Project

Residential Development at
Newcastle, Co. Dublin

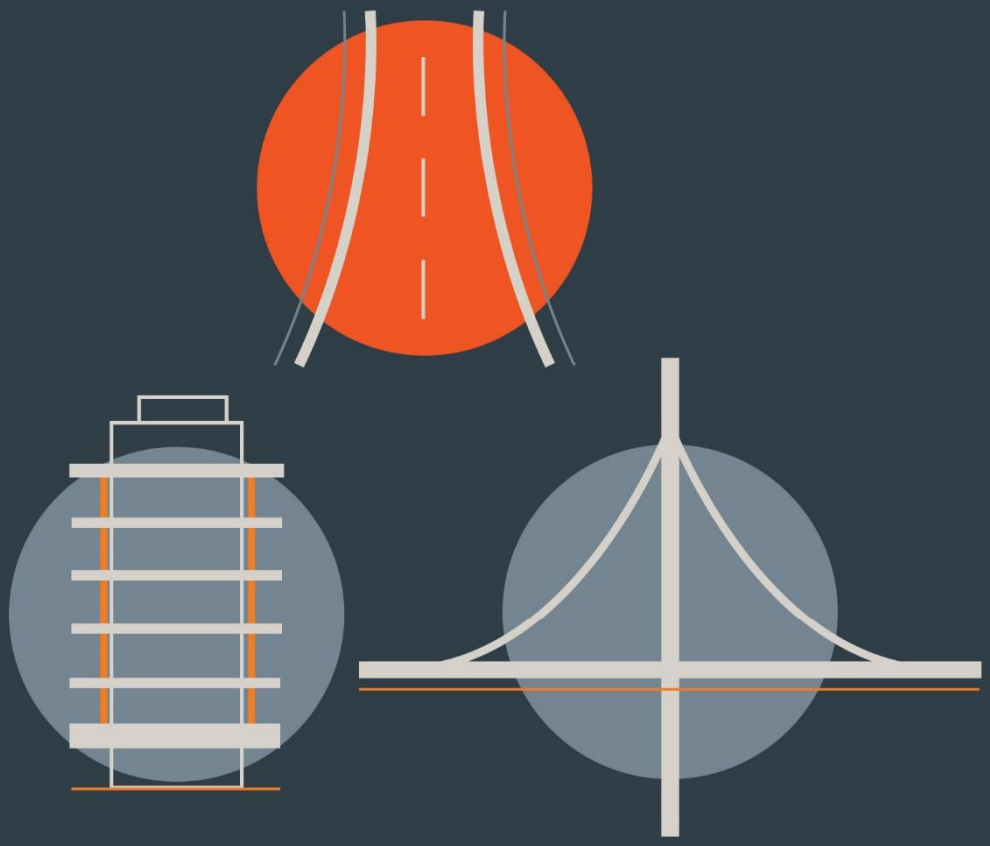
Report Title

TRAFFIC AND TRANSPORT ASSESSMENT REPORT

Client

Cairn Homes Properties Ltd.

TRANSPORTATION



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APPENDICES

1.0 INTRODUCTION

1.1 BACKGROUND

1.1.1 DBFL Consulting Engineers (DBFL) has been commissioned by Cairn Homes Properties Ltd to compile a Traffic and Transport Assessment (TTA) for a proposed residential development on a greenfield site located within the Newcastle Local Area Plan (LAP) lands at Newcastle, Co. Dublin.

1.1.2 The proposals incorporating 406 residential units (281 houses, 125 apartments / duplexes) represent Phase 1 of a larger land holding. The subsequent phased delivery of a further residential development (Phase 2) will be subject to a separate planning application.

1.1.3 The report has been produced to assess and evaluate the likely impact of the proposed development upon the local transportation system.

1.1.4 During the development of this report, traffic turning count surveys have been commissioned specifically for this assessment, with the objective of providing background information relating to existing traffic movement patterns across the local road network. This information has been supplemented with data obtained from site audits of the local road network, subsequently enabling the identification of existing local travel characteristics and an appreciation of the local receiving environment from a transportation perspective.

1.2 SCOPE

1.2.1 The purpose of this TTA is to quantify the existing transport environment and to detail the results of assessment work undertaken to identify the potential level of any transport impact generated as a result of the proposed residential development. The scope of the assessment covers transport and related sustainability issues including means of vehicular access, pedestrian, cyclist and local public transport connections. The principal objective of the report is to quantify any level of impact across the local road network and subsequently ascertain both the existing and future operational performance of the local road network.

1.2.2 The scope of this assessment has been discussed with the local authority during a technical meeting undertaken on 18th October 2018 at SDCC offices. A range of

requirements were agreed including the inclusion of an additional Sensitivity Analysis which would consider the potential Phase 2 lands under the control of the Applicant.

1.3 METHODOLOGY

1.3.1 Our approach to the study accords with policy and guidance both at a national and local level. Accordingly, the adopted methodology responds to 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;
- *'Traffic Management Guidelines'* Dublin Transportation Office & Department of the Environment and Local Government (May 2003);
- *'Guidelines for Traffic Impact Assessments'* The Institution of Highways and Transportation;
- Newcastle Local Area Plan 2012; and
- South Dublin County Council Development Plan 2016-2022.

1.3.2 Our methodology incorporated a number of key inter-related stages, including;

- Background Review: This important exercise incorporated three parallel tasks which included (a) an examination of the local regulatory and development management documentation; (b) an analysis of previous 'transport' related, strategic and site specific studies of development and transport infrastructure proposals across the Newcastle area, and (c) a review of planning applications to establish the status of various third party development schemes that were either considered within the strategic 'transport' studies or which have emerged and received full planning permission since.
- Site Audit: A site audit was undertaken to quantify existing road network issues and identify local infrastructure characteristics, in addition to establishing the level of accessibility to the site in terms of walking, cycling and public

transport. An inventory of the local road network was also developed during this stage of the assessment.

- Traffic Counts: Junction traffic counts in addition to vehicle queue length surveys were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed residential development.

- Trip Generation: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed residential development.

- Trip Distribution: Based upon both the existing and future network characteristics, 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 site access strategy more detailed computer simulations have been undertaken to assess the operational performance of key junctions in the post development 2020, 2025 and 2035 development scenarios.

1.4 REPORT STRUCTURE

1.4.1 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.

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

1.4.3 A description of the proposed development scheme is described in Chapter 4 whilst 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 the local road network.

1.4.4 The operational performance of key local junctions are assessed for the 2020 Opening Year and the 2025 (Opening Year +5 years) and the 2035 (Opening Year +15 years) Horizon Years are summarised within Chapter 6.

1.4.5 Chapter 7 incorporates a sensitivity analysis undertaken to consider the impact of the potential Phase 2 development lands whilst a potential future 3rd Party development and associated vehicle trip generation on the key local junctions is assessed in a second sensitivity analysis within Chapter 8.

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

2.0 RECEIVING ENVIRONMENT

2.1 LAND USE

2.1.1 The application site comprises of a main development site of approximately 16 hectares, to the south of Main Street, together with three infill sites which comprise of a 0.80ha site at Ballynakelly; a 0.18ha site at Ballynakelly Rise and a 0.05ha site at Ballynakelly Edge.

2.1.2 The Main Development Site and largest infill site predominantly comprises greenfield site, the majority of which is zoned RES-N *"To provide for new residential communities in accordance with approved area plans"* within the 2016-2022 South Dublin County Development Plan. Similarly, the LAP provides for the extensive / comprehensive residential development of the subject land. The 2 no. smaller infill sites are zoned RES *"To protect and / or improve residential amenity"* each of which a adjoin existing residential developments.

2.2 LOCATION

2.2.1 The general location of the subject site in relation to the surrounding road network is illustrated in Figure 2.1 below whilst Figure 2.2 indicatively shows the extent of the subject site boundary and neighbouring lands. The subject Newcastle site is located approximately 4km north west of Rathcoole and 10km northwest of Tallaght whilst Dublin City Centre lies approximately 18km to the northeast.

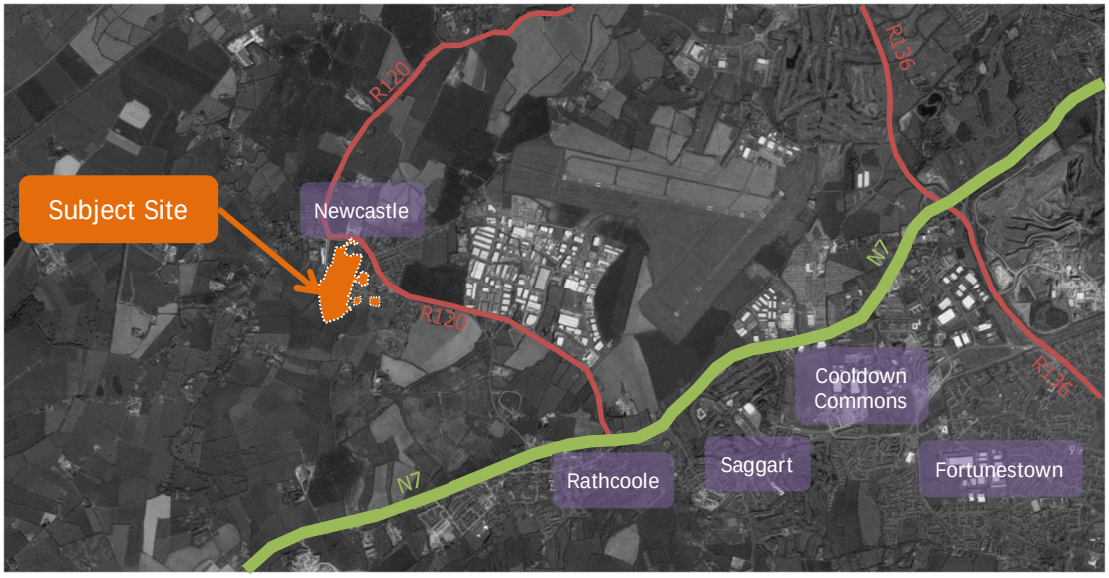


Figure 2.1: Site Location (source googlemaps)

2.2.2 The development site is bounded by the R120 road corridor to the north in addition to a number of residential units. The Burgage Crescent corridor forms the eastern boundary. The Athgoe western site boundary comprises St. Finians NS (and future residential development approved under Planning Application Ref. SD17A/0378) and greenfield sites which will later accommodate Phase 2 of the development site whilst agricultural lands lie to the south of the southern site boundary.

Figure 2.2: Indicative Phase 1 Site Boundary (source googlemaps)

2.3 LOCAL AMENTIES

2.3.1 The proposed development site is very well placed in terms of the availability of local amenities including St. Finian's NS.

2.3.1 Furthermore, the subject site benefits from good access to employment opportunities including the Aerodrome / Greenogue business Parks located approximately 1.5km to the east, Grange Castle business Park approximately 5km to the north and the Baldonnell Business Park and Citywest Business Campus located approximately 5km and 6.5km to the east respectively. Figure 2.3 above shows indicatively the subject site's location in relation to the aforementioned local amenities.

Figure 2.3: Subject Site Local Amenities

2.4 EXISTING TRANSPORTATION INFRASTRUCTURE

Road Network

2.4.1 The subject lands are bounded to the north by Newcastle Main Street (R120) and existing residential dwellings. Travelling west and north along the R120 leads to Lucan (8km) and the N4 corridor (J4). Continuing west along Newcastle Main Street leads to the R405 corridor which provides access to Celbridge (6km), Maynooth (12km) and the strategic M4 Motorway.

2.4.2 The N7 national road corridor is located approximately 3.5km to the south east and is accessed along the R210 via the Rathcoole Interchange. Travelling northbound on the N7 leads to the M50 motorway and Dublin City Centre. The strategic M7 motorway is accessible by travelling southbound on the N7.

Existing Cycling and Pedestrian Facilities

2.4.3 Currently there are cycle lanes in on both sides of the Burgage Crescent and Newcastle Boulevard corridors located to the east of the subject lands as presented in Figure 2.4 below.

Figure 2.4: Pedestrian & Cycle Facilities on Newcastle Boulevard and Burgage Crescent

2.4.4 To the west of the subject site lands, a 2-way cycle track is located on the western side of the St. Finian's school access road (Figure 2.5) which will in the future also serve a planning approved (Pl. Ref. SD17A/0378) 40 unit residential development located between the subject site lands and St. Finian's NS. Future linkages are proposed between Phase 2 of the subject lands and this adjoining residential development.

Figure 2.5: Pedestrian & Cycle Facilities on St. Finian's Access Road

2.4.5 Along the R120 (north of the subject site) a footway is currently provided along both sides of the carriageway with street lighting on the southern side of the corridor (Figure 2.6).

Figure 2.6: Pedestrian Facilities Along R120

Public Transport – Bus

2.4.6 Dublin Bus operates two routes (one of which is an express route) that serve the subject site locale including the number 68/a and 68x (Newcastle – Greenogue Business Park Towards Dublin City Centre). These routes provide links from the subject site's general vicinity to the city centre and all intermediate destinations. The associated bus stops are all within convenient walking distance of the subject site. The scheduled arrival/departure times for bus's to and from the city centre are better outlined in Table 2.1 below.

2.4.7 In addition, Dualway Transport (accessible at the Aylmer road bus stop) provides a two daily services (Route 311) from Newcastle/Rathcoole to The Square, Tallaght from Mondays to Fridays only, with the exception of Wednesdays when there an additional one-way service to Tallaght. One of the intermediate stops along this route is located at Citywest Shopping Centre (located to the southeast of the subject site).

Bus Route	Weekdays		Saturdays		Sundays & Bank Holidays	
	To City Centre	From City Centre	To City Centre	From City Centre	To City Centre	From City Centre
68/a	22	20	18	17	11	12
68x	1	-	-	-	-	-

Table 2.1: Dublin Bus Service Frequency (No. of services per day)

Public Transport – Rail / Park and Ride

2.4.8 The subject development site is located approximately 4km away from the Hazelhatch and Celbridge rail station where services between Dublin Heuston and various destinations including Cork, Galway and Limerick / Ennis. The Hazelhatch and Celbridge rail station benefits from a Park & Ride facility incorporating 400 no. car parking spaces making travel by rail a feasible alternative to future residents of the subject development.

2.4.9 Furthermore, the Saggart LUAS station and Cheeverstown LUAS P & R station are located approximately 5.5km and 8.0km respectively to the east of the subject site providing access to LUAS Red Line services operating between Saggart and Connolly Station / The Point via Dublin City Centre. Red line services from this stop operate between 05:42-23:52 Monday to Friday, 06:42-23:52 on Saturday's and 07:12-22:52 on Sunday's (and Bank Holiday's). A summary of the average LUAS frequency by day of the week is presented in Table 2.2 below.

Time	Monday – Friday	Saturday	Sunday
Earlier than 07:00	18	14	13
07:00 – 10:00	7	14	13
10:00-16:00	7	12	10-13
16:00-19:00	6	11	10
Later than 19:00	11	10	11

Table 2.2: LUAS Red Line Service Frequency (Minutes)

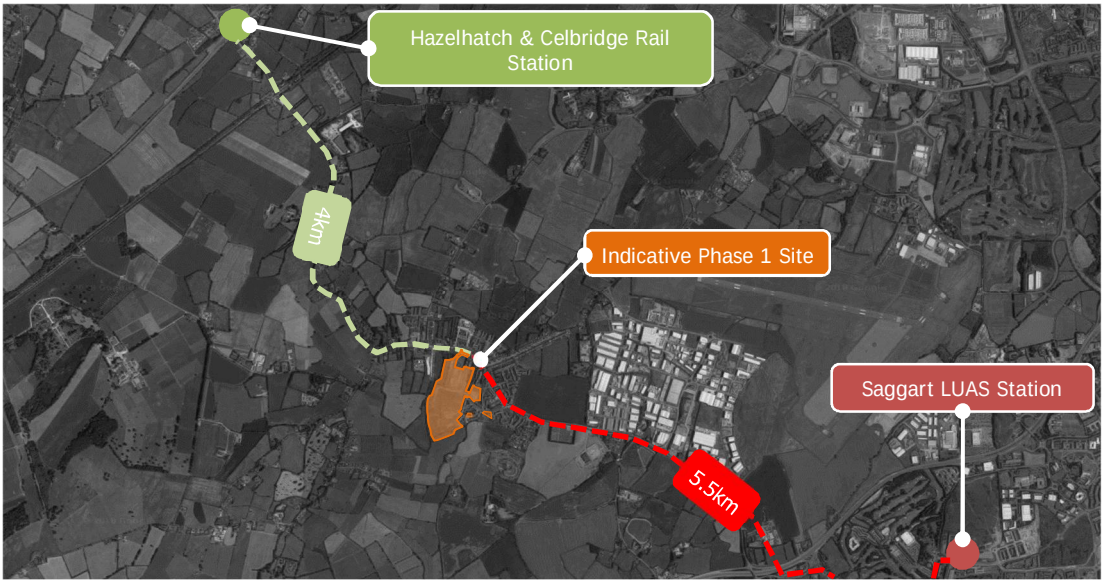


Figure 2.7: Rail & Park & Ride Accessibility

2.5 PROPOSED TRANSPORT INFRASTRUCTURE

Cycle Network Proposals

2.5.1 The subject site lies within the "South Meath / North Kildare sector" as outlined within the Dublin Greater Area Cycle Network Plan (2013). Figure 2.8 below illustrates the cycle network proposals in the vicinity of the subject site as outlined within the Plan. In the vicinity of the subject site the Plan includes proposals for an Inter-urban cycle route along the R120 corridor (Newcastle Main Street) located just to the north of the subject site.

2.5.2 The Newcastle LAP 2012 (Extended 2017) proposes a series of 'Green Links' through the LAP area which will provide pedestrian / cycle links between future development within the LAP lands and the existing transport network via dedicated pedestrian / cycle facilities segregated from vehicular traffic. Figure 2.9 below presents the indicative location of the 'Green Links' as per the LAP.

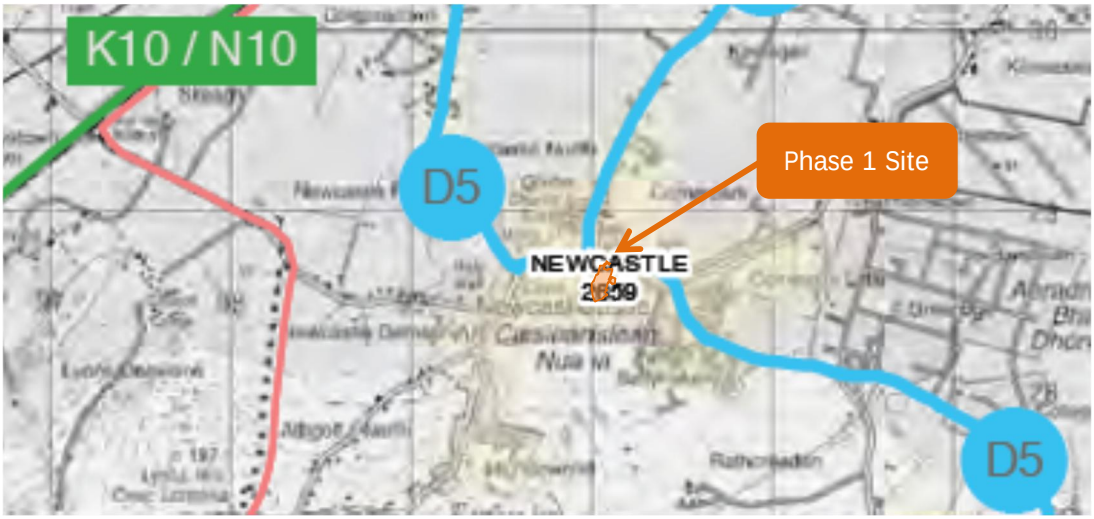


Figure 2.8: GDA Cycle Network Plan Proposals (Extract of Sheet RN5)

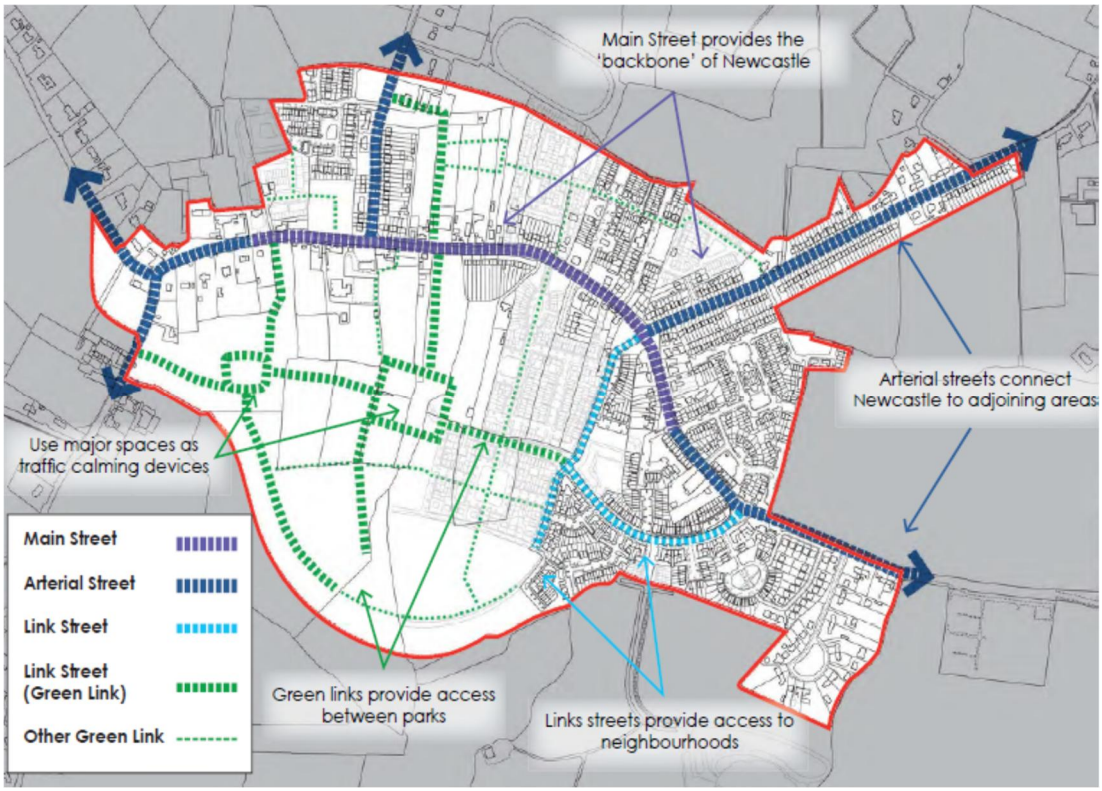


Figure 2.9: Newcastle LAP Movement Framework (Source: Fig 5.6 Newcastle LAP 2012)

Road Infrastructure Proposals

2.5.3 The South Dublin County Development Plan 2016-2022 proposes a *"strategic road network consisting of national and regional routes"*. Newcastle is located along / adjoining a route designated as a *"New Major regional Route"* as presented in Figure 2.10 below. Table 6.5 of the Development Plan lists a total of sixteen 6-year roads objectives of which 2 will, once complete, improve road infrastructure within and / or travelling to Newcastle and include;

- Newcastle Street Network – includes various streets within the Newcastle LAP lands; and
- Newcastle Road (R120) – comprises junction upgrades at Supervalu roundabout, Hillcrest Road and N4 overbridge.

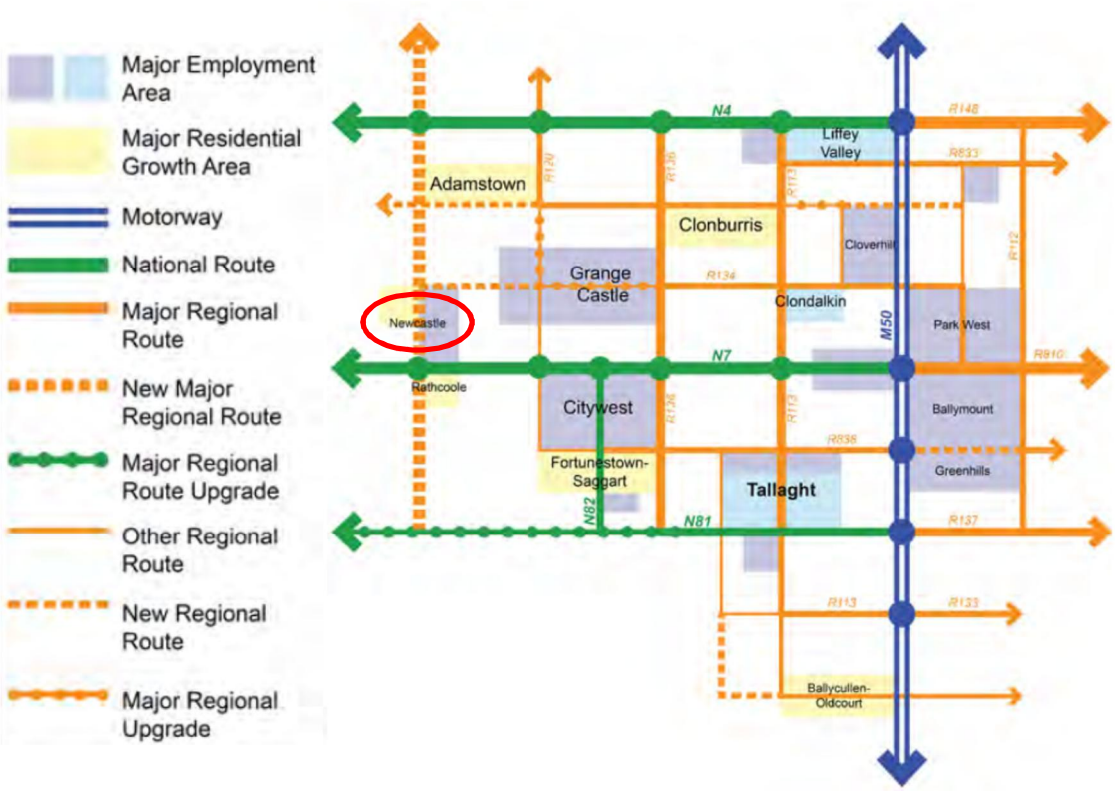


Figure 2.10: SDCC Strategic Road Network (Source: Fig 6.3 SDCC Development Plan 2016-2022)

2.5.4 A medium to long term objective, as included within Table 6.6 of the Development Plan, promotes the provision of the Western Dublin Orbital Route (North) which is a "New high capacity road from Tootenhill to the Leixlip Interchange (with a provision to make a further connection to the N3)". This roads objective will form a "Major regional link between the N7 to N4". Furthermore, of the Western Dublin Orbital Route (South) is proposed also as a medium to long term objective and is described as a "New road from Boherboy to Tootenhill" which will act as a "link between the N81 and the N4 with a by-pass function around Rathcoole and Saggart". Figure 2.11 below presents the location of these SDCC road infrastructure proposals relative to the subject development site lands.

2.5.5 The future delivery of the Western Dublin Orbital Route will transform Newcastle by removing all through traffic. Accordingly, the quantum of vehicle movements along the R120 and through the busy N7 Rathcoole Interchange (Junction 4) will reduce dramatically in time.

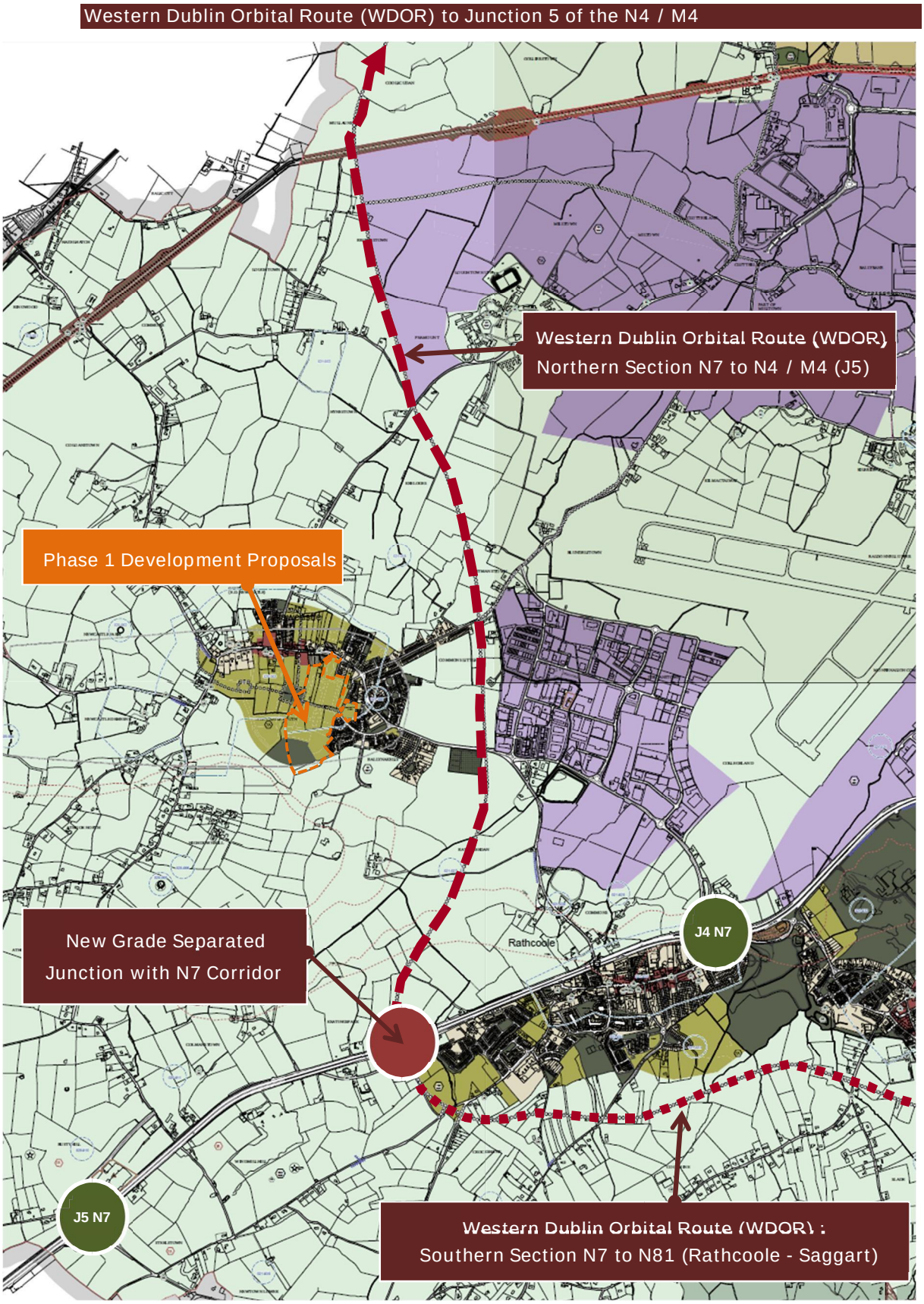


Figure 2.11: Western Dublin Orbital Route Proposal (Source: SDCC Dev. Plan Maps)

2.5.6 The subject development site is located within the Newcastle LAP lands. The Newcastle LAP 2012 (Extended 2017) includes an movement framework map which indicatively shows the proposed road network within the LAP lands (Figure 2.12).

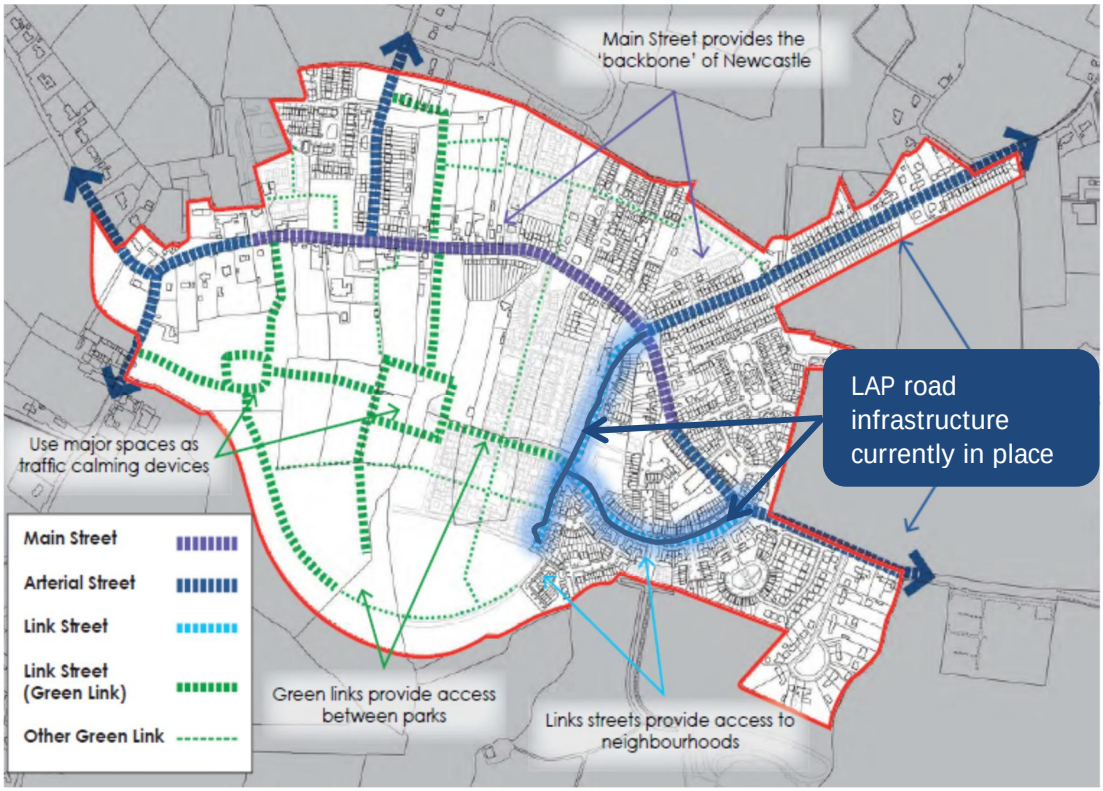
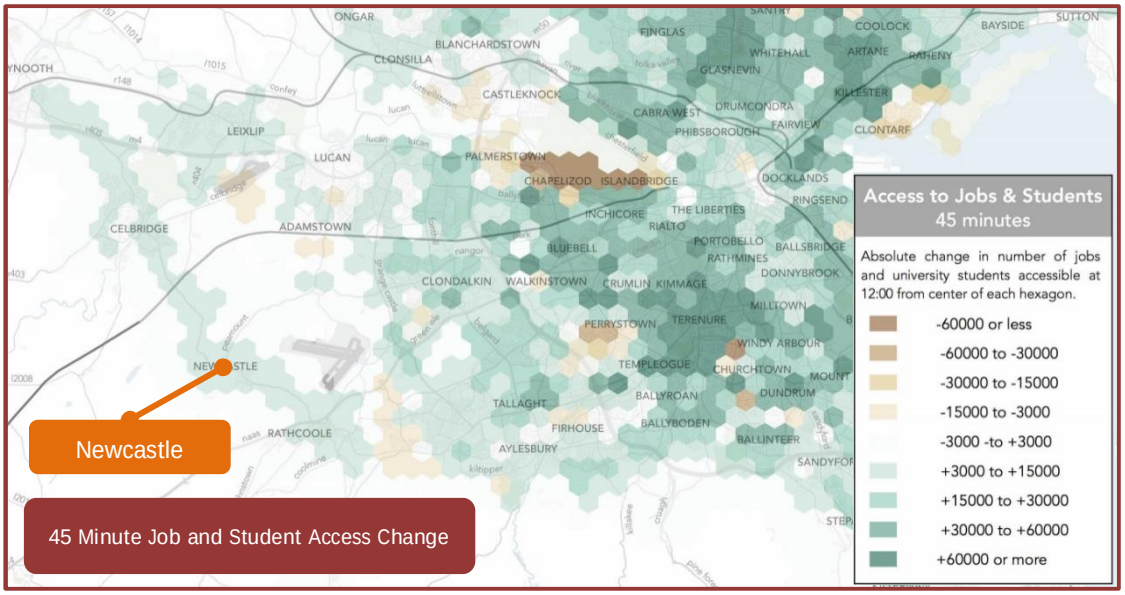


Figure 2.12: Newcastle LAP Overall Strategy Map (Source: Fig 5.6 Newcastle LAP 2012)

Public Transport Proposals

2.5.7 The Dublin Area Bus Network Redesign (which is currently under review following the public consultation stage) aims "to provide a network designed around the needs of Dublin today and tomorrow, rather than based on the past". The existing Dublin Bus service no. 68 is proposed to be replaced with the new Route 256 which provides direct access to the Red Cow Luas interchange and a new Route 63 bus service. Furthermore, the proposed new orbital Route W8 between Tallaght and Maynooth.

2.5.8 The aforementioned bus service alterations will result in greater accessibility between Newcastle and work / education opportunities. Figure 2.13 below illustrates that, following the proposed bus network amendments, there is predicted to be an absolute increase in number of jobs and education accessibility of between 3000-15000 within a 45 minute catchment and between 15000-30000 within the 60 minute catchment.



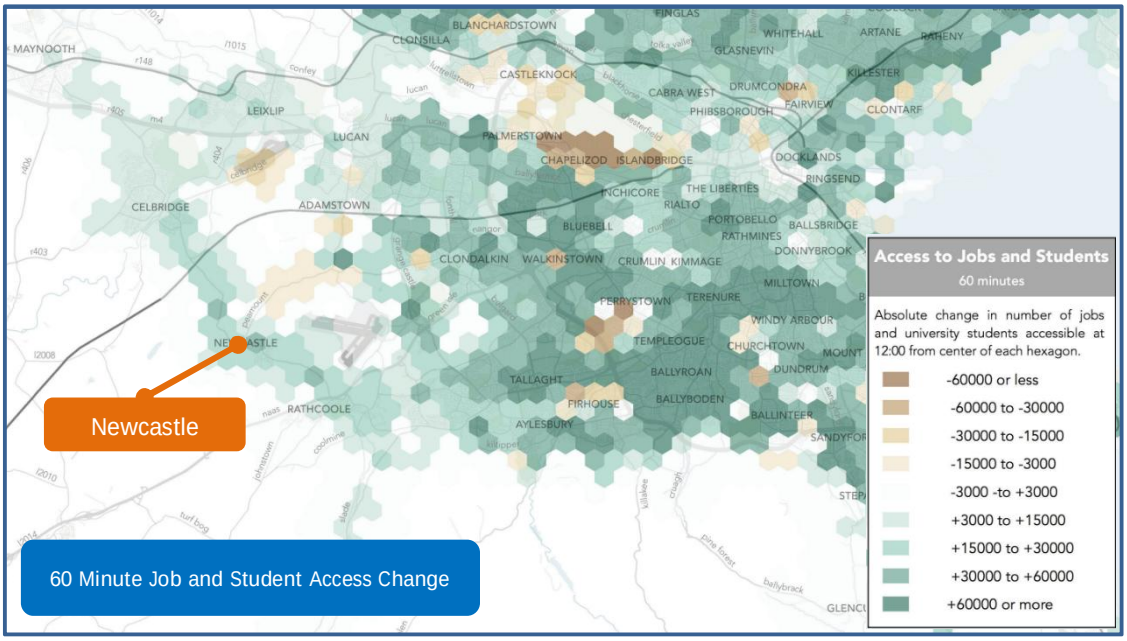


Figure 2.13: Job and Student Access Change (Source:Figures 12.3&12.4 Dublin Area Bus Network Redesign Public Consultation Report)

2.6 ROAD SAFETY REVIEW

2.6.1 With the objective of ascertaining the road safety record of the immediate routes leading to/from the subject site, the collision statistics as detailed on the Road Safety Authority's (RSA) website (www.rsa.ie) have been examined. The RSA website includes basic information relating to reported collisions over the most recent ten-year period, from 2005 to 2014 inclusive.

2.6.2 The RSA database records details where collision events has been officially recorded such as the when the Garda being present to formally record details of the incident.

2.6.3 In reference to Figure 2.14 and Table 2.3 below, incident numbers 1, 3, 5, 6 resulted in minor casualties involving a car.

Ref	Severity	Year	Vehicle	Circumstances	Day	Time	Casualty
1	Minor	2009	Car	Single Vehicle Only	Wed	1700-1000	3
2	Minor	2008	Good Vehicle	Head On Conflict	Sat	1000-1600	1
3	Minor	2013	Car	Other	Tues	1600-1900	2
4	Minor	2014	Bicycle	Other	Sat	1600-1900	1
5	Minor	2012	Car	Rear End, Striaght	Mon	1600-1900	2
6	Minor	2011	Car	Rear End, Striaght	Sat	1000-1600	1
7	Serious	2012	Car	Rear End, Straight	Mon	1600-1900	5

Table 2.3: Collision Records - (source www.rsa.ie)

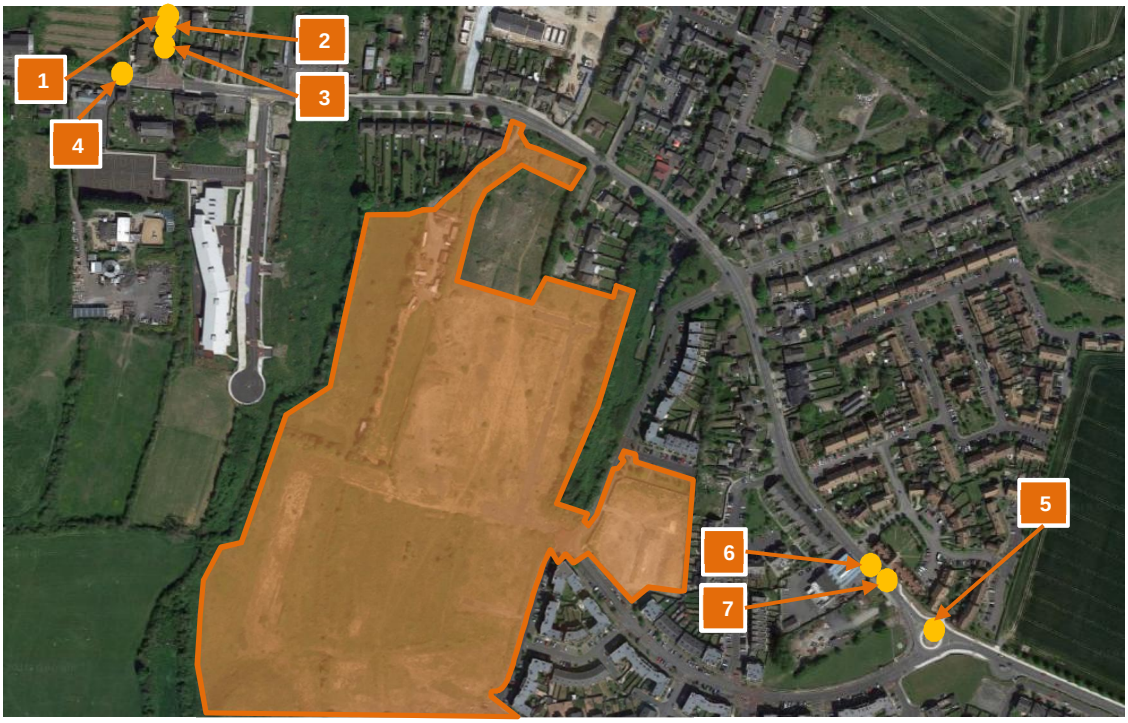


Figure 2.14: Collision Records - (source www.rsa.ie)

2.6.4 Incident number 2 resulted in a minor casualty and involved a goods vehicle whilst incident 4 was recorded as involving a bicycle resulting in a minor casualty. Finally, incident number 7 resulted in a serious casualty and involved a car.

2.6.5 The review of the RSA data available reveals that there are no apparent trends in collisions which have occurred in the vicinity of the subject site during the most recent 10-year period (2005-2014). The analysis demonstrates that there are currently no road safety issues across in the immediate vicinity of the proposed subject site access location points.

3.0 POLICY FRAMEWORK

3.1 SOUTH DUBLIN COUNTY DEVELOPMENT PLAN 2016-2022

3.1.1 The South Dublin County Development Plan 2016-2022 sets the broad development framework for the county and the development areas within its administrative boundary. In the context of the subject proposals, the following are the relevant transport and development objectives set out in the plan: -

Housing Policy

"Policy 6 – Sustainable Communities: It is the policy of the Council to support the development of sustainable communities and to ensure that new housing development is carried out in accordance with Government policy in relation to the development of housing and residential communities."

Housing Objective

"H2 Objective 1: To ensure that sufficient zoned land, which could be serviced by sufficient public transport and road capacity, continues to be available at appropriate locations to satisfy the housing requirements of the County and to support and facilitate the development of housing lands based on the Settlement Strategy outlined in Chapter 1 Introduction and Core Strategy."

Transport & Mobility Policies

"Policy 1 – Overarching: It is the policy of the Council to promote the sustainable development of the County through the creation of an integrated transport network that services the needs of communities and businesses."

"Policy 2 – Public Transport: It is the policy of the Council to promote the sustainable development of the County by supporting and guiding national agencies in delivering major improvements to the public transport network and to ensure existing and planned public transport services provide an attractive and convenient alternative to the car."

"Policy 3 – Walking and Cycling: It is the policy of the Council to re-balance movement priorities towards more sustainable modes of transportation by prioritising the development of walking and cycling facilities within a safe and traffic calmed street environment."

