKS DUCT ROUTES TO MINI PILLAR TO BE CONFIRMED WHEN ESB NETWORK SUB-STATION LOCATION IS FINALISED.
8. LIGHT COLUMN SETBACK SHALL BE 0.8M FROM KERB IN ACCORDANCE WITH BS5489-1

SCHEDULE OF SYMBOLS

X1	LUMINAIRE X1 TRAFFIK R POLE MOUNTED AT 8M AFFL
X2	LUMINAIRE X2 TRAFFIK R POLE MOUNTED AT 6M AFFL
X4	LUMINAIRE X4 AVENIDA LENS LED POLE MOUNTED AT 3M AFFL
X5	LUMINAIRE X5 TARGET LATGE POLE MOUNTED AT 3M AFFL
X6	LUMINAIRE X6 AMENIDA BOLLARD LED SURFACE MOUNTED
EX	EXISTING PUBLIC LIGHTING POLE
	MINI PILLAR
M	MICRO PILLAR
	PUBLIC LIGHTING POLE JUNCTION BOX

REV	ISSUE	DRN	ENG	APP	DATE
P1	ISSUED FOR PLANNING	KDL	KDL	NP	13/12/22

PMEP
Penston MEP Consulting
1st Floor, Block A,
Citywest Shopping Centre, D24
01 2530710
info@pmep.ie
www.pmep.ie
© Copyright PMEP
nsai ISO 9001:2015 QUALITY
nsai ISO 45001:2018 HEALTH & SAFETY