"Policy 4 – Strategic Road and Street Network: It is the policy of the Council to improve and expand the County-wide strategic road and street network to support economic development and provide access to new communities and development."

Transport & Mobility Objectives

"TM1 Objective 4: To prioritise new road construction that provides access to new communities and development areas and supports the economic development of the County."

"TM1 Objective 4: To support the delivery of sufficient public transport and road capacity to facilitate sustainable new development in the County."

"TM2 Objective 3: To generate additional demand for public transport services through integrated land use planning and maximising access to existing and planned public transport services throughout the network."

"TM2 Objective 4: To create an interlinked network that maximises the efficiency of existing services, reduces overall journey times and facilitates easy exchanges between modes and/or routes."

"TM3 Objective 2: To ensure that connectivity for pedestrians and cyclists is maximised in new communities and improved within existing areas in order to maximise access to local shops, schools, public transport services and other amenities, while seeking to minimise opportunities for anti-social behaviour and respecting the wishes of local communities."

Strategic Road and Street Network

3.1.2 Table 6.6 of the Development Plan presents a list of medium to long term roads objectives in the Plan area. Included in this table is the Western Dublin Orbital Route (North) which is a "New high capacity road from Tootenhill to the Leixlip Interchange (with a provision to make a further connection to the N3)". This roads objective will form a "Major regional link between the N7 to N4". Furthermore, the Western Dublin Orbital Route (South) is proposed also as a medium to long term objective and is described as a"New road from Boherboy to Tootenhill" which will act as a "link between the N81 and the N4 with a by-pass function around Rathcoole and Saggart".

3.2 NEWCASTLE LOCAL AREA PLAN MAY 2012

3.2.1 The subject site lies within the Newcastle Local Area Plan (LAP) lands (Figure 3.1) and as such is governed by the specific policies and objectives outlined with the Newcastle Local Area Plan (2012). In the context of the subject proposals, the following are the relevant transport and development objectives set out in the plan:

Local Area Plan Objective AM2

"Development proposals shall offer choices of routes and help to dissipate vehicular traffic throughout the Plan Lands. This will include a design speed of 30 kilometres per hour for Access Streets."

Local Area Plan Objective AM3

"All Neighbourhoods shall be afforded direct vehicular, pedestrian and cyclist access to Main Street. Access routes and streets shall be safe, barrier free and overlooked by development."

Figure 3.1: Newcastle LAP Area (Extract of Fig 2.4 Newcastle LAP 2012)

Local Area Plan Objective AM4

"Cycling and walking shall be encouraged within and through the Plan Lands by creating an open ended and integrated network of safe and accessible pedestrian and cycle routes that serve all streets and spaces including existing streets. All existing and new Neighbourhoods shall be afforded direct pedestrian and cyclist access to

Main Street and direct or indirect links to each other and community facilities especially schools."

Local Area Plan Objective AM6

"Signalised junctions shall be provided as opposed to roundabouts in order to encourage cyclist and pedestrian safety and movement. Roundabout junctions are prohibited."

Local Area Plan Objective AM7

"Planning applications for residential, commercial and employment development are required to provide for or integrate with direct, safe and attractive pedestrian and cyclist routes to public transport stops especially bus stops along Main Street."

Local Area Plan Objective AM16

"Support the provision of pedestrian and cyclist routes at a wider level outside of the Plan Lands that will integrate with Newcastle's planned cycle and pedestrian network and link Newcastle with Hazelhatch, Rathcoole and Saggart to include for access to Greenogue (with street lighting) and routes towards the Luas terminus in Saggart and the railway station in Hazelhatch."

Land Use Zoning

3.2.2 As set out within the South Dublin County Development Plan 2016-2022, the subject site has been zoned as follows;

- Main site and largest in-fill site: RES-N *"To provide for new residential communities in accordance with approved area plans",*
- Two smaller in-fill sites: *RES "To protect and / or improve residential amenity".*

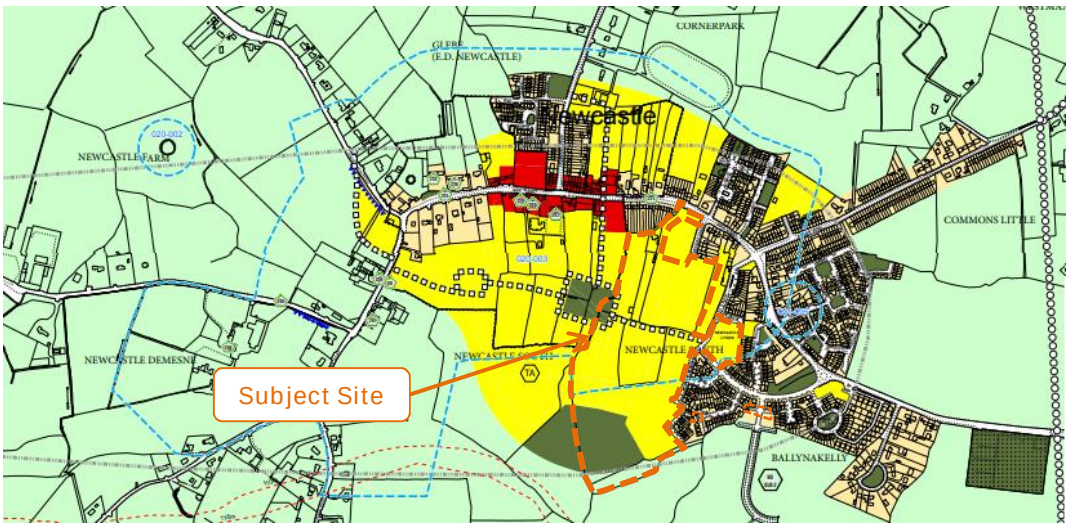


Figure 3.2: Land Use Zoning (Extract from Maps 3 & 7 of the SDCC Development Plan 2016-2022)

3.3 DEVELOPMENT CONTROL

Car Parking Standards

3.3.1 Reference has been made to Table 11.24 of the South Dublin County Council Development Plan (2016-2022) which outlines the maximum car parking standards for the county and Section 4.22 of the Department of Housing, planning and Local Government (DHPLG) "Sustainable Urban Housing: Design Standards for New Apartments".

3.3.2 With regard to the proposed development schedule, the associated car parking requirements are outlined in Table 3.1 below.

3.3.3 In response to the above local development management standards the scheme is permitted to provide up to a maximum of 734 on-site car parking spaces based on the Development Plan requirements and 723-734 based on the departmental requirements.

Unit Type		SDCC Development Standard	DHPLG Standards	No. of Units / Size (GFA)	SDCC Development Plan Requirement		DHPLG Requirement
Apartment	1 bed	1 / 1 unit	1 / unit plus 1 visitor / 3-4 units	8	8	35	36-39
	2 bed	1.25 / unit		20	25		
	3 bed	1.5 / unit		1	2		
Duplex	2 bed	1.25 / unit	1 / unit plus 1 visitor / 3-4 units	48	60	132	120-128
	3 bed	1.5 / unit		48	72		
Houses	2 bed	1.5 / unit	-	21	32	552	552*
	3 bed	2 / unit	-	208	416		
	4 bed			52	104		
Crèche		1 / classroom	-	6	6	6	6*
Commercial		1/15m^2		67.7m^2	5	5	5*
Total						734	723-734

* N/A Corresponding SDCC requirements stated

Table 3.1: Car Parking Standards (Maximums)

Disabled Car Parking

3.3.4 The development plan does not specify a quantum of disabled parking to be provided as part of new developments. Nevertheless, the DLRCC development plan requires that *"4% of car parking spaces provided shall be suitable for use by disabled persons".* Accordingly, the DLRCC provision will be incorporated into the subject scheme.

Electrical Vehicles

3.3.5 Section 11.4.3 of the development plan requires that, *"all developments shall provide facilities for the charging of battery operated cars at a rate of up to 10% of the total car parking spaces"*.

Motorcycle Parking

3.3.6 The development plan does not specify a quantum of motorcycle parking to be provided as part of new developments. Nevertheless, the DLRCC development plan requires *"a minimum of four or more spaces per 100 car parking spaces".* Accordingly, the DLRCC provision will be incorporated into the subject scheme.

Cycle Parking Standards

3.3.7 Reference has been made to the South Dublin County Council Development Plan (2016-2022) which outlines the minimum cycle parking provision sought for new developments within the area governed by SDCC and Section 4.17 of the Department of Housing, planning and Local Government (DHPLG) "Sustainable Urban Housing: Design Standards for New Apartments".

3.3.8 The cycle parking standards stated within the development plan refer to Residential Apartments only specifying 1 no. long term parking space per 5 apartments, and 1 no. short stay (visitor) parking space per 10 apartments. In the absence of a residential house cycle parking standard, it is proposed to incorporate the cycle parking standards as set out in the neighbouring Fingal and Dun Laoghaire-Rathdown County Council Development Plans.

3.3.9 In response to the local Development Plan requirements the scheme is required to provide at least 57 on-site cycle parking spaces comprising at minimum 31 long term and 26 short stay bicycle parking spaces as part of the proposed residential development. With reference to the DHPLG requirements, the subject scheme is required to provide a minimum of 354 cycle parking spaces for the apartment / duplex units (291 long term and 63 short stay).

Dwelling Type	Development Plan Standards		DHPLG Standards		No. of Units	Development Plan Requirement		DHPLG Requirements	
	Long Term	Short Stay	Long Term	Short Stay		Long Term	Short Stay	Long Term	Short Stay
Apartment	1/5 apts	1/10 apts	1 / bed	1/2 apts	1 bed - 8 2 bed - 20 3 bed - 1	6	3	51	15
Duplex	1/5 apts	1/10 apts	1 / bed	1/2 apts	2 bed – 48 3 bed - 48	19	10	240	48
House	-	-	-	-	281 (99[1])	-	-	-	-
Crèche	1/5 staff	1/10 children	-	-	22 staff / 110 children	5	11	-	-
Commercial	1/5 staff	1 / 50m^2	-	-	2 staff / 67.7m^2	1	2	-	-
Sub-Total						31	26	291	63
Total						57		354	

1 Houses with no side access only (99 no.)

Table 3.2: Cycle Parking Standards

4.0 CHARACTERISTICS OF PROPOSALS

4.1 PLANNING HISTORY

4.1.1 A previous planning application (SDCC Pl. Ref. SD05A/0344, ABP Pl. Ref. PL06S.217096) was submitted in May 2005 to South Dublin County Council for the construction of 743 residential units, a neighbourhood Centre (comprising 5 no. retail units, a public house, off-licence and restaurant), 7 no. commercial units and 1 no. crèche facility.

4.2 CURRENT 2019 SCHEME PROPOSALS

Residential Development

4.2.1 The subject Phase 1 proposals seek permission for the provision of 406 no. residential units comprising 125 no. apartments / duplexes and 281 no. houses in addition to a 518 m^2 crèche facility and 67m^2 of commercial land use. A primary school site (approximately 1.5ha) has been reserved at the south-east of the application site in accordance with the Newcastle LAP 2012. A new public park is proposed (approximately 2ha) together with a range of pocket parks and greenways to serve the proposed development and the wider Newcastle community.

4.2.2 The Phase 1 development proposals form part of an overall 2 phase development scheme by the Applicant. It is envisioned that the Phase 2 scheme will incorporate in the region of 291 dwelling units and will be subject to a separate planning application in the future. The Applicant's lands (Phase 1 and Phase 2) incorporating 38.1 Ha makes up the majority of zoned lands located to the south of Newcastle R120 / R405 'Main Street' corridor. The zoned lands, to the south of Main Street incorporating 3rd Party lands have the potential to deliver somewhere in the region of 808 dwelling units (inclusive of the subject development proposals). The 3rd Party lands encompass both Taobh Chnoic Extension and a parcel of land within Burgage South.

4.2.3 In addition to the residential proposals, a 3rd Party commercial development is considered on a plot (adjoining Main Street) of land which lies within the Applicant's ownership boundary, but which will be subject to a separate planning application sometime in the future. A summary of the proposed development, in addition to indicative proposals for the overall 'southern' lands proposals are presented in Table

4.1 and Figure 4.1. Further details of the Phase 1 development proposals are illustrated in the architects' drawings as submitted with this planning application.

4.2.4 The 3rd party Taobh Chnoic Extension and parcel of land within Burgage South development as included in Table 4.1 below has been incorporated into this assessment by way of an additional Sensitivity Analysis summarised in Section 7 of this report.

Unit Type	Units	Phase 1[1]		Phase 2[2]	Future 3rd Party Applications		Total
		Main Site	Infill Sites		Commercial[4]	Taobh Chnoic Extension / Burgage South[3]	
Residential							
Apartment / Duplex	1 Bed	-	8	-	-	-	8
	2 Bed	36	32	-	-	-	68
	3 Bed	36	13	-	-	-	49
House	2 Bed	21	-	-	-	-	21
	3 Bed	201	7	228	-	83	519
	4 Bed	52	-	63	-	28	143
Total		346	60	291	-	111	808
Non-Residential							
Commercial	1 no.	-	67.7m^2	-	1140 m^2	-	1207 m^2
Crèche	6 classes	518m^2	-	518m^2	-	-	1036m^2

1 Phase 1 proposals comprise subject application scheme
2 Phase 2 lands are within applicant's ownership but does not form part of the subject proposals and will be subject to a separate planning application
3 Not within applicant's ownership and will be subject to a separate planning application
4 3rd party commercial proposals to the north of the masterplan lands.

Table 4.1: Masterplan Schedule

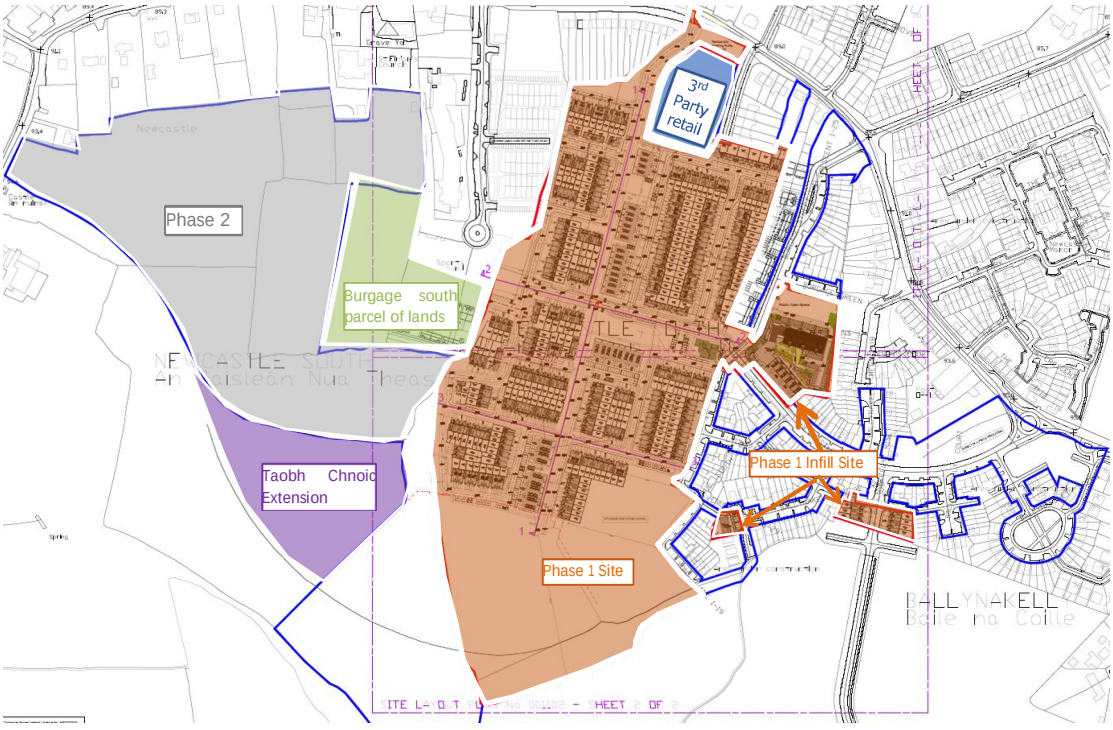


Figure 4.1: Proposed Development Layout

Road Infrastructure

4.2.5 The subject proposals include for the provision of the through east-west access road, as per the Newcastle LAP, between the Newcastle Boulevard / Burgage Crescent junction to the western boundary of the subject Phase 1 site boundary. Furthermore, a new north-south road link is proposed between the aforementioned access road and the R120 correlating with the LAP's link road proposal as presented in Figure 4.2.

4.2.6 The design of the road infrastructure has sought to respectfully the LAP objectives in addition to the DMURS design objectives. Further information, including geometric details, of the road infrastructure proposed as part of the subject scheme within the subject site boundary can be seen in DBFL Drawing 170024-2001 and 2002 as submitted with this planning application.

Pedestrian / Cycle Infrastructure

4.2.7 A series of 'green' links are proposed as part of the subject scheme comprising; i) 4m wide shared segregated cycle / pedestrian facilit along the proposed link road to the north and in a notht / south direction through the site and ii) 2m footways and cycle lanes / tracks along either side of the main spine road as presented in Figure 4.2 below.

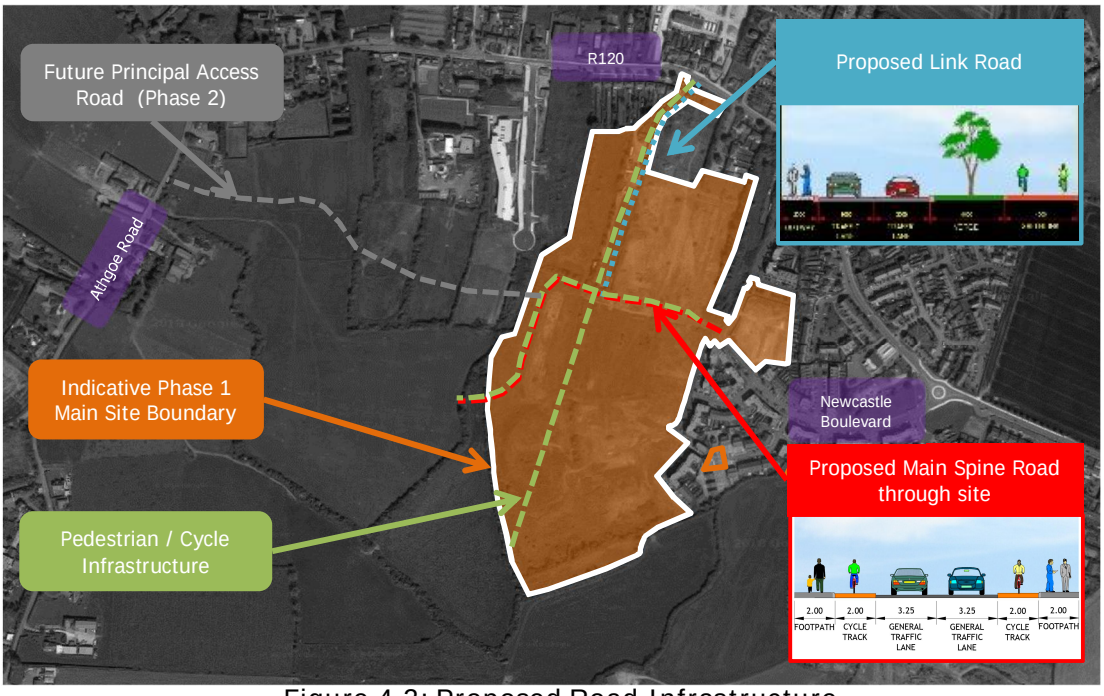


Figure 4.2: Proposed Road Infrastructure

Vehicle Access

4.2.8 The proposed development site is proposed to be accessible from 3 no. access points. The first will be located to the east on Burgage Crescent in the form of a four arm crossroads with Burgage Road / Newcastle Boulevard junction and the second in the form of a simple T-junction further south on Burgage Crescent [Lyons Avenue]. The third site access is proposed to the north with the R120 Main Street corridor and takes the form of a new 3-arm priority controlled junction including the introduction of a 'ghost' island arrangement on the R120 incorporating a new right turn lane to be carried out in conjunction with SDCC. It is expected that this third site access junction will be implemented sometime between the 2020 Opening Year and 2025 Future Design Year with the introduction of the future 3rd party commercial development located to the north of the masterplan lands.

4.2.9 As introduced previously, the subject proposals form Phase 1 of an overall masterplan development. Following the implementation of the overall masterplan development, a fourth site access is proposed to the west of the subject site in the form of a new priority controlled junction with the Athgoe Road corridor which will be implemented with the introduction of the future Phase 2 development.

4.2.10 Figure 4.3 below presents the aforementioned site access locations. Further details of the proposed site access junctions are provided in DBFL Drawing 170024-2001 as submitted with this planning application.

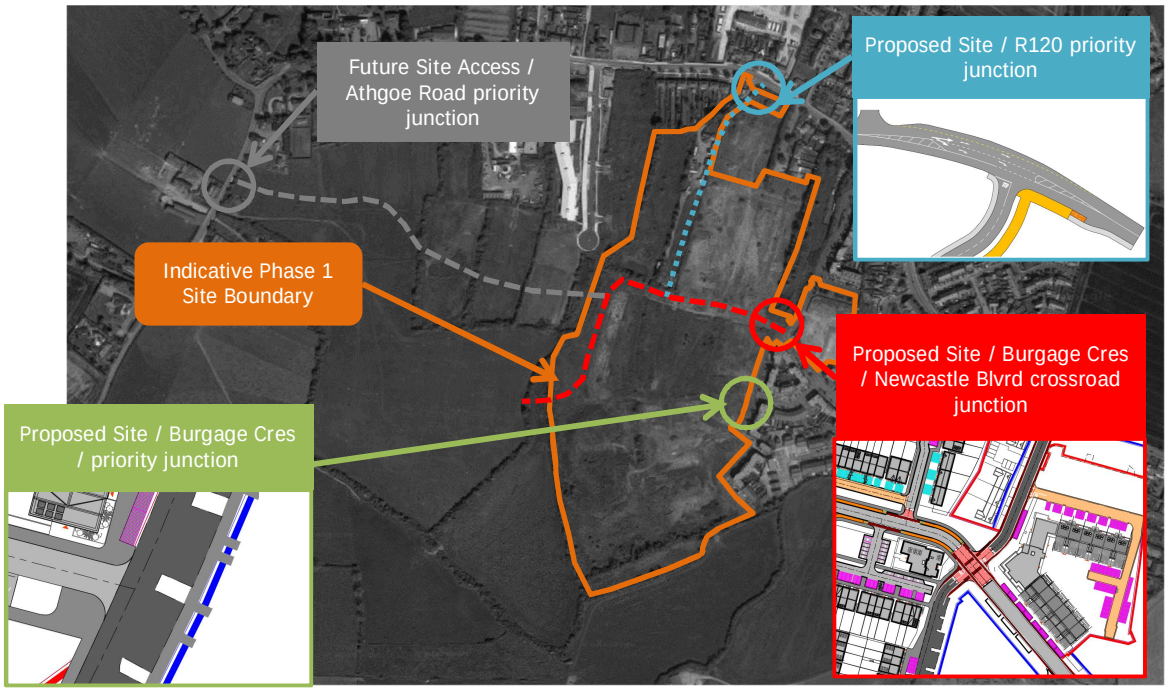


Figure 4.3: Proposed Site Access Locations

Pedestrian / Cycle Access and Permeability

4.2.11 The proposed vehicular site access locations introduced above will also facilitate access to the subject site lands for cyclists and pedestrians. Furthermore, a number of permeable links have been facilitated which will accommodate accessibility to existing / future 3rd party developments as presented in Figure 4.4 below.

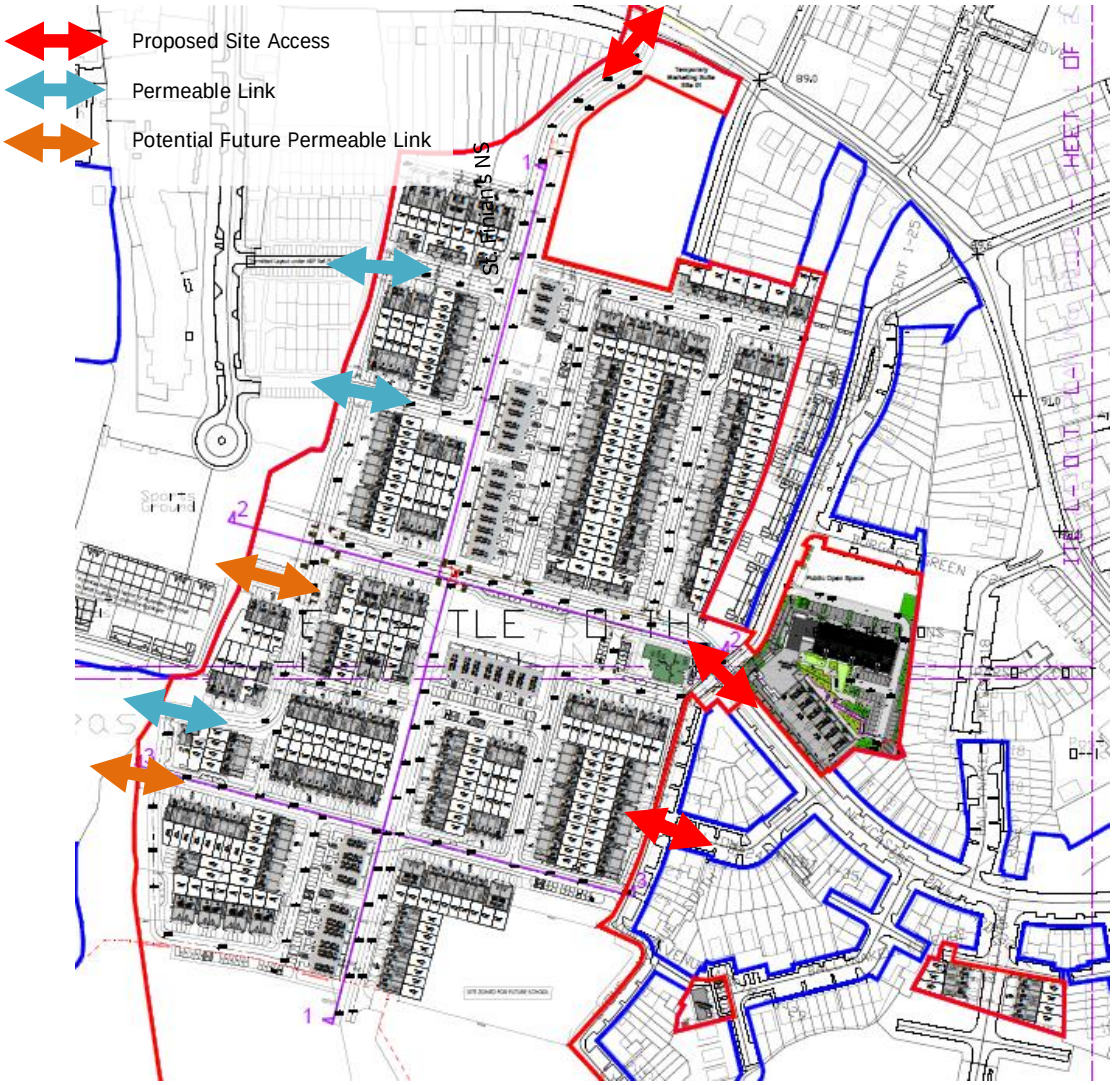


Figure 4.4: Proposed /Potential Cycle & Pedestrian Access and Permeability

Vehicle Parking

General Car Parking

4.2.12 The proposed development layout design provides a total of 721 no. car parking spaces (excluding 14 no. additional car parking spaces adjoining “open space” areas) comprising 709 residential car parking spaces, 11 creche car parking spaces and 1 no. commercial car parking space. Table 4.2 below provides a summary of the proposed vehicle parking provision.

4.2.13 The provision of 721 no. car parking spaces (excluding 14 no. additional car parking spaces adjoining "open space" areas) is compliant with both the development plan standards and the DHPLG standards for apartments which requires a maximum car parking provision of 734 no. spaces and between 723 to 734 no. car parking spaces respectively.

Car Parking Management Regime

4.2.14 All of the proposed apartment / duplex car parking facilities whilst accessible via public roads will not be located within public areas (e.g. areas adopted by the local roads authority). Accordingly, the proposed developments on-site car parking spaces will remain within the control of the appointed management company. A management regime will be implemented by the development's management company to control access to these on-site apartment car parking bays thereby actively managing the availability of on-site car parking for residents and visitors.

4.2.15 The outright purchase of one of the proposed residential apartments / duplexes will NOT include the ownership of a designated parking space. Nevertheless, all residents of the proposed apartments / duplexes will have the opportunity to apply to the management company for both a (i) residents car parking permit (updated annually or upon return of same permit) to the management company to gain access to a dedicated (assigned) on-site car parking space or (ii) a visitor's car parking permit (which will be issued electronically and subject to time restrictions). A nominal charge will be applied to obtain a permit with the objective of covering the associated management and enforcement costs.

4.2.16 Each permit will enable the resident (or visitor) to park a vehicle within a specific assigned parking bay for a defined period of time. This management regime will enhance the availability of on-site car parking, ensure that every resident who needs car parking can avail of an on-site car parking space whilst residents that actually don't own a car are not unnecessarily assigned a car parking space.

Mobility Impaired Car Parking

4.2.17 Whilst the SDCC Development Plan does not specify a specific quantum of mobility impaired car parking provision, the DLRCC standard has been adopted in the subject assessment which states that *"4% of car parking spaces provided shall be suitable for use by disabled persons"*. A total of 8 no. mobility impaired car parking spaces are

proposed which equates to 4% of the Apartment / Duplex and non-residential car parking provision.

Land Use	General	Visitor	Disabled	Electric Vehicles	Car Share	Motorcycle
Apartments	29	10	7	4	4	10
Duplexes	126					
Houses	508	21	-	-		
Open Space	-	14	-	-		-
Subtotal	663	45	7	4	4	10
Residential Total	723					
Creche	6	3	1	1	-	-
Commercial	1	-	-	-	-	-
Non-Residential Subtotal	7	3	1	1	-	-
Non-Residential Total	12					
Development Total	735					10

Table 4.2: Proposed Car Parking Provision

Electrical Vehicles

4.2.18 A total of 5 no. electrical vehicle car parking spaces are proposed which equates to 10% of the apartment / duplex and non-residential car parking provision. It is assumed that residents of the housing units can utilise their private power supply to charge electric vehicles parked in-curtilage. Accordingly, the proposed electric vehicle parking provision is considered to be compliant with the development plan standards.

Car Share

4.2.19 Further to the above car parking provision, 4 no. car share spaces are proposed within the development site boundary. Residents / visitors of the subject development can book cars online or via the app for as little as an hour, then unlock with their phone; the keys are in the car, with fuel, insurance and city parking all included. The benefits of such car sharing services include, (i) the reduction of the number of cars on the road and therefore traffic congestion, noise and air pollution; (ii) frees up land traditionally used for private parking spaces but which may not be used, (iii) increases use of public transport, walking and cycling as the need for car ownership is reduced and (iv) Car sharing allows those who cannot afford a car the opportunity to drive, encouraging social inclusivity.

Motorcycle Parking

4.2.20 The SDCC Development Plan does not specify a quantum of motorcycle parking to be provided as part of new developments. Nevertheless, the DLRCC Development Plan requires “a minimum of four or more spaces per 100 car parking spaces”. Accordingly, the DLRCC provision will be incorporated into the subject scheme. Therefore, a total

of 10 motorcycle parking spaces are proposed as part of the subject scheme which equates to 4.5 spaces per 100 car parking spaces (excluding housing car parking spaces).

Cycle Parking

4.2.21 A total of 323 number bicycle parking spaces are proposed as part of the development scheme comprising 157 Long Term secured / sheltered spaces and 166 Short Term parking spaces. Table 4.3 below provides a summary of the cycle parking provision proposed. Whilst the development plan does not specify a cycle parking requirement for the residential housing units, 99 Long Term and 57 Short Term cycle parking spaces are provided for houses with no rear side access (99 no.) within the subject scheme proposals.

4.2.22 The proposed overall cycle parking provision of 323 spaces is 266 (or 467%) higher than the Development Plan minimum requirement. Therefore, the subject development proposals are compliant with the development plan cycle parking requirements. The proposed assignment of dedicated apartment / duplex cycle parking is proposed at a rate of approximately double the development plan requirements.

4.2.23 It is noted that the apartment / duplex designated cycle parking spaces represent approximately 21% of the DHPLG requirement. As per Section 4.16 of the DHPLG document, this 'full' apartment cycle parking requirement is for *"new development proposals in central urban and public transport accessible locations and which otherwise feature appropriate reductions in car parking provision"*.

4.2.24 The subject scheme proposes a comparable provision of car parking spaces compared to both the development plan and DHPLG standards. Furthermore, the location of the subject development is characterised as *"Peripheral and /or Less Accessible Urban Locations"* due to both the site's geographical location and current absence of an accessible high quality public transport service.

4.2.25 Accordingly, it is concluded that this proposed cycle parking provision is justifiable and, as stated previously, represents an increase on the development plan requirements. Nevertheless, the cycle parking provided will be monitored by the Management Company and should the demand for cycle parking spaces surpass the supply, additional cycle parking spaces can be accommodated as necessary.

Land Use	Proposed Development		SDCC Requirement		DHPLG Requirement	
	Long Term	Short Term	Long Term	Short Term	Long Term	Short Stay
Apartments	12	7	6	3	51	15
Duplex	38	22	19	10	240	48
Houses	99	57	-	-	-	-
Crèche	6	12	5	11	-	-
Commercial	2	4	1	2	-	-
Open Space	-	64	-	-	-	-
Sub-Total	157	166	31	26	291	63
Total	323		57		354	

Table 4.3: Proposed Bicycle Parking Provision

5.0 TRIP GENERATION AND DISTRIBUTION

5.1 CURRENT TRANSPORT MODAL SPLIT

5.1.1 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. SAPMAP is an interactive mapping tool that allows users to pinpoint a location on the map and access 2016 census data related to that area.

5.1.2 A number of residential developments close to the subject site were analysed to establish current commuter trends in the Newcastle area. This analysis will form the basis of the initial travel characteristics that could be generated by the proposed residential development.

5.1.3 Figure 5.1 below illustrates the areas selected for this analysis. These residential sites were selected due to their proximity to the subject site and as such best represents the development's future travel trends (at least in the short term).

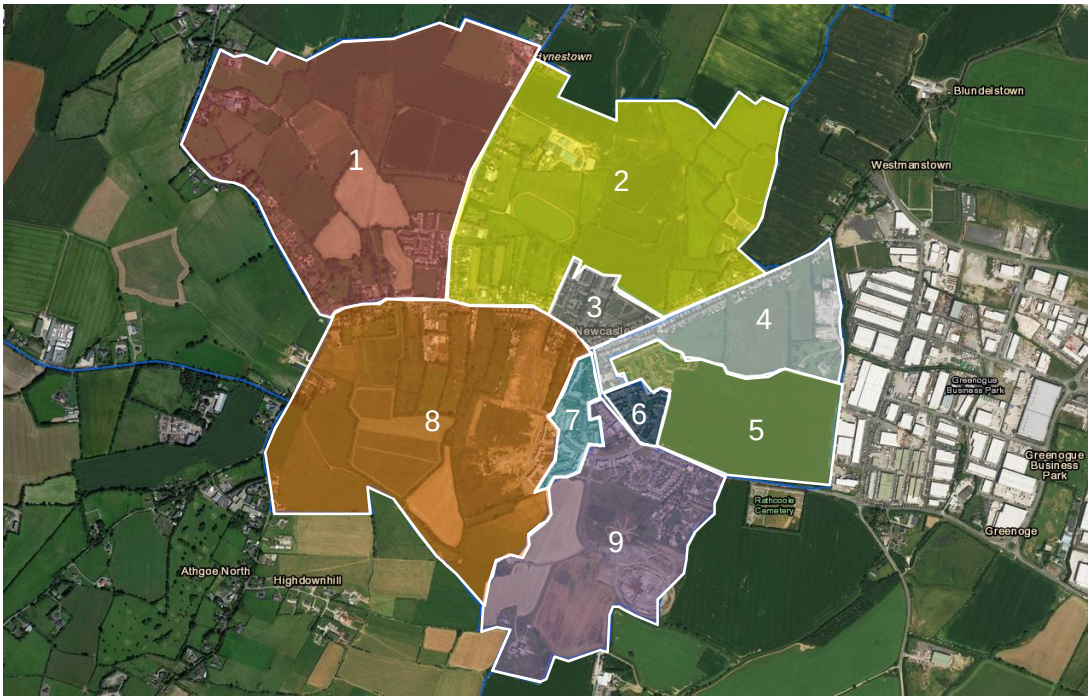


Figure 5.1: Residential Areas of Interest for Trend Analysis
(Source : http://census.cso.ie/sapmap/)

5.1.4 The local residential areas analysed included the following:

1) Newcastle North,
2) Cornerpark,
3) Castlelyon,
4) Commons Little,

5) Newcastle Manor Square / Newcastle Manor Green,
6) Newcastle Manor Park / Newcastle Manor Rise / Newcastle Manor Crescent,
7) Burgage Green / Ballynakelly Edge / Ballynakelly Mews,
8) Newcastle South, and
9) Ballynakelly

5.1.5 The analysis highlights the existing trend in modes used by the residents when travelling to work, school / College from their homes. The summary of the 2016 data for the aforementioned 9 selected sites are illustrated in Figure 5.2 below.

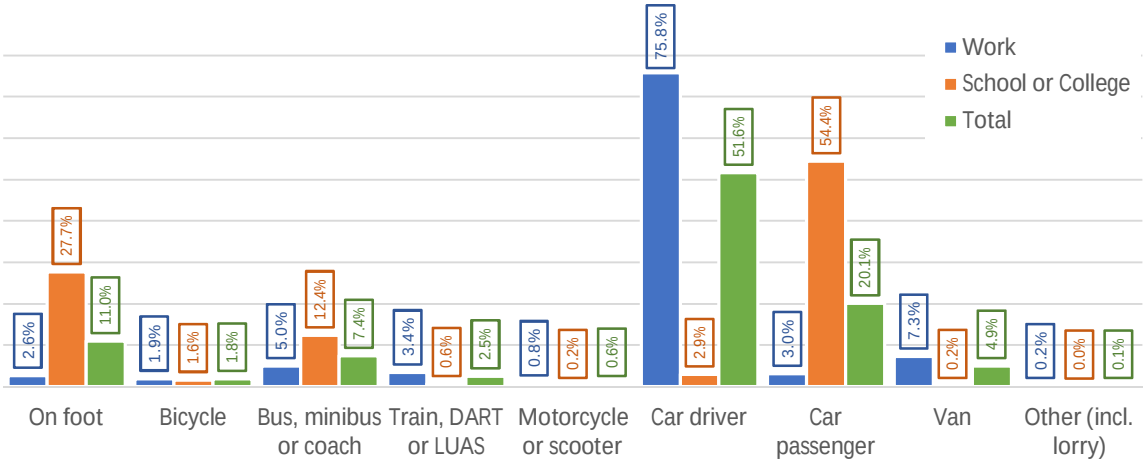


Figure 5.2: 2016 Modal Split for Existing Residential Developments (Newcastle Area)

5.1.6 The above graph indicates that travel by car is the primary mode of transportation in the study area with 75.8% of residents travelling to work as a car driver and 51.6% travelling to school / college as a car passenger.

5.1.7 8.4% of residents travelling to work use public transport (5.0% by bus, 3.4% by Train) whilst 13% of residents travelling for educational purposes do so using public transport (12.4% by bus, 0.6% by LUAS).

5.1.8 The analysis reveals that 4.5% of work trips are undertaken using active modes of travel whilst active travel trips to school / college account for a 29.3% mode share.

5.2 TRAFFIC SURVEYS

5.2.1 In order to establish the existing up to date local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed residential development, a number of traffic surveys were commissioned and undertaken by an independent specialist survey firm Tracsis plc in May 2018.

Junction Turning Counts

5.2.2 With the objective of quantifying the existing traffic movements across the local road network vehicle turning counts were undertaken at a number of local junctions. Weekday traffic counts (classified junction turning counts) were conducted by Tracsis plc over two number three-hour survey periods from 07:00 to 10:00 in the AM and again from 16:00 to 19:00 in the PM period on Tuesday 13th March 2018 at the following six junctions:

- Junction 1 – R405 / Athgoe Road / Hazelhatch Road priority junction
- Junction 2 – R120 Peamount Road / R120 Main Street / R450 Mai Street
- Junction 3 – R120 Main Street (NW) / Aylmer Road / R120 Main Street (SE) / Burgage Cres 4-arm signal junction
- Junction 4 – R120 (NW) / R120 (E) / Newcastle Boulevard 3-arm roundabout junction

5.2.3 The analysis of the survey results established that the local weekday AM and PM peak hours currently occur between 07:30 – 08:30 and 17:00 – 18:00 respectively.

5.2.4 In order to analyse and assess the predicted traffic generation from the proposed residential development upon the local road network, an area wide traffic model incorporating the aforementioned local junctions has been created.

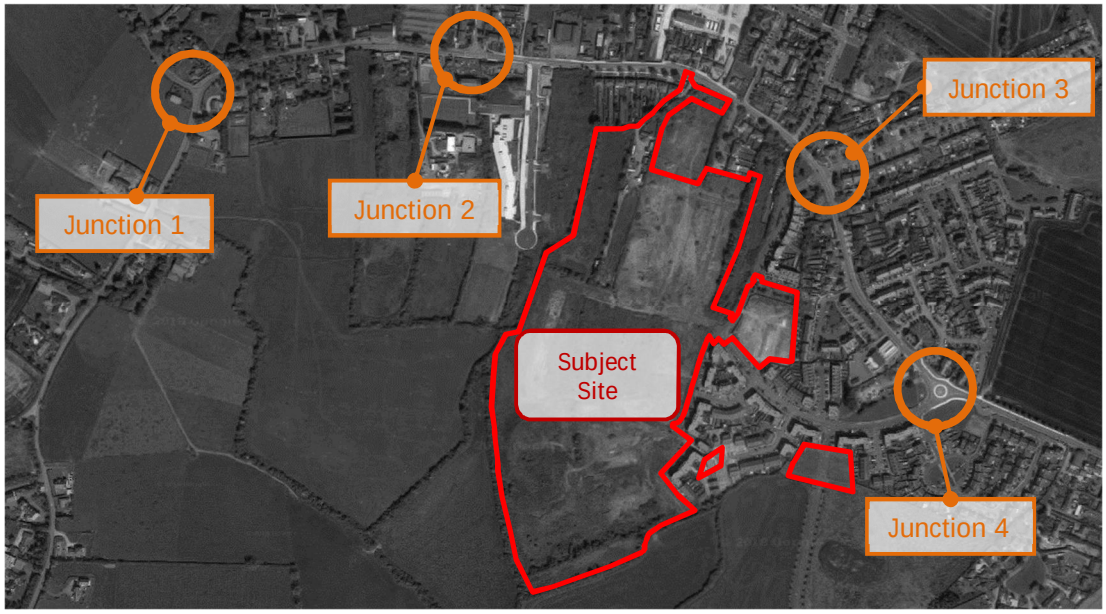


Figure 5.3: Junctions Surveyed (March 2018)

5.2.5 Additional third party data has been obtained to establish traffic flows at the N7 / R120 Rathcoole interchange junction. The recorded 2018 peak hour weekday traffic flows are presented in Figure 1 as included within Appendix A.

5.3 TRIP GENERATION

5.3.1 It is predicted, particularly in the 2020 Opening Year, that the residents travel mode share will be similar to that illustrated in Figure 5.2 (local area 2016 Census data). Nevertheless, with the objective of investigating the long term vehicle trip demand that could potentially be generated by the proposed development, trip rates have been derived from the TRICS database for residential developments with similar characteristics to the subject development site. These vehicle trip rates as predicted by TRICS are presented in Table 5.5 and 5.6 below.

Person Trips

5.3.2 Based on the mode share proportions derived from the Census 2016 data in Section 5.1 above, the total person trips can be estimated.

5.3.3 It has been assumed that the predicted vehicle trips generated by the subject residential development correspond to the proportion of vehicle trips derived within the Census mode share data. Table 5.1 below presents the predicted person trips generated by the subject residential development during the AM and PM peak hours.

Mode of Travel	Average Mode Share (%)	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
On Foot	11.0%	6	19	24	13
Bicycle	1.8%	1	3	4	2
Bus, minibus or coach	7.4%	4	13	17	9
Train, DART or LUAS	2.5%	1	4	6	3
Motorcycle or scooter	0.6%	0	1	1	1
Car driver	51.6%	30	91	115	62
Car Passenger	20.1%	12	35	45	24
Van	4.9%	3	9	11	6
Total Person Trips		58	176	223	120

Table 5.1: Proposed Residential Predicted Person Trips (Phase 1)

Construction Rate

5.3.4 For the purpose of this assessment and utilising typical house construction rates it is estimated that 120 houses could be constructed by the end of the adopted Opening Year 2020, whilst the remaining 161 houses and 125 apartments of Phase 1 could be constructed by the Future Design Year 2025. In addition, for the purpose of the worst case sensitivity tests (Section 7.0 and 8.0) all future Phase 2 development units (assumed to be in the region of 291 units and is subject to a separate planning

application) could potentially be constructed by the 2025 Future Design Year. Table 5.2 summarises the construction schedule for the proposed Phase 1 and 2 residential development in each of the adopted design years. In addition to the residential construction rate highlighted below, it has been assumed that the proposed Phase 1 Creche facility will be in place sometime after the 2020 Opening Year but before the 2025 Future Design Year.

Land Use	Phase 1			Phase 2		
	2020	2025	2035	2020	2025	2035
Houses	120	281	281	-	291	291
Apartments	0	125	125	-	-	-
Total	120	406	406	0	291	291

Table 5.2: Phase 1 and Phase 2 Residential Construction Schedule

Vehicle Trip Generation

5.3.5 Table 5.3 presents the predicted trip generation and the estimated traffic flows arriving and departing the proposed development during the morning and evening peak hour periods. The TRICs output data will be provided with the full submission to the Bord.

Land Use	Unit	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
Houses	Per Unit	0.081	0.267	0.309	0.168
Apartments	Per Unit	0.056	0.130	0.120	0.347

Table 5.3: Proposed Residential Development Trip Rates

5.3.6 As introduced previously, the subject proposals incorporate modest non-residential land uses including a 518m^2 creche and 67m^2 of commercial. It is predicted that the creche facility will predominantly facilitate the proposed development within the Masterplan lands and therefore will generate a very small quantum of vehicle trips on the surrounding road network. Similarly, the modest commercial proposals are predicted to result in a negligible increase in vehicles flows as it is expected that the proposals will serve predominantly the local catchment and pass by traffic. Therefore, the TRICS predicted trip rates derived for the creche and commercial land uses have been discounted by 70% and 80% respectively. Table 5.4 below presents the predicted non-residential vehicle trip generation.

Land Use	AM Peak Hour		PM Peak Hour	
	Arr	Dep	Arr	Dep
Creche	1.680	1.290	1.946	2.150
Commercial	2.277	1.991	3.274	3.574

Table 5.4: Non-Residential Vehicle Trip Rates

Land Use	Unit	AM Peak Hour		PM Peak Hour	
		Arr	Dep	Arr	Dep
Creche	Total	9	7	10	11
	Discounted	3	2	3	3
Commercial	Total	5	4	7	8
	Discounted	1	1	1	2

Table 5.5: Non-Residential Vehicle Trip Generation

5.3.7 Based on the above trip rates, potential peak hour vehicle traffic flow has been calculated based on the total development quantities (i.e. 406 residential units). Table 5.6A summarises the predicted AM and PM peak hour traffic generated by the proposed development. Whilst the Phase 2 development does not form part of the subject planning application it has been incorporated into the trip generation process and is therefore included in the figures presented in Table 5.6B.

Year	AM Peak Hour			PM Peak Hour		
	Arr	Dep	2-way	Arr	Dep	2-way
2020	10	32	42	37	20	57
2025	33	94	127	119	66	186
2035	33	94	127	119	66	186

Table 5.6A: Proposed Phase 1 Development Trips Per Design Year

Year	AM Peak Hour			PM Peak Hour		
	Arr	Dep	2-way	Arr	Dep	2-way
2020	10	32	42	37	20	57
2025	56	171	228	209	115	325
2035	56	171	228	209	115	325

Table 5.6B: Proposed Phase 1 & 2 Development Trips Per Design Year

5.4 COMMITTED DEVELOPMENT

5.4.1 With the objective of providing a robust appraisal we have included third party committed developments that have the potential to generate additional vehicle movements across the local road network above that have been established by the commissioned traffic surveys.

5.4.2 A total of five number third party committed developments have been identified, which being located in close proximity to the proposed residential development, may generate an impact upon the local road networks existing traffic characteristics. These committed developments, as introduced below comprise different development land uses including residential, commercial and leisure.

- Site 1 – Residential Development (Planning Ref: SD17A/0378) – 40 no. houses
- Site 2 – Residential Development (Planning Ref: SD15A/0193 - SD17A/0288) – 74 no. houses
- Site 3 – Residential Development (Planning Ref: SD16A/0117) – 48 no. houses
- Site 4 – Mixed Use Development (Planning Ref: SD14A/0021) – 255 bed hotel & retirement village
- Site 5 – Residential Development (Planning Ref: SD17A/0010) – 21 residential houses, 6 apartments and 3 no. retail units

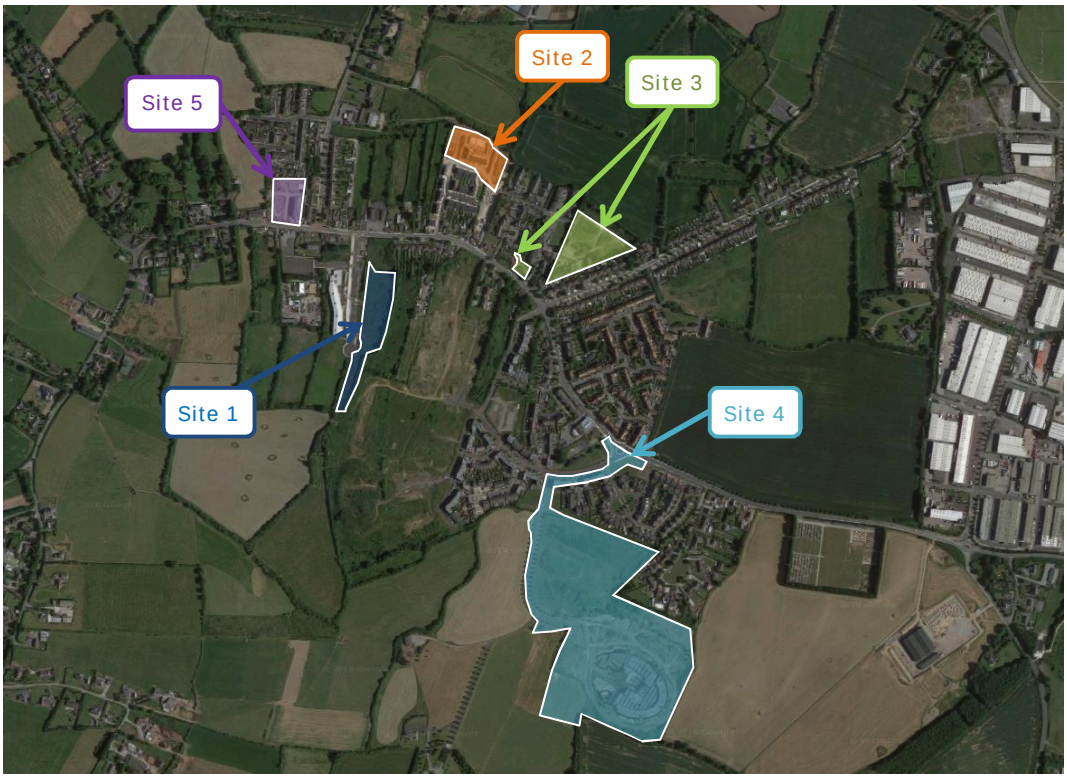


Figure 5.4: Committed Development Locations

Committed Development Trip Generation

5.4.3 In order to establish the potential quantum of vehicle traffic generated by the five no. third party development trips, the South Dublin County Council's online planning system has been referenced and each third-party scheme's corresponding TTA report (where applicable) was obtained and reviewed. The vehicle trips derived from this exercise have been incorporated as committed development within the Excel based network traffic assignment model developed by DBFL for the subject development proposals. For those committed developments which did not include a TTA, vehicle trip rates have been derived from the TRICS database.

5.5 TRIP DISTRIBUTION & ASSIGNMENT

5.5.1 The distribution of proposed development traffic as proposed by DBFL are presented in Figures 5a and 5b as included in Appendix A of this report. The associated residential vehicle trips have been assigned to the network based on the available routes to / from key destinations. Accordingly, five major strategic cordon points have been identified where the majority of vehicular traffic will be coming from/ going to the subject site (Figure 5.5).

Figure 5.5: Strategic Vehicle Movements

5.6 REDISTRIBUTION OF NETWORK TRAFFIC FLOWS

5.6.1 For the purposes of this assessment, it has been assumed that the Phase 1 proposals only will be completed and that the Principal Access Road (which would be implemented as the Phase 2 scheme is developed) through the site will not be complete before the adopted 2035 Future Design Year and therefore, in this scenario, no redistribution of local network traffic had been redistributed.

5.6.2 Nevertheless, it is expected that the future Phase 2 lands could be developed by this time and a sensitivity assessment has been undertaken to reflect this. In this scenario, it has been assumed that the Principal Access Road (as per the LAP objective) through the site will be fully complete sometime before the 2025 Future Design Year (accompanying the completion of the Phase 2 lands) and therefore, at this time, a through route will be available between Newcastle Boulevard / R120 and Athgoe Road. Whilst the proposed internal roads layout will be designed in such a way as to deter potential 'rat running' through the subject lands, it is expected that a small proportion of existing traffic may divert through the subject site in order to avoid Newcastle village centre. DBFL have assumed that 15% of existing traffic entering / exiting the network at the Athgoe / Hazelhatch Road will be reassigned to the new Principal Access Road in the 2025 and 2035 Future Design Years. These redistributed traffic flows are presented on Figures 6a and 6b in Appendix A.

5.7 TRAFFIC GROWTH

5.7.1 The TTA adopts an Opening Design year of 2020 and accordingly Future Horizon Years of 2025 (Opening Year +5 years) and 2035 (Opening Year + 15 years) as per TII guidelines. 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 5.3.2 (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 'Region 1 – Dublin' with the growth factors as outlined within Table 5.7 below.

County	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
Dublin	1.0163	1.0303	1.0046	1.0123	1.0180	1.0317	1.0062	1.0139	1.0211	1.0348	1.0100	1.0170

Table 5.7: National Traffic Growth Forecasts: Annual Growth Factors (Extract from Table 5.3.2 PAG)

5.7.2 Applying the annual factors as outlined in Table 5.8 above for the adopted Opening Year of 2020 and Future Horizon Years of 2025 (Opening Year +5 years) and 2035 (Opening Year +15 years), the following growth rates have been adopted to establish corresponding 2020, 2025 and 2035 baseline network flows.

	2018 to 2020	2018 to 2025	2018 to 2035
Central Growth	1.036	1.133	1.263
	3.6%	13.3%	26.3%

Table 5.8: Growth Rates

5.7.3 It is noted that the TII Project Appraisal Guidelines states that *"the central growth rates are intended for use in project appraisal with the low and high growth rates to be used as sensitivity tests for economic and environmental impacts."*

5.8 ASSESSMENT SCOPE

Assessment Scenarios

5.8.1 Two different traffic scenarios have been assessed, namely (a) the 'Base' (Do-Nothing) traffic characteristics and (b) the 'Post Development' (Do-Something).

5.8.2 The 'Do-Nothing' traffic scenario takes into account the potential level of traffic that could be generated by the 'committed development' in addition to the existing flows travelling across the network.

5.8.3 The proposed development traffic flows are then added to the network's 'Do-Nothing (Base + Committed Development) traffic flows to establish the new 'Post Development' traffic flows.

5.8.4 In summary the following scenarios are considered: -

Do Nothing

- A1 – 2020 Base Flows + Committed Developments
- A2 – 2025 Base Flows + Committed Developments
- A3 – 2035 Base Flows + Committed Developments

Do Something

- B1 – 2020 Do Nothing (A1) + Proposed Development Flows
- B2 – 2025 Do Nothing (A2) + Proposed Development Flows
- B3 – 2035 Do Nothing (A2) + Proposed Development Flows

5.8.5 In reference to Table 5.9, a total of three different 'Do-Something' assessments have been undertaken.

	Size	Main Assessment (Section 6.0)	Sensitivity Test 1 (Section 7.0)	Sensitivity Test 2 (Section 8.0)
Phase 1 Proposals	281 Houses 125 Apartments 518m^2 Creche 67.7m^2 Commercial	✓	✓	✓
Phase 2	291 Houses	x	✓	✓
3rd Party Retail	1140m^2	✓	✓	✓
3rd Party Residential	111 Houses	x	x	✓

Table 5.9: Do-Something Assessments

Assessment Period

5.8.6 The AM and PM peak hour flows have been identified as occurring between 07:30 - 08:30 and 17:00 – 18:00 respectively. These peak hour periods form the basis of the 2020, 2025 and 2035 network assessments.

Network Vehicle Flows

5.8.7 The following Figures as included in Appendix A present the vehicle flows across the local road network for each of the adopted development scenarios: -

- Figure 8 – 2020 Do Nothing
- Figure 9 – 2020 Do Something
- Figure 10 – 2025 Do Nothing
- Figure 14 – 2025 Do Something
- Figure 15 – 2035 Do Nothing
- Figure 16 – 2035 Do Something

5.9 NETWORK IMPACT

5.9.1 The Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments' states that the impact of a proposed development upon the local road network is considered material when the level of traffic it generates surpasses 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. These same thresholds are reproduced in the NRA (TII) document entitled Traffic and Transport Assessment Guidelines (2014). In accordance with the IHT and NRA (TII) guidelines

we have undertaken an assessment to establish the potential level of impact upon the key junctions of the local road network. To enable this calculation to be undertaken we have based the analysis upon the 2020 Opening Year and the 2025 and 2035 Future Design Year scenarios.

5.9.2 Table 5.10 details the specific scale of network impact predicted at each of the key local junctions during the 2020, 2025 and 2035 design years as a result of the subject Phase 1 development proposals and with the addition of the future Phase 2 proposals.

Ref	Junction	Design Year	Proposed Phase 1		Potential Phase 1 & 2 (Sensitivity Test)	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1	R405 / Athgoe Road / Hazelhatch Road priority junction	2020	0.6%	0.6%	0.6%	0.6%
		2025	1.7%	2.0%	3.2%	3.8%
		2035	1.5%	1.8%	2.9%	3.5%
2	R120 Peamount Road / R120 Main Street / R450 Main Street	2020	1.2%	1.4%	1.2%	1.4%
		2025	1.9%	2.5%	3.7%	4.6%
		2035	1.7%	2.2%	3.4%	4.2%
3	R120 (NW) / Aylmer Road / R120 (SE) / Burgage Cres signal junction	2020	2.1%	2.2%	2.1%	2.2%
		2025	2.7%	3.0%	5.0%	5.2%
		2035	2.4%	2.7%	4.5%	4.8%
4	R120 (NW) / R120 (E) / Newcastle Boulevard 3-arm roundabout junction	2020	1.3%	1.6%	1.3%	1.6%
		2025	3.7%	4.7%	6.8%	8.3%
		2035	3.4%	4.3%	6.2%	7.7%
5	R120 / N7 Slip Road roundabout	2020	0.4%	0.7%	0.4%	0.7%
		2025	1.3%	2.1%	2.2%	3.6%
		2035	1.1%	1.9%	2.0%	3.3%

Table 5.10: Proposed Developments Network Impact

5.9.3 Table 5.10 reveals that the impact on the surrounding road network will be sub threshold at all junctions with the introduction of the subject Phase 1 junction only with a maximum percentage impact of 4.7% observed at the R120 / Newcastle Boulevard roundabout junction. With the addition of the future Phase 2 development traffic the impact will be sub threshold (for uncongested networks) at all junctions with a maximum percentage impact of 8.3% observed at the R120 / Newcastle Boulevard roundabout junction.

5.9.4 In Table 5.11 (AM Peak Hour) and Table 5.12 (PM Peak Hour) the predicted impacts have been categorised for the 2035 future design year. Table 5.11 reveals that, during the AM peak hour, the impact significance of Phase 1 proposals only are

categorised as *Insignificant* to *Low* whilst the impact significance of Phase 1 proposals only are categorised as *Low* to *Moderate*.

	Junction - Nature of Impact (Additional Vehicular Traffic on key Junctions)	Phase 1 Only		Potential Phase 1 & 2	
		Impact Scale	Impact Significance	Impact Scale	Impact Significance
1	R405 / Athgoe Road / Hazelhatch Road priority junction	1.5 %	Insignificant	2.9 %	Low
2	R120 Peamount Road / R120 Main Street / R450 Main Street	1.7 %	Insignificant	3.4 %	Low
3	R120 Main Street (NW) / Aylmer Road / R120 Main Street (SE) / Burgage Cres 4-arm signal junction	2.4 %	Low	4.5 %	Low
4	R120 (NW) / R120 (E) / Newcastle Boulevard 3-arm roundabout junction	3.4%	Low	6.2 %	Moderate
5	R120 / N7 Slip Road roundabout	1.1 %	Insignificant	2.0 %	Low

Table 5.11: Network Impact Categorisation 2035 AM Peak Hour

	Junction - Nature of Impact (Additional Vehicular Traffic on key Junctions)	Phase 1 Only		Potential Phase 1 & 2	
		Impact Scale	Impact Significance	Impact Scale	Impact Significance
1	R405 / Athgoe Road / Hazelhatch Road priority junction	1.8 %	Insignificant	3.5 %	Low
2	R120 Peamount Road / R120 Main Street / R450 Main Street	2.2 %	Low	4.2 %	Low
3	R120 Main Street (NW) / Aylmer Road / R120 Main Street (SE) / Burgage Cres 4-arm signal junction	2.7 %	Low	4.8 %	Low
4	R120 (NW) / R120 (E) / Newcastle Boulevard 3-arm roundabout junction	4.3 %	Low	7.7 %	Moderate
5	R120 / N7 Slip Road roundabout	1.9 %	Insignificant	3.3 %	Low

Table 5.12: Network Impact Categorisation 2035 PM Peak Hour

5.9.5 Similar to the network impact categorisation observed in the AM peak hour, during the PM peak hour, the impact significance of Phase 1 proposals only are categorised as *Insignificant* to *Low* whilst the impact significance of Phase 1 and Phase 2 proposals are categorised as *Low* to *Moderate*.

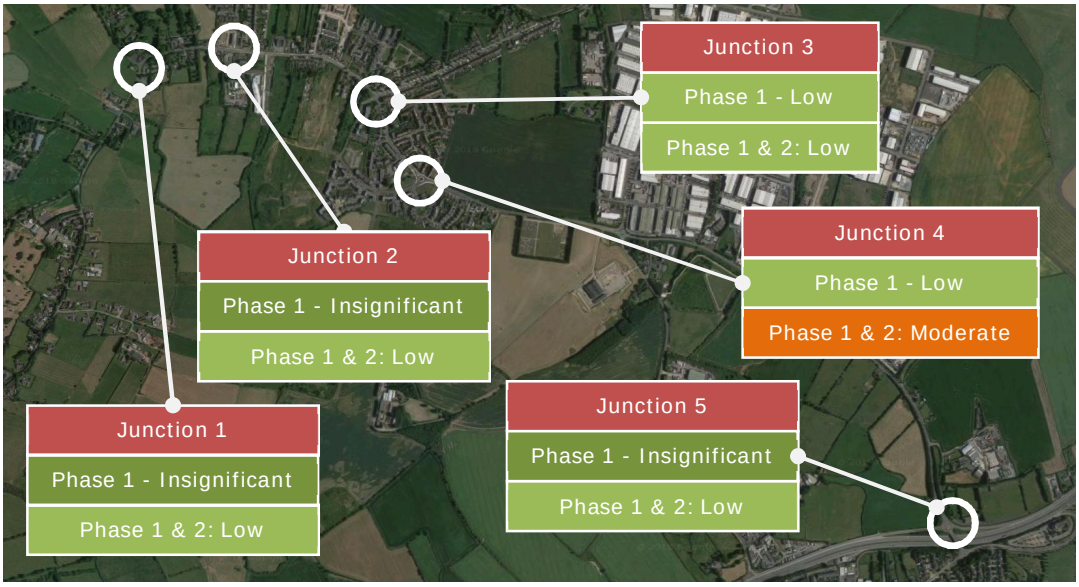


Figure 5.7: Network Impact Categorisation - 2035 Future Design Year (AM Peak)

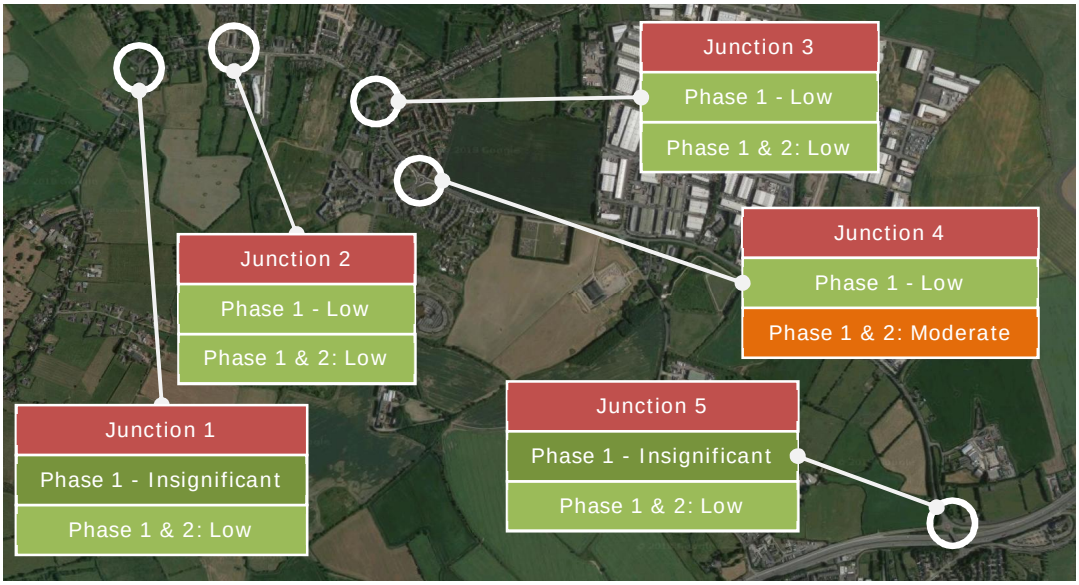


Figure 5.8: Network Impact Categorisation - 2035 Future Design Year (PM Peak)

5.9.6 Figure 5.9 and 5.10 below details the total amount of two-way vehicle trips that will pass through the key off-site junctions in the 2035 assessment year and the resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development.

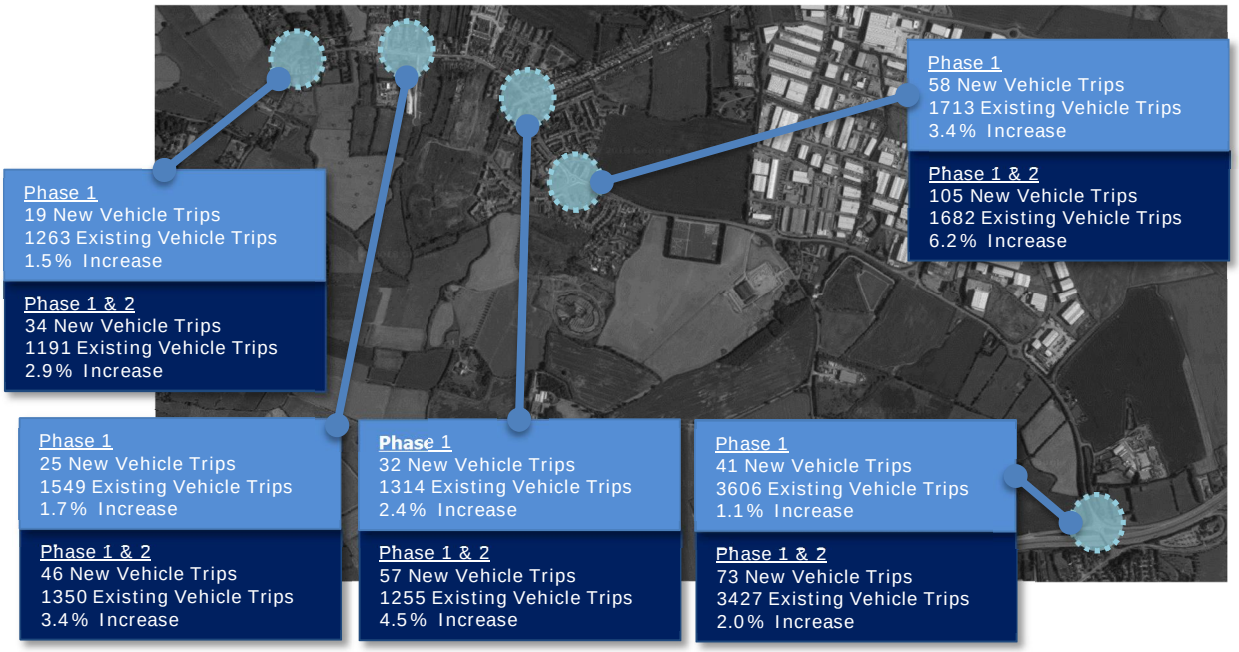


Figure 5.9: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2035 AM Peak Hour)

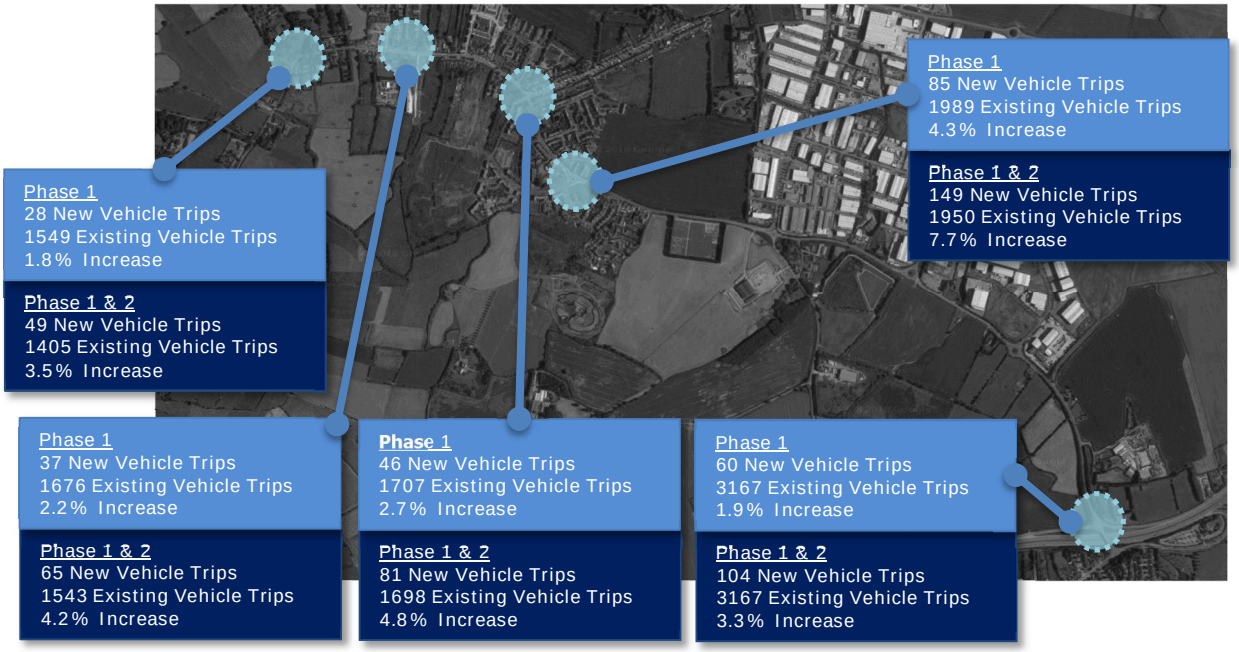


Figure 5.10: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2035 PM Peak Hour)

5.10 MITIGATION STRATEGY

5.10.1 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.

Construction Stage

5.10.2 The Construction Management Plan (an outline CMP accompanies the application) and the associated Construction Traffic Management Plan (CTMP) in addition to the applications 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.

Operational Stage

5.10.3 With the objective of mitigating the potential impact of the proposed development as predicted in Section 5.9 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 to and from the proposed development.
- Infrastructure - The proposed scheme design incorporates the LAP objectives of 'Green Links' through the site for the benefits of pedestrians and cyclists. The implementation of dedicated infrastructure along an integrated area wide catchment provides an attractive, convenient, seamless 'green' corridor providing a permeable, safe connection between existing (and future) residential neighbouring's and key community facilities including schools, shops and local service centres.
- Infrastructure - The future (long term) Western Dublin Orbital Route as proposed by SDCC will, once implemented, result in a significant reduction in traffic travelling through Newcastle Village centre and the N7 Rathcoole Interchange. Following the delivery of this infrastructure objective all local junctions along the existing R120 Main Street corridor are protected to operate within capacity. Accordingly, the long term performance of the local road network is safeguarded.

6.0 NETWORK ANALYSIS

6.1 INTRODUCTION

6.1.1 This network assessment considers the impact of the subject Phase 1 development only on the surrounding road network. Two further yet separate assessments (Sensitivity Tests) consider the potential effect of the additional vehicle trips generated by the potential future Phase 2 development by the Applicant and the potential development of the 3rd Party Taobh Chnoic Extension. In reference to Table 5.9 these additional assessments are summarised in Section 7 (Sensitivity Analysis 1) and 8 (Sensitivity Analysis 2) of this report.

6.1.2 The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer packages TRANSYT for signal-controlled junctions, ARCADY for roundabouts and PICADY for priority-controlled junctions.

6.1.3 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 and roundabout 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.

6.1.4 For the TRANSYT analysis a one-hour AM and PM period has been simulated from 07:30 to 08:30 and 17:00 to 18:00. Additionally, for the PICADY and ARCADY analyses a 90-minute AM period has been simulated; from 07:15 to 08:45 and 16:45 to 18:15. For the PICADY and TRANSYT analyses, traffic flows were entered using an Origin-Destination table for the peak hours.

6.1.5 In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic model of the key junctions were analysed for the schemes following opening and design years:

- 2020 Opening Year
- 2025 Future Horizon Year (Opening Year +5 years)
- 2035 Future Horizon Year (Opening Year +15 years)

6.1.6 As discussed in Section 5, with the exception of the R120 / Newcastle Boulevard Roundabout Junction, the subject development proposals are predicted to have

subthreshold impacts upon all off-site key junctions across the surrounding road network. Nevertheless, the following junctions (Figure 6.1) have been considered for further analysis due to their close proximity to the subject site. Also included in the detailed network analysis is the proposed new northern site access.

- Junction 3 – R120 / Burgage Crescent / Aylmer Rd 4-arm signalised junction
- Junction 4 – R120 / Newcastle Boulevard Roundabout Junction
- Junction 6 – Proposed Northern Site Access / R120 Priority Controlled Junction

Figure 6.1: Junctions included within the Detailed Network Analysis

6.2 JUNCTION 3: R120 / BURGAGE CRESCENT / AYLMER RD

6.2.1 The results of the operational assessment of this existing signal controlled off-site junction during the weekday morning and evening peaks are summarised in Tables 6.1 to 6.3 below. The arms were labelled as follows within the TRANSYT model:

Arm A: R120 (S)
Arm B: Burgage Crescent
Arm C: R120 (N)
Arm D: Aylmer Road

2020 Opening Year

6.2.2 The TRANSYT results indicate that the R120 / Burgage Crescent / Aylmer Road four arm signalised junction will operate within capacity for both the 2020 “Do Nothing” (DN) and Phase 1 “Do Something” (DS) AM & PM peak hours. A maximum Degree of Saturation (DoS) value of 58% and a maximum Mean Max Queue (MMQ) of 10.32 pcu’s was recorded during the DN AM peak hour and similarly a DoS value of 58% and a maximum MMQ of 13.88 pcu’s was recorded during the DS AM peak hour. In

the 2020 DN PM peak hour scenario, a max DoS of 68% with a corresponding MMQ of 13.88 pcu's was recorded whilst a DoS value of 68% and a maximum MMQ of 13.88 pcu's was recorded during the DS PM peak hour. A copy of the TRANSYT output data is provided in Appendix C of this TTA report.

Scenario		Arm	Arm Name	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
Do-Nothing	AM Peak Hour	A	R120 (S)	24	6.99	3.23
		B	Burgage Crescent	7	24.05	0.29
		C	R120 (N)	58	10.51	10.27
		D	Aylmer Road	20	25.40	0.90
	PM Peak Hour	A	R120 (S)	68	13.57	13.88
		B	Burgage Crescent	7	24.01	0.27
		C	R120 (N)	29	7.40	3.96
		D	Aylmer Road	54	32.85	2.90
Do-Something	AM Peak Hour	A	R120 (S)	24	6.99	3.23
		B	Burgage Crescent	14	24.77	0.60
		C	R120 (N)	58	10.55	10.32
		D	Aylmer Road	20	25.49	0.94
	PM Peak Hour	A	R120 (S)	68	13.57	13.88
		B	Burgage Crescent	11	24.39	0.46
		C	R120 (N)	31	7.49	4.21
		D	Aylmer Road	57	33.75	3.07

Table 6.1: 2020 Peak Hour Analysis

2025 Future Design Year

Scenario		Arm	Arm Name	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
Do-Nothing	AM Peak Hour	A	R120 (S)	26	7.15	3.64
		B	Burgage Crescent	8	24.12	0.32
		C	R120 (N)	63	11.67	11.76
		D	Aylmer Road	22	25.76	1.03
	PM Peak Hour	A	R120 (S)	75	16.51	16.09
		B	Burgage Crescent	7	24.07	0.30
		C	R120 (N)	33	7.68	4.56
		D	Aylmer Road	60	34.89	3.30
Do-Something	AM Peak Hour	A	R120 (S)	26	7.16	3.65
		B	Burgage Crescent	13	24.59	0.57
		C	R120 (N)	64	11.94	11.91
		D	Aylmer Road	24	26.05	1.16
	PM Peak Hour	A	R120 (S)	76	16.74	16.21
		B	Burgage Crescent	11	24.33	0.46
		C	R120 (N)	34	7.74	4.77
		D	Aylmer Road	68	39.51	4.07

Table 6.2: 2025 Peak Hour Analysis

6.2.3 For the 2025 Future Design Year scenario, a maximum DoS value of 63% and a maximum MMQ of 11.76 pcu's was recorded during the DN AM peak hour whilst a DoS value of 64% and a maximum MMQ of 11.91 pcu's was recorded during the DS AM peak hour. In the 2025 DN PM peak hour scenario, a max DoS of 75% with a corresponding MMQ of 16.09 pcu's was recorded whilst a DoS value of 76% and a maximum MMQ of 16.21 pcu's was recorded during the DS PM peak hour.

2035 Future Design Year

6.2.4 In the 2035 Future Design Year scenario, a maximum DoS value of 70% and a maximum MMQ of 13.72 pcu's was recorded during the DN AM peak hour whilst a DoS value of 71% and a maximum MMQ of 13.91 pcu's was recorded during the DS AM peak hour. In the 2035 DN PM peak hour scenario, a max DoS of 83% with a corresponding MMQ of 19.22 pcu's was recorded whilst a DoS value of 84% and a maximum MMQ of 19.60 pcu's was recorded during the DS PM peak hour.

Scenario		Arm	Arm Name	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
Do-Nothing	AM Peak Hour	A	R120 (S)	29	7.37	4.05
		B	Burgage Crescent	9	24.23	0.37
		C	R120 (N)	70	14.32	13.72
		D	Aylmer Road	24	26.02	1.12
	PM Peak Hour	A	R120 (S)	83	21.44	19.22
		B	Burgage Crescent	8	24.15	0.34
		C	R120 (N)	36	7.98	5.29
		D	Aylmer Road	66	38.09	3.80
Do-Something	AM Peak Hour	A	R120 (S)	29	7.37	4.06
		B	Burgage Crescent	14	24.75	0.62
		C	R120 (N)	71	14.66	13.91
		D	Aylmer Road	34	27.70	1.66
	PM Peak Hour	A	R120 (S)	84	21.80	19.60
		B	Burgage Crescent	12	24.44	0.51
		C	R120 (N)	37	8.04	5.38
		D	Aylmer Road	75	44.58	4.72

Table 6.3: 2035 Peak Hour Analysis

6.3 JUNCTION 4: R120 / NEWCASTLE BOULEVARD ROUNDABOUT JUNCTION

6.3.1 The principal results of the operational assessment of this three-arm roundabout junction during the weekday morning and evening peaks are summarised in Tables 6.4 to 6.6 below. The four arms were labelled as follows within the ARCADY model:

Arm A: R120 (SE)

Arm B: Newcastle Boulevard

Arm C: R120 (NW)

2020 Opening Year

6.3.2 The ARCADY results indicate that the R120 / Newcastle Boulevard three arm roundabout junction will operate within capacity for both the 2020 "Do Nothing" (DN) and "Do Something" (DS) AM & PM peak hours. A maximum Ratio of Flow to Capacity (RFC) value of 0.71 (71%) and a corresponding queue length of 2.4 pcu's was recorded during the DN AM peak hour and similarly a RFC value of 0.71 (71%) and a corresponding queue length of 2.5 pcu's was recorded during the DS AM peak hour. In the 2020 DN PM peak hour scenario, a max RFC of 0.85 (85%) with a corresponding queue length of 5.2 pcu's was recorded whilst a RFC value of 0.86 (86%) and a corresponding queue length of 5.7 pcu's was recorded during the DS PM peak hour. A copy of the ARCADY output data is provided in Appendix D of this TTA report.

Scenario		Arm	Arm Name	Queue (pcu)	Delay (s)	RFC
Do-Nothing	AM Peak Hour	A	R120 (SE)	0.4	3.68	0.30
		B	Newcastle Boulevard	0.3	3.70	0.24
		C	R120 (NW)	2.4	9.82	0.71
	PM Peak Hour	A	R120 (SE)	5.2	16.70	0.85
		B	Newcastle Boulevard	0.5	6.20	0.33
		C	R120 (NW)	0.5	3.98	0.31
Do-Something	AM Peak Hour	A	R120 (SE)	0.4	3.70	0.30
		B	Newcastle Boulevard	0.3	3.76	0.25
		C	R120 (NW)	2.5	10.09	0.71
	PM Peak Hour	A	R120 (SE)	5.7	18.20	0.86
		B	Newcastle Boulevard	0.5	6.30	0.34
		C	R120 (NW)	0.5	4.00	0.31

Table 6.4: 2020 ARCADY Analysis

2025 Future Design Year

6.3.3 For the 2025 Future Design Year scenario, a maximum RFC value of 0.78 (78%) and a corresponding queue length of 3.3 pcu's was recorded during the DN AM peak hour and similarly a RFC value of 0.80 (80%) and a corresponding queue length of 3.7 pcu's was recorded during the DS AM peak hour. In the 2025 DN PM peak hour scenario, the junction is approaching capacity with a max RFC of 0.92 (92%) and a corresponding queue length of 9.9 pcu's recorded whilst a RFC value of 0.97 (97%)

and a corresponding queue length of 16.4 pcu's was recorded during the DS PM peak hour.

Scenario		Arm	Arm Name	Queue (pcu)	Delay (s)	RFC
Do-Nothing	AM Peak Hour	A	R120 (SE)	0.5	3.81	0.32
		B	Newcastle Boulevard	0.3	3.82	0.25
		C	R120 (NW)	3.3	12.73	0.78
	PM Peak Hour	A	R120 (SE)	9.9	30.05	0.92
		B	Newcastle Boulevard	0.6	6.94	0.36
		C	R120 (NW)	0.5	4.19	0.34
Do-Something	AM Peak Hour	A	R120 (SE)	0.5	3.88	0.33
		B	Newcastle Boulevard	0.4	4.00	0.29
		C	R120 (NW)	3.7	14.20	0.80
	PM Peak Hour	A	R120 (SE)	16.4	46.86	0.97
		B	Newcastle Boulevard	0.7	7.35	0.40
		C	R120 (NW)	0.5	4.29	0.35

Table 6.5: 2025 ARCADY Analysis

2035 Future Design Year

6.3.4 In the 2035 Future Design Year scenario, a maximum RFC value of 0.86 (86%) and a corresponding queue length of 5.8 pcu's was recorded during the DN AM peak hour and similarly a RFC value of 0.88 (88%) and a corresponding queue length of 6.8 pcu's was recorded during the DS AM peak hour.

Scenario		Arm	Arm Name	Queue (pcu)	Delay (s)	RFC
Do-Nothing	AM Peak Hour	A	R120 (SE)	0.5	3.96	0.34
		B	Newcastle Boulevard	0.4	3.97	0.27
		C	R120 (NW)	5.8	20.34	0.86
	PM Peak Hour	A	R120 (SE)	32.1	81.10	1.02
		B	Newcastle Boulevard	0.7	7.83	0.40
		C	R120 (NW)	0.6	4.42	0.38
Do-Something	AM Peak Hour	A	R120 (SE)	0.6	4.04	0.36
		B	Newcastle Boulevard	0.4	4.17	0.30
		C	R120 (NW)	6.8	24.09	0.88
	PM Peak Hour	A	R120 (SE)	55.0	125.15	1.06
		B	Newcastle Boulevard	0.7	8.03	0.43
		C	R120 (NW)	0.6	4.54	0.39

Table 6.6: 2035 ARCADY Analysis

6.3.5 In the 2035 DN PM peak hour scenario, the junction is approaching capacity for a short period of time during the peak hour with a max RFC of 1.02 (102%) and a corresponding queue length of 16.7 pcu's recorded whilst a RFC value of 1.06 (106%)

and a corresponding queue length of 55.0 pcu's was recorded during the DS PM peak hour.

6.4 JUNCTION 6: NORTHERN SITE ACCESS/ R120 PRIORITY JUNCTION

6.4.1 The principal results of the operational assessment of this three-arm priority-controlled northern site access junction during the weekday morning and evening peaks are summarised in Tables 6.7 to 6.8 below. It has been assumed that during the 2020 Opening Year, no traffic will enter / exit the subject development at this proposed junction and therefore only the Future Design Years have been included in the analysis. The three arms were labelled as follows within the PICADY model:

Arm A: R120 (east)

Arm B: Subject Site

Arm C: R120 (west)

2025 Do Something Scenario

6.4.2 The 2025 "Do-Something" PICADY results indicate that the proposed subject Northern Site access/ R120 three arm priority-controlled junction will operate within capacity during the AM & PM peak hours. A maximum RFC value of 0.07 (7%) and a queue length of 0.1 pcu's was recorded during the AM peak hour whilst a maximum RFC value of 0.14 (14%) and a corresponding queue length of 0.2 pcu's was recorded during the PM peak hour. A copy of the PICADY output data is provided in Appendix E of this TTA report.

Scenario	Arm	Queue (pcu)	Delay (s)	RFC
AM Peak	R120 (east)	-	-	-
	Subject Site	0.1	9.27	0.07
	R120 (west)	0.0	5.52	0.01
PM Peak	R120 (east)	-	-	-
	Subject Site	0.2	15.22	0.14
	R120 (west)	0.1	8.17	0.05

Table 6.7: 2025 PICADY Do-Something Analysis

2035 Do Something Scenario

6.4.3 The 2035 "Do-Something" PICADY results indicate that the proposed three arm priority-controlled junction will operate well within capacity during the AM & PM peak

hours. A maximum RFC value of 0.07 (7%) and a queue length of 0.1 pcu's was recorded during the AM peak hour whilst a maximum RFC value of 0.16 (16%) and a corresponding queue length of 0.2 pcu's was recorded during the PM peak hour.

Scenario	Arm	Queue (pcu)	Delay (s)	RFC
AM Peak	R120 (east)	-	-	-
	Subject Site	0.1	9.69	0.07
	R120 (west)	0.0	5.60	0.01
PM Peak	R120 (east)	-	-	-
	Subject Site	0.2	17.46	0.16
	R120 (west)	0.1	8.76	0.06

Table 6.8: 2035 PICADY Do-Something Analysis

6.5 CONCLUSION

6.5.1 The analysis reveals that all three local junctions will operate within acceptable parameters during all design year scenarios.

7.0 SENSITIVITY ANALYSIS 1

7.1 INTRODUCTION

7.1.1 As previously introduced, the subject proposals form Phase 1 of an overall 2 Phase development. In reference to Table 5.9 this section discusses the first of two additional sensitivity assessments undertaken which consider the scenario where both the Phase 1 and Phase 2 (addition of somewhere in the region of 291 residential units) lands are completed in due course. As Phase 2 will not commence any sooner than the Phase 1 2020 Opening Year, only the Future 2025 & 2035 Design Years have been assessed in this first Sensitivity Analysis. The appraisal considers the following three junctions;

- Junction 3 – R120 / Burgage Crescent / Aylmer Rd 4-arm signalised junction
- Junction 4 – R120 / Newcastle Boulevard Roundabout Junction
- Junction 6 – Proposed Northern Site Access / R120 Priority Controlled Junction

7.2 JUNCTION 3: R120 / BURGAGE CRESCENT / AYLMER RD

7.2.1 The results of the operational assessment of this existing signal controlled off-site junction during the weekday morning and evening peaks are summarised in Tables 7.1 and 7.2 below. The arms were labelled as follows within the TRANSYT model:

Arm A: R120 (S)

Arm B: Burgage Crescent

Arm C: R120 (N)

Arm D: Aylmer Road

2025 Future Design Year

7.2.2 For the 2025 Future Design Year scenario, a maximum DoS value of 57% and a maximum MMQ of 9.98 pcu's was recorded during the AM peak hour whilst a DoS value of 77% and a maximum MMQ of 16.48 pcu's was recorded during the PM peak hour.