CLIENT
GLENVEAGH HOMES

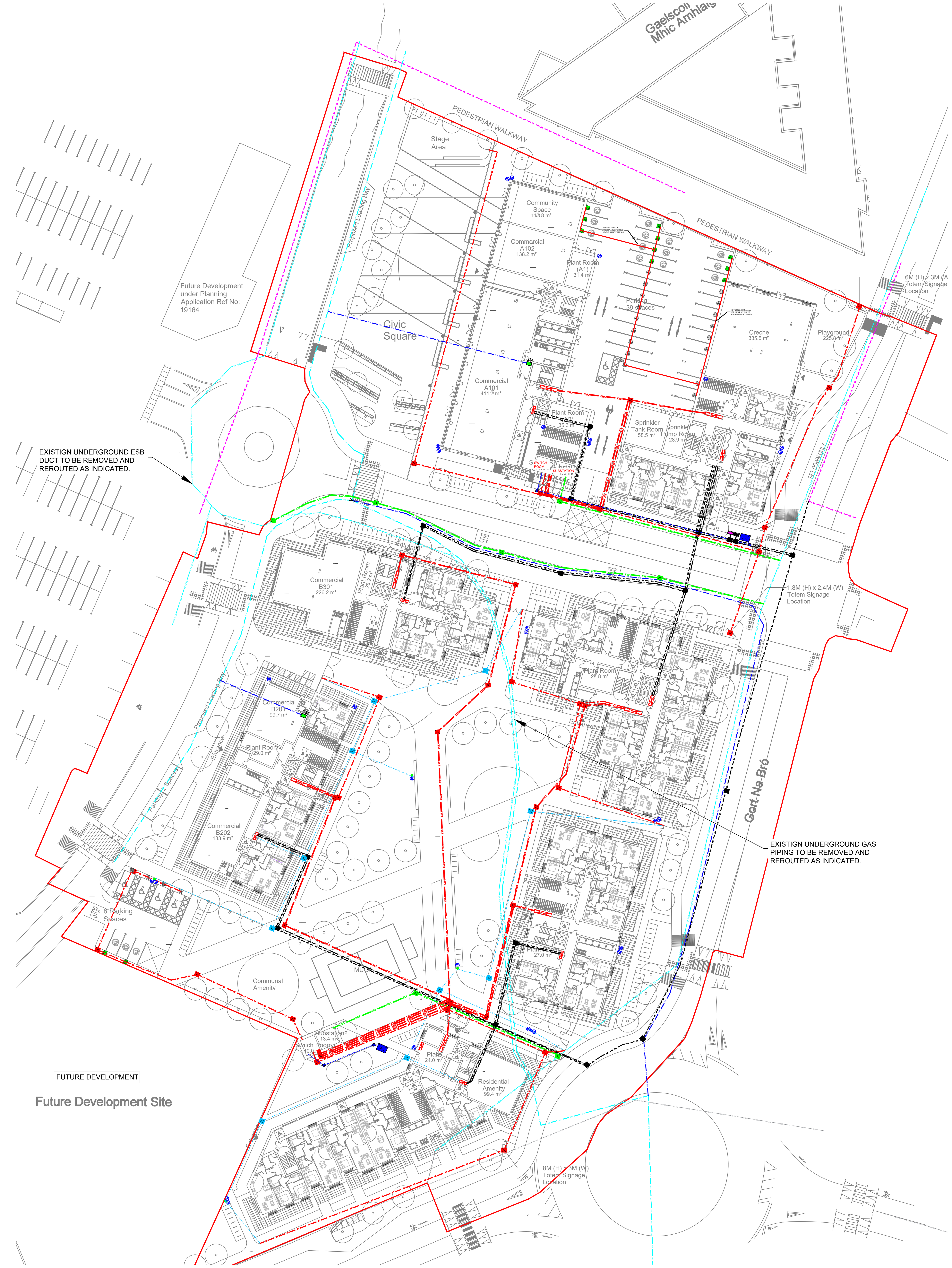
ARCHITECT
REDDY ARCHITECTURE DARTRY RD DUBLIN 6

PROJECT
KNOCKNACARRA DISTRICT CENTRE LRD
KNOCKNACARRA
GALWAY

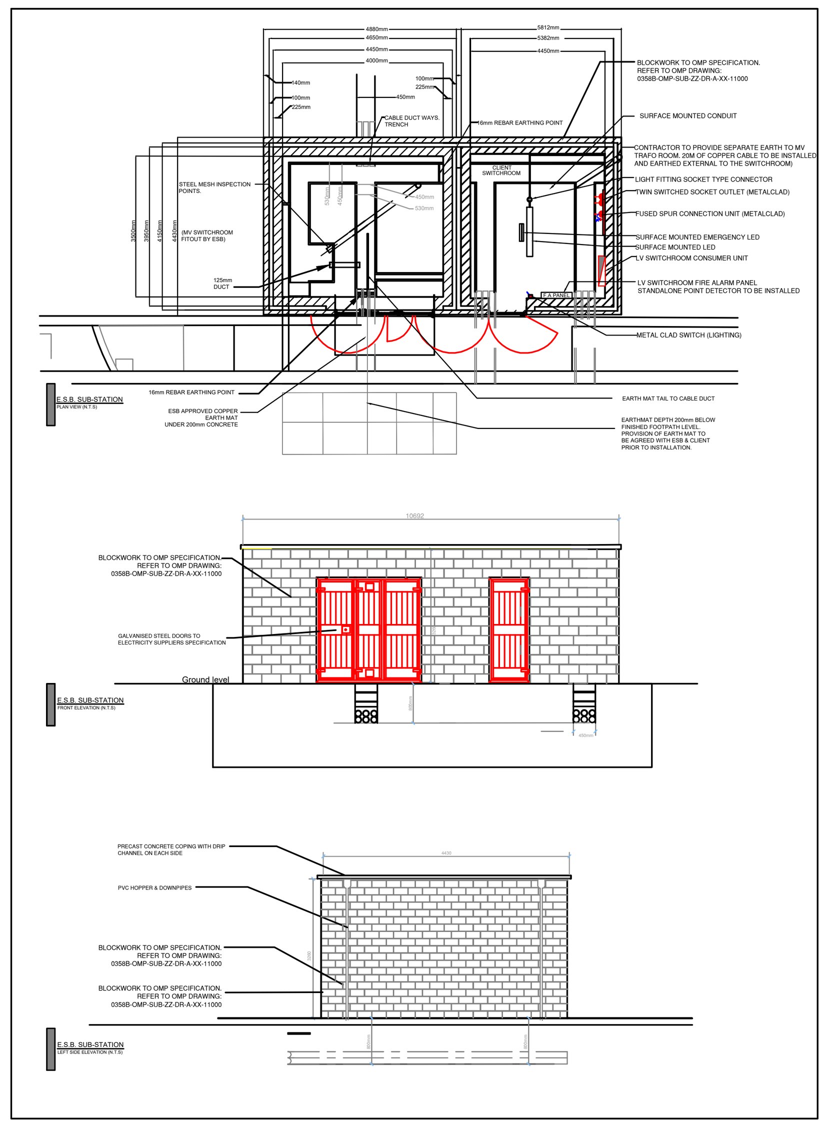
DISCIPLINE
ELECTRICAL SERVICES INSTALLATION

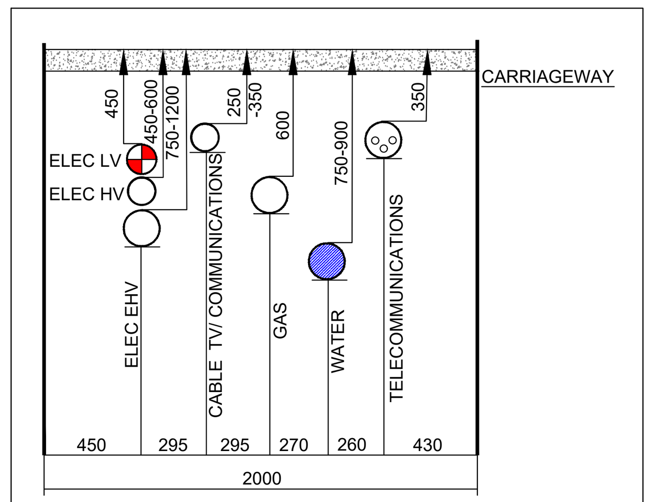