Scenario		Arm	Arm Name	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
Do-Something	AM Peak Hour	A	R120 (S)	27	7.19	3.70
		B	Burgage Crescent	23	25.94	1.07
		C	R120 (N)	57	10.45	9.98
		D	Aylmer Road	36	27.88	1.75
	PM Peak Hour	A	R120 (S)	77	18.46	16.48
		B	Burgage Crescent	19	24.15	0.92
		C	R120 (N)	34	8.45	4.90
		D	Aylmer Road	76	43.15	5.34

Table 7.1: 2025 Phase 1 & 2 Peak Hour Analysis

2035 Future Design Year

7.2.3 In the 2035 Future Design Year scenario, a maximum DoS value of 63% and a maximum MMQ of 11.77 pcu's was recorded during the AM peak hour whilst a DoS value of 84% and a maximum MMQ of 19.70 pcu's was recorded during the DS PM peak hour.

Scenario		Arm	Arm Name	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
Do-Something	AM Peak Hour	A	R120 (S)	29	7.38	4.06
		B	Burgage Crescent	24	26.08	1.12
		C	R120 (N)	63	11.73	11.77
		D	Aylmer Road	39	28.59	1.96
	PM Peak Hour	A	R120 (S)	84	23.29	19.70
		B	Burgage Crescent	19	24.24	0.96
		C	R120 (N)	37	8.73	5.49
		D	Aylmer Road	81	49.02	6.14

Table 7.2: 2035 Phase 1 & 2 Peak Hour Analysis

7.3 JUNCTION 4: R120 / NEWCASTLE BOULEVARD ROUNDABOUT JUNCTION

7.3.1 The principal results of the operational assessment of this three-arm roundabout junction during the weekday morning and evening peaks are summarised in Tables 7.3 and 7.4 below. The four arms were labelled as follows within the TRANSYT model:

Arm A: R120 (SE)

Arm B: Newcastle Boulevard

Arm C: R120 (NW)

2025 Future Design Year

Scenario		Arm	Arm Name	Queue (pcu)	Delay (s)	RFC
Do-Something	AM Peak Hour	A	R120 (SE)	0.5	3.92	0.34
		B	Newcastle Boulevard	0.6	4.54	0.38
		C	R120 (NW)	2.8	12.16	0.74
	PM Peak Hour	A	R120 (SE)	25.8	68.09	1.00
		B	Newcastle Boulevard	0.6	6.44	0.38
		C	R120 (NW)	0.5	4.25	0.33

Table 7.3: 2025 Phase 1 & 2 ARCADY Analysis

7.3.2 For the 2025 Future Design Year scenario, a maximum RFC value of 0.74 (74%) and a corresponding queue length of 2.8 pcu's was recorded during the DN AM peak hour whilst a RFC value of 1.00 (100%) and a corresponding queue length of 25.8 pcu's was recorded during the PM peak hour.

2035 Future Design Year

7.3.3 In the 2035 Future Design Year scenario, a maximum RFC value of 0.83 (83%) and a corresponding queue length of 4.6 pcu's was recorded during the AM peak hour whilst a RFC value of 1.09 (109%) and a corresponding queue length of 75.4 pcu's was recorded during the PM peak hour.

Scenario		Arm	Arm Name	Queue (pcu)	Delay (s)	RFC
Do-Something	AM Peak Hour	A	R120 (SE)	0.6	4.09	0.37
		B	Newcastle Boulevard	0.7	4.84	0.41
		C	R120 (NW)	4.6	18.45	0.83
	PM Peak Hour	A	R120 (SE)	75.4	164.22	1.09
		B	Newcastle Boulevard	0.7	6.82	0.41
		C	R120 (NW)	0.6	4.47	0.36

Table 7.4: 2035 Phase 1 & 2 ARCADY Analysis

7.4 JUNCTION 6: NORTHERN SITE ACCESS/ R120 PRIORITY JUNCTION

2025 Do Something Scenario

7.4.1 The 2025 "Do-Something" PICADY results indicate that the proposed subject Northern Site access/ R120 three arm priority-controlled junction will operate within capacity during the AM & PM peak hours. A maximum RFC value of 0.12 (12%) and a queue length of 0.1 pcu's was recorded during the AM peak hour whilst a maximum RFC value of 0.15 (15%) and a corresponding queue length of 0.2 pcu's was recorded during the PM peak hour.

Scenario	Arm	Queue (pcu)	Delay (s)	RFC
AM Peak	R120 (east)	-	-	-
	Subject Site	0.1	9.36	0.12
	R120 (west)	0.0	5.53	0.02
PM Peak	R120 (east)	-	-	-
	Subject Site	0.2	13.32	0.15
	R120 (west)	0.1	7.95	0.08

Table 7.5: 2025 PICADY Phase 1 & 2 Do-Something Analysis

2035 Do Something Scenario

7.4.2 The 2035 "Do-Something" PICADY results indicate that the proposed three arm priority-controlled junction will operate well within capacity during the AM & PM peak hours. A maximum RFC value of 0.12 (12%) and a queue length of 0.1 pcu's was recorded during the AM peak hour whilst a maximum RFC value of 0.16 (16%) and a corresponding queue length of 0.2 pcu's was recorded during the PM peak hour.

Scenario	Arm	Queue (pcu)	Delay (s)	RFC
AM Peak	R120 (east)	-	-	-
	Subject Site	0.1	9.71	0.12
	R120 (west)	0.0	5.60	0.02
PM Peak	R120 (east)	-	-	-
	Subject Site	0.2	14.75	0.16
	R120 (west)	0.1	8.43	0.09

Table 7.6: 2035 PICADY Phase 1 & 2 Do-Something Analysis

7.5 CONCLUSION

7.5.1 The analysis reveals that for the Phase 1 and Phase 2 scenario all three local junctions will operate within acceptable parameters. Whilst Junction 3 (R120 / Burgage Crescent / Aylmer Rd 4-arm signalised junction) and Junction 6 (Proposed Northern Site Access / R120 Priority Controlled Junction) will operate well within capacity even in the 2035 Future Design Year, it is noted that the south eastern arm of Junction 4 (R120 / Newcastle Boulevard Roundabout Junction) will be operating at capacity during a period of the PM peak hour in 2035.

8.0 SENSITIVITY ANALYSIS 2

8.1 INTRODUCTION

8.1.1 As introduced previously in Section 4.2 (and Figure 4.1), the Taobh Chnoic Extension 3rd party lands / parcel of Burgage South lands have the potential to accommodate somewhere in the region of 111 residential units. The development of these lands will be subject to a separate planning application by third parties. In reference to Table 5.9 this second sensitivity analysis incorporates this potential 3rd party development into the projected network flows. It is envisioned that this scheme will not be constructed until sometime after the 2025 Future Design Year and therefore only the 2035 Future Design Year is assessed in this sensitivity analysis. The following three local junctions have been investigated;

- Junction 3 – R120 / Burgage Crescent / Aylmer Rd 4-arm signalised junction
- Junction 4 – R120 / Newcastle Boulevard Roundabout Junction
- Junction 6 – Proposed Northern Site Access / R120 Priority Controlled Junction

8.2 NETWORK ANALYSIS

8.2.1 The results of the operational assessment of the 3 no. junctions assessed in Section 6 above are as follows.

R120 / Burgage Crescent / Aylmer Road Junction

8.2.2 The TRANSYT results indicate with the introduction of this 3rd Party development, that the R120 / Burgage Crescent / Aylmer Road four arm signalised junction will operate within capacity for both the 2035 AM & PM peak hours.

Scenario		Arm	Arm Name	Degree of Saturation (%)	Mean Delay per Veh (s)	Mean Max Queue (pcu)
Sensitivity Analysis	AM Peak Hour	A	R120 (S)	30	7.43	4.20
		B	Burgage Crescent	35	27.90	1.70
		C	R120 (N)	65	12.36	12.11
		D	Aylmer Road	43	29.53	2.21
	PM Peak Hour	A	R120 (S)	88	28.79	22.19
		B	Burgage Crescent	23	23.65	1.28
		C	R120 (N)	39	9.69	6.04
		D	Aylmer Road	87	55.72	7.84

Table 8.1: R120 / Burgage Crescent / Aylmer Road Sensitivity Analysis

8.2.3 A maximum DoS value of 65% and a maximum Mean Max Queue (MMQ) of 12.11 pcu's was recorded during the AM peak hour whilst a DoS value of 88% and a maximum MMQ of 22.19 pcu's was recorded during the PM peak hour.

R120 / Newcastle Boulevard Roundabout Junction

8.2.4 In the 2035 Future Design Year scenario, a maximum RFC value of 0.88 (88%) and a corresponding queue length of 6.6 pcu's was recorded during the 2035 AM peak hour whilst a RFC value of 1.18 (118%) and a corresponding queue length of 138.4 pcu's was recorded during the 2035 PM peak hour indicating that this roundabout junction is predicted to be operating over capacity in this scenario.

Scenario		Arm	Arm Name	Queue (pcu)	Delay (s)	RFC
Sensitivity Analysis	AM Peak Hour	A	R120 (SE)	0.6	4.25	0.39
		B	Newcastle Boulevard	0.9	5.52	0.48
		C	R120 (NW)	6.6	26.20	0.88
	PM Peak Hour	A	R120 (SE)	138.4	348.16	1.18
		B	Newcastle Boulevard	0.8	7.16	0.46
		C	R120 (NW)	0.6	4.72	0.38

Table 8.2: R120 / Newcastle Boulevard Sensitivity Analysis

R120 / Site Access Priority Controlled Junction

8.2.5 In the 2035 Future Design Year scenario, a maximum RFC value of 0.25 (25%) and a corresponding queue length of 0.3 pcu's was recorded during the 2035 AM peak hour whilst a RFC value of 0.30 (30%) and a corresponding queue length of 0.4 pcu's was recorded during the 2035 PM peak hour indicating that this proposed priority controlled junction is predicted to be operating well within capacity in this scenario.

Scenario	Arm	Queue (pcu)	Delay (s)	RFC
AM Peak	R120 (east)	-	-	-
	Subject Site	0.3	11.35	0.25
	R120 (west)	0.0	5.72	0.03
PM Peak	R120 (east)	-	-	-
	Subject Site	0.4	18.30	0.30
	R120 (west)	0.2	9.45	0.17

Table 8.3: R120 / Northern Site Access Sensitivity Analysis

8.3 CONCLUSIONS

8.3.1 The analysis reveals that, for the Phase 1 and 2 plus Third Party lands development scenario, all three local junctions will operate within acceptable parameters. Whilst

Junction 3 (R120 / Burgage Crescent / Aylmer Rd 4-arm signalised junction) and Junction 6 (Proposed Northern Site Access / R120 Priority Controlled Junction) will operate well within capacity even in the 2035 Future Design Year, it is noted that the southeastern arm of Junction 4 (R120 / Newcastle Boulevard Roundabout Junction) will be operating at capacity during a period of the PM peak hour in 2035.

8.3.2 Should the delivery of the Western Dublin Orbital Route be delayed significantly beyond 2035, it may be prudent to consider mitigation measures at Junction 4 (R120 / Newcastle Boulevard Roundabout Junction) as part of this 3rd party development proposal.

9.0 SUMMARY AND CONCLUSION

9.1 OVERVIEW

9.1.1 DBFL Consulting Engineers (DBFL) have been commissioned by Cairn Home Properties Ltd to compile a Traffic and Transport Assessment (TTA) for a proposed residential development on a greenfield site located within the Newcastle LAP lands at Newcastle, Co. Dublin.

9.1.2 The proposals seek permission for the provision of 406 no. residential units comprising 125 no. apartments / duplexes and 281 no. houses in addition to a 518m^2 crèche facility and 67.7m^2 of commercial land use. The proposals represent Phase 1 of a larger land holding. The subsequent phased delivery (Phase 2) of a future 291 units will be subject to a separate planning application.

9.1.3 The purpose of this TTA is 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. Our methodology incorporated a number of key inter-related stages, including;

- Site Audit,
- Planning File Review,
- Policy Review,
- Commissioning and Analysis of Traffic Surveys,
- Trip Generation, Distribution and Assignment, and Network Impact
- Network Analysis.

9.1.4 As per best practice guidance this TTA has carried out a range of network assessments investigating different traffic conditions for an Opening Year of 2020, and Future Design Year assessments of 2025 and 2035.

9.2 SUMMARY

9.2.1 Based upon the information and analysis detailed within this Traffic and Transport Assessment it has been demonstrated that: -

- The development site benefits from the appropriate land use zoning in both the Newcastle LAP (2012) and the South Dublin County Development Plan (2016-2022).

- The review of the RSA road collision data demonstrated that the local road network benefits from having a very good road safety record.
- The subject site is highly accessible to pedestrians and cyclists from Burgage Crescent and Newcastle Boulevard to the east in the short term and from the north and west in the medium term.
- In the vicinity of the subject site the GDA Cycle Network Plan includes proposals for an Inter-urban cycle route along the R120 corridor located immediately to the north of the subject site.
- The design of the scheme proposals has sought to maximise the ability to provide attractive safe permeable connections to the adjoining third-party lands surrounding the subject development site thereby encouraging walking, cycling and public transport as a viable and preferred mode of travel.
- A series of 'green' links are proposed as part of the subject scheme comprising; i) 4m wide shared segregated cycle / pedestrian facilit along the proposed link road to the north and in a notht / south direction through the site and ii) 2m footways and cycle lanes / tracks along either side of the main spine road.
- The subject proposals include for the provision of the principal access road, as per the Newcastle LAP, between the Newcastle Boulevard / Burgage Crescent junction to the western boundary of the subject site boundary. Furthermore, a new road link is proposed between the aforementioned principal access road and the R120 correlating with the LAP's central link road proposal.
- The design of the proposals respect fully the guidance outlined in DMURS.
- The proposed development layout design provides a total of 721 no. car parking spaces (excluding 14 no. additional car parking spaces adjoining "open space" areas) comprising 709 residential car parking spaces, 11 creche car parking spaces and 1 no. commercial car parking space. It has been demonstrated that this level of provision is appropriate for the subject site.
- The proposed development layout design provides a total of 323 no. cycle parking spaces comprising 157 long term and 166 short stay cycle parking spaces.
- The subject Phase 1 development site is proposed to be accessible from 3 no. access locations in the short term. This includes two accesses with the Burgage Crescent corridor and third site access located to the north with the R120 Main Street corridor.

- Following the implementation of the overall masterplan development (i.e. Phase 2), a fourth site access is proposed to the west of the subject site in the form of a new priority controlled junction with the Athgoe Road corridor which will be implemented with the introduction of the future Phase 2 development.
- A total of five number third party committed developments have been identified and included within the reported network assessment.
- A junction impact analysis was undertaken and has demonstrated that the proposals will generate a subthreshold impact upon all local key junctions during the 2035 Future Design Year scenario. Figure 9.1 and 9.2 below details the total amount of two-way vehicle trips that will pass through the key off-site junctions in the assessment year of 2035 and the resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development.

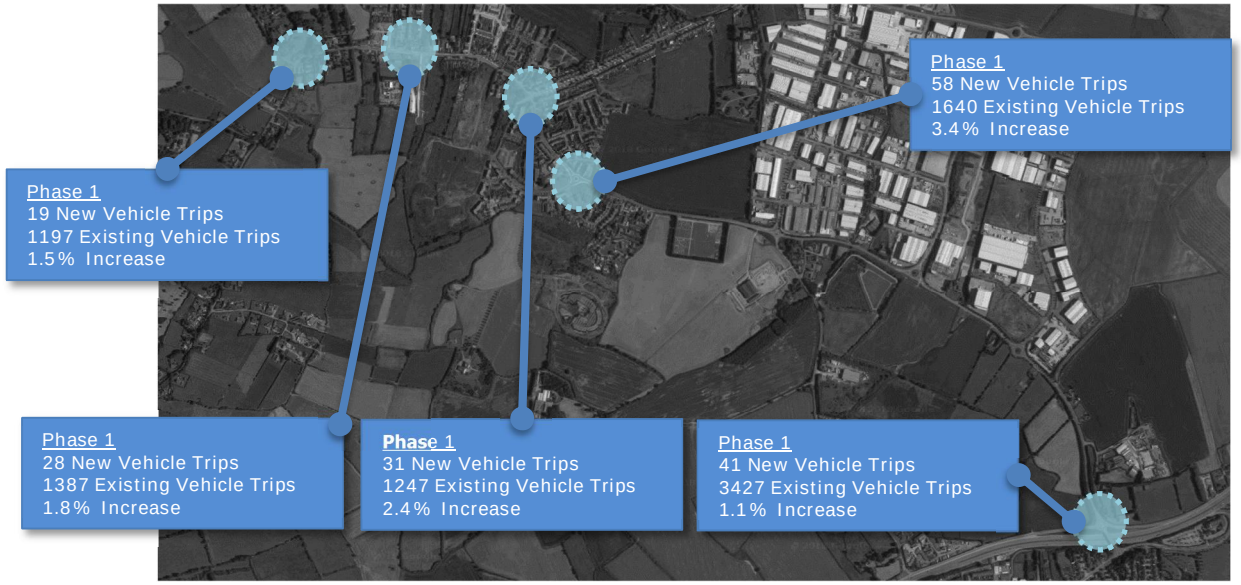


Figure 9.1: Increase in Vehicle Trips Generated Through Key Of-Site Junctions(2035 AM Peak Hour)

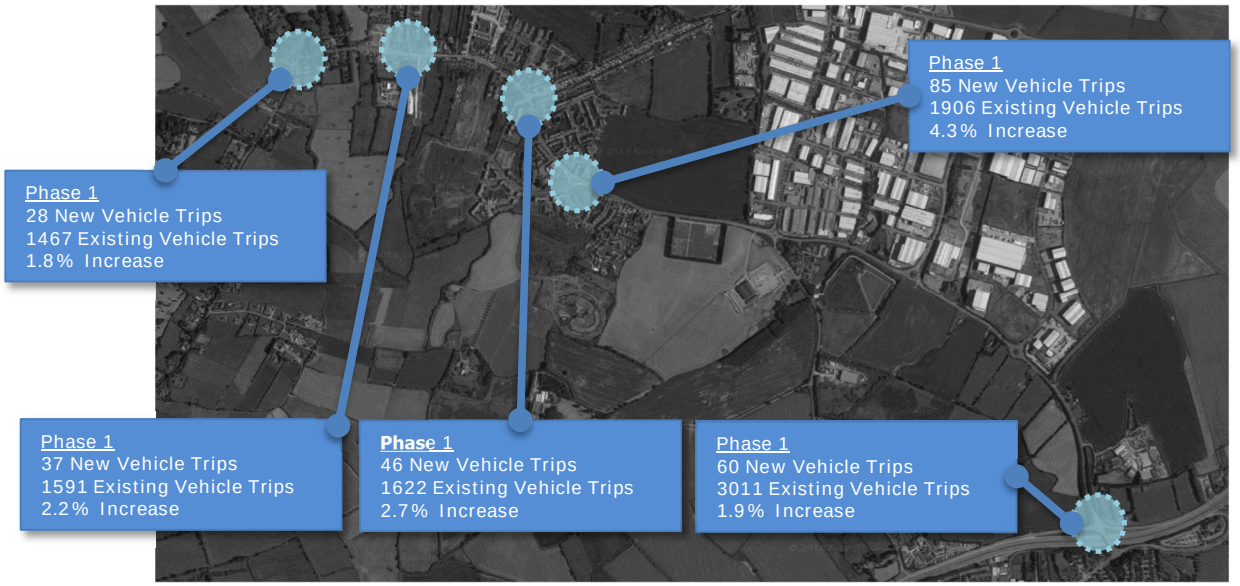


Figure 9.2: Increase in Vehicle Trips Generated Through Key Of-Site Junctions (2035 PM Peak Hour)

- The following junctions have been considered for further analysis using junction modelling software due to the scale of the impact recorded and their close proximity to the subject site;

  Junction 3 – R120 / Burgage Crescent / Aylmer rd 4-arm signalised junction

  Junction 4 – R120 / Newcastle Boulevard Roundabout Junction

  Junction 6 – Proposed Northern Site Access / R120 Priority Controlled Junction

- The junction analysis undertaken at the aforementioned junctions reveals that the proposals will not have a notable impact on the above three junction's operational performance compared to the Do-Nothing scenario. It is noted that the R120 / Newcastle Boulevard roundabout will be operating at capacity in the Future 2035 Design Year however this is only predicted to occur for a short duration during the PM peak hour only as would be expected for a junction in an urban environment.

- The long term (beyond 2035) capacity of the local road network is safeguarded by the delivery of the W.D.O.R infrastructure objectives of SDCC which will result in a significant reduction in vehicle movements in Newcastle following the removal of all existing 'rat-running' traffic flows.

9.3 CONCLUSION

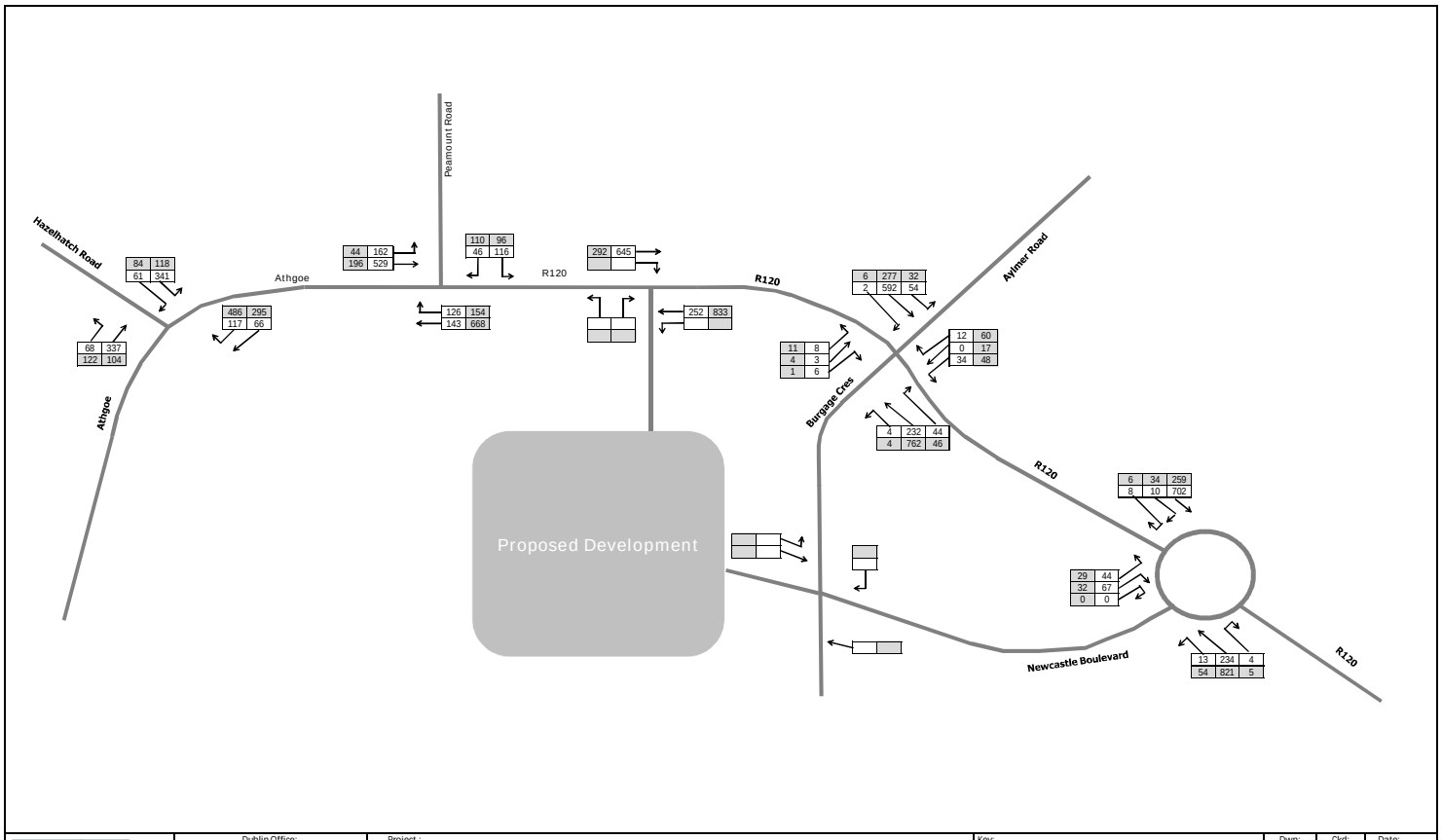
9.3.1 In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed development will be negligible. This is based on the anticipated levels of traffic generated by the proposed development and the information and analysis summarised in the above report.

9.3.2 It is concluded that the proposals represent a sustainable and practical approach to development on the subject zoned lands and with no material traffic or road safety related reasons that should prevent the granting of planning permission for the proposed residential development.

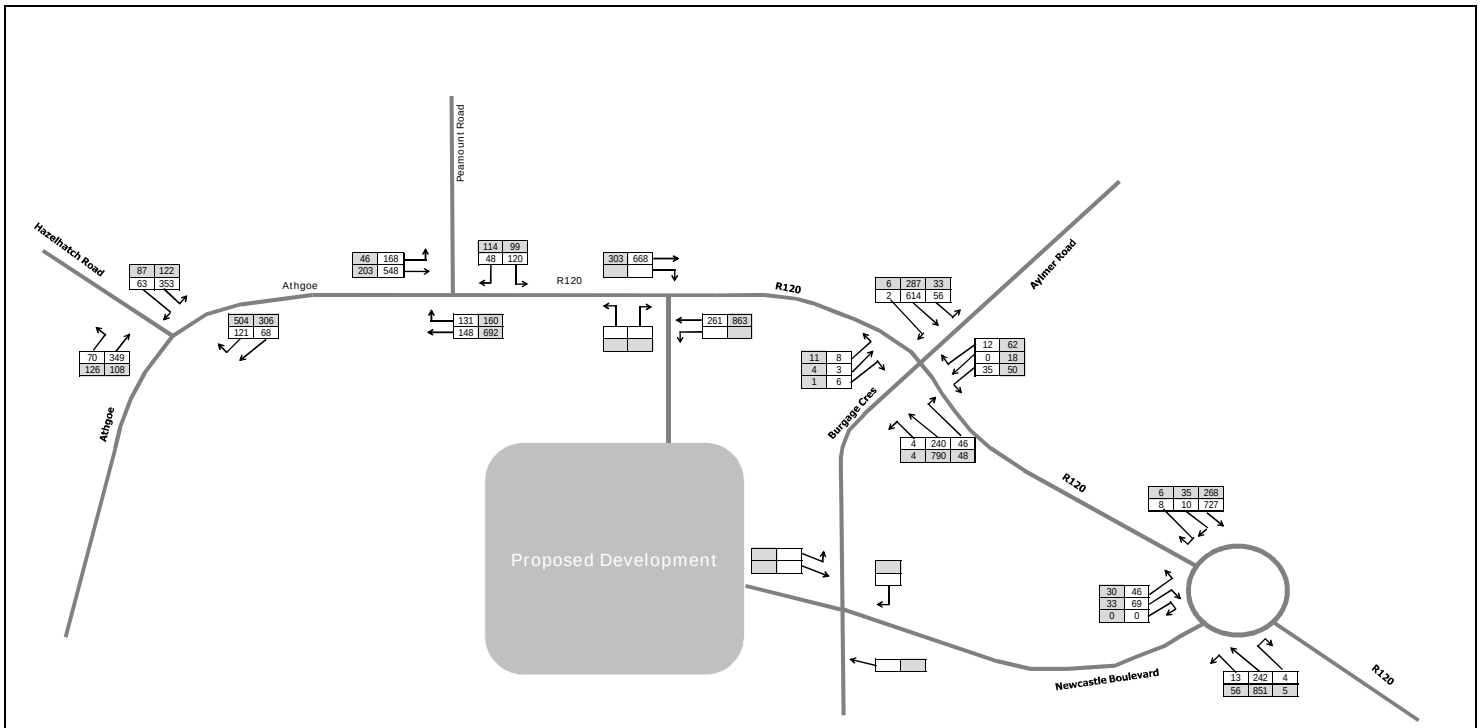
APPENDICES

APPENDIX A

Traffic Flow Diagrams



DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : Network Traffic Flows - PCU's 2018 Base Flows	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 1 Rev:	



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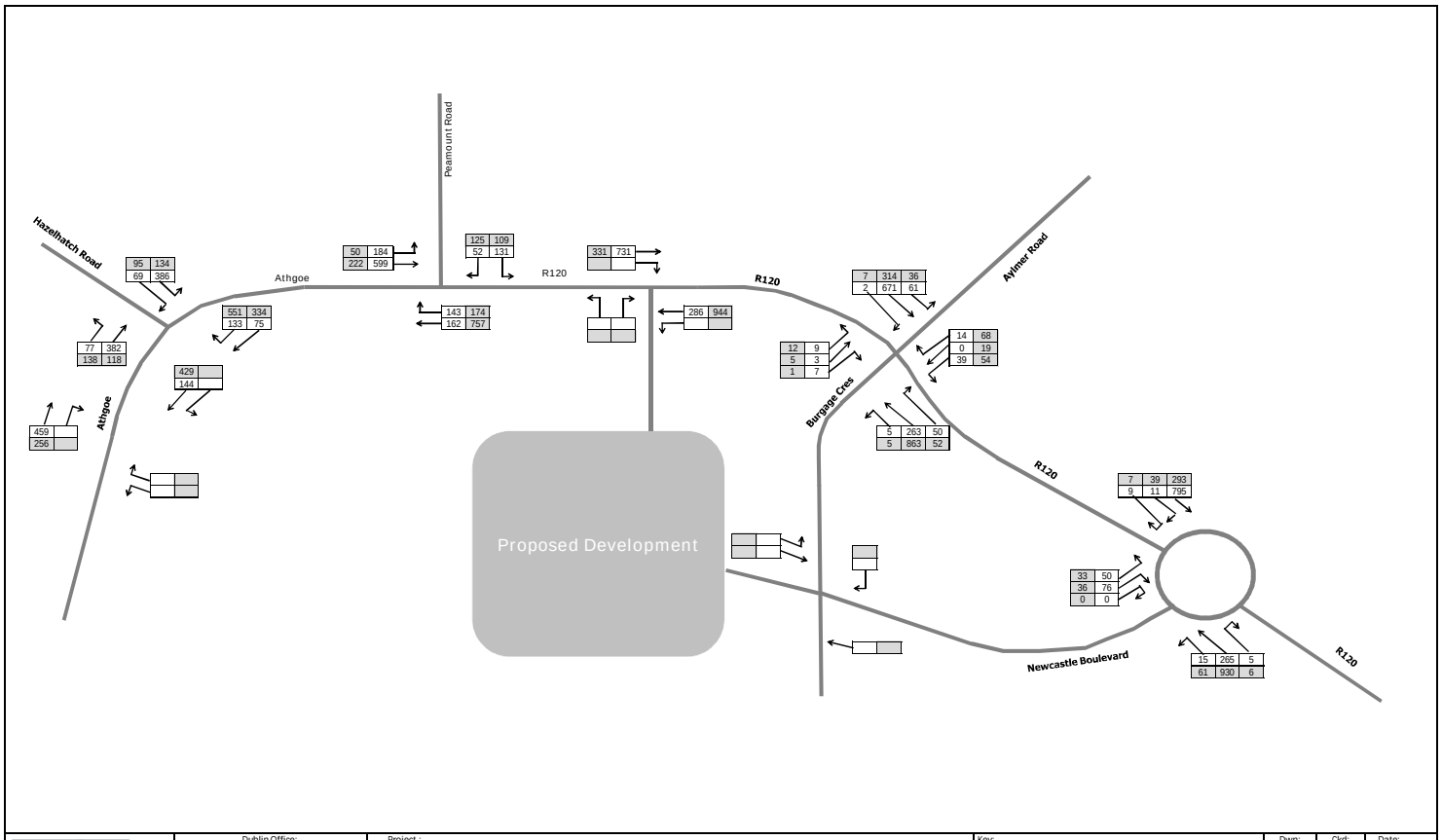

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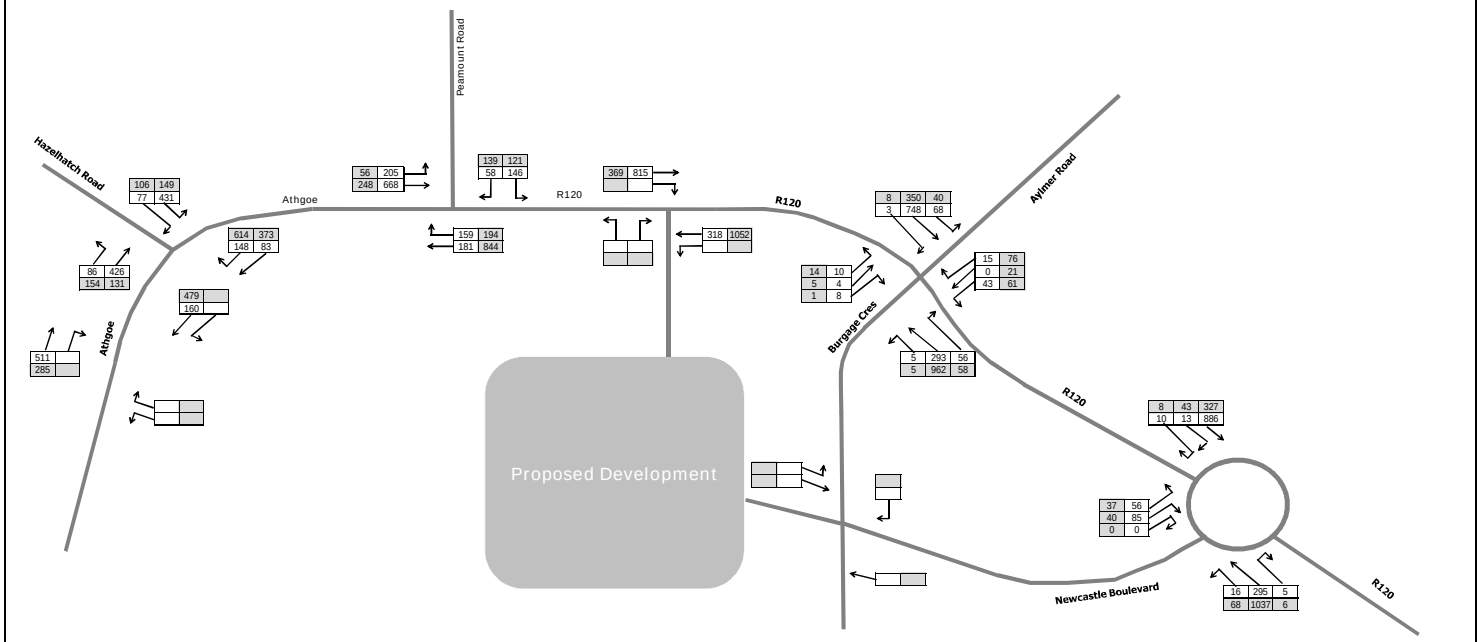

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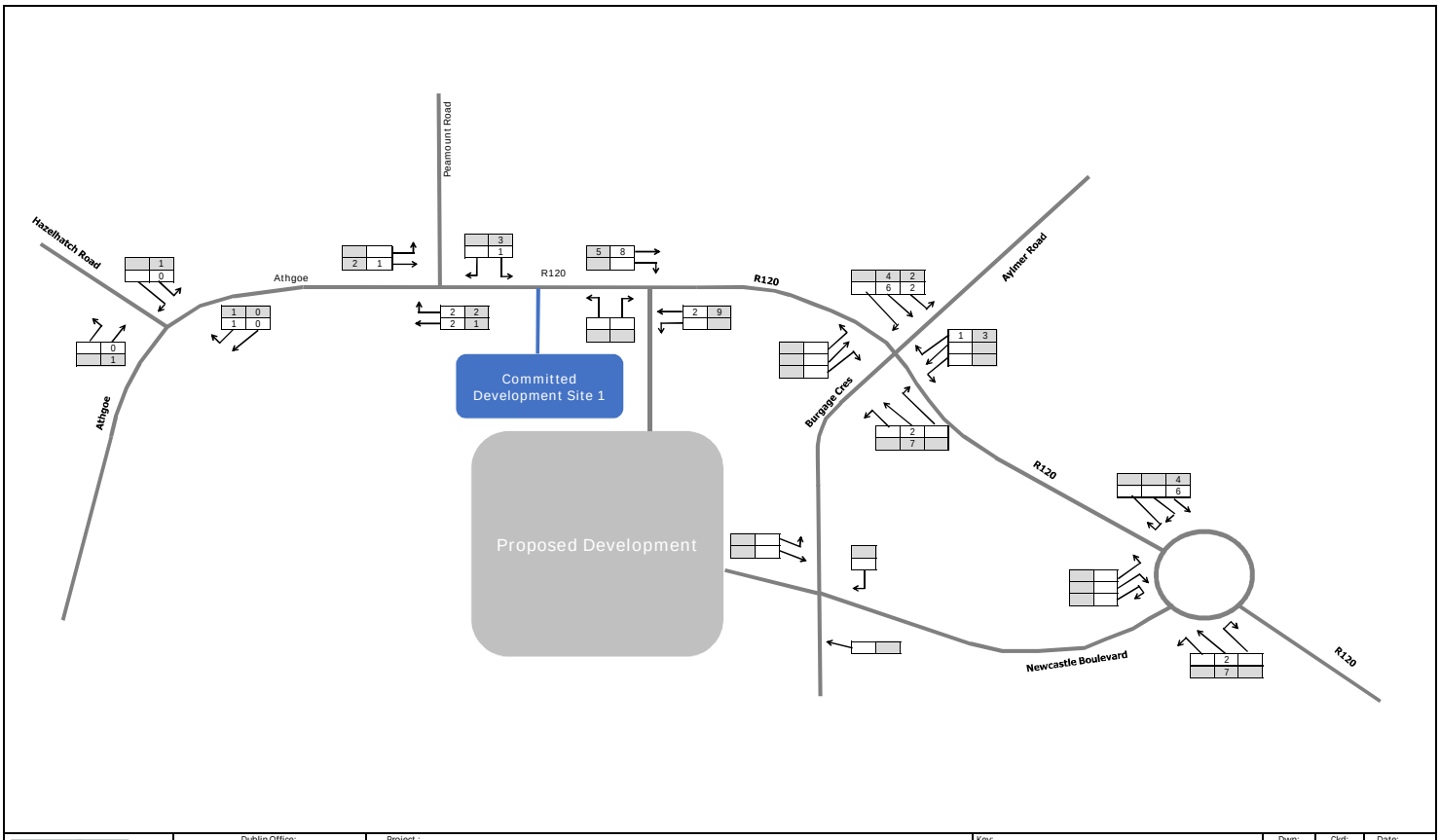

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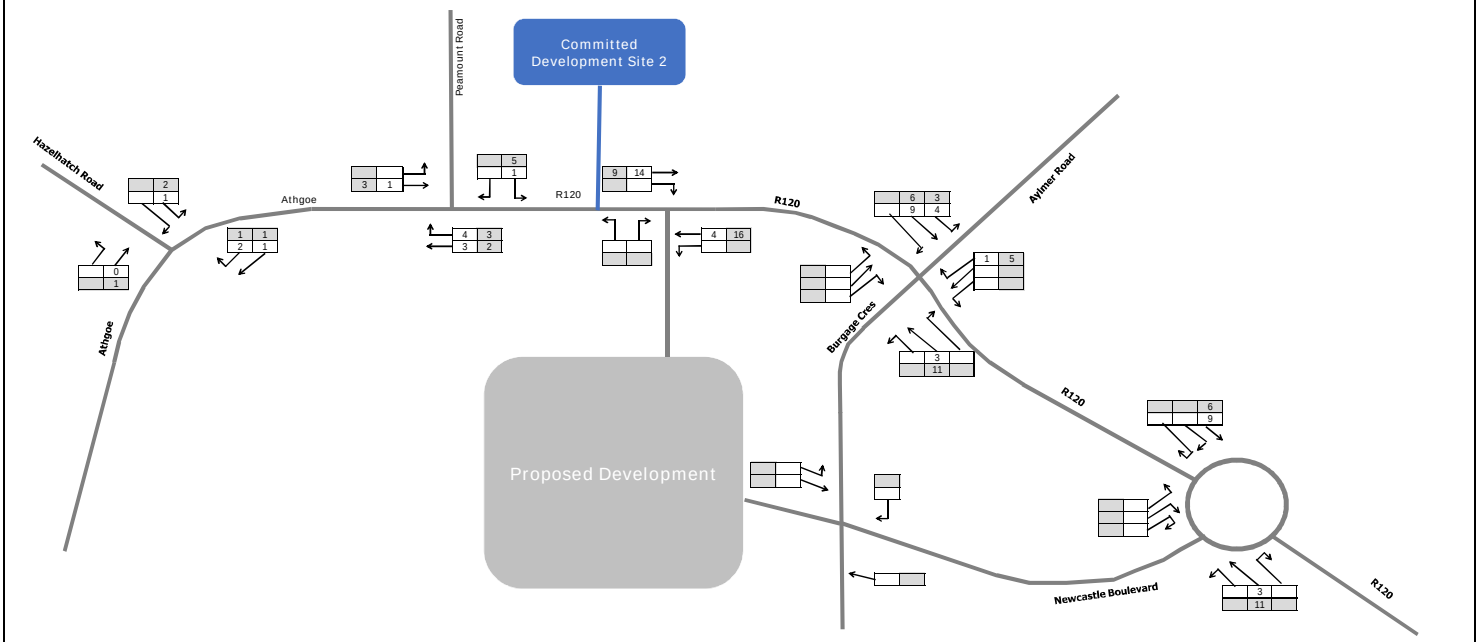

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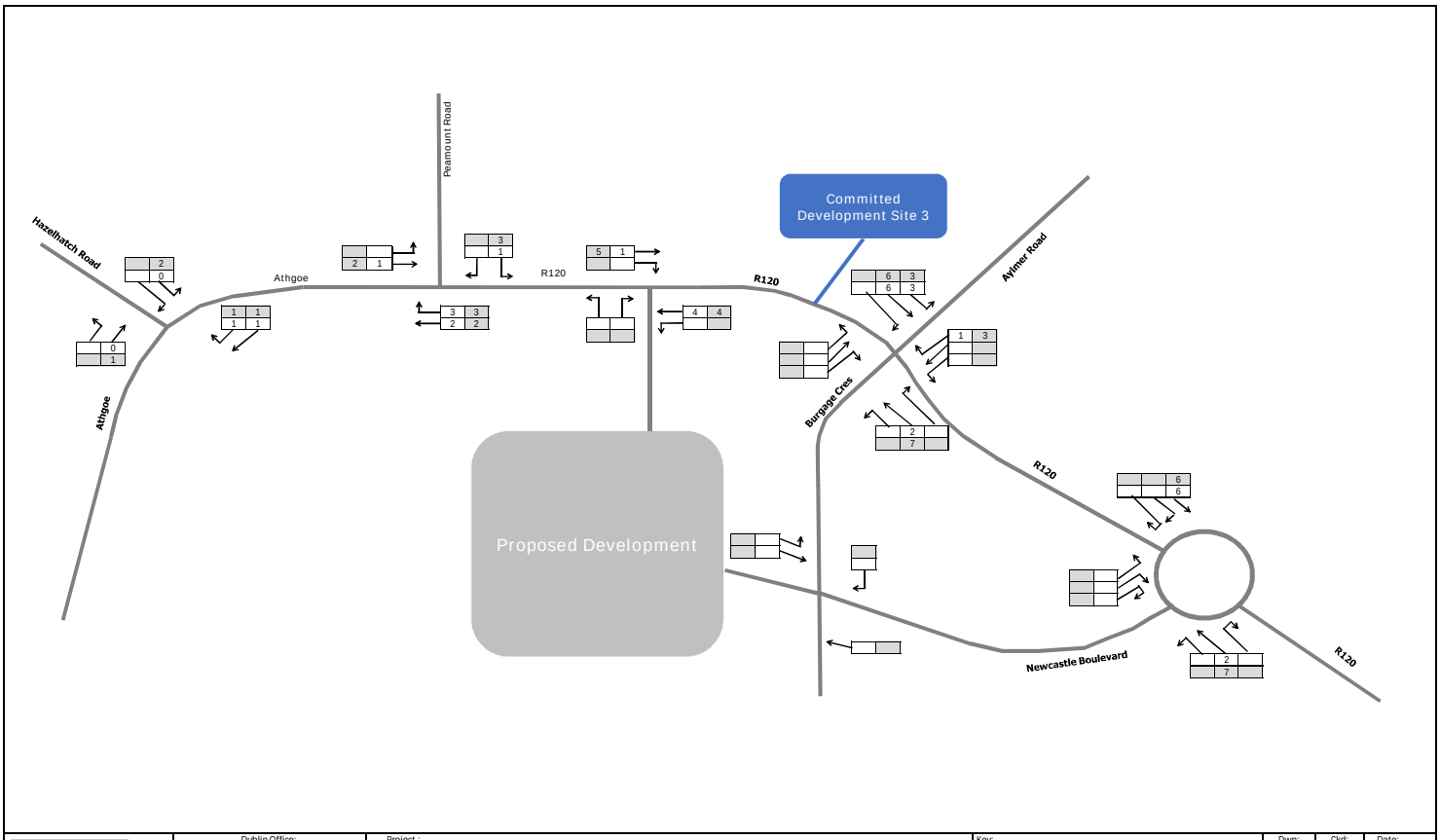