DRAWING TITLE
SITE LIGHTING ISO LINES LAYOUT

DRAWING No.	SCALE	REV
G025-PMEP-00-00-DR-E-02	1:500@A1 1:1000@A3	P1

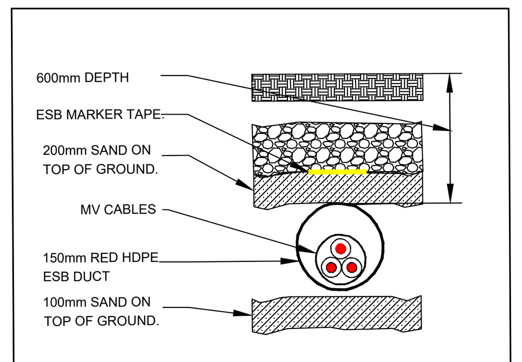


SITE PLAN
SCALE 1:500

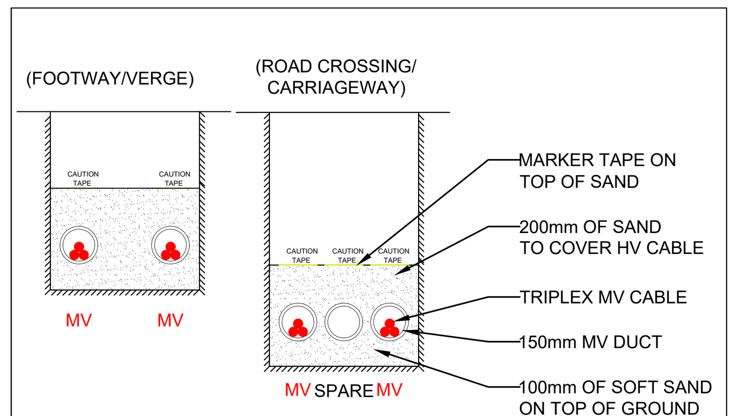




TYPICAL DUCT INSTALLATION



TYPICAL DUCT DETAIL 1.