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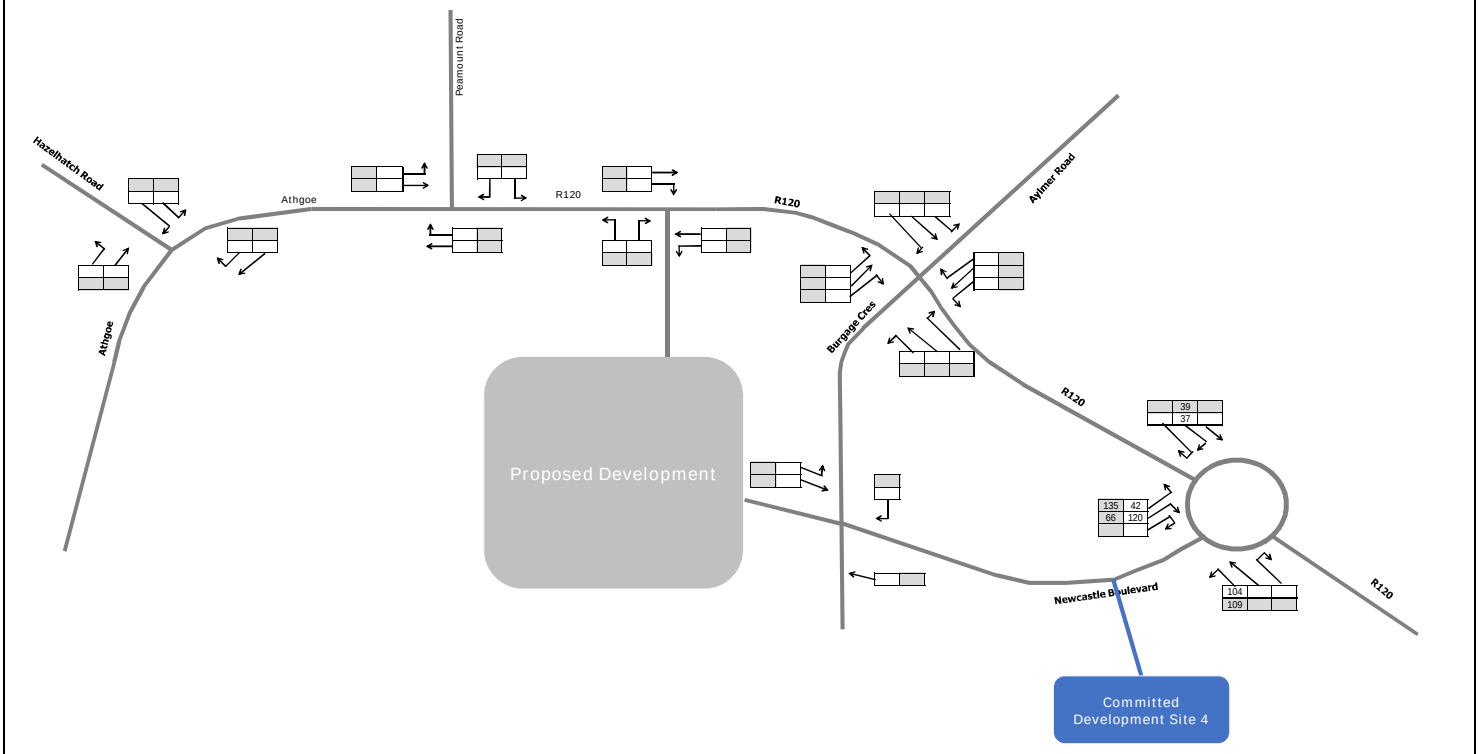

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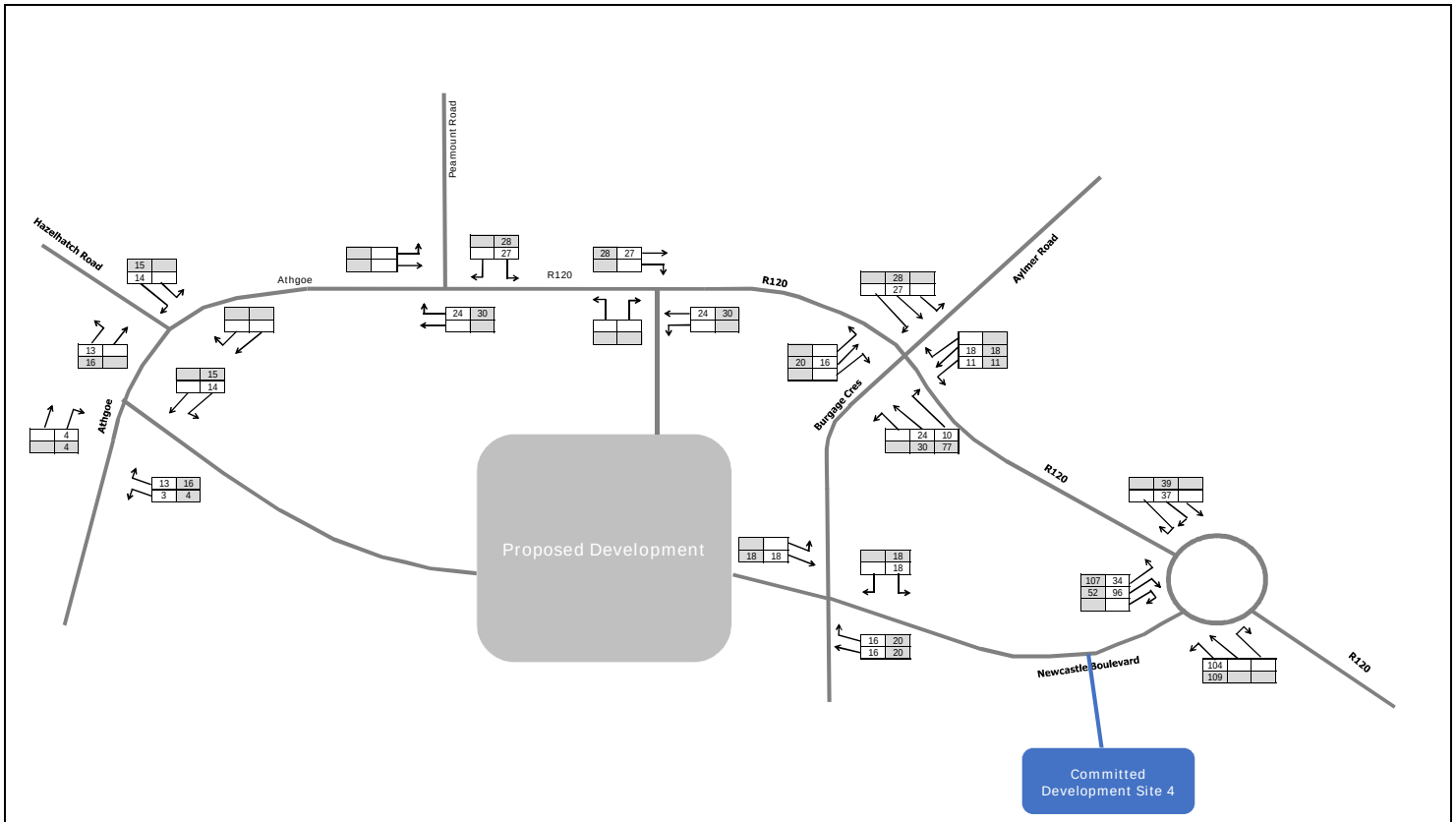

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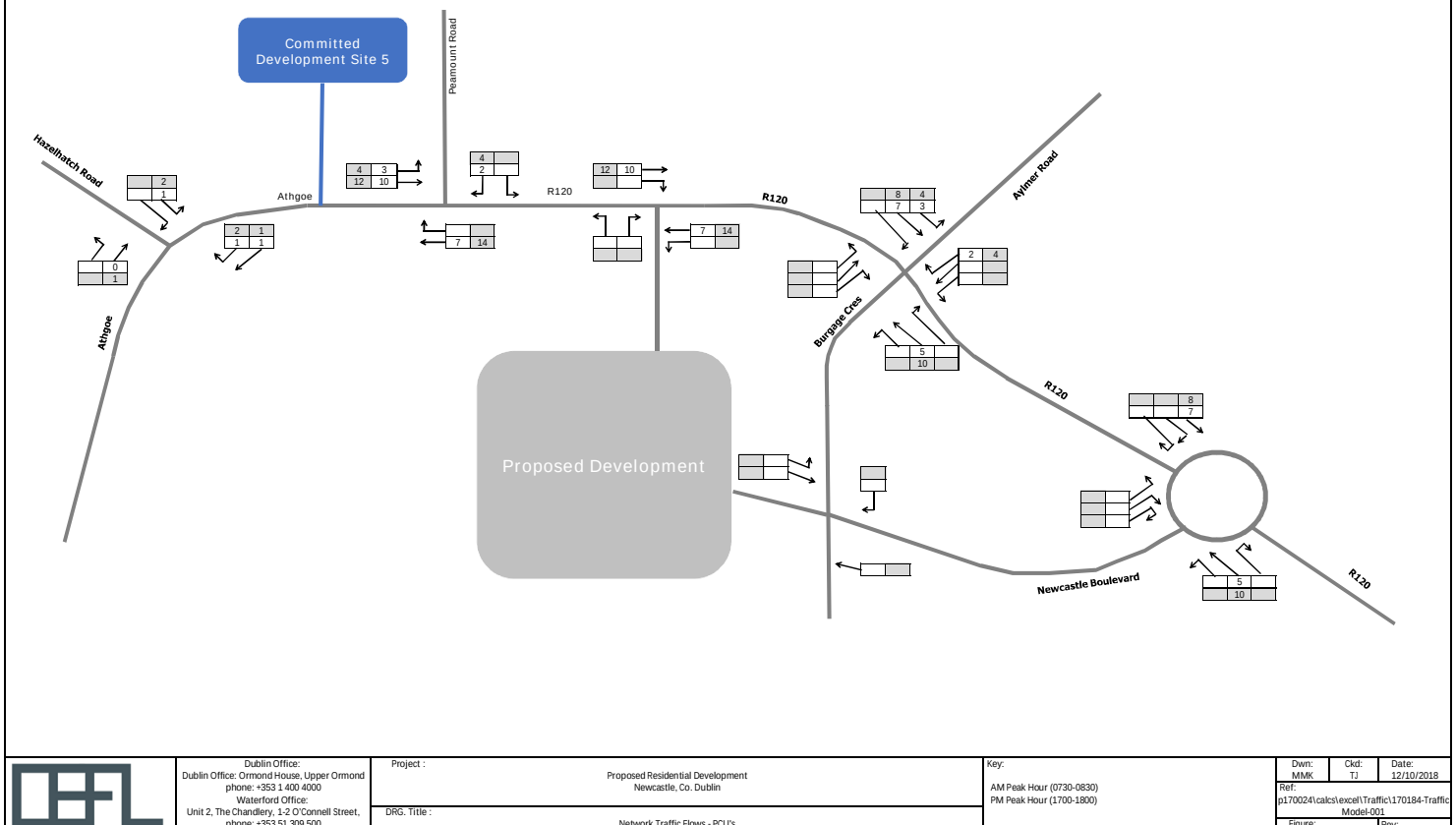

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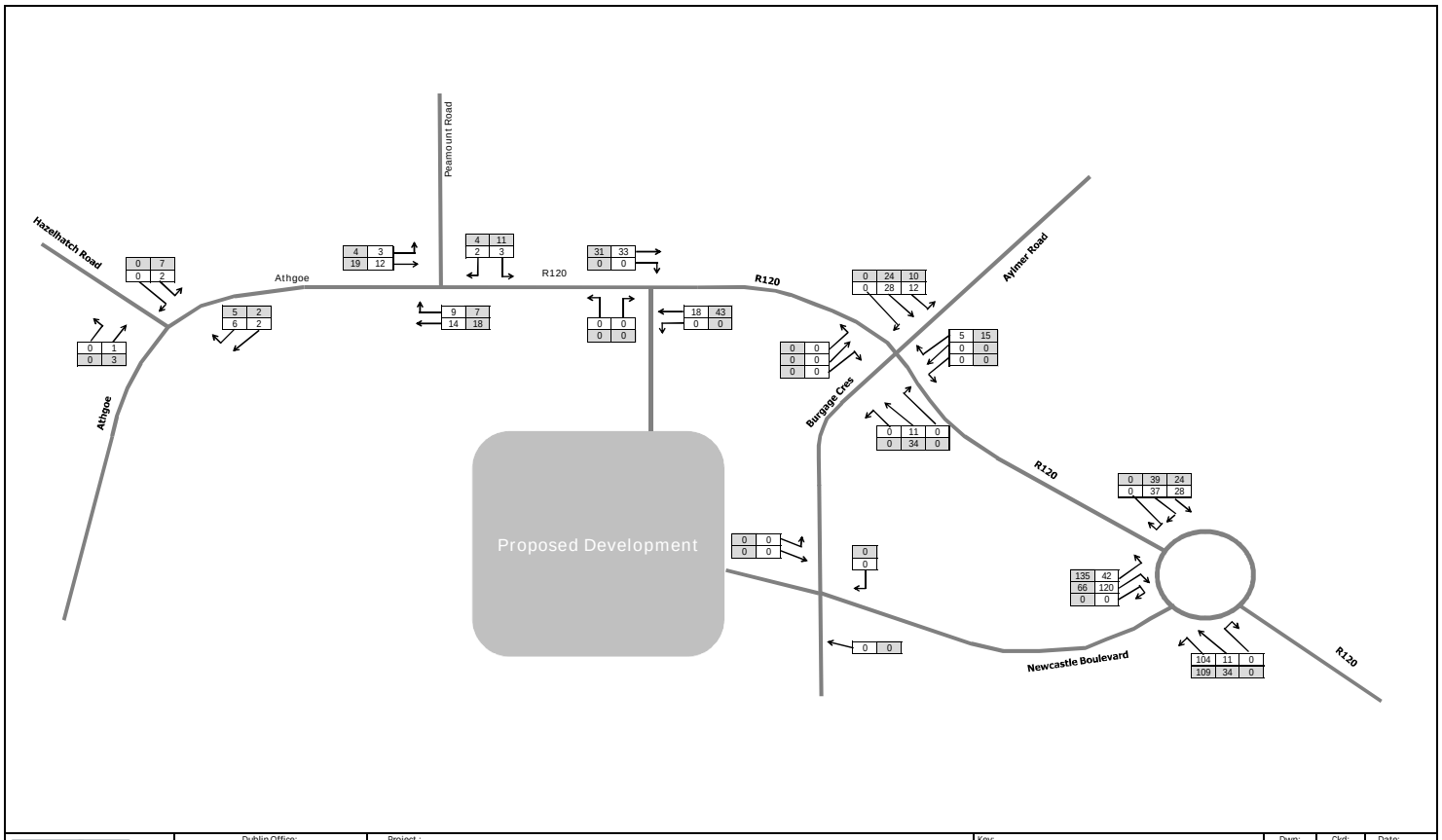

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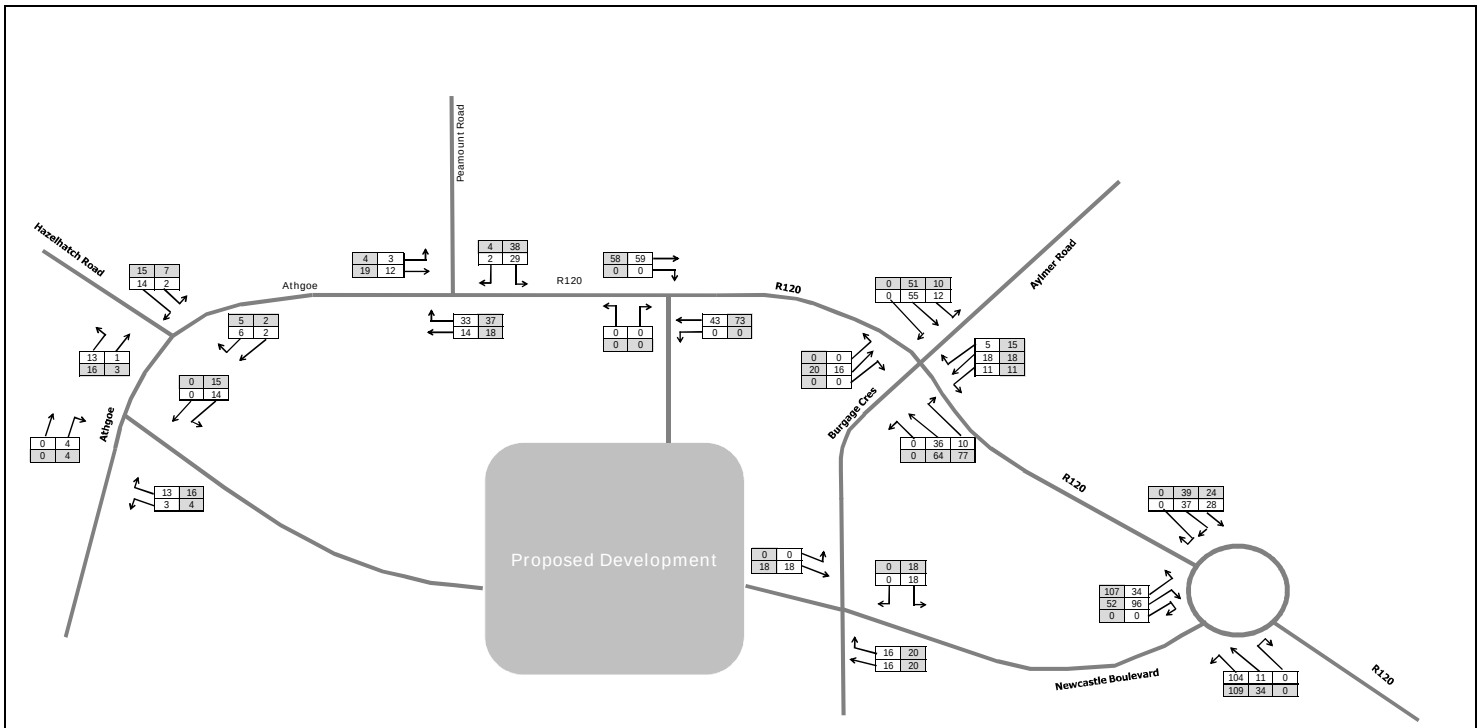

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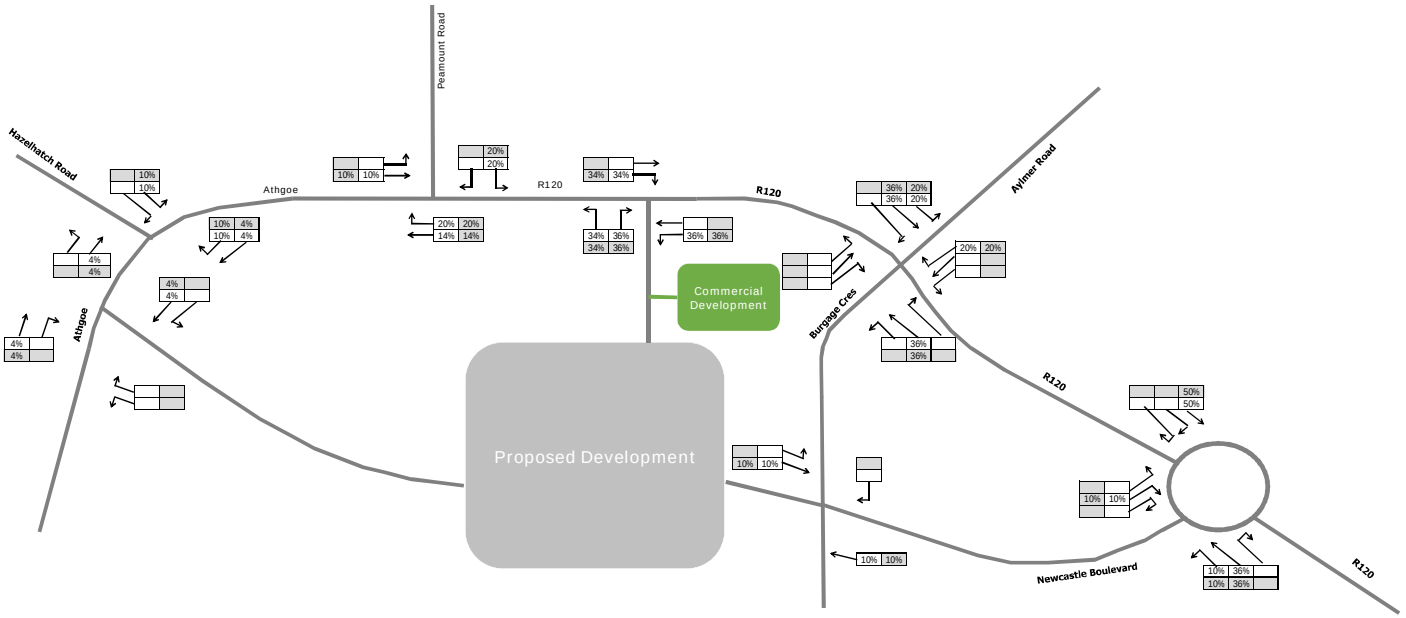

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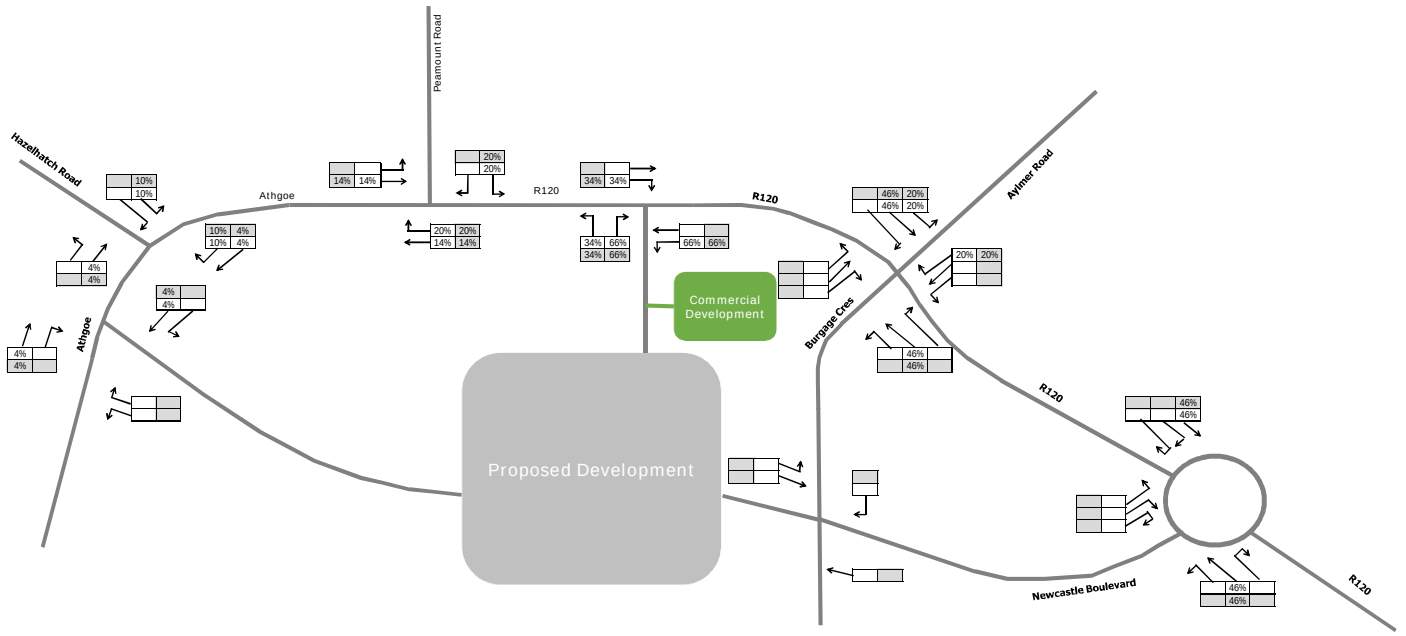

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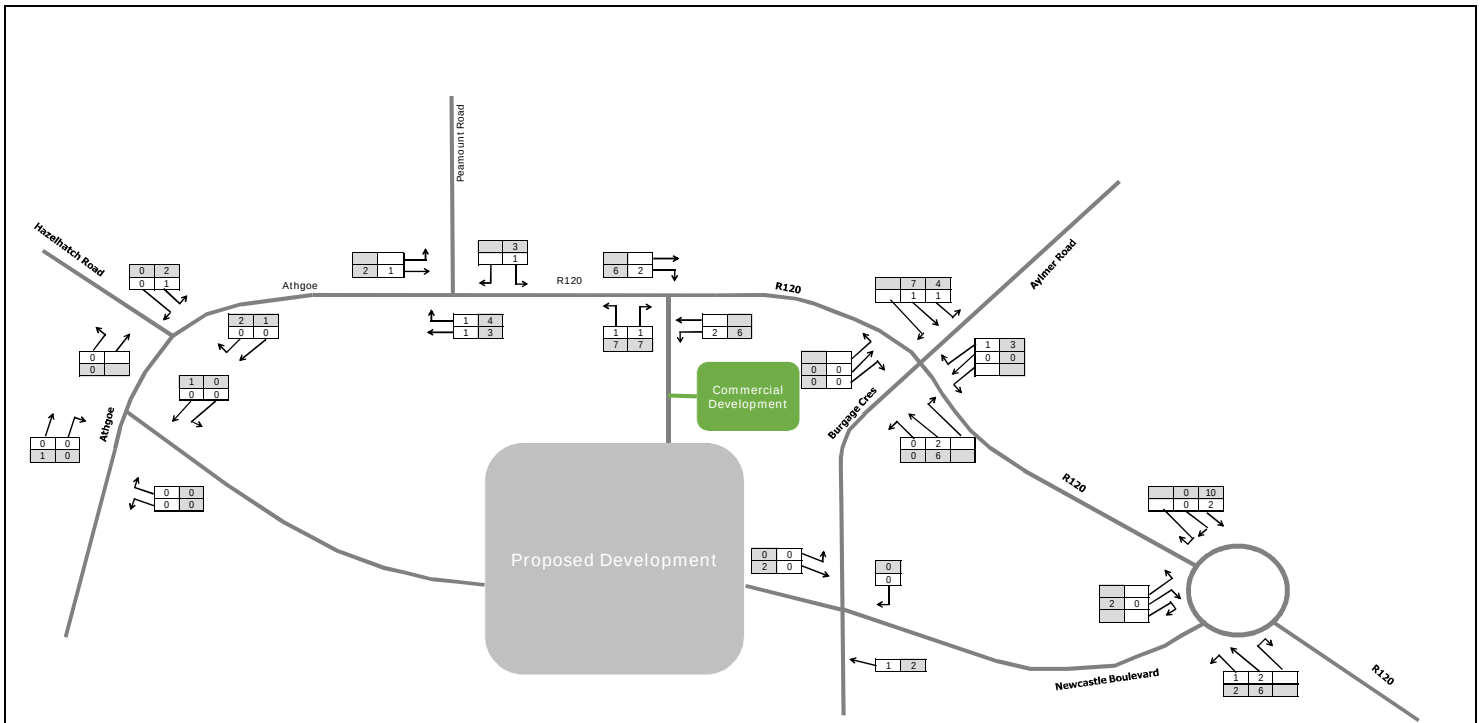

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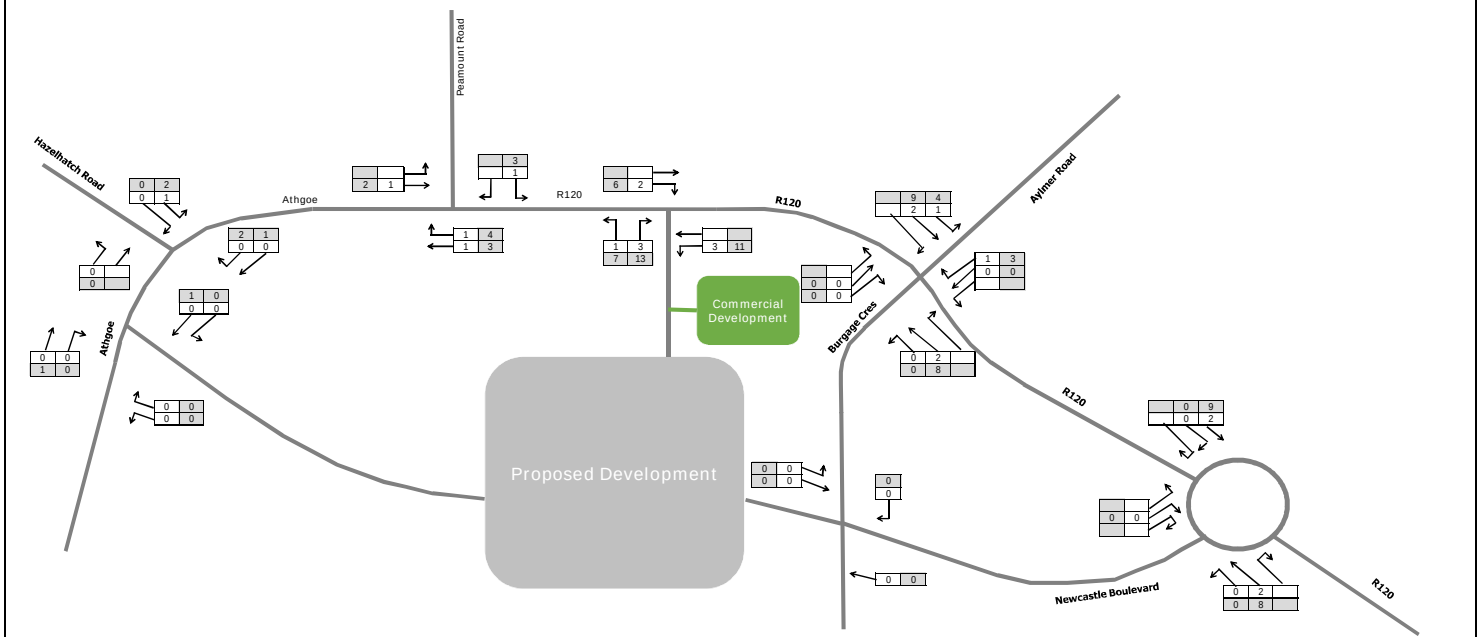

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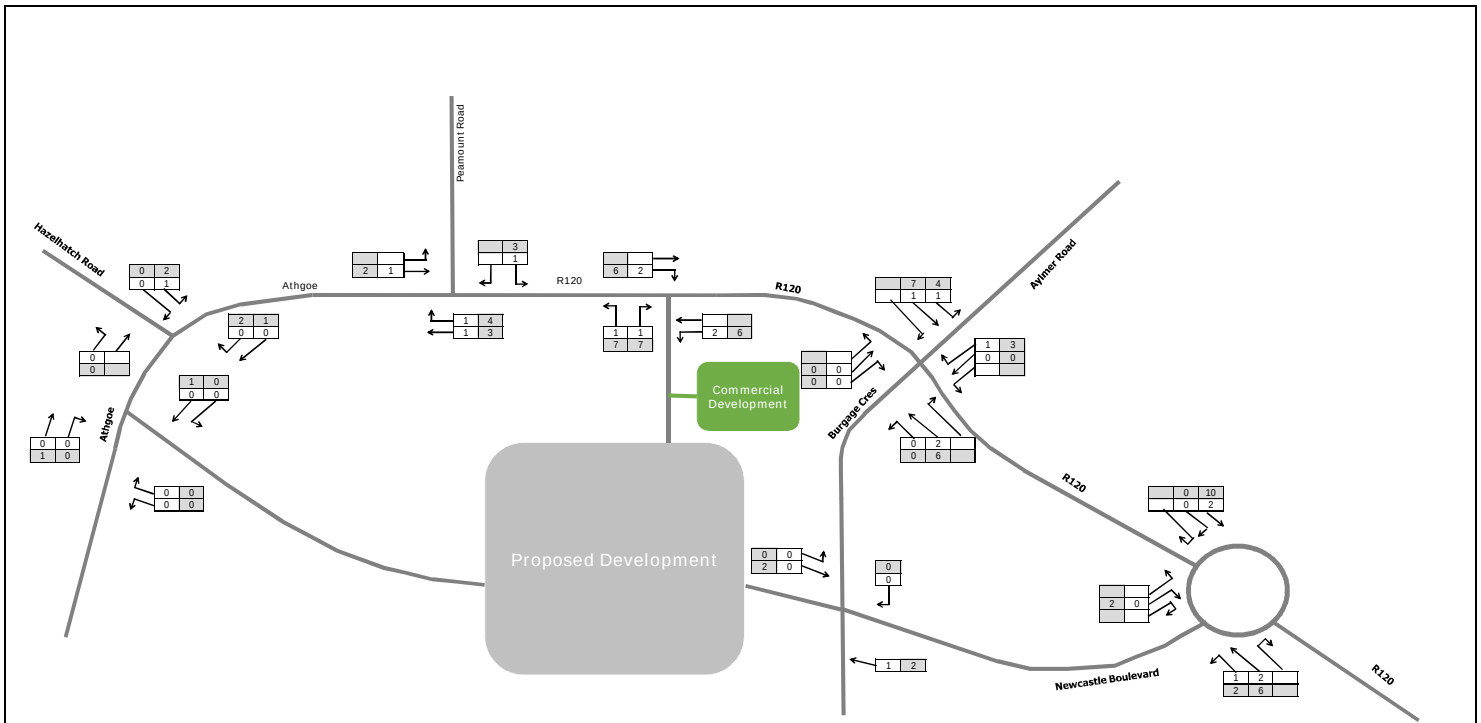

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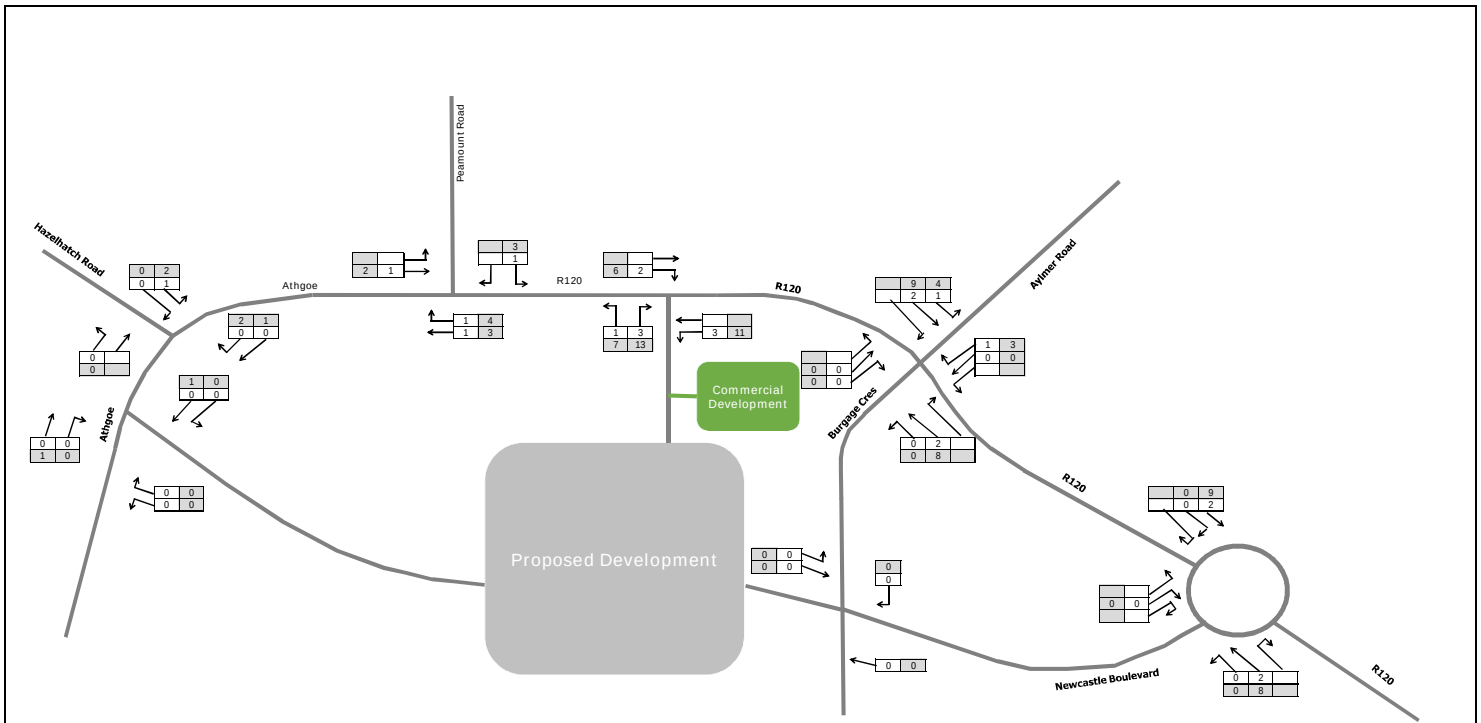

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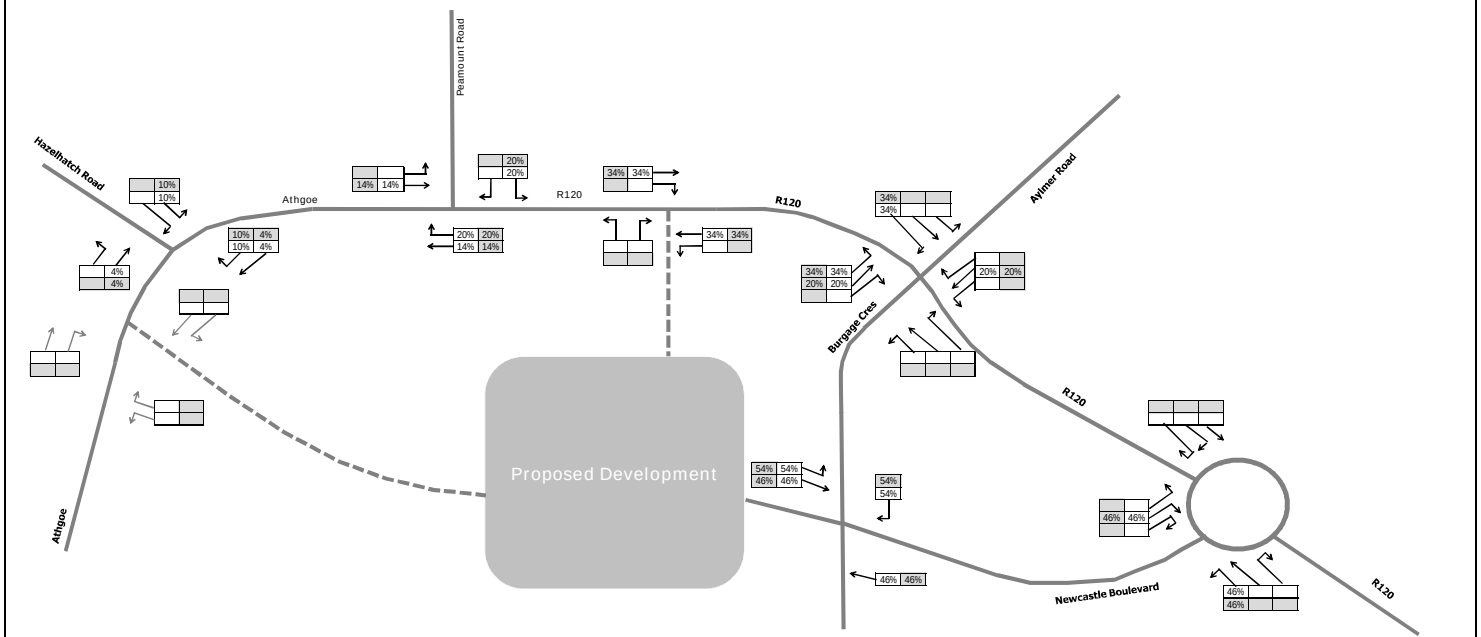

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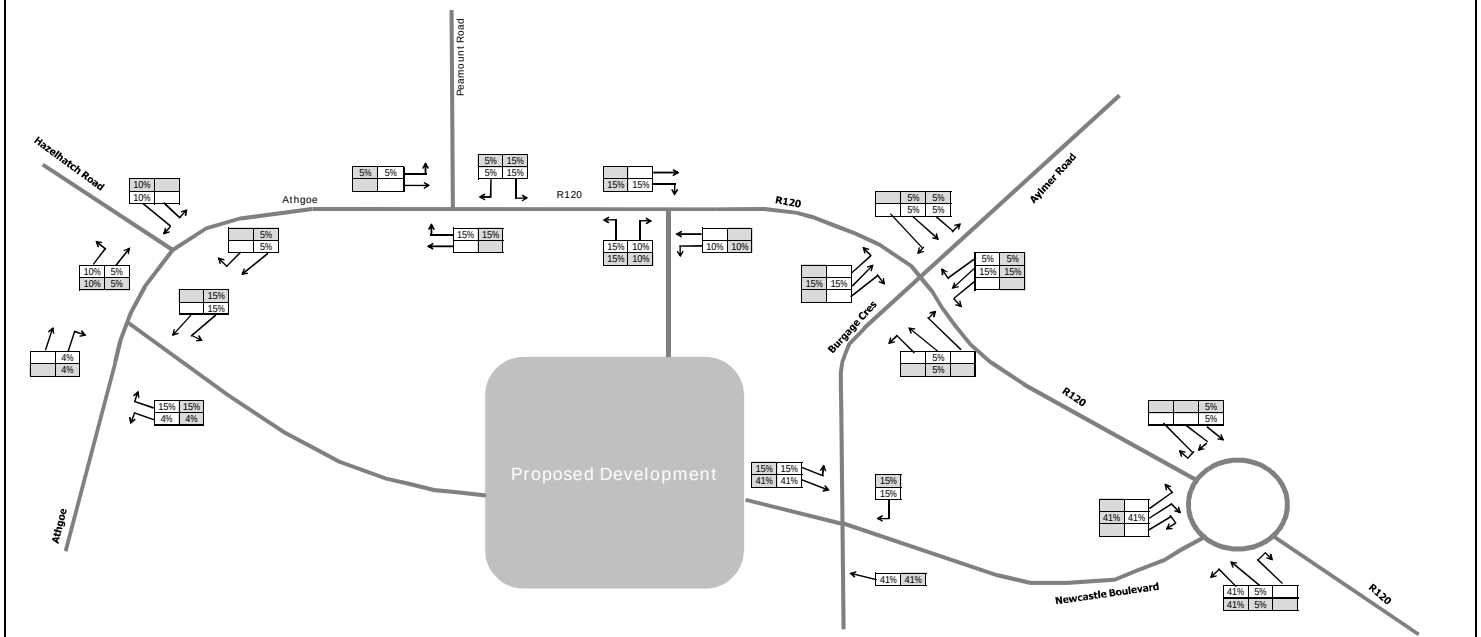

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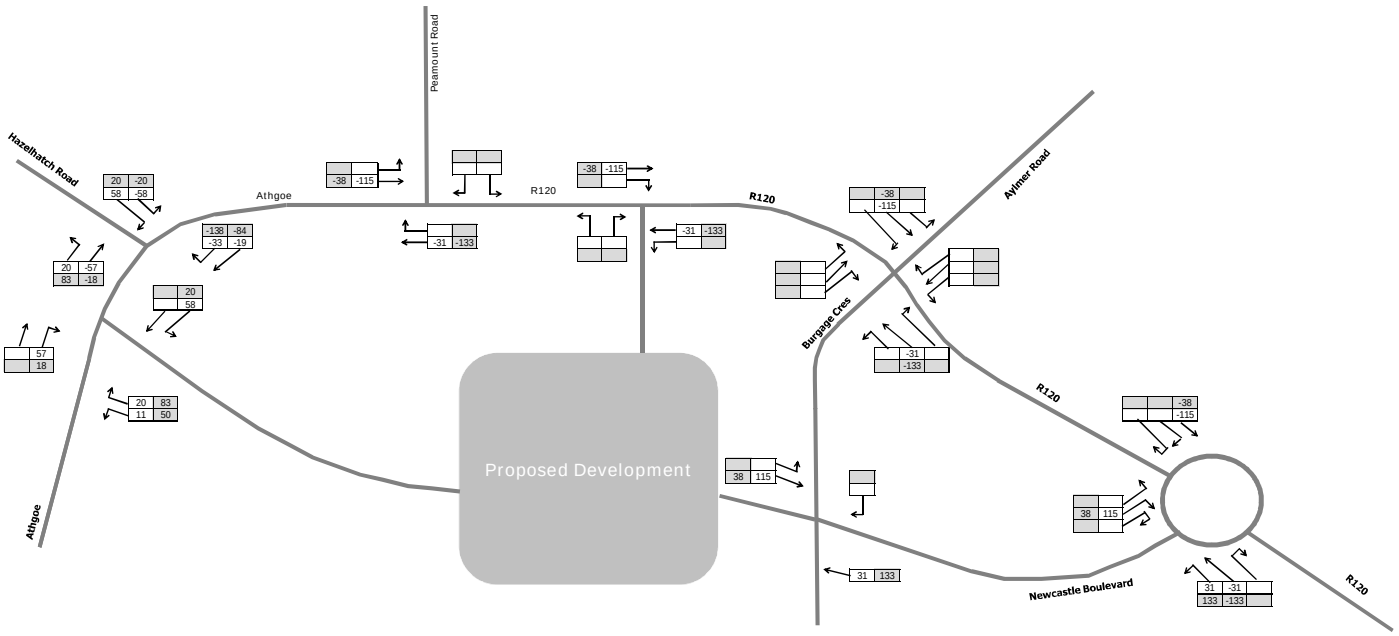

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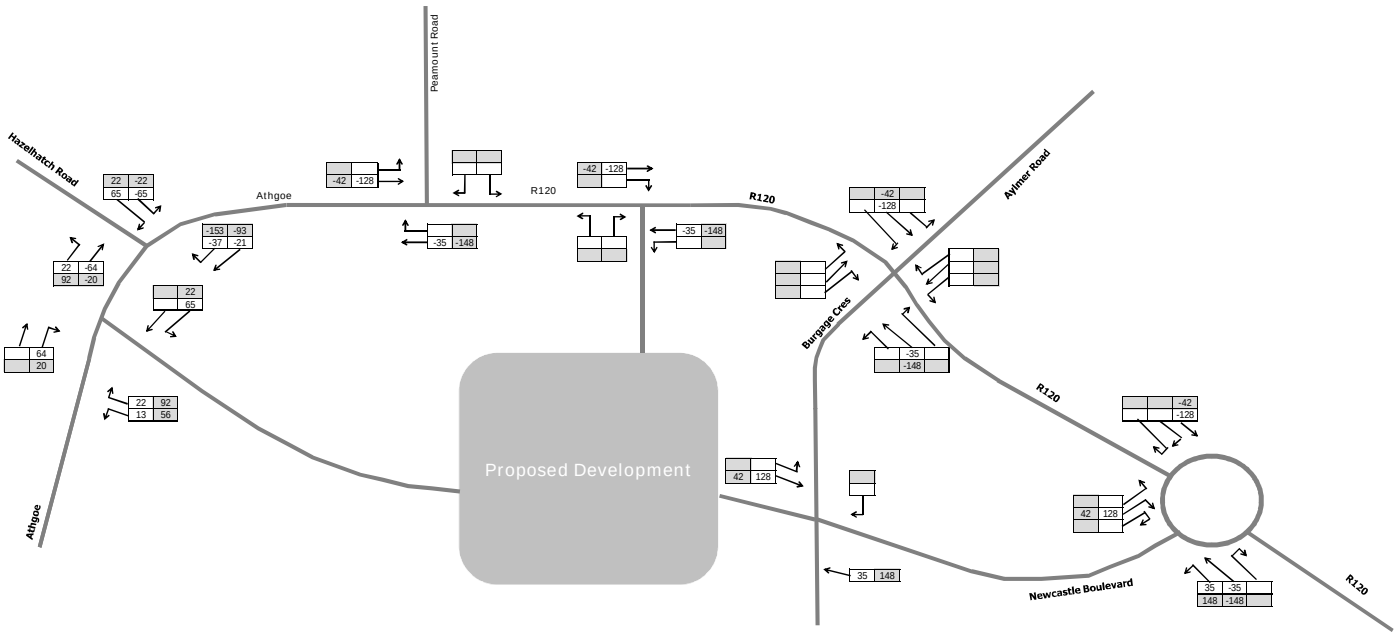

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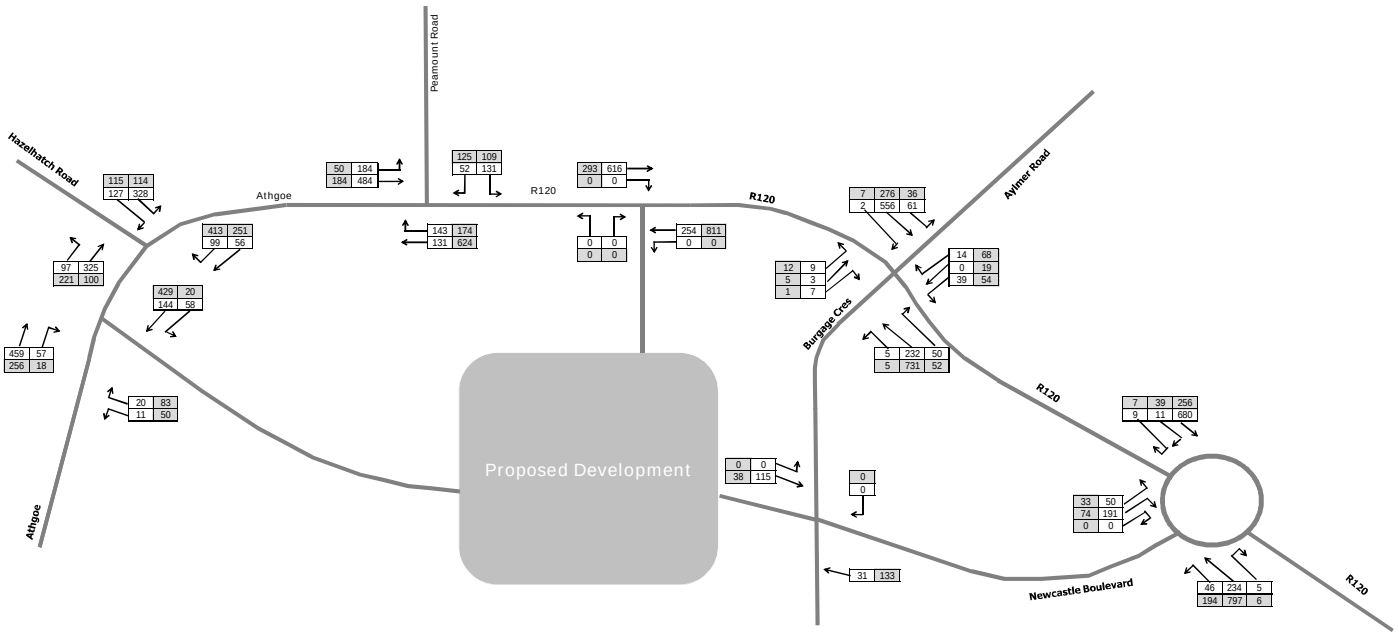

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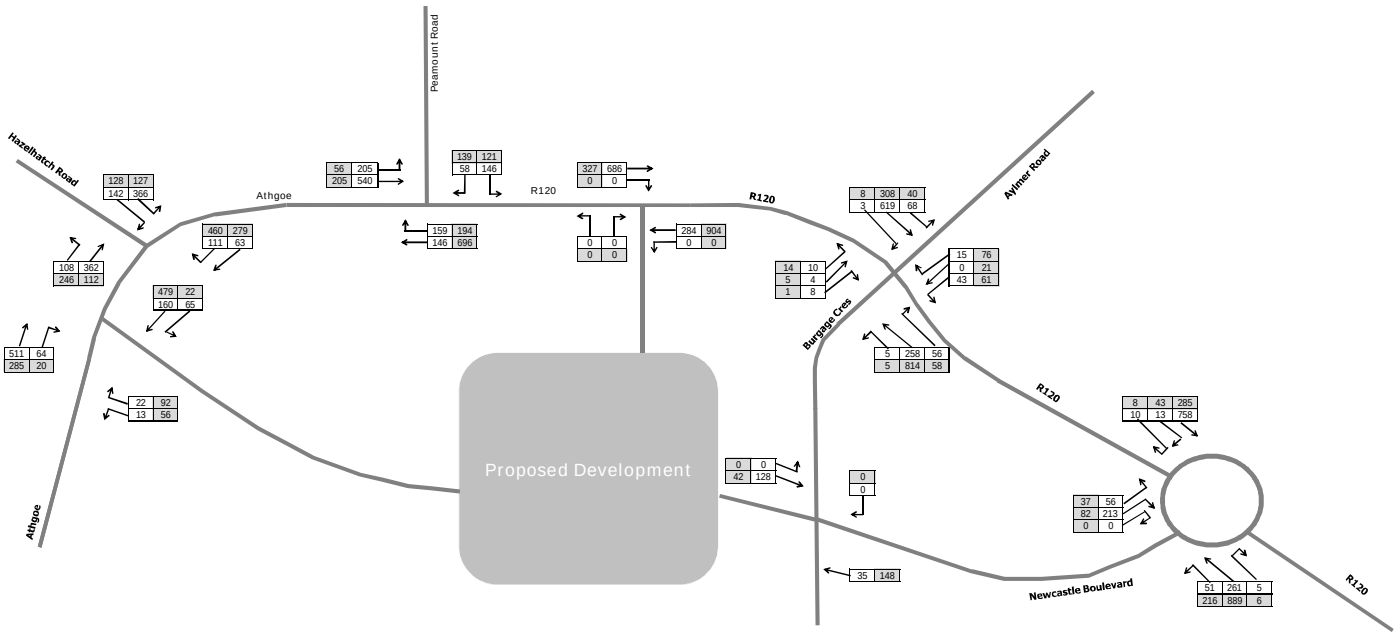

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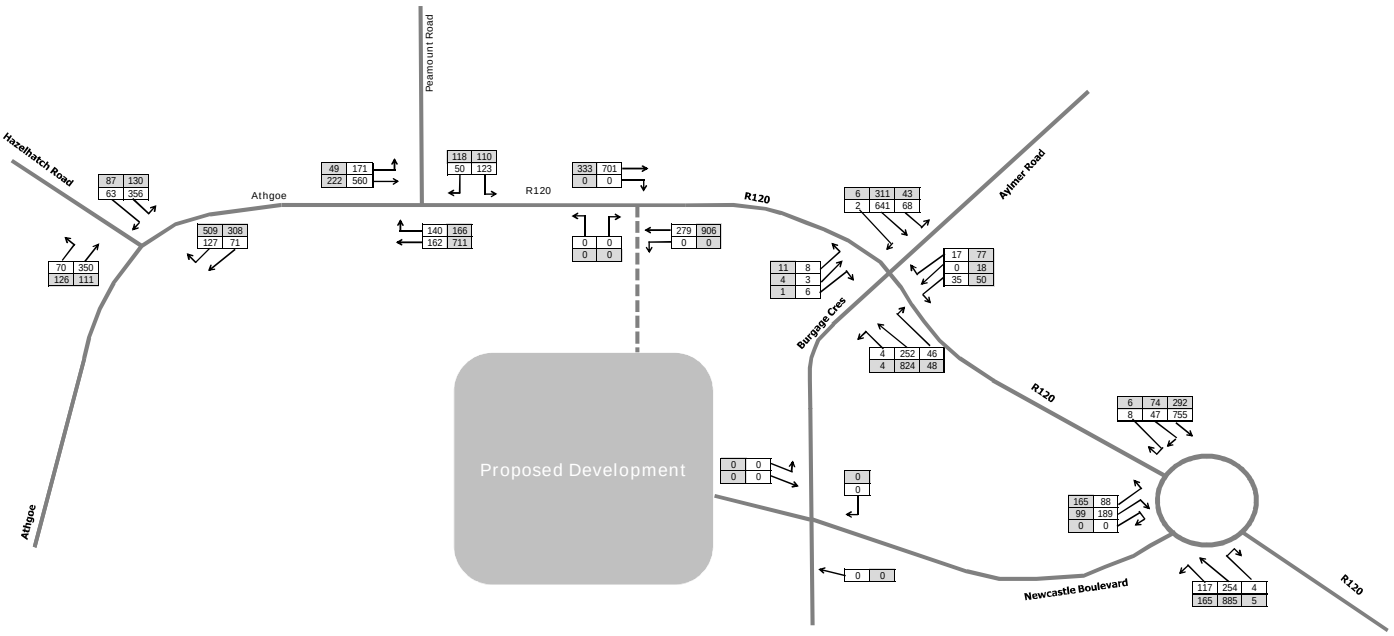

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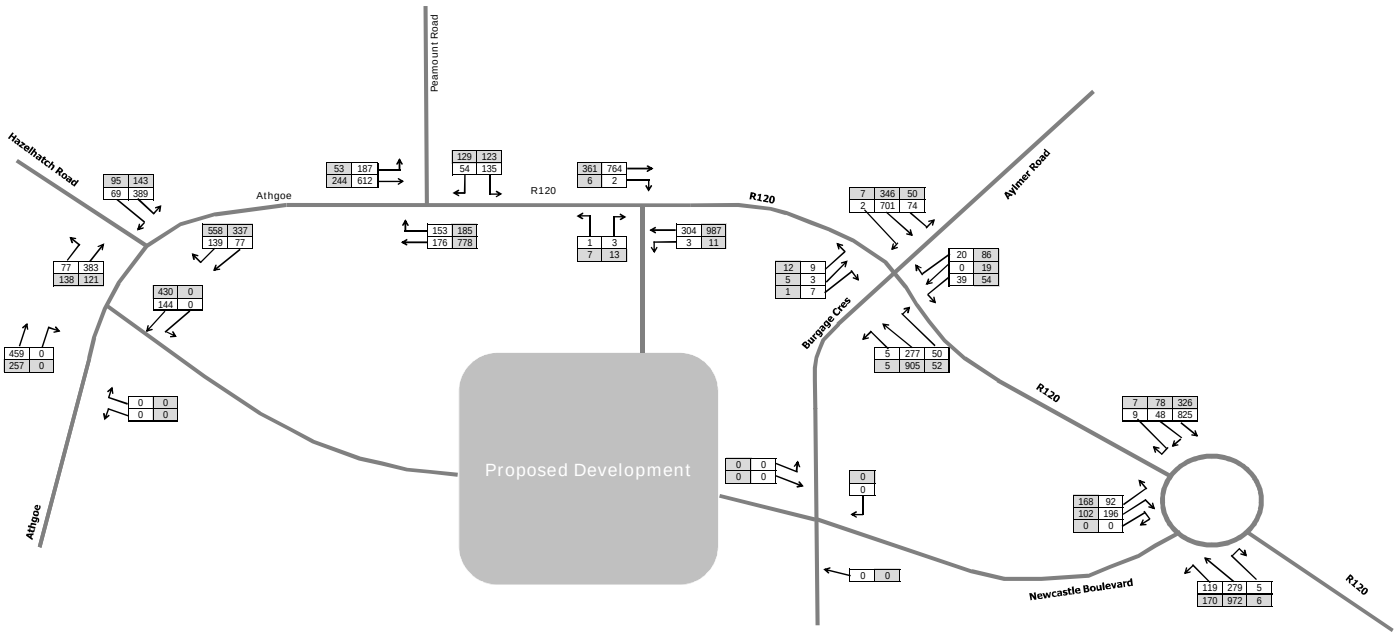

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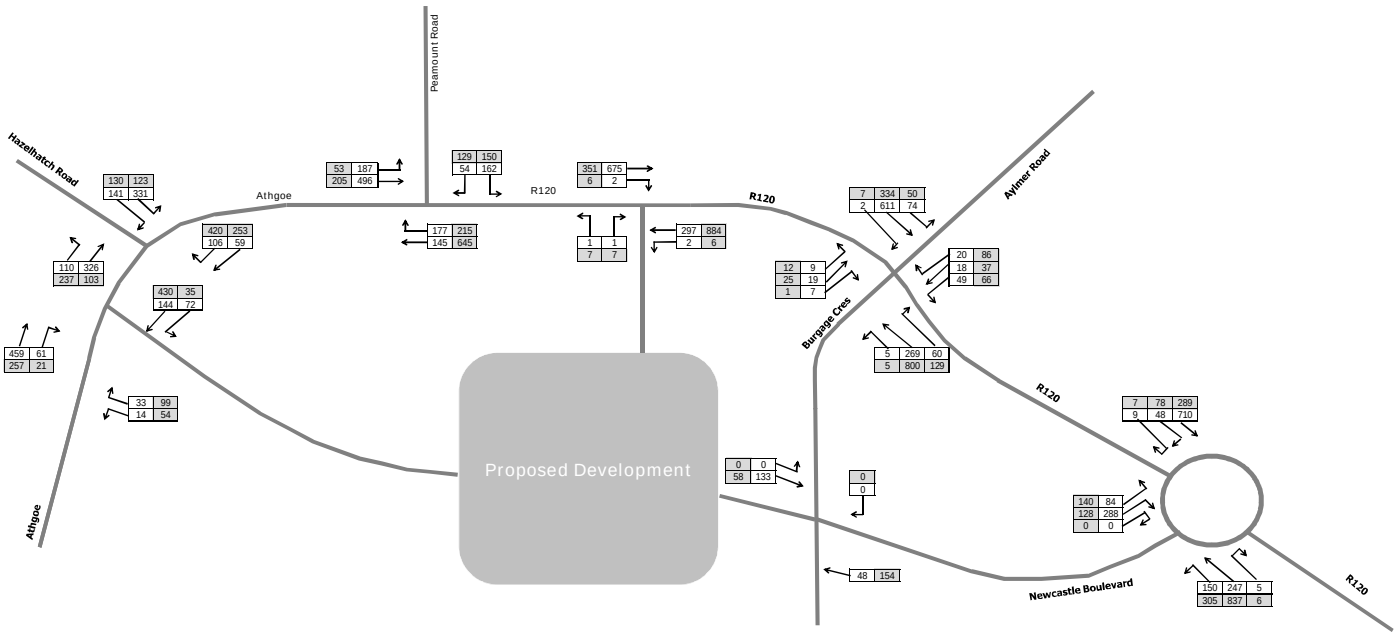

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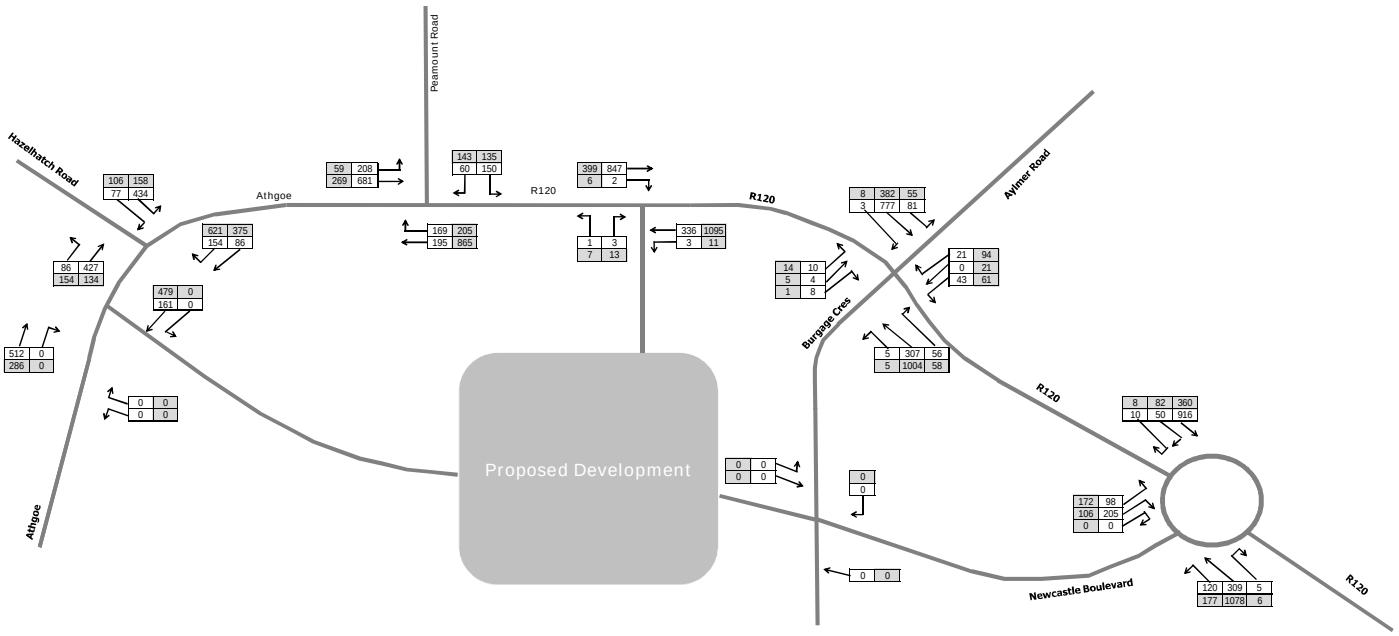

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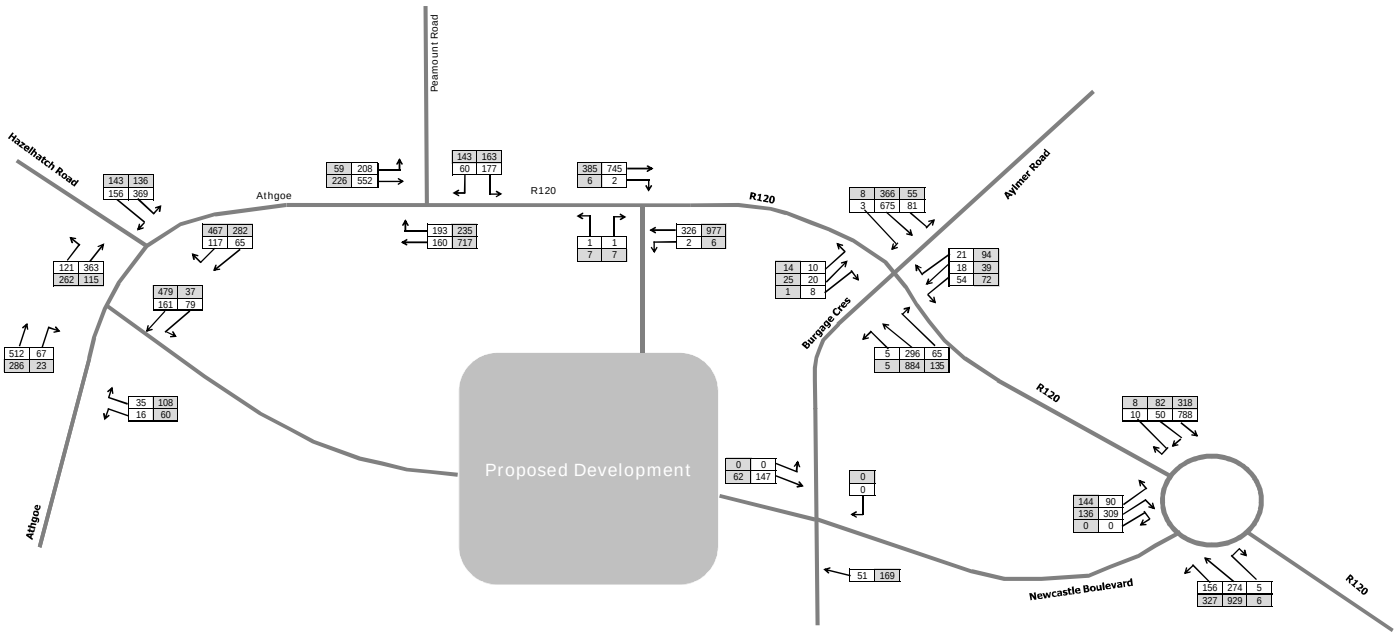

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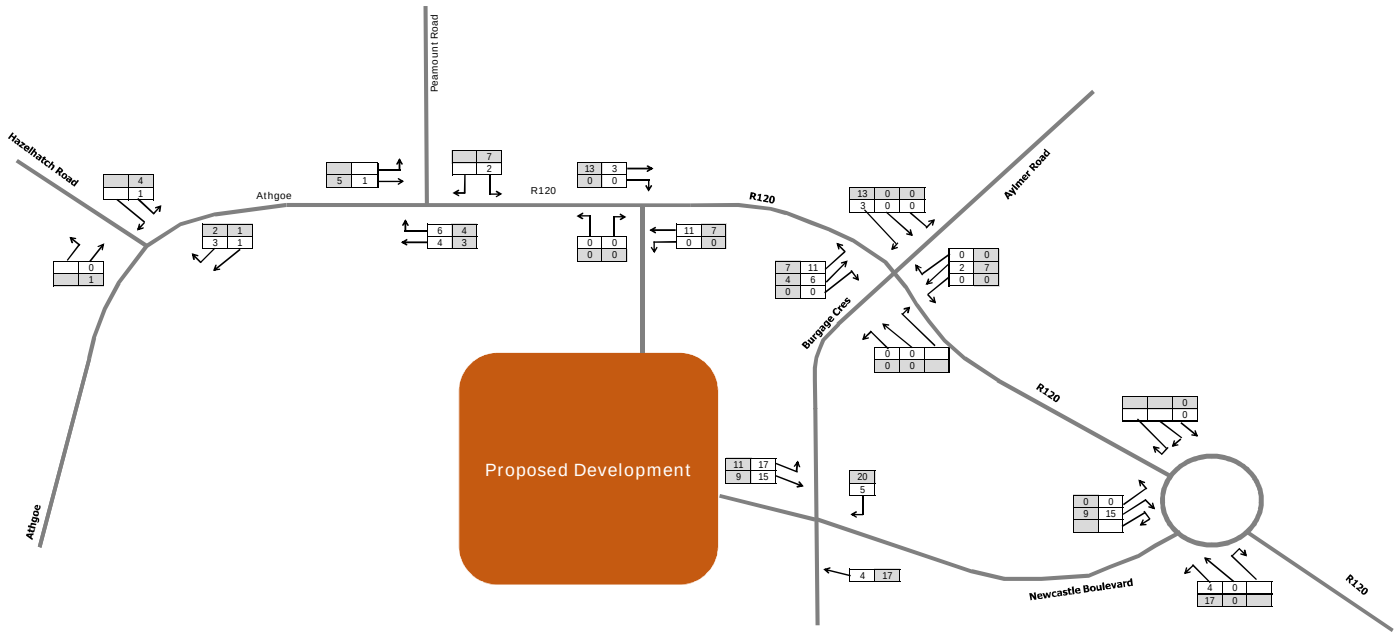
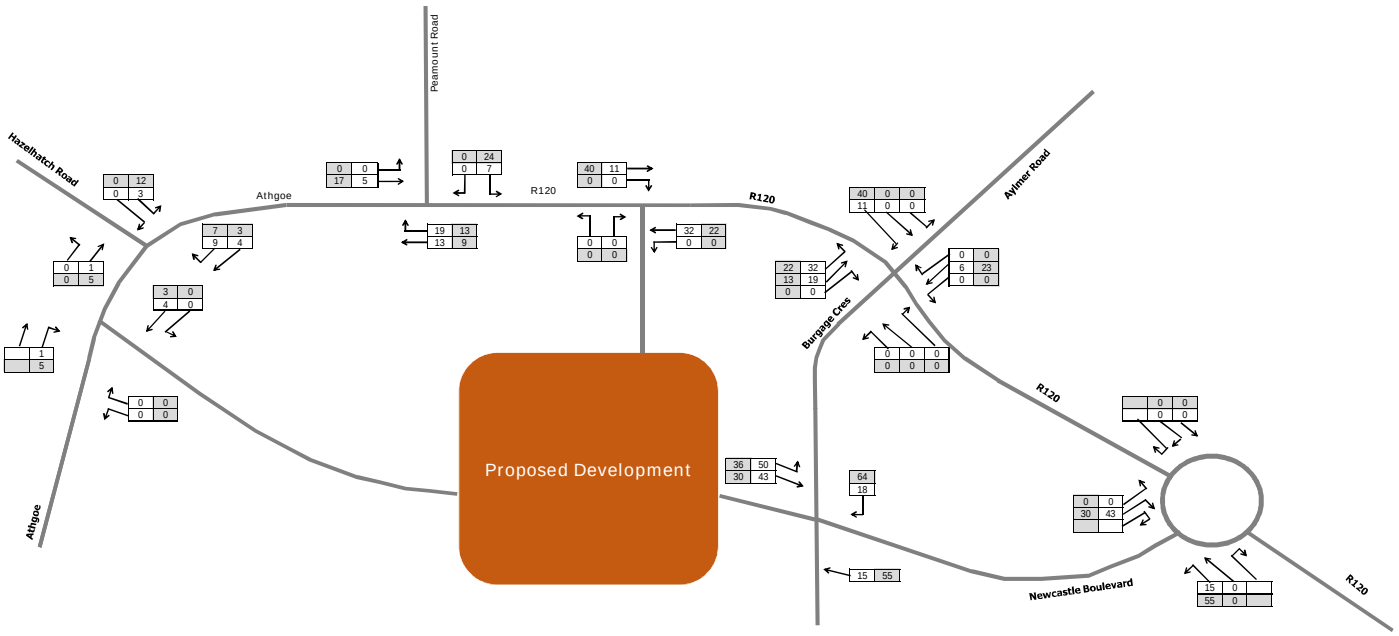
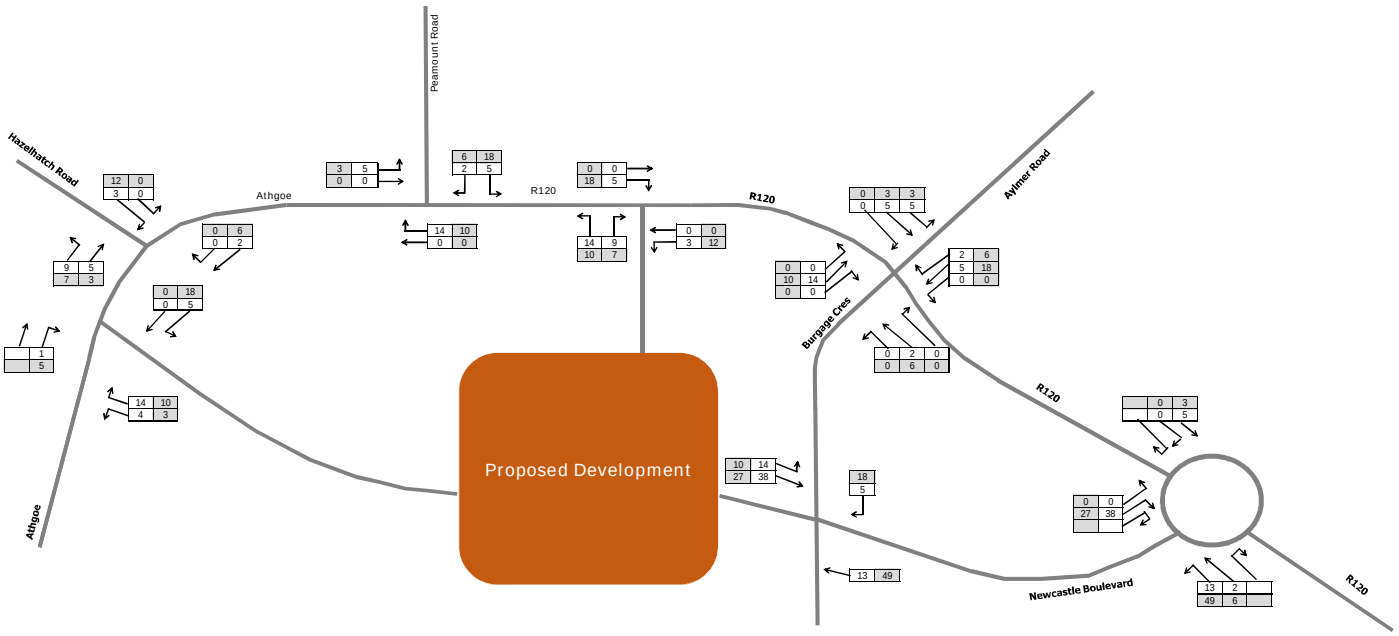


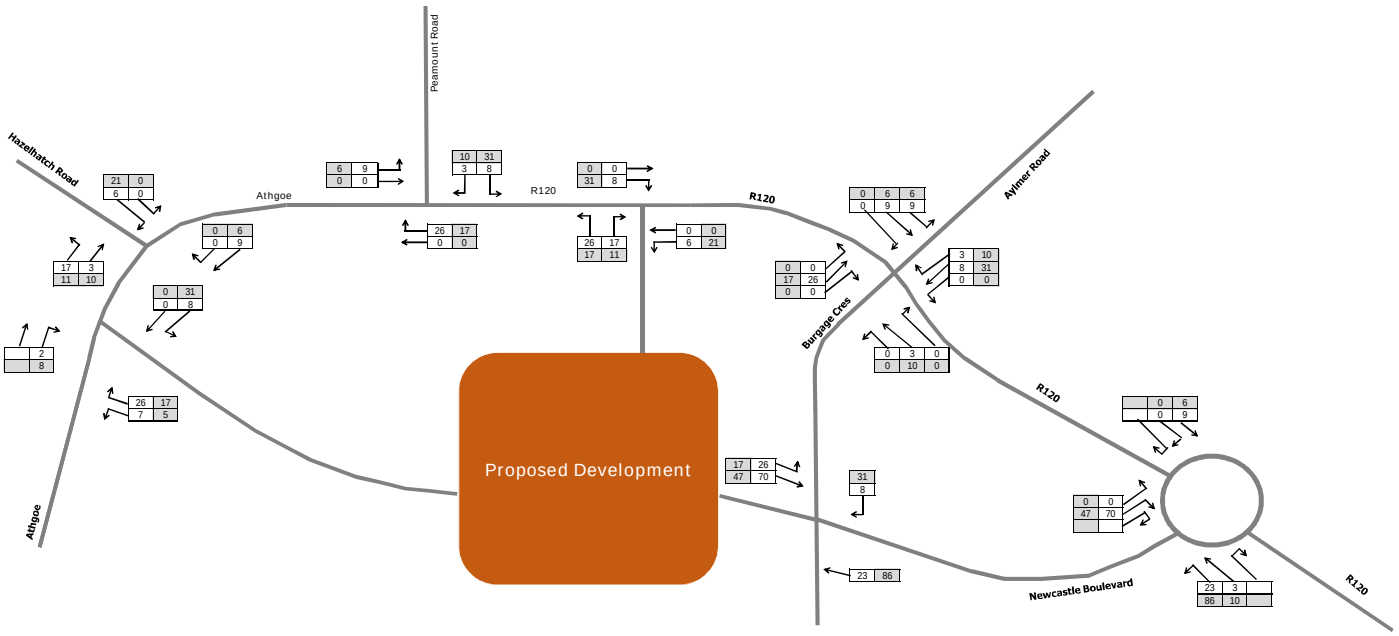
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2020 Opening Year Development Trips	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 11 Rev:



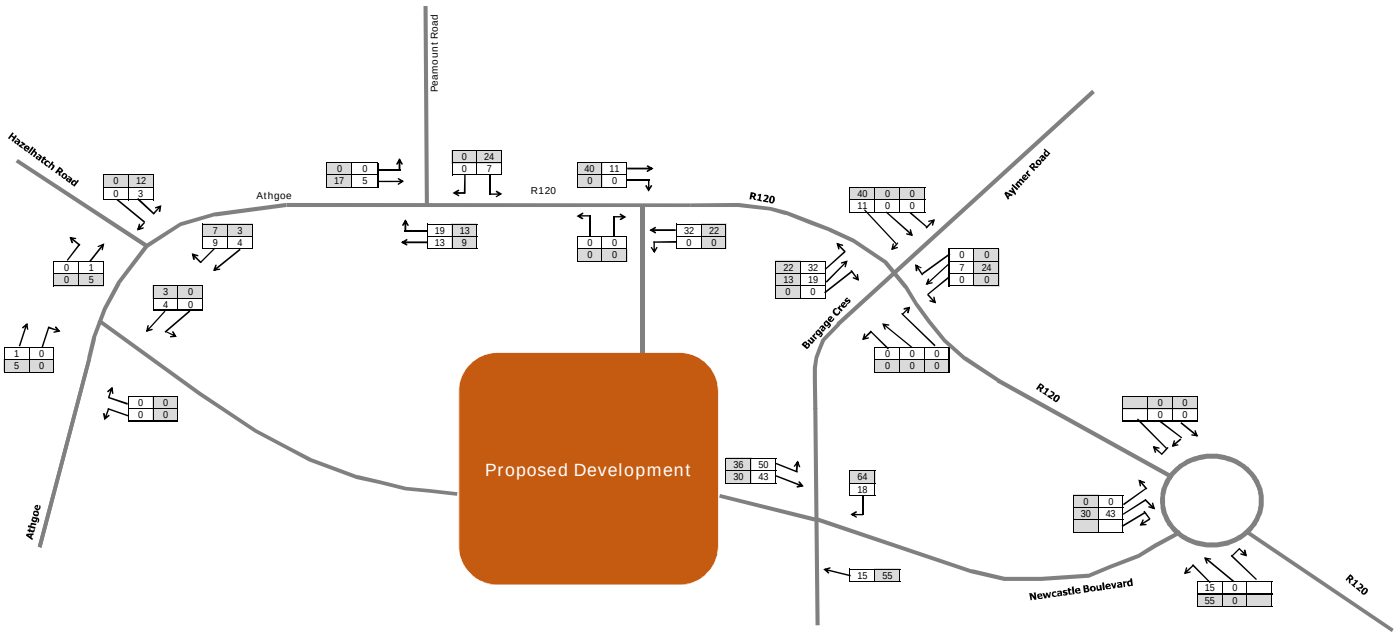
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2025 Future Design Year Development Trips (Phase 1 - No Through Road)	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK | Ckd: TJ | Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 12a | Rev:



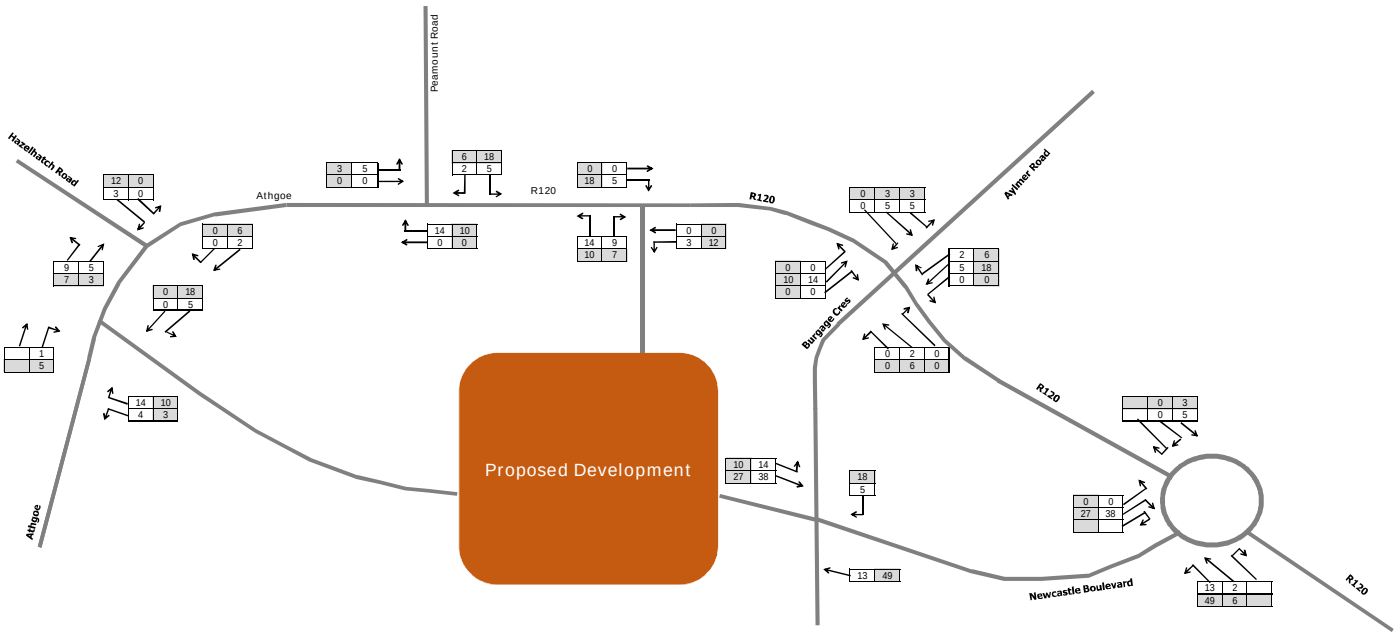
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2025 Future Design Year Development Trips (Phase 1 with Through Road)	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK | Ckd: TJ | Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 12b | Rev:



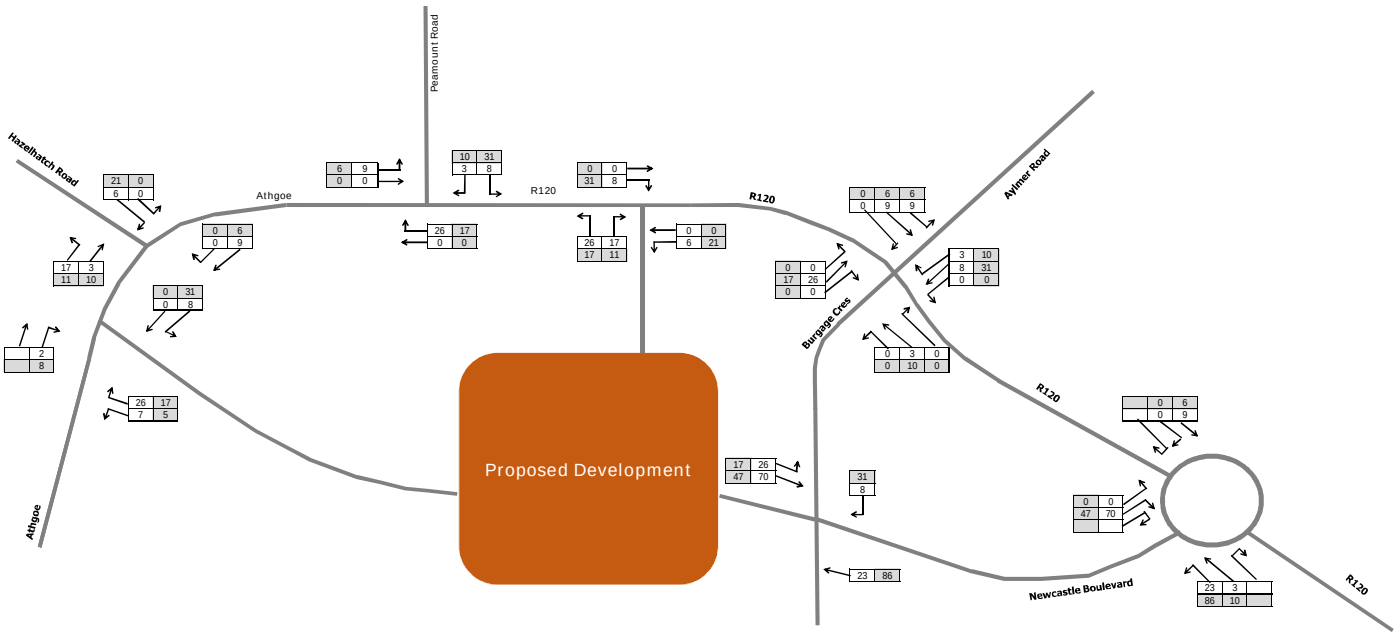
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2025 Future Design Year Development Trips (Phase 1 & 2)	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 12c Rev:	



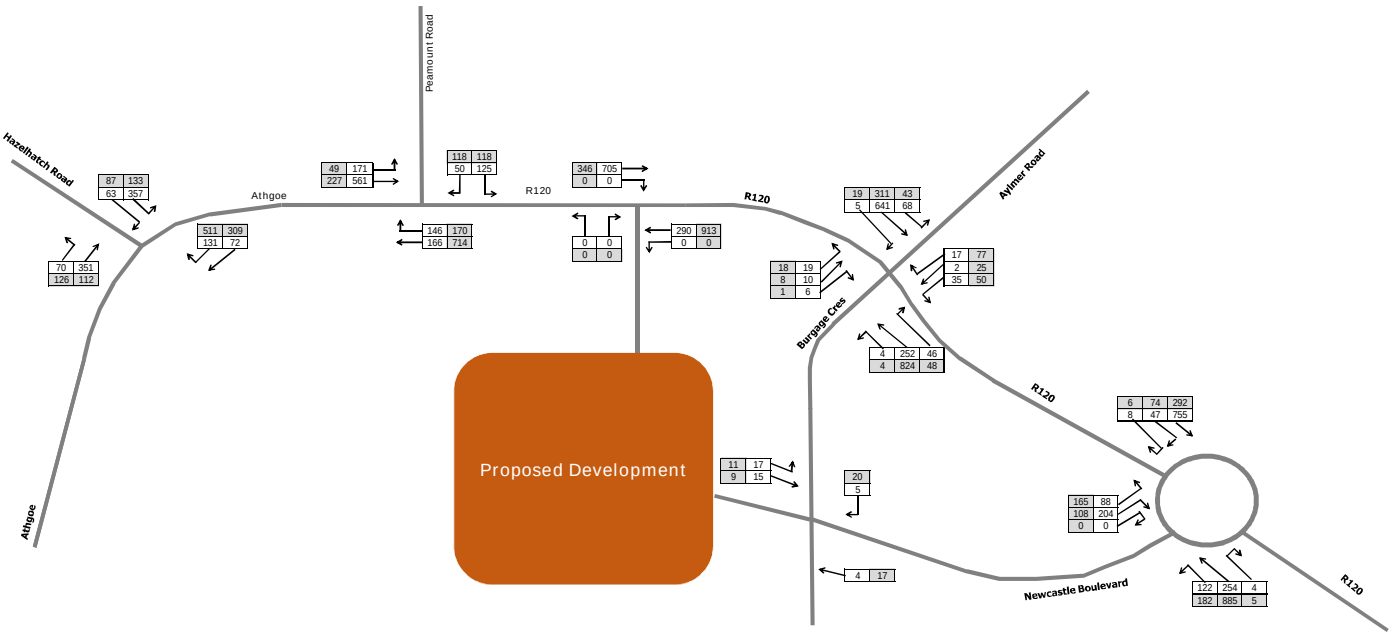
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2035 Future Design Year Development Trips (Phase 1)	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 13a Rev:	