MV CABLE DUCT DETAIL 3

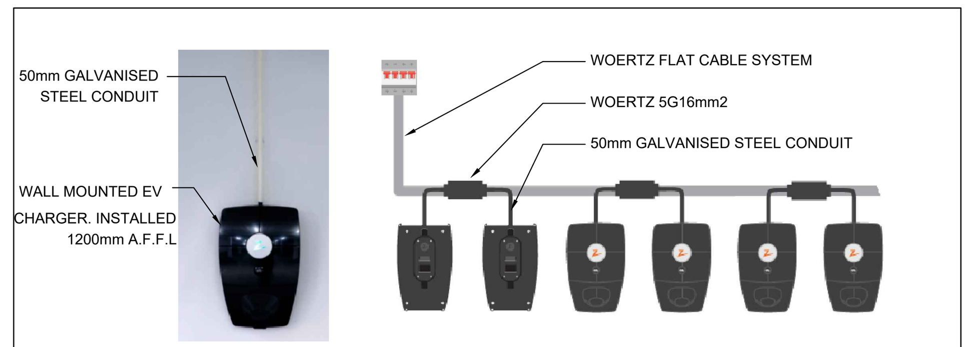
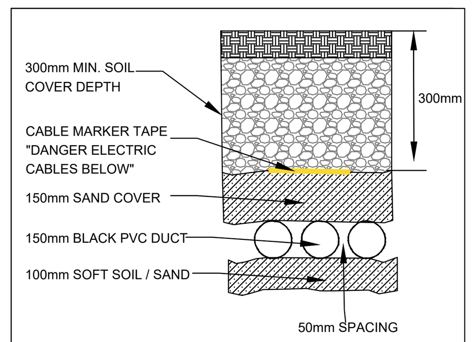
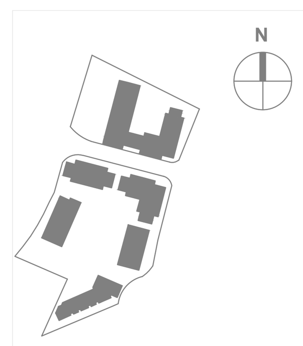


FIG.1 - WALL MOUNTED EV CHARGER DETAILS
(SCALE: N.T.S)



TYPICAL DUCT DETAIL 2



0 5 10 20 30 50 (m)
SCALE 1:500

NOTES

1. PMEP SITE SERVICES DRAWING DETAILS SHOWN ARE INDICATIVE OF PROPOSED SITE SERVICES DUCTING & CABLING INFRASTRUCTURE FOR DISCUSSION / COMMENT ONLY.
2. REFER TO UTILITY PROVIDERS DESIGN DRAWINGS FOR EXACT DETAILS OF UTILITY DUCTING POINTS OF ENTRY TO THE SITE AND TO ENSURE ALL DUCTING CHAMBER LOCATIONS ARE INCLUDED.
3. COMMS DUCTING TO ENTER THE SITE AT 2 NO. POSITIONS INDICATED AND BE DISTRIBUTED AROUND THE SITE IN DUCTING AS INDICATED. TELECOMMS DUCTING TO BE Ø125mm AND QUANTITIES AS INDICATED ON THE DRAWINGS.
4. ESB MV DUCTING TO ENTER SITE ESB SUBSTATION AS SHOWN AND BE DISTRIBUTED AROUND THE SITE IN MV DUCTING INSTALL Ø125mm ESB DUCTS BETWEEN LOCAL SUB-STATION AND SWITCH ROOM.
5. QUANTITY OF ESB DUCTS TO BE CONFIRMED BY ESB NETWORKS
6. ALL DUCTING SERVICE CHAMBER LIDS AND TRENCH LIDS USED TROUGHOUT THE SITE CAR PARK; CIRCULATION AREAS & LOADING/UNLOADING AREAS MUST BE SUITABLY IK RATED TO EN41 STANDARDS AND SUITABLE BEARING WEIGHT OF HGVS.
7. SERVICE CHAMBER LIDS AND TRENCH LIDS DESIGNED FOR PEDESTRIAN ROUTES WILL NOT BE ACCEPTED ON ROADS.
8. REFER TO CIVIL ENGINEERS DRAWINGS FOR FINAL COORDINATION DETAILS INCLUDING SITE LIGHTING LAYOUT AND UTILITY PROVIDER WAYLEAVE/ SLEEVE DRAWING LAYOUTS.
9. ALL EQUIPMENT TO BE SUITABLY IP RATED FOR THE ENVIRONMENT THEY ARE BEING INSTALLED.
10. REFER TO TYPICAL DETAIL DRAWINGS FOR ADDITIONAL INFORMATION PERTAINING TO INSTALLATION OF SERVICES/ DUCTS/ ETC.
11. ESB SUBSTATION TO BE INSTALLED AND CONSTRUCTED IN ACCORDANCE TO THE ESB SPECIFICATION AND REGULATIONS.