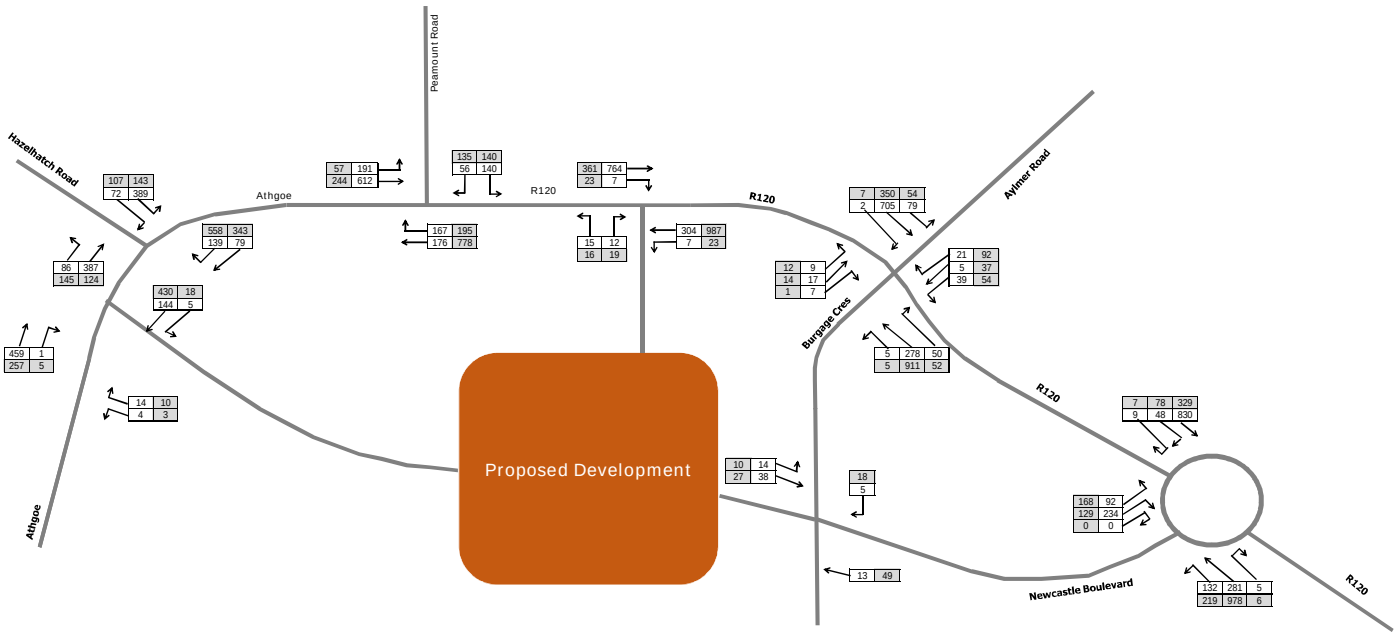
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2035 Future Design Year Development Trips (Phase 1 with through road)	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 13b Rev:	



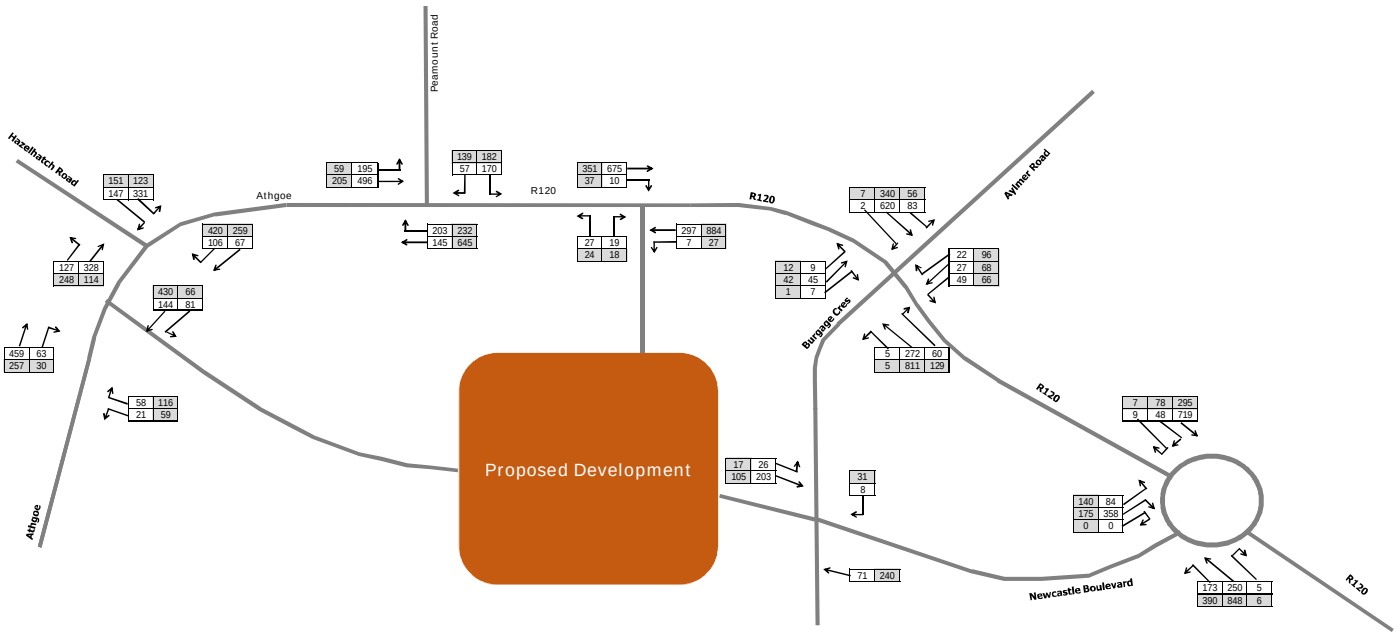
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2035 Future Design Year Development Trips (Phase 1 & 2)	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 13c Rev:	



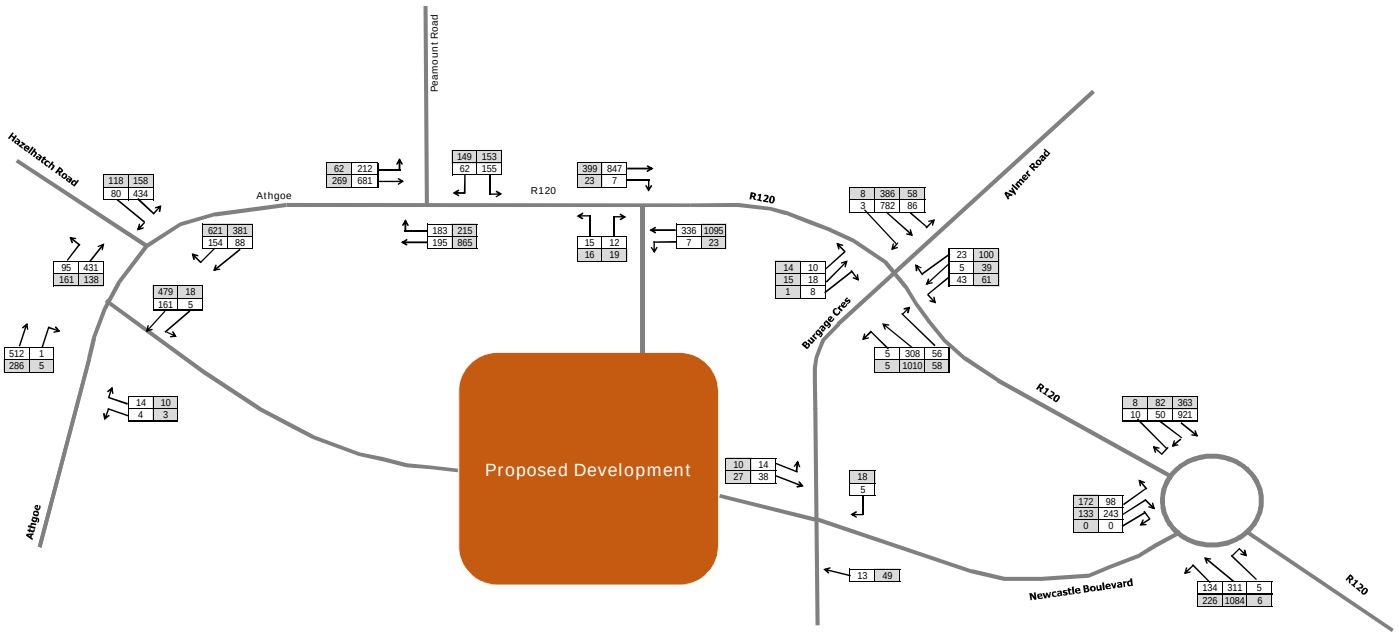
DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2020 Opening Year Do-Something	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 14 Rev:	



DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2025 Future Design Year Do-Something Phase 1	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 15a Rev:	



DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2025 Future Design Year Do-Something	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 15 Rev:	



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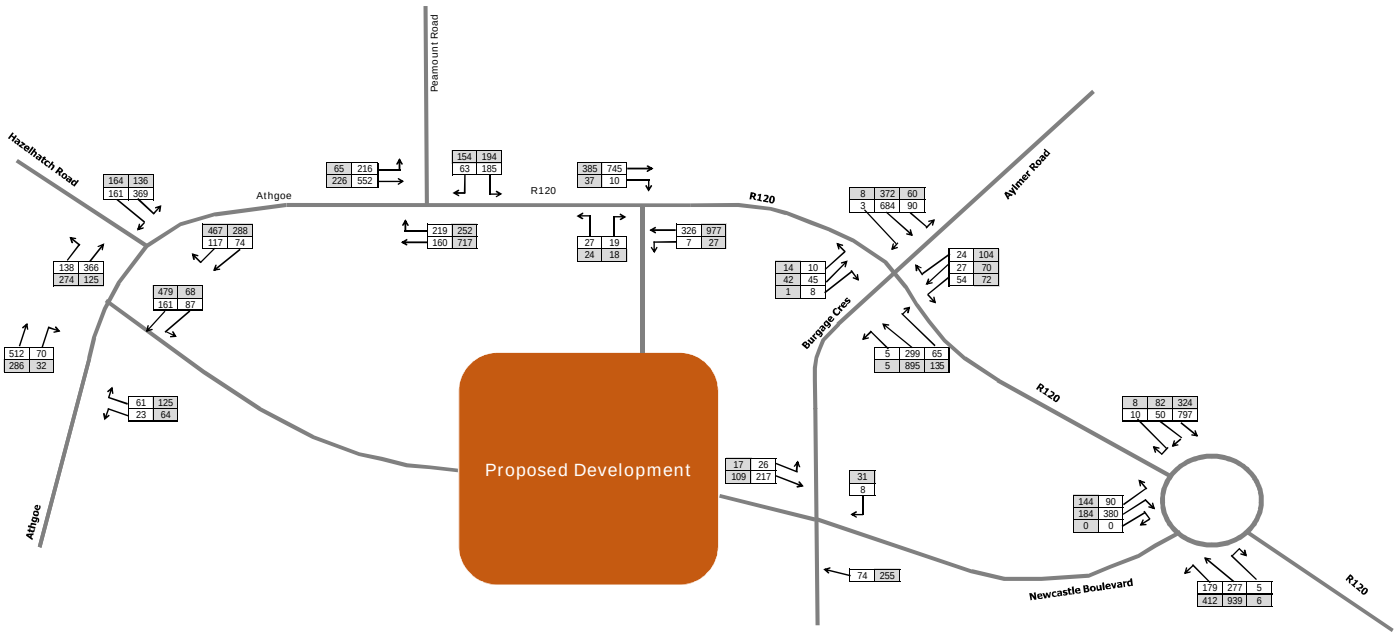
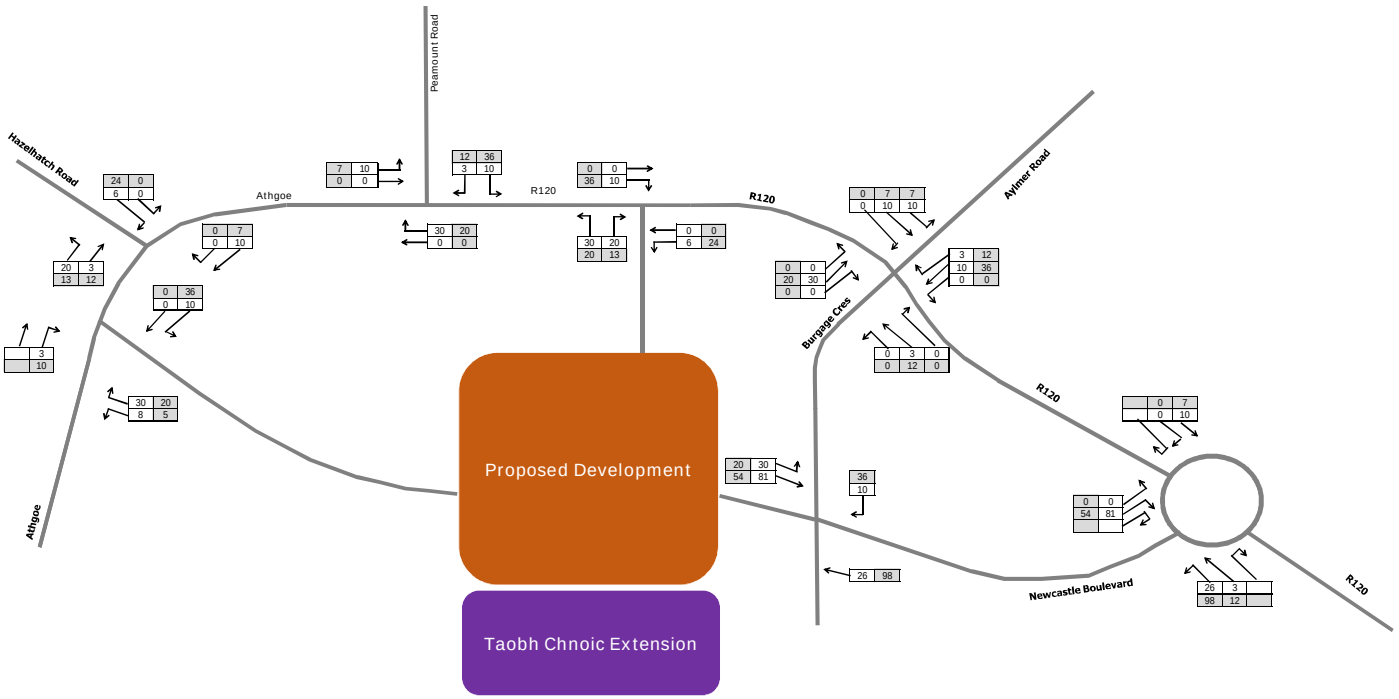
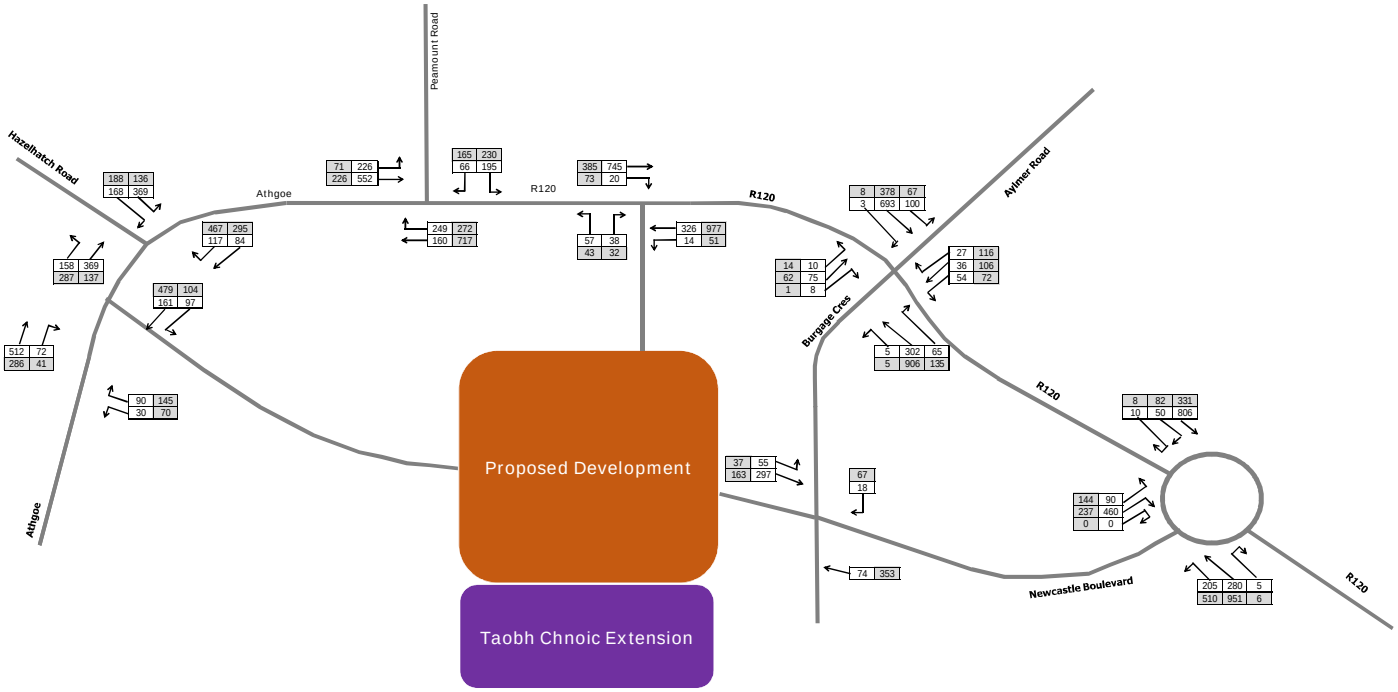


DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2035 Future Design Year Do-Something Phase 1 and 2	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK | Ckd: TJ | Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 16b | Rev:



DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2035 Future Design Year Taobh Chnoic Trip Generation	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK | Ckd: TJ | Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 17a | Rev:



DBFL Consulting Engineers	Dublin Office: Dublin Office: Ormond House, Upper Ormond phone: +353 1 400 4000 Waterford Office: Unit 2, The Chandlery, 1-2 O'Connell Street, phone: +353 51 309 500 email: info@dbfl.ie website: www.dbfl.ie	Project : Proposed Residential Development Newcastle, Co. Dublin DRG. Title : 2035 Sensitivity Analysis	Key: AM Peak Hour (0730-0830) PM Peak Hour (1700-1800)	Dwn: MMK Ckd: TJ Date: 12/10/2018 Ref: p170024\calcs\excel\Traffic\170184-Traffic Model-001 Figure: 17b Rev:	

APPENDIX B TRICS Output Data

Calculation Reference: AUDIT-638801-181015-1008

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

03	SOUTH WEST		
	DC	DORSET	1 days
04	EAST ANGLIA		
	NF	NORFOLK	1 days
	SF	SUFFOLK	1 days
10	WALES		
	DB	DENBIGHSHIRE	1 days
11	SCOTLAND		
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	1 days
13	MUNSTER		
	WA	WATERFORD	1 days
14	LEINSTER		
	LU	LOUTH	2 days
16	ULSTER (REPUBLIC OF IRELAND)		
	MG	MONAGHAN	1 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 14 to 80 (units:)
Range Selected by User: 8 to 215 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 18/09/17

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	2 days
Wednesday	2 days
Thursday	1 days
Friday	3 days

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

Selected survey types:

Manual count	10 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	6
Suburban Area (PPS6 Out of Centre)	3
Neighbourhood Centre (PPS6 Local Centre)	1

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

Selected Location Sub Categories:

Residential Zone	7
Built-Up Zone	1
No Sub Category	2

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 10 days

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

Population within 1 mile:

1,001 to 5,000	2 days
5,001 to 10,000	3 days
10,001 to 15,000	5 days

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

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	2 days
50,001 to 75,000	6 days
75,001 to 100,000	1 days

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

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	7 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:
No 10 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 10 days

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

LIST OF SITES relevant to selection parameters

1 DB-03-C-01 FLATS IN HOUSES DENBIGHSHIRE
RHYL ROAD
RHUDDLAN

Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 16
Survey date: FRIDAY 07/10/11 Survey Type: MANUAL

2 DC-03-C-02 FLATS IN BLOCKS DORSET
PALM COURT
WEYMOUTH
SPA ROAD
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 14
Survey date: FRIDAY 28/03/14 Survey Type: MANUAL

3 LU-03-C-02 BLOCK OF FLATS LOUTH
NICHOLAS STREET
DUNDALK

Edge of Town Centre
Residential Zone
Total Number of dwellings: 33
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

4 LU-03-C-03 BLOCK OF FLATS LOUTH
NICHOLAS STREET
DUNDALK

Edge of Town Centre
Residential Zone
Total Number of dwellings: 20
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

5 MG-03-C-01 BLOCK OF FLATS MONAGHAN
MALL ROAD
MONAGHAN

Edge of Town Centre
No Sub Category
Total Number of dwellings: 28
Survey date: FRIDAY 06/09/13 Survey Type: MANUAL

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

Edge of Town Centre
Built-Up Zone
Total Number of dwellings: 51
Survey date: THURSDAY 11/12/14 Survey Type: MANUAL

7 SA-03-C-01 BLOCK OF FLATS SOUTH AYRSHIRE
RACECOURSE ROAD
AYR

Edge of Town Centre
Residential Zone
Total Number of dwellings: 51
Survey date: TUESDAY 16/09/14 Survey Type: MANUAL

8 SF-03-C-03 BLOCKS OF FLATS SUFFOLK
TOLLGATE LANE
BURY ST EDMUNDS

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 30
Survey date: WEDNESDAY 03/12/14 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

9 SR-03-C-01 FLATS STIRLING
FORTHSIDE WAY
STIRLING

Edge of Town Centre
No Sub Category
Total Number of dwellings: 80
Survey date: WEDNESDAY 18/06/14 Survey Type: MANUAL

10 WA-03-C-01 BLOCKS OF FLATS WATERFORD
UPPER YELLOW ROAD
WATERFORD

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 51
Survey date: TUESDAY 12/05/15 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
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	10	37	0.051	10	37	0.099	10	37	0.150
08:00 - 09:00	10	37	0.061	10	37	0.160	10	37	0.221
09:00 - 10:00	10	37	0.088	10	37	0.107	10	37	0.195
10:00 - 11:00	10	37	0.072	10	37	0.086	10	37	0.158
11:00 - 12:00	10	37	0.102	10	37	0.118	10	37	0.220
12:00 - 13:00	10	37	0.120	10	37	0.099	10	37	0.219
13:00 - 14:00	10	37	0.094	10	37	0.112	10	37	0.206
14:00 - 15:00	10	37	0.120	10	37	0.115	10	37	0.235
15:00 - 16:00	10	37	0.112	10	37	0.102	10	37	0.214
16:00 - 17:00	10	37	0.115	10	37	0.112	10	37	0.227
17:00 - 18:00	10	37	0.227	10	37	0.120	10	37	0.347
18:00 - 19:00	10	37	0.150	10	37	0.134	10	37	0.284
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.312			1.364			2.676

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:	14 - 80 (units:)
Survey date date range:	01/01/10 - 18/09/17
Number of weekdays (Monday-Friday):	10
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	10	37	0.003	10	37	0.003	10	37	0.006
08:00 - 09:00	10	37	0.003	10	37	0.003	10	37	0.006
09:00 - 10:00	10	37	0.003	10	37	0.003	10	37	0.006
10:00 - 11:00	10	37	0.000	10	37	0.000	10	37	0.000
11:00 - 12:00	10	37	0.000	10	37	0.000	10	37	0.000
12:00 - 13:00	10	37	0.000	10	37	0.000	10	37	0.000
13:00 - 14:00	10	37	0.005	10	37	0.005	10	37	0.010
14:00 - 15:00	10	37	0.005	10	37	0.005	10	37	0.010
15:00 - 16:00	10	37	0.005	10	37	0.005	10	37	0.010
16:00 - 17:00	10	37	0.005	10	37	0.005	10	37	0.010
17:00 - 18:00	10	37	0.008	10	37	0.005	10	37	0.013
18:00 - 19:00	10	37	0.003	10	37	0.005	10	37	0.008
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.040			0.039			0.079

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.*

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

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	10	37	0.005	10	37	0.008	10	37	0.013
08:00 - 09:00	10	37	0.003	10	37	0.000	10	37	0.003
09:00 - 10:00	10	37	0.008	10	37	0.008	10	37	0.016
10:00 - 11:00	10	37	0.000	10	37	0.003	10	37	0.003
11:00 - 12:00	10	37	0.000	10	37	0.000	10	37	0.000
12:00 - 13:00	10	37	0.005	10	37	0.003	10	37	0.008
13:00 - 14:00	10	37	0.003	10	37	0.005	10	37	0.008
14:00 - 15:00	10	37	0.005	10	37	0.005	10	37	0.010
15:00 - 16:00	10	37	0.003	10	37	0.000	10	37	0.003
16:00 - 17:00	10	37	0.000	10	37	0.003	10	37	0.003
17:00 - 18:00	10	37	0.000	10	37	0.000	10	37	0.000
18:00 - 19:00	10	37	0.000	10	37	0.000	10	37	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.032			0.035			0.067

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.*

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

Time Range	ARRIVALS No. Days	ARRIVALS Ave. DWELLS	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. DWELLS	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. DWELLS	TOTALS 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	37	0.000	10	37	0.000	10	37	0.000
08:00 - 09:00	10	37	0.000	10	37	0.000	10	37	0.000
09:00 - 10:00	10	37	0.000	10	37	0.000	10	37	0.000
10:00 - 11:00	10	37	0.003	10	37	0.003	10	37	0.006
11:00 - 12:00	10	37	0.003	10	37	0.003	10	37	0.006
12:00 - 13:00	10	37	0.000	10	37	0.000	10	37	0.000
13:00 - 14:00	10	37	0.000	10	37	0.000	10	37	0.000
14:00 - 15:00	10	37	0.000	10	37	0.000	10	37	0.000
15:00 - 16:00	10	37	0.003	10	37	0.000	10	37	0.003
16:00 - 17:00	10	37	0.000	10	37	0.003	10	37	0.003
17:00 - 18:00	10	37	0.000	10	37	0.000	10	37	0.000
18:00 - 19:00	10	37	0.000	10	37	0.000	10	37	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.009			0.009			0.018

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.*

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

Time Range	ARRIVALS No. Days	ARRIVALS Ave. DWELLS	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. DWELLS	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. DWELLS	TOTALS 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	37	0.003	10	37	0.005	10	37	0.008
08:00 - 09:00	10	37	0.005	10	37	0.005	10	37	0.010
09:00 - 10:00	10	37	0.005	10	37	0.003	10	37	0.008
10:00 - 11:00	10	37	0.003	10	37	0.003	10	37	0.006
11:00 - 12:00	10	37	0.003	10	37	0.000	10	37	0.003
12:00 - 13:00	10	37	0.003	10	37	0.005	10	37	0.008
13:00 - 14:00	10	37	0.000	10	37	0.003	10	37	0.003
14:00 - 15:00	10	37	0.003	10	37	0.000	10	37	0.003
15:00 - 16:00	10	37	0.008	10	37	0.008	10	37	0.016
16:00 - 17:00	10	37	0.005	10	37	0.005	10	37	0.010
17:00 - 18:00	10	37	0.000	10	37	0.000	10	37	0.000
18:00 - 19:00	10	37	0.003	10	37	0.000	10	37	0.003
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.041			0.037			0.078

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.*

Calculation Reference: AUDIT-638801-181015-1012

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	HC	HAMPSHIRE	1 days
	KC	KENT	1 days
	WS	WEST SUSSEX	1 days
03	SOUTH WEST		
	DV	DEVON	2 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	1 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	3 days
	SY	SOUTH YORKSHIRE	1 days
08	NORTH WEST		
	MS	MERSEYSIDE	1 days
09	NORTH		
	DH	DURHAM	2 days
	TW	TYNE & WEAR	1 days
10	WALES		
	PS	POWYS	1 days
12	CONNAUGHT		
	LT	LEITRIM	1 days
	MA	MAYO	1 days
	RO	ROSCOMMON	2 days
16	ULSTER (REPUBLIC OF IRELAND)		
	DN	DONEGAL	1 days
17	ULSTER (NORTHERN IRELAND)		
	AN	ANTRIM	2 days

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

Secondary Filtering selection:

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

Parameter: Number of dwellings
Actual Range: 8 to 146 (units:)
Range Selected by User: 4 to 4334 (units:)

Public Transport Provision:
Selection by: Include all surveys

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

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

Selected survey days:

Monday	6 days
Tuesday	5 days
Wednesday	2 days
Thursday	3 days
Friday	8 days

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

Selected survey types:

Manual count	24 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	20
Neighbourhood Centre (PPS6 Local Centre)	4

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.

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 1 mile:

1,001 to 5,000	11 days
5,001 to 10,000	8 days
10,001 to 15,000	5 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
5,001 to 25,000	9 days
25,001 to 50,000	3 days
50,001 to 75,000	1 days
75,001 to 100,000	3 days
125,001 to 250,000	3 days
250,001 to 500,000	4 days

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

Car ownership within 5 miles:

0.6 to 1.0	8 days
1.1 to 1.5	14 days
1.6 to 2.0	2 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	1 days
No	23 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	24 days

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

LIST OF SITES relevant to selection parameters

1 AN-03-A-06 SEMI-DET. ANTRIM
GLENMOUNT ROAD
NEWTOWNABBEY

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total Number of dwellings: 132
Survey date: THURSDAY 10/06/10 Survey Type: MANUAL

2 AN-03-A-07 SEMI DETACHED/TERRACED HOUSING ANTRIM
CASTLE WAY
ANTRIM

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 55
Survey date: TUESDAY 20/12/11 Survey Type: MANUAL

3 CA-03-A-04 DETACHED CAMBRIDGESHIRE
PETERBOROUGH
THORPE PARK ROAD
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 9
Survey date: TUESDAY 18/10/11 Survey Type: MANUAL

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

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

5 DH-03-A-02 MIXED HOUSES DURHAM
LEAZES LANE
BISHOP AUCKLAND
ST HELEN AUCKLAND
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 125
Survey date: MONDAY 27/03/17 Survey Type: MANUAL

6 DN-03-A-05 DETACHED/SEMI-DETACHED DONEGAL
GORTLEE ROAD
LETTERKENNY
GORTLEE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 146
Survey date: WEDNESDAY 03/09/14 Survey Type: MANUAL

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

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

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

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

LIST OF SITES relevant to selection parameters (Cont.)

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

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

10 KC-03-A-05 DETACHED & SEMI-DETACHED KENT
ROCHESTER ROAD
NEAR CHATHAM
BURHAM
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Number of dwellings: 8
Survey date: FRIDAY 22/09/17 Survey Type: MANUAL

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

12 LT-03-A-01 SEMI-DETACHED & DETACHED LEITRIM
ARD NA SI
CARRICK-ON-SHANNON
ATTIRORY
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 90
Survey date: FRIDAY 24/04/15 Survey Type: MANUAL

13 MA-03-A-01 SEMI-DET. & TERRACED MAYO
N26 STATION ROAD
BALLINA

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 74
Survey date: FRIDAY 15/07/11 Survey Type: MANUAL

14 MS-03-A-03 DETACHED MERSEYSIDE
BEMPTON ROAD
LIVERPOOL
OTTERSPOOL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 15
Survey date: FRIDAY 21/06/13 Survey Type: MANUAL

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

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

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

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

17 NY-03-A-08 TERRACED HOUSES NORTH YORKSHIRE
NICHOLAS STREET
YORK

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 21
Survey date: MONDAY 16/09/13 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

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

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

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

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

20 RO-03-A-02 SEMI DET. & BUNGALOWS ROSCOMMON
SLIGO ROAD
BALLAGHADERREEN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 31
Survey date: THURSDAY 14/07/11 Survey Type: MANUAL

21 RO-03-A-04 SEMI DET. & BUNGALOWS ROSCOMMON
EAGLE COURT
ROSCOMMON
ARDNANAGH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 39
Survey date: FRIDAY 26/09/14 Survey Type: MANUAL

22 SY-03-A-01 SEMI DETACHED HOUSES SOUTH YORKSHIRE
A19 BENTLEY ROAD
DONCASTER
BENTLEY RISE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Number of dwellings: 54
Survey date: WEDNESDAY 18/09/13 Survey Type: MANUAL

23 TW-03-A-03 MIXED HOUSES TYNE & WEAR
STATION ROAD
NEAR NEWCASTLE
BACKWORTH
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Number of dwellings: 33
Survey date: FRIDAY 13/11/15 Survey Type: MANUAL

24 WS-03-A-07 BUNGALOWS WEST SUSSEX
EMMS LANE
NEAR HORSHAM
BROOKS GREEN
Neighbourhood Centre (PPS6 Local Centre)
Village
Total Number of dwellings: 57
Survey date: THURSDAY 19/10/17 Survey Type: MANUAL

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

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	24	60	0.046	24	60	0.187	24	60	0.233
08:00 - 09:00	24	60	0.115	24	60	0.346	24	60	0.461
09:00 - 10:00	24	60	0.159	24	60	0.212	24	60	0.371
10:00 - 11:00	24	60	0.143	24	60	0.159	24	60	0.302
11:00 - 12:00	24	60	0.130	24	60	0.145	24	60	0.275
12:00 - 13:00	24	60	0.164	24	60	0.168	24	60	0.332
13:00 - 14:00	24	60	0.165	24	60	0.159	24	60	0.324
14:00 - 15:00	24	60	0.162	24	60	0.171	24	60	0.333
15:00 - 16:00	24	60	0.229	24	60	0.154	24	60	0.383
16:00 - 17:00	24	60	0.236	24	60	0.155	24	60	0.391
17:00 - 18:00	24	60	0.309	24	60	0.168	24	60	0.477
18:00 - 19:00	24	60	0.245	24	60	0.164	24	60	0.409
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.103			2.188			4.291

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:	8 - 146 (units:)
Survey date date range:	01/01/10 - 19/04/18
Number of weekdays (Monday-Friday):	24
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	2
Surveys manually removed from selection:	0

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

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
TAXIS
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	24	60	0.000	24	60	0.000	24	60	0.000
08:00 - 09:00	24	60	0.005	24	60	0.005	24	60	0.010
09:00 - 10:00	24	60	0.003	24	60	0.003	24	60	0.006
10:00 - 11:00	24	60	0.002	24	60	0.003	24	60	0.005
11:00 - 12:00	24	60	0.004	24	60	0.003	24	60	0.007
12:00 - 13:00	24	60	0.003	24	60	0.003	24	60	0.006
13:00 - 14:00	24	60	0.003	24	60	0.003	24	60	0.006
14:00 - 15:00	24	60	0.001	24	60	0.001	24	60	0.002
15:00 - 16:00	24	60	0.003	24	60	0.003	24	60	0.006
16:00 - 17:00	24	60	0.004	24	60	0.003	24	60	0.007
17:00 - 18:00	24	60	0.003	24	60	0.003	24	60	0.006
18:00 - 19:00	24	60	0.004	24	60	0.004	24	60	0.008
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.035			0.034			0.069

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.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
OGVS
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	24	60	0.001	24	60	0.001	24	60	0.002
08:00 - 09:00	24	60	0.003	24	60	0.001	24	60	0.004
09:00 - 10:00	24	60	0.002	24	60	0.003	24	60	0.005
10:00 - 11:00	24	60	0.006	24	60	0.004	24	60	0.010
11:00 - 12:00	24	60	0.002	24	60	0.001	24	60	0.003
12:00 - 13:00	24	60	0.001	24	60	0.001	24	60	0.002
13:00 - 14:00	24	60	0.000	24	60	0.000	24	60	0.000
14:00 - 15:00	24	60	0.002	24	60	0.003	24	60	0.005
15:00 - 16:00	24	60	0.003	24	60	0.004	24	60	0.007
16:00 - 17:00	24	60	0.001	24	60	0.001	24	60	0.002
17:00 - 18:00	24	60	0.001	24	60	0.000	24	60	0.001
18:00 - 19:00	24	60	0.000	24	60	0.000	24	60	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.022			0.019			0.041

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.*

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
PSVS
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	24	60	0.000	24	60	0.000	24	60	0.000
08:00 - 09:00	24	60	0.003	24	60	0.003	24	60	0.006
09:00 - 10:00	24	60	0.000	24	60	0.000	24	60	0.000
10:00 - 11:00	24	60	0.000	24	60	0.000	24	60	0.000
11:00 - 12:00	24	60	0.000	24	60	0.000	24	60	0.000
12:00 - 13:00	24	60	0.000	24	60	0.000	24	60	0.000
13:00 - 14:00	24	60	0.000	24	60	0.000	24	60	0.000
14:00 - 15:00	24	60	0.001	24	60	0.001	24	60	0.002
15:00 - 16:00	24	60	0.003	24	60	0.003	24	60	0.006
16:00 - 17:00	24	60	0.000	24	60	0.001	24	60	0.001
17:00 - 18:00	24	60	0.000	24	60	0.000	24	60	0.000
18:00 - 19:00	24	60	0.000	24	60	0.000	24	60	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.007			0.008			0.015

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.*

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

Time Range	ARRIVALS No. Days	ARRIVALS Ave. DWELLS	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. DWELLS	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. DWELLS	TOTALS 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	24	60	0.002	24	60	0.013	24	60	0.015
08:00 - 09:00	24	60	0.002	24	60	0.013	24	60	0.015
09:00 - 10:00	24	60	0.002	24	60	0.005	24	60	0.007
10:00 - 11:00	24	60	0.005	24	60	0.006	24	60	0.011
11:00 - 12:00	24	60	0.001	24	60	0.003	24	60	0.004
12:00 - 13:00	24	60	0.004	24	60	0.003	24	60	0.007
13:00 - 14:00	24	60	0.004	24	60	0.002	24	60	0.006
14:00 - 15:00	24	60	0.005	24	60	0.003	24	60	0.008
15:00 - 16:00	24	60	0.010	24	60	0.003	24	60	0.013
16:00 - 17:00	24	60	0.015	24	60	0.007	24	60	0.022
17:00 - 18:00	24	60	0.010	24	60	0.006	24	60	0.016
18:00 - 19:00	24	60	0.010	24	60	0.003	24	60	0.013
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.070			0.067			0.137

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.*

Calculation Reference: AUDIT-638801-181105-1103

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 04 - EDUCATION
Category : D - NURSERY
VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	WL	WILTSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	1 days
11	SCOTLAND		
	DU	DUNDEE CITY	1 days
17	ULSTER (NORTHERN IRELAND)		
	DE	DERRY	1 days

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

Secondary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 182 to 1300 (units: sqm)
Range Selected by User: 150 to 2350 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 31/10/17

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	2 days
Wednesday	3 days
Thursday	1 days
Friday	1 days

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

Selected survey types:

Manual count	9 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	3
Suburban Area (PPS6 Out of Centre)	5
Free Standing (PPS6 Out of Town)	1

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

Selected Location Sub Categories:

Industrial Zone	1
Residential Zone	7
No Sub Category	1

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

Secondary Filtering selection:

Use Class:

D1	9 days

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

Population within 1 mile:

1,001 to 5,000	2 days
15,001 to 20,000	2 days
20,001 to 25,000	1 days
25,001 to 50,000	4 days

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

Population within 5 miles:

5,001 to 25,000	1 days
75,001 to 100,000	4 days
125,001 to 250,000	4 days

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

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	2 days
1.1 to 1.5	6 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:

No	9 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	9 days

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

LIST OF SITES relevant to selection parameters

1 CA-04-D-02 NURSERY CAMBRIDGESHIRE
EASTFIELD ROAD
PETERBOROUGH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 400 sqm
Survey date: TUESDAY 18/10/16 Survey Type: MANUAL

2 CH-04-D-01 NURSERY CHESHIRE
CHESTER ROAD
MACCLESFIELD

Edge of Town Centre
No Sub Category
Total Gross floor area: 500 sqm
Survey date: MONDAY 24/11/14 Survey Type: MANUAL

3 DE-04-D-01 DAY NURSERY DERRY
COURTAULD WAY
NEAR LONDONDERRY
EGLINTON
Free Standing (PPS6 Out of Town)
Industrial Zone
Total Gross floor area: 1300 sqm
Survey date: FRIDAY 22/06/12 Survey Type: MANUAL

4 DU-04-D-01 NURSERY DUNDEE CITY
LONGTOWN TERRACE
DUNDEE

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 325 sqm
Survey date: MONDAY 24/04/17 Survey Type: MANUAL

5 LN-04-D-01 NURSERY LINCOLNSHIRE
NEWARK ROAD
LINCOLN
SWALLOW BECK
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 600 sqm
Survey date: TUESDAY 31/10/17 Survey Type: MANUAL

6 NR-04-D-02 NURSERY NORTHAMPTONSHIRE
PARK AVENUE
KETTERING

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 182 sqm
Survey date: WEDNESDAY 26/09/12 Survey Type: MANUAL

7 SF-04-D-03 NURSERY SUFFOLK
CAMP ROAD
LOWESTOFT

Edge of Town Centre
Residential Zone
Total Gross floor area: 750 sqm
Survey date: WEDNESDAY 10/12/14 Survey Type: MANUAL

8 SH-04-D-01 NURSERY SHROPSHIRE
OLD COLEHAM
SHREWSBURY

Edge of Town Centre
Residential Zone
Total Gross floor area: 326 sqm
Survey date: WEDNESDAY 28/05/14 Survey Type: MANUAL

9 WL-04-D-01 NURSERY WILTSHIRE
SHREWSBURY ROAD
SWINDON
WALCOT
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 500 sqm
Survey date: THURSDAY 22/09/16 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 04 - EDUCATION/D - NURSERY
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS No. Days	ARRIVALS Ave. GFA	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. GFA	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. GFA	TOTALS 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	1	400	0.000	1	400	0.000	1	400	0.000
07:00 - 08:00	9	543	1.065	9	543	0.696	9	543	1.761
08:00 - 09:00	9	543	2.294	9	543	1.884	9	543	4.178
09:00 - 10:00	9	543	0.778	9	543	0.717	9	543	1.495
10:00 - 11:00	9	543	0.246	9	543	0.184	9	543	0.430
11:00 - 12:00	9	543	0.328	9	543	0.328	9	543	0.656
12:00 - 13:00	9	543	0.696	9	543	0.717	9	543	1.413
13:00 - 14:00	9	543	0.635	9	543	0.737	9	543	1.372
14:00 - 15:00	9	543	0.225	9	543	0.307	9	543	0.532
15:00 - 16:00	9	543	0.410	9	543	0.430	9	543	0.840
16:00 - 17:00	9	543	1.126	9	543	1.188	9	543	2.314
17:00 - 18:00	9	543	1.946	9	543	2.150	9	543	4.096
18:00 - 19:00	9	543	0.225	9	543	0.389	9	543	0.614
19:00 - 20:00	1	400	0.000	1	400	0.000	1	400	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			9.974			9.727			19.701

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:	182 - 1300 (units: sqm)
Survey date date range:	01/01/10 - 31/10/17
Number of weekdays (Monday-Friday):	9
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
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.

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
TAXIS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS No. Days	ARRIVALS Ave. GFA	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. GFA	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. GFA	TOTALS 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	1	400	0.000	1	400	0.000	1	400	0.000
07:00 - 08:00	9	543	0.041	9	543	0.041	9	543	0.082
08:00 - 09:00	9	543	0.000	9	543	0.000	9	543	0.000
09:00 - 10:00	9	543	0.020	9	543	0.020	9	543	0.040
10:00 - 11:00	9	543	0.000	9	543	0.000	9	543	0.000
11:00 - 12:00	9	543	0.000	9	543	0.000	9	543	0.000
12:00 - 13:00	9	543	0.020	9	543	0.020	9	543	0.040
13:00 - 14:00	9	543	0.000	9	543	0.000	9	543	0.000
14:00 - 15:00	9	543	0.020	9	543	0.020	9	543	0.040
15:00 - 16:00	9	543	0.000	9	543	0.000	9	543	0.000
16:00 - 17:00	9	543	0.000	9	543	0.000	9	543	0.000
17:00 - 18:00	9	543	0.000	9	543	0.000	9	543	0.000
18:00 - 19:00	9	543	0.000	9	543	0.000	9	543	0.000
19:00 - 20:00	1	400	0.000	1	400	0.000	1	400	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.101			0.101			0.202

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.