SCHEDULE OF SYMBOLS

- 125mm ESB MV DUCTS
- 125mm ESB LV DUCTS (FROM SUBSTATION TO MINIPILLARS)
- 125mm LV DUCTS (PROPOSED ROUTES)
- Ø110mm EIRCOM DUCTING 110mm DUCT, Ø50mm DUCT TO RESIDENTIAL UNIT
- EXISTING EIRCOM DUCTING
- 2No. 100mm TELCO (ALTERNATIVE) DUCTING
- Ø42MM GAS DUCT
- EXISTING GAS DUCT
- PUBLIC LIGHTING DUCTING
- EIR — EIRCOM CHAMBER
- VM — VIRGIN MEDIA CHAMBER
- VM6 — VIRGIN MEDIA CHAMBER VM6
- MICRO PILLAR
- PUBLIC LIGHTING POLE JUNCTION BOX
- LV CHAMBER
- ESB MINI PILLAR / VAULT
- E-CAR CHARGER POINT
- FUTURE E-CAR CHARGER POINT
- JUNCTION BOX
- ESB1& EIR, VIRGIN MEDIA TERMINATION POINT
- VIRGIN MEDIA CONTROL CABINET
- EIR CONTROL CABINET
- GM — GAS METER LOCATION
- CCTV MOUNTED ON LIGHT POLE
- CCTV MOUNTED ON POLE
- CCTV

REV	ISSUE	DRN	ENG	APP	DATE
P4	ISSUED FOR PLANNING	KDL	KDL	NP	13/12/22
P3	REVISED AS PER COMMENTS	KDL	KDL	NP	24/08/22
P2	REVISED TO LATEST ARCH LAYOUT	KDL	KDL	NP	22/08/22
P1	PRELIMINARY ISSUE	KDL	ST	NP	05/08/22

PMEP
Penston MEP Consulting
ISO 9001:2015 QUALITY
ISO 45001 :2018 HEALTH & SAFETY
1st Floor, Block A,
Citywest Shopping Centre, D24
01 2530710
info@pmep.ie
www.pmep.ie

CLIENT
GLENVEAGH HOMES

ARCHITECT
REDDY ARCHITECTURE DARTRY RD DUBLIN 6

PROJECT
KNOCKNACARRA DISTRICT CENTRE LRD
KNOCKNACARRA
GALWAY

DISCIPLINE
MECHANICAL & ELECTRICAL SERVICES INSTALLATION

DRAWING TITLE
SITE SERVICES LAYOUT

DRAWING No.	SCALE	REV
G025-PMEP-00-00-DR-ME-01	1:500@A1 1:1000@A3	P4