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TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS No. Days	ARRIVALS Ave. GFA	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. GFA	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. GFA	TOTALS 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	1	400	0.000	1	400	0.000	1	400	0.000
07:00 - 08:00	9	543	0.020	9	543	0.020	9	543	0.040
08:00 - 09:00	9	543	0.000	9	543	0.000	9	543	0.000
09:00 - 10:00	9	543	0.041	9	543	0.041	9	543	0.082
10:00 - 11:00	9	543	0.000	9	543	0.000	9	543	0.000
11:00 - 12:00	9	543	0.020	9	543	0.020	9	543	0.040
12:00 - 13:00	9	543	0.041	9	543	0.041	9	543	0.082
13:00 - 14:00	9	543	0.020	9	543	0.020	9	543	0.040
14:00 - 15:00	9	543	0.000	9	543	0.000	9	543	0.000
15:00 - 16:00	9	543	0.000	9	543	0.000	9	543	0.000
16:00 - 17:00	9	543	0.020	9	543	0.020	9	543	0.040
17:00 - 18:00	9	543	0.000	9	543	0.000	9	543	0.000
18:00 - 19:00	9	543	0.000	9	543	0.000	9	543	0.000
19:00 - 20:00	1	400	0.000	1	400	0.000	1	400	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.162			0.162			0.324

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.*

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
CYCLISTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS No. Days	ARRIVALS Ave. GFA	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. GFA	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. GFA	TOTALS 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	1	400	0.000	1	400	0.000	1	400	0.000
07:00 - 08:00	9	543	0.000	9	543	0.000	9	543	0.000
08:00 - 09:00	9	543	0.102	9	543	0.041	9	543	0.143
09:00 - 10:00	9	543	0.000	9	543	0.000	9	543	0.000
10:00 - 11:00	9	543	0.000	9	543	0.000	9	543	0.000
11:00 - 12:00	9	543	0.000	9	543	0.000	9	543	0.000
12:00 - 13:00	9	543	0.020	9	543	0.000	9	543	0.020
13:00 - 14:00	9	543	0.000	9	543	0.000	9	543	0.000
14:00 - 15:00	9	543	0.000	9	543	0.000	9	543	0.000
15:00 - 16:00	9	543	0.000	9	543	0.000	9	543	0.000
16:00 - 17:00	9	543	0.000	9	543	0.000	9	543	0.000
17:00 - 18:00	9	543	0.020	9	543	0.061	9	543	0.081
18:00 - 19:00	9	543	0.000	9	543	0.041	9	543	0.041
19:00 - 20:00	1	400	0.000	1	400	0.000	1	400	0.000
20:00 - 21:00	1	400	0.000	1	400	0.000	1	400	0.000
21:00 - 22:00	1	400	0.000	1	400	0.000	1	400	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.142			0.143			0.285

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.*

Calculation Reference: AUDIT-638801-181024-1051

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 01 - RETAIL
Category : A - FOOD SUPERSTORE
VEHICLES

Selected regions and areas:
04 EAST ANGLIA
CA CAMBRIDGESHIRE 1 days
SF SUFFOLK 1 days
12 CONNAUGHT
MA MAYO 1 days

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

Secondary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 2210 to 7045 (units: sqm)
Range Selected by User: 800 to 8000 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 28/10/17

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:
Friday 3 days

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

Selected survey types:
Manual count 3 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:
Town Centre 2
Edge of Town Centre 1

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

Selected Location Sub Categories:
Retail Zone 1
High Street 2

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:
A1 3 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®.

Secondary Filtering selection (Cont.):

Population within 1 mile:
5,001 to 10,000 2 days
10,001 to 15,000 1 days

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

Population within 5 miles:
5,001 to 25,000 1 days
100,001 to 125,000 1 days
125,001 to 250,000 1 days

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

Car ownership within 5 miles:
0.6 to 1.0 1 days
1.1 to 1.5 2 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:
PFS is present at the site and is included in the count 0 days
PFS is present at the site but is excluded from the count 0 days
There is no PFS at the site 3 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:
Yes 2 days
No 1 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 3 days

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

LIST OF SITES relevant to selection parameters

1 CA-01-A-01 SAINSBURY'S CAMBRIDGESHIRE
SIDNEY STREET
CAMBRIDGE

Town Centre
High Street
Total Gross floor area: 2210 sqm
Survey date: FRIDAY 12/07/13 Survey Type: MANUAL

2 MA-01-A-01 TESCO MAYO
HOPKINS ROAD
CASTLEBAR

Edge of Town Centre
Retail Zone
Total Gross floor area: 7045 sqm
Survey date: FRIDAY 24/09/10 Survey Type: MANUAL

3 SF-01-A-02 SAINSBURY'S SUFFOLK
UPPER BROOK STREET
IPSWICH

Town Centre
High Street
Total Gross floor area: 3280 sqm
Survey date: FRIDAY 19/07/13 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/A - FOOD SUPERSTORE
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	3	4178	0.558	3	4178	0.439	3	4178	0.997
08:00 - 09:00	3	4178	1.276	3	4178	0.957	3	4178	2.233
09:00 - 10:00	3	4178	2.569	3	4178	1.627	3	4178	4.196
10:00 - 11:00	3	4178	2.952	3	4178	2.074	3	4178	5.026
11:00 - 12:00	3	4178	4.132	3	4178	4.029	3	4178	8.161
12:00 - 13:00	3	4178	5.848	3	4178	5.146	3	4178	10.994
13:00 - 14:00	3	4178	4.771	3	4178	4.962	3	4178	9.733
14:00 - 15:00	3	4178	3.391	3	4178	4.021	3	4178	7.412
15:00 - 16:00	3	4178	3.287	3	4178	4.164	3	4178	7.451
16:00 - 17:00	3	4178	3.470	3	4178	3.502	3	4178	6.972
17:00 - 18:00	3	4178	2.880	3	4178	3.359	3	4178	6.239
18:00 - 19:00	3	4178	3.287	3	4178	3.071	3	4178	6.358
19:00 - 20:00	3	4178	1.875	3	4178	2.353	3	4178	4.228
20:00 - 21:00	2	4628	1.372	2	4628	1.934	2	4628	3.306
21:00 - 22:00	2	4628	0.864	2	4628	0.908	2	4628	1.772
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			42.532			42.546			85.078

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:	2210 - 7045 (units: sqm)
Survey date date range:	01/01/10 - 28/10/17
Number of weekdays (Monday-Friday):	3
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.

TRIP RATE for Land Use 01 - RETAIL/A - FOOD SUPERSTORE
TAXIS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	3	4178	0.000	3	4178	0.000	3	4178	0.000
08:00 - 09:00	3	4178	0.000	3	4178	0.000	3	4178	0.000
09:00 - 10:00	3	4178	0.032	3	4178	0.000	3	4178	0.032
10:00 - 11:00	3	4178	0.024	3	4178	0.048	3	4178	0.072
11:00 - 12:00	3	4178	0.016	3	4178	0.008	3	4178	0.024
12:00 - 13:00	3	4178	0.008	3	4178	0.008	3	4178	0.016
13:00 - 14:00	3	4178	0.016	3	4178	0.032	3	4178	0.048
14:00 - 15:00	3	4178	0.008	3	4178	0.008	3	4178	0.016
15:00 - 16:00	3	4178	0.024	3	4178	0.024	3	4178	0.048
16:00 - 17:00	3	4178	0.032	3	4178	0.016	3	4178	0.048
17:00 - 18:00	3	4178	0.000	3	4178	0.016	3	4178	0.016
18:00 - 19:00	3	4178	0.024	3	4178	0.016	3	4178	0.040
19:00 - 20:00	3	4178	0.016	3	4178	0.008	3	4178	0.024
20:00 - 21:00	2	4628	0.000	2	4628	0.022	2	4628	0.022
21:00 - 22:00	2	4628	0.000	2	4628	0.000	2	4628	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.200			0.206			0.406

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.*

TRIP RATE for Land Use 01 - RETAIL/A - FOOD SUPERSTORE
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	3	4178	0.016	3	4178	0.008	3	4178	0.024
08:00 - 09:00	3	4178	0.008	3	4178	0.016	3	4178	0.024
09:00 - 10:00	3	4178	0.000	3	4178	0.000	3	4178	0.000
10:00 - 11:00	3	4178	0.016	3	4178	0.000	3	4178	0.016
11:00 - 12:00	3	4178	0.000	3	4178	0.016	3	4178	0.016
12:00 - 13:00	3	4178	0.000	3	4178	0.000	3	4178	0.000
13:00 - 14:00	3	4178	0.008	3	4178	0.008	3	4178	0.016
14:00 - 15:00	3	4178	0.008	3	4178	0.000	3	4178	0.008
15:00 - 16:00	3	4178	0.000	3	4178	0.008	3	4178	0.008
16:00 - 17:00	3	4178	0.008	3	4178	0.008	3	4178	0.016
17:00 - 18:00	3	4178	0.000	3	4178	0.000	3	4178	0.000
18:00 - 19:00	3	4178	0.000	3	4178	0.000	3	4178	0.000
19:00 - 20:00	3	4178	0.000	3	4178	0.000	3	4178	0.000
20:00 - 21:00	2	4628	0.000	2	4628	0.000	2	4628	0.000
21:00 - 22:00	2	4628	0.000	2	4628	0.000	2	4628	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.064			0.064			0.128

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.*

TRIP RATE for Land Use 01 - RETAIL/A - FOOD SUPERSTORE
CYCLISTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS No. Days	ARRIVALS Ave. GFA	ARRIVALS Trip Rate	DEPARTURES No. Days	DEPARTURES Ave. GFA	DEPARTURES Trip Rate	TOTALS No. Days	TOTALS Ave. GFA	TOTALS 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	3	4178	0.160	3	4178	0.032	3	4178	0.192
08:00 - 09:00	3	4178	0.319	3	4178	0.271	3	4178	0.590
09:00 - 10:00	3	4178	0.423	3	4178	0.335	3	4178	0.758
10:00 - 11:00	3	4178	0.519	3	4178	0.487	3	4178	1.006
11:00 - 12:00	3	4178	0.503	3	4178	0.654	3	4178	1.157
12:00 - 13:00	3	4178	0.718	3	4178	0.638	3	4178	1.356
13:00 - 14:00	3	4178	0.798	3	4178	0.694	3	4178	1.492
14:00 - 15:00	3	4178	0.550	3	4178	0.646	3	4178	1.196
15:00 - 16:00	3	4178	0.590	3	4178	0.503	3	4178	1.093
16:00 - 17:00	3	4178	0.646	3	4178	0.702	3	4178	1.348
17:00 - 18:00	3	4178	0.662	3	4178	0.646	3	4178	1.308
18:00 - 19:00	3	4178	0.391	3	4178	0.654	3	4178	1.045
19:00 - 20:00	3	4178	0.152	3	4178	0.136	3	4178	0.288
20:00 - 21:00	2	4628	0.076	2	4628	0.086	2	4628	0.162
21:00 - 22:00	2	4628	0.000	2	4628	0.032	2	4628	0.032
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			6.507			6.516			13.023

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.*

Calculation Reference: AUDIT-638801-181024-1048

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 01 - RETAIL
Category : I - SHOPPING CENTRE - LOCAL SHOPS
VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	GS	GLOUCESTERSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
	WO	WORCESTERSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
	LC	LANCASHIRE	1 days
09	NORTH		
	TV	TEES VALLEY	1 days
11	SCOTLAND		
	SR	STIRLING	1 days
13	MUNSTER		
	CR	CORK	1 days
16	ULSTER (REPUBLIC OF IRELAND)		
	DN	DONEGAL	1 days
17	ULSTER (NORTHERN IRELAND)		
	DE	DERRY	2 days
	DO	DOWN	1 days

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

Secondary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 260 to 4052 (units: sqm)
Range Selected by User: 210 to 84009 (units: sqm)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/10 to 23/03/18

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

Selected survey days:

Monday	4 days
Tuesday	1 days
Wednesday	1 days
Thursday	5 days
Friday	3 days

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

Selected survey types:

Manual count	14 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:

Town Centre	1
Suburban Area (PPS6 Out of Centre)	4
Edge of Town	2
Neighbourhood Centre (PPS6 Local Centre)	7

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

Selected Location Sub Categories:

Residential Zone	11
Retail Zone	1
No Sub Category	2

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:

A1	11 days

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

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	4 days
10,001 to 15,000	2 days
15,001 to 20,000	2 days
20,001 to 25,000	1 days
25,001 to 50,000	4 days

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

Population within 5 miles:

25,001 to 50,000	2 days
75,001 to 100,000	3 days
100,001 to 125,000	3 days
125,001 to 250,000	6 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	2 days
1.1 to 1.5	12 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	14 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:

Yes	1 days
No	13 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	14 days

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

LIST OF SITES relevant to selection parameters

1 CA-01-I-01 LOCAL SHOPS CAMBRIDGESHIRE
WARWICK ROAD
PETERBOROUGH

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 478 sqm
Survey date: MONDAY 17/10/11 Survey Type: MANUAL

2 CH-01-I-02 LOCAL SHOPS CHESHIRE
CHRISTLETON ROAD
CHESTER
BOUGHTON HEATH
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 260 sqm
Survey date: TUESDAY 15/05/12 Survey Type: MANUAL

3 CH-01-I-03 LOCAL SHOPS CHESHIRE
MILL LANE
CHESTER
BACHE
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 365 sqm
Survey date: THURSDAY 17/05/12 Survey Type: MANUAL

4 CR-01-I-01 LOCAL SHOPS CORK
BISHOPSTOWN ROAD
CORK
WILTON
Neighbourhood Centre (PPS6 Local Centre)
Retail Zone
Total Gross floor area: 1575 sqm
Survey date: FRIDAY 23/03/18 Survey Type: MANUAL

5 DE-01-I-01 LOCAL SHOPS DERRY
ROSSDOWNEY PARK
LONDONDERRY
CLOONEY
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 820 sqm
Survey date: WEDNESDAY 20/06/12 Survey Type: MANUAL

6 DE-01-I-02 LOCAL SHOPS DERRY
BEECHWOOD AVENUE
LONDONDERRY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 1425 sqm
Survey date: THURSDAY 21/06/12 Survey Type: MANUAL

7 DN-01-I-02 LOCAL SHOPS DONEGAL
PEARSE ROAD
LETTERKENNY

Town Centre
No Sub Category
Total Gross floor area: 3394 sqm
Survey date: FRIDAY 26/09/14 Survey Type: MANUAL

8 DO-01-I-01 LOCAL SHOPS DOWN
COMBER ROAD
BELFAST
DUNDONALD
Neighbourhood Centre (PPS6 Local Centre)
No Sub Category
Total Gross floor area: 1305 sqm
Survey date: FRIDAY 25/11/11 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

9 GS-01-I-01 LOCAL SHOPS GLOUCESTERSHIRE
SALISBURY AVENUE
CHELTENHAM
WARDEN HILL
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 525 sqm
Survey date: MONDAY 26/04/10 Survey Type: MANUAL

10 LC-01-I-01 LOCAL SHOPS LANCASHIRE
TALBOT ROW
NEAR CHORLEY
EUXTON
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 720 sqm
Survey date: MONDAY 17/10/11 Survey Type: MANUAL

11 SH-01-I-02 LOCAL SHOPS SHROPSHIRE
WREKIN DRIVE
TELFORD
DONNINGTON
Edge of Town
Residential Zone
Total Gross floor area: 900 sqm
Survey date: THURSDAY 24/10/13 Survey Type: MANUAL

12 SR-01-I-02 LOCAL SHOPS STIRLING
ALLOA ROAD
STIRLING

Edge of Town
Residential Zone
Total Gross floor area: 550 sqm
Survey date: THURSDAY 26/06/14 Survey Type: MANUAL

13 TV-01-I-04 LOCAL SHOPS TEES VALLEY
CARGO FLEET LANE
MIDDLESBROUGH
ORMESBY
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 585 sqm
Survey date: MONDAY 07/10/13 Survey Type: MANUAL

14 WO-01-I-02 LOCAL SHOPS WORCESTERSHIRE
CRANHAM DRIVE
WORCESTER

Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Gross floor area: 4052 sqm
Survey date: THURSDAY 22/05/14 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/I - SHOPPING CENTRE - LOCAL SHOPS
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	14	1211	1.941	14	1211	1.769	14	1211	3.710
08:00 - 09:00	14	1211	2.613	14	1211	2.212	14	1211	4.825
09:00 - 10:00	14	1211	3.262	14	1211	2.790	14	1211	6.052
10:00 - 11:00	14	1211	3.114	14	1211	2.855	14	1211	5.969
11:00 - 12:00	14	1211	3.533	14	1211	3.657	14	1211	7.190
12:00 - 13:00	14	1211	4.335	14	1211	4.200	14	1211	8.535
13:00 - 14:00	14	1211	4.064	14	1211	4.070	14	1211	8.134
14:00 - 15:00	14	1211	3.592	14	1211	3.592	14	1211	7.184
15:00 - 16:00	14	1211	3.504	14	1211	3.633	14	1211	7.137
16:00 - 17:00	14	1211	3.722	14	1211	3.675	14	1211	7.397
17:00 - 18:00	14	1211	3.274	14	1211	3.574	14	1211	6.848
18:00 - 19:00	14	1211	3.250	14	1211	3.392	14	1211	6.642
19:00 - 20:00	11	1176	3.363	11	1176	3.402	11	1176	6.765
20:00 - 21:00	11	1176	3.147	11	1176	3.402	11	1176	6.549
21:00 - 22:00	8	961	3.891	8	961	4.450	8	961	8.341
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			50.605			50.673			101.278

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:	260 - 4052 (units: sqm)
Survey date date range:	01/01/10 - 23/03/18
Number of weekdays (Monday-Friday):	14
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.

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
TAXIS
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	14	1211	0.035	14	1211	0.035	14	1211	0.070
08:00 - 09:00	14	1211	0.094	14	1211	0.088	14	1211	0.182
09:00 - 10:00	14	1211	0.124	14	1211	0.124	14	1211	0.248
10:00 - 11:00	14	1211	0.106	14	1211	0.083	14	1211	0.189
11:00 - 12:00	14	1211	0.106	14	1211	0.118	14	1211	0.224
12:00 - 13:00	14	1211	0.083	14	1211	0.077	14	1211	0.160
13:00 - 14:00	14	1211	0.071	14	1211	0.088	14	1211	0.159
14:00 - 15:00	14	1211	0.077	14	1211	0.083	14	1211	0.160
15:00 - 16:00	14	1211	0.106	14	1211	0.094	14	1211	0.200
16:00 - 17:00	14	1211	0.083	14	1211	0.077	14	1211	0.160
17:00 - 18:00	14	1211	0.088	14	1211	0.100	14	1211	0.188
18:00 - 19:00	14	1211	0.065	14	1211	0.059	14	1211	0.124
19:00 - 20:00	11	1176	0.101	11	1176	0.085	11	1176	0.186
20:00 - 21:00	11	1176	0.162	11	1176	0.147	11	1176	0.309
21:00 - 22:00	8	961	0.338	8	961	0.299	8	961	0.637
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.639			1.557			3.196

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.*

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
OGVS
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	14	1211	0.065	14	1211	0.053	14	1211	0.118
08:00 - 09:00	14	1211	0.083	14	1211	0.065	14	1211	0.148
09:00 - 10:00	14	1211	0.094	14	1211	0.124	14	1211	0.218
10:00 - 11:00	14	1211	0.053	14	1211	0.041	14	1211	0.094
11:00 - 12:00	14	1211	0.041	14	1211	0.041	14	1211	0.082
12:00 - 13:00	14	1211	0.088	14	1211	0.112	14	1211	0.200
13:00 - 14:00	14	1211	0.071	14	1211	0.083	14	1211	0.154
14:00 - 15:00	14	1211	0.047	14	1211	0.035	14	1211	0.082
15:00 - 16:00	14	1211	0.041	14	1211	0.035	14	1211	0.076
16:00 - 17:00	14	1211	0.035	14	1211	0.024	14	1211	0.059
17:00 - 18:00	14	1211	0.012	14	1211	0.018	14	1211	0.030
18:00 - 19:00	14	1211	0.012	14	1211	0.018	14	1211	0.030
19:00 - 20:00	11	1176	0.031	11	1176	0.023	11	1176	0.054
20:00 - 21:00	11	1176	0.000	11	1176	0.008	11	1176	0.008
21:00 - 22:00	8	961	0.000	8	961	0.000	8	961	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.673			0.680			1.353

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.*

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
PSVS
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	14	1211	0.006	14	1211	0.006	14	1211	0.012
08:00 - 09:00	14	1211	0.000	14	1211	0.000	14	1211	0.000
09:00 - 10:00	14	1211	0.006	14	1211	0.000	14	1211	0.006
10:00 - 11:00	14	1211	0.000	14	1211	0.006	14	1211	0.006
11:00 - 12:00	14	1211	0.006	14	1211	0.006	14	1211	0.012
12:00 - 13:00	14	1211	0.006	14	1211	0.006	14	1211	0.012
13:00 - 14:00	14	1211	0.006	14	1211	0.006	14	1211	0.012
14:00 - 15:00	14	1211	0.000	14	1211	0.000	14	1211	0.000
15:00 - 16:00	14	1211	0.000	14	1211	0.000	14	1211	0.000
16:00 - 17:00	14	1211	0.012	14	1211	0.012	14	1211	0.024
17:00 - 18:00	14	1211	0.000	14	1211	0.000	14	1211	0.000
18:00 - 19:00	14	1211	0.000	14	1211	0.000	14	1211	0.000
19:00 - 20:00	11	1176	0.000	11	1176	0.000	11	1176	0.000
20:00 - 21:00	11	1176	0.000	11	1176	0.000	11	1176	0.000
21:00 - 22:00	8	961	0.000	8	961	0.000	8	961	0.000
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.042			0.042			0.084

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.*

TRIP RATE for Land Use 01 - RETAIL/I - SHOPPING CENTRE - LOCAL SHOPS
CYCLISTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

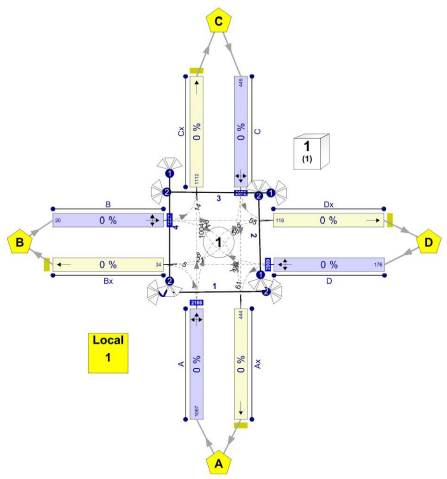
	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	14	1211	0.065	14	1211	0.041	14	1211	0.106
08:00 - 09:00	14	1211	0.094	14	1211	0.094	14	1211	0.188
09:00 - 10:00	14	1211	0.041	14	1211	0.029	14	1211	0.070
10:00 - 11:00	14	1211	0.053	14	1211	0.041	14	1211	0.094
11:00 - 12:00	14	1211	0.035	14	1211	0.053	14	1211	0.088
12:00 - 13:00	14	1211	0.041	14	1211	0.053	14	1211	0.094
13:00 - 14:00	14	1211	0.065	14	1211	0.047	14	1211	0.112
14:00 - 15:00	14	1211	0.047	14	1211	0.071	14	1211	0.118
15:00 - 16:00	14	1211	0.183	14	1211	0.153	14	1211	0.336
16:00 - 17:00	14	1211	0.147	14	1211	0.153	14	1211	0.300
17:00 - 18:00	14	1211	0.059	14	1211	0.083	14	1211	0.142
18:00 - 19:00	14	1211	0.153	14	1211	0.142	14	1211	0.295
19:00 - 20:00	11	1176	0.093	11	1176	0.108	11	1176	0.201
20:00 - 21:00	11	1176	0.031	11	1176	0.039	11	1176	0.070
21:00 - 22:00	8	961	0.091	8	961	0.091	8	961	0.182
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.198			1.198			2.396

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.*

APPENDIX C TRANSYT Output Files

Network Diagrams



Newcastle
Cycletime 0s / 120s , Timesteps 119 / 120
2, 6
Diagram produced using TRANSYT 15.5.1.7048

A1 - 2020 DN AM
D1 - 2020 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	302	302
B	1	17	17
C	1	711	711
D	1	52	52
Ax	1	682	682
Bx	1	6	6
Cx	1	277	277
Dx	1	117	117

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

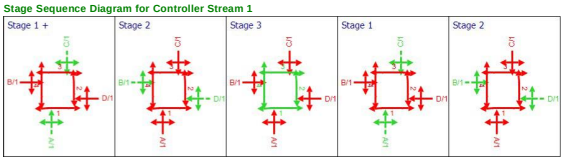
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

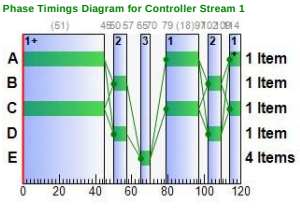
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	24	276	302	2131	69	6.99	3.23	9.27	8.33	1.71	10.04
	B	1	7	1192	17	1830	14	24.05	0.29	0.82	1.61	0.18	1.79
	C	1	58	56	711	2081	69	10.51	10.27	29.52	29.46	5.44	34.90
	D	1	20	359	52	1989	14	25.40	0.90	2.60	5.21	0.58	5.79
	Ax	1	0	Unrestricted	682	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	6	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	277	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	117	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	302	302	0		2131	1261	24		276	0.00	69	71
	B	1	17	17	0		1830	244	7		1192	0.00	14	16
	C	1	711	711	0		2081	1231	58		56	0.00	69	71
	D	1	52	52	0		1989	265	20		359	0.00	14	16
	Ax	1	682	682	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Bx	1	6	6	0		Unrestricted	Unrestricted	0		Unrestricted	0.68	120	12
	Cx	1	277	277	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Dx	1	117	117	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	6.99	0.55	0.04	8.33	8.33	45.15	134.11	2.26	1.71	1.71
	B	1	24.00	24.05	0.11	0.00	1.61	1.61	85.16	14.40	0.08	0.18	0.18
	C	1	24.00	10.51	1.68	0.39	29.46	29.46	61.03	410.53	23.39	5.44	5.44
	D	1	24.00	25.40	0.34	0.02	5.21	5.21	89.08	44.90	1.42	0.58	0.58
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	3.23	34.78	9.27	0.00	0.00	0.00	0.04	2.81	0.00	0.00	0.00	
	B	1	0.00	0.29	34.78	0.82	0.00	0.00	0.00	0.00	0.29	14.00	0.00	14.00	
	C	1	0.00	10.27	34.78	29.52	0.00	0.00	0.00	0.39	6.91	0.00	0.00	0.00	
	D	1	0.00	0.90	34.78	2.60	0.00	0.00	0.00	0.02	0.89	12.00	0.00	12.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			19.00	0.00	19.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			120.00	0.00	120.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			24.00	0.00	24.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			40.00	0.00	40.00	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

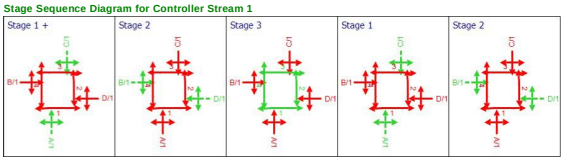
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

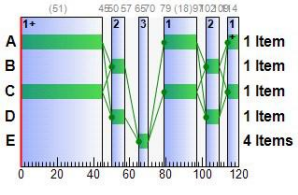
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



A2 - 2020 DN PM
D2 - 2020 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	876	876
B	1	16	16
C	1	360	360
D	1	145	145
Ax	1	362	362
Bx	1	28	28
Cx	1	912	912
Dx	1	95	95

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

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 (PCU/hr)	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)
17:00-18:00	A	1	68	32	876	2164	69	13.57	13.88	39.89	46.90	7.54	54.43
	B	1	7	1284	16	1846	14	24.01	0.27	0.77	1.52	0.17	1.69
	C	1	29	206	360	2072	69	7.40	3.96	11.39	10.51	2.12	12.63
	D	1	54	65	145	1998	14	32.85	2.90	8.33	18.79	1.88	20.67
	Ax	1	0	Unrestricted	362	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	28	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	912	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	95	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	876	876	0		2164	1280	68		32	0.00	69	71
	B	1	16	16	0		1846	246	7		1284	0.00	14	16
	C	1	360	360	0		2072	1226	29		206	0.00	69	71
	D	1	145	145	0		1998	266	54		65	0.00	14	16
	Ax	1	362	362	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12
	Bx	1	28	28	0		Unrestricted	Unrestricted	0		Unrestricted	0.83	120	12
	Cx	1	912	912	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Dx	1	95	95	0		Unrestricted	Unrestricted	0		Unrestricted	0.61	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	13.57	2.57	0.74	46.90	46.90	68.62	579.16	21.93	7.54	7.54
	B	1	24.00	24.01	0.10	0.00	1.52	1.52	85.12	13.55	0.07	0.17	0.17
	C	1	24.00	7.40	0.68	0.06	10.51	10.51	46.99	165.53	3.65	2.12	2.12
	D	1	24.00	32.85	1.00	0.32	18.79	18.79	103.31	131.20	18.60	1.88	1.88
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	13.88	34.78	39.89	0.00	0.00	0.00	1.97	8.77	0.00	0.00	0.00	
	B	1	0.00	0.27	34.78	0.77	0.00	0.00	0.00	0.00	0.27	14.00	0.00	14.00	
	C	1	0.00	3.96	34.78	11.39	0.00	0.00	0.00	0.06	3.36	0.00	0.00	0.00	
	D	1	0.00	2.90	34.78	8.33	0.00	0.00	0.00	0.32	2.74	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			105.00	0.00	105.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			14.00	0.00	14.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			41.00	0.00	41.00	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

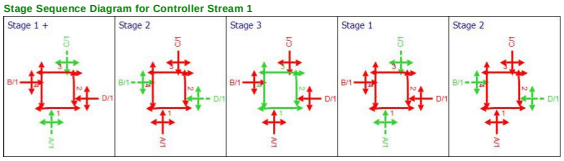
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

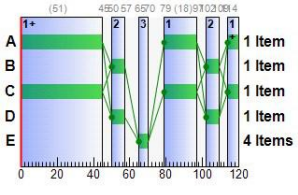
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



A3 - 2025 DN AM
D3 - 2025 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	332	332
B	1	19	19
C	1	777	777
D	1	59	59
Ax	1	747	747
Bx	1	7	7
Cx	1	306	306
Dx	1	127	127

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

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 (PCU/hr)	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)
07:30-08:30	A	1	26	242	332	2131	69	7.15	3.64	10.48	9.36	1.90	11.27
	B	1	8	1054	19	1827	14	24.12	0.32	0.92	1.81	0.20	2.01
	C	1	63	43	777	2081	69	11.67	11.76	33.81	35.77	6.21	41.97
	D	1	22	305	59	1989	14	25.76	1.03	2.97	5.99	0.66	6.66
	Ax	1	0	Unrestricted	747	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	7	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	306	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	127	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	332	332	0		2131	1261	26		242	0.00	69	71
	B	1	19	19	0		1827	244	8		1054	0.00	14	16
	C	1	777	777	0		2081	1231	63		43	0.00	69	71
	D	1	59	59	0		1989	265	22		305	0.00	14	16
	Ax	1	747	747	0		Unrestricted	Unrestricted	0		Unrestricted	0.58	120	12
	Bx	1	7	7	0		Unrestricted	Unrestricted	0		Unrestricted	0.68	120	12
	Cx	1	306	306	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Dx	1	127	127	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.15	0.61	0.05	9.36	9.36	45.67	148.81	2.81	1.90	1.90
	B	1	24.00	24.12	0.12	0.00	1.81	1.81	85.22	16.09	0.10	0.20	0.20
	C	1	24.00	11.67	1.98	0.54	35.77	35.77	63.74	479.22	16.03	6.21	6.21
	D	1	24.00	25.76	0.39	0.03	5.99	5.99	89.57	50.95	1.89	0.66	0.66
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	3.64	34.78	10.48	0.00	0.00	0.00	0.05	3.09	0.00	0.00	0.00	
	B	1	0.00	0.32	34.78	0.92	0.00	0.00	0.00	0.00	0.32	14.00	0.00	14.00	
	C	1	0.00	11.76	34.78	33.81	0.00	0.00	0.00	0.78	7.66	0.00	0.00	0.00	
	D	1	0.00	1.03	34.78	2.97	0.00	0.00	0.00	0.03	1.02	12.00	0.00	12.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			17.00	0.00	17.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			120.00	0.00	120.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			22.00	0.00	22.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			39.00	0.00	39.00	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

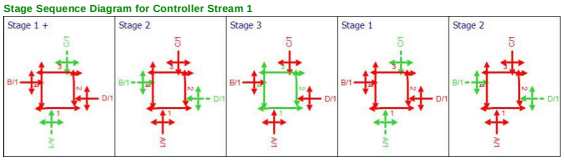
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

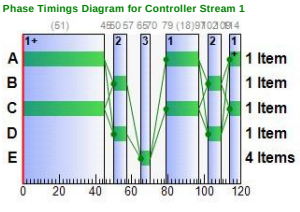
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



A4 - 2025 DN PM
D4 - 2025 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	962	962
B	1	18	18
C	1	403	403
D	1	159	159
Ax	1	401	401
Bx	1	31	31
Cx	1	1003	1003
Dx	1	107	107

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

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 (PCU/hr)	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)
17:00-18:00	A	1	75	20	962	2164	69	16.51	16.09	46.25	62.64	8.98	71.61
	B	1	7	1136	18	1854	14	24.07	0.30	0.87	1.71	0.19	1.90
	C	1	33	174	403	2072	69	7.68	4.56	13.10	12.21	2.43	14.64
	D	1	60	51	159	1998	14	34.89	3.30	9.50	21.88	2.13	24.01
	Ax	1	0	Unrestricted	401	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	31	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	1003	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	107	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	962	962	0		2164	1281	75		20	0.00	69	71
	B	1	18	18	0		1854	247	7		1136	0.00	14	16
	C	1	403	403	0		2072	1226	33		174	0.00	69	71
	D	1	159	159	0		1998	266	60		51	0.00	14	16
	Ax	1	401	401	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12
	Bx	1	31	31	0		Unrestricted	Unrestricted	0		Unrestricted	0.78	120	12
	Cx	1	1003	1003	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Dx	1	107	107	0		Unrestricted	Unrestricted	0		Unrestricted	0.61	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	16.51	3.29	1.12	62.64	62.64	74.43	682.70	33.35	8.98	8.98
	B	1	24.00	24.07	0.12	0.00	1.71	1.71	85.17	15.25	0.09	0.19	0.19
	C	1	24.00	7.68	0.78	0.08	12.21	12.21	48.16	189.26	4.81	2.43	2.43
	D	1	24.00	34.89	1.11	0.43	21.88	21.88	106.84	144.91	24.97	2.13	2.13
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	16.09	34.78	46.25	0.00	0.00	0.00	3.59	9.94	0.00	0.00	0.00	
	B	1	0.00	0.30	34.78	0.87	0.00	0.00	0.00	0.00	0.30	14.00	0.00	14.00	
	C	1	0.00	4.56	34.78	13.10	0.00	0.00	0.00	0.08	3.77	0.00	0.00	0.00	
	D	1	0.00	3.30	34.78	9.50	0.00	0.00	0.00	0.43	3.08	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			15.00	0.00	15.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			104.00	0.00	104.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			13.00	0.00	13.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			37.00	0.00	37.00	

A5 - 2035 DN AM
D5 - 2035 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	368	368
B	1	22	22
C	1	861	861
D	1	64	64
Ax	1	828	828
Bx	1	8	8
Cx	1	338	338
Dx	1	141	141

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

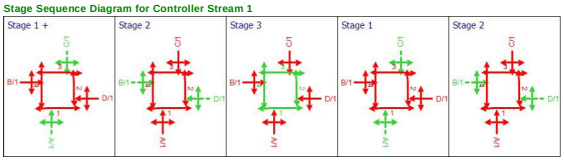
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

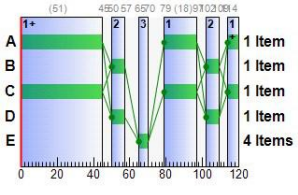
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	29	208	368	2131	69	7.37	4.05	11.63	10.69	2.17	12.86
	B	1	9	898	22	1830	14	24.23	0.37	1.07	2.10	0.24	2.34
	C	1	70	29	861	2081	69	14.32	13.72	39.45	48.62	7.56	56.18
	D	1	24	273	64	1989	14	26.02	1.12	3.23	6.57	0.72	7.29
	Ax	1	0	Unrestricted	828	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	8	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	338	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	141	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	368	368	0		2131	1261	29		208	0.00	69	71
	B	1	22	22	0		1830	244	9		898	0.00	14	16
	C	1	861	861	0		2081	1231	70		29	0.00	69	71
	D	1	64	64	0		1989	265	24		273	0.00	14	16
	Ax	1	828	828	0		Unrestricted	Unrestricted	0		Unrestricted	0.58	120	12
	Bx	1	8	8	0		Unrestricted	Unrestricted	0		Unrestricted	0.68	120	12
	Cx	1	338	338	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Dx	1	141	141	0		Unrestricted	Unrestricted	0		Unrestricted	0.63	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.37	0.69	0.06	10.69	10.69	46.93	169.12	3.60	2.17	2.17
	B	1	24.00	24.23	0.14	0.00	2.10	2.10	85.30	18.63	0.13	0.24	0.24
	C	1	24.00	14.32	2.62	0.81	48.62	48.62	70.03	578.91	24.03	7.56	7.56
	D	1	24.00	26.02	0.42	0.04	6.57	6.57	89.92	55.27	2.28	0.72	0.72
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	4.05	34.78	11.63	0.00	0.00	0.00	0.06	3.43	0.00	0.00	0.00	
	B	1	0.00	0.37	34.78	1.07	0.00	0.00	0.00	0.00	0.37	14.00	0.00	14.00	
	C	1	0.00	13.72	34.78	39.45	0.00	0.00	0.00	2.26	8.70	0.00	0.00	0.00	
	D	1	0.00	1.12	34.78	3.23	0.00	0.00	0.00	0.04	1.10	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			17.00	0.00	17.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			120.00	0.00	120.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			22.00	0.00	22.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			37.00	0.00	37.00	

A6 - 2035 DN PM
D6 - 2035 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	1067	1067
B	1	20	20
C	1	445	445
D	1	176	176
Ax	1	444	444
Bx	1	34	34
Cx	1	1112	1112
Dx	1	118	118

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

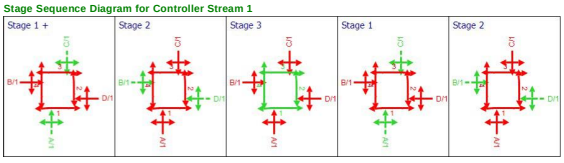
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

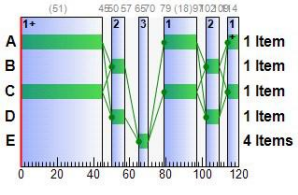
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	83	8	1067	2164	69	21.44	19.22	55.25	90.22	11.16	101.38
	B	1	8	1008	20	1846	14	24.15	0.34	0.97	1.90	0.21	2.12
	C	1	36	148	445	2072	69	7.98	5.29	15.22	14.00	2.78	16.78
	D	1	66	36	176	1998	14	38.09	3.80	10.93	26.45	2.48	28.92
	Ax	1	0	Unrestricted	444	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	34	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	1112	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	118	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	1067	1067	0		2164	1281	83		8	0.00	69	71
	B	1	20	20	0		1846	246	8		1008	0.00	14	16
	C	1	445	445	0		2072	1226	36		148	0.00	69	71
	D	1	176	176	0		1998	266	66		36	0.00	14	16
	Ax	1	444	444	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Bx	1	34	34	0		Unrestricted	Unrestricted	0		Unrestricted	0.77	120	12
	Cx	1	1112	1112	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Dx	1	118	118	0		Unrestricted	Unrestricted	0		Unrestricted	0.61	120	12

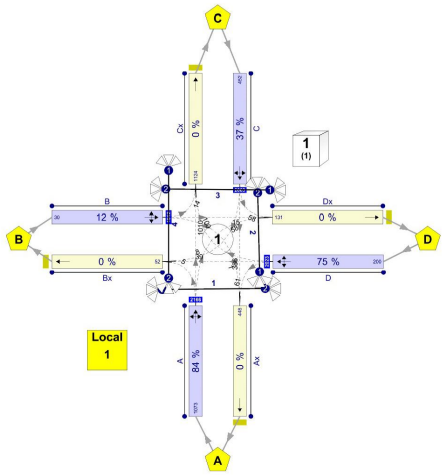
Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	21.44	4.33	2.03	90.22	90.22	83.40	829.92	59.98	11.16	11.16
	B	1	24.00	24.15	0.13	0.00	1.90	1.90	85.23	16.94	0.11	0.21	0.21
	C	1	24.00	7.98	0.88	0.10	14.00	14.00	49.78	215.36	6.18	2.78	2.78
	D	1	24.00	38.09	1.24	0.63	26.45	26.45	112.21	161.92	35.57	2.48	2.48
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	19.22	34.78	55.25	0.00	0.00	0.00	6.02	11.81	0.00	0.00	0.00	
	B	1	0.00	0.34	34.78	0.97	0.00	0.00	0.00	0.00	0.34	14.00	0.00	14.00	
	C	1	0.00	5.29	34.78	15.22	0.00	0.00	0.00	0.10	4.18	0.00	0.00	0.00	
	D	1	0.00	3.80	34.78	10.93	0.00	0.00	0.00	0.63	3.56	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			15.00	0.00	15.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			103.00	0.00	103.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			13.00	0.00	13.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			37.00	0.00	37.00	

Network Diagrams



Newcastle
Cyclotime 0s / 120s , Timesteps 119 / 120
6, 6
Diagram produced using TRANSYT 15.5.1.7048

A1 - 2020 DS AM
D1 - 2020 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	302	302
B	1	35	35
C	1	714	714
D	1	54	54
Ax	1	682	682
Bx	1	11	11
Cx	1	288	288
Dx	1	124	124

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

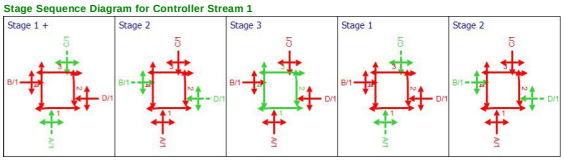
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

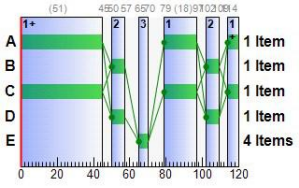
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	24	276	302	2131	69	6.99	3.23	9.27	8.33	1.71	10.04
	B	1	14	535	35	1852	14	24.77	0.60	1.74	3.42	0.38	3.80
	C	1	58	55	714	2081	69	10.55	10.32	29.66	29.70	5.48	35.18
	D	1	20	343	54	1993	14	25.49	0.94	2.70	5.43	0.60	6.03
	Ax	1	0	Unrestricted	682	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	11	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	288	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	124	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	302	302	0		2131	1261	24		276	0.00	69	71
	B	1	35	35	0		1852	247	14		535	0.00	14	16
	C	1	714	714	0		2081	1231	58		55	0.00	69	71
	D	1	54	54	0		1993	266	20		343	0.00	14	16
	Ax	1	682	682	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Bx	1	11	11	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12
	Cx	1	288	288	0		Unrestricted	Unrestricted	0		Unrestricted	0.58	120	12
	Dx	1	124	124	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	6.99	0.55	0.04	8.33	8.33	45.15	134.11	2.26	1.71	1.71
	B	1	24.00	24.77	0.23	0.01	3.42	3.42	86.52	29.93	0.35	0.38	0.38
	C	1	24.00	10.55	1.69	0.40	29.70	29.70	61.24	413.55	23.73	5.48	5.48
	D	1	24.00	25.49	0.36	0.03	5.43	5.43	89.21	46.63	1.54	0.60	0.60
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	3.23	34.78	9.27	0.00	0.00	0.00	0.04	2.81	0.00	0.00	0.00	
	B	1	0.00	0.60	34.78	1.74	0.00	0.00	0.00	0.01	0.60	13.00	0.00	13.00	
	C	1	0.00	10.32	34.78	29.66	0.00	0.00	0.00	0.40	6.94	0.00	0.00	0.00	
	D	1	0.00	0.94	34.78	2.70	0.00	0.00	0.00	0.03	0.93	12.00	0.00	12.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			19.00	0.00	19.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			120.00	0.00	120.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			21.00	0.00	21.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			33.00	0.00	33.00	

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A2 - 2020 DS PM
D2 - 2020 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	876	876
B	1	27	27
C	1	373	373
D	1	152	152
Ax	1	362	362
Bx	1	48	48
Cx	1	919	919
Dx	1	99	99

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Generated on 18/06/2019 16:43:48 using TRANSYT 15 (15.5.1.7048)

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

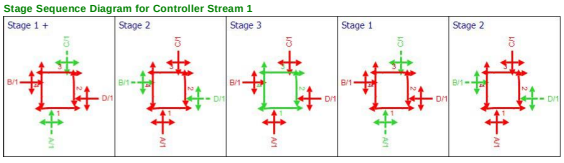
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

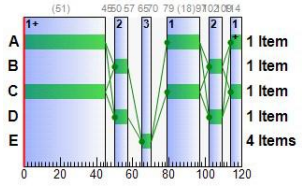
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	68	32	876	2164	69	13.57	13.88	39.89	46.90	7.54	54.43
	B	1	11	726	27	1859	14	24.39	0.46	1.31	2.60	0.29	2.89
	C	1	31	195	373	2065	69	7.49	4.21	12.11	11.03	2.23	13.26
	D	1	57	58	152	2002	14	33.75	3.07	8.83	20.23	1.99	22.23
	Ax	1	0	Unrestricted	362	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	48	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	919	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	99	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	876	876	0		2164	1280	68		32	0.00	69	71
	B	1	27	27	0		1859	248	11		726	0.00	14	16
	C	1	373	373	0		2065	1222	31		195	0.00	69	71
	D	1	152	152	0		2002	267	57		58	0.00	14	16
	Ax	1	362	362	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12
	Bx	1	48	48	0		Unrestricted	Unrestricted	0		Unrestricted	0.72	120	12
	Cx	1	919	919	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	120	12
	Dx	1	99	99	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	13.57	2.57	0.74	46.90	46.90	68.62	579.16	21.93	7.54	7.54
	B	1	24.00	24.39	0.18	0.01	2.60	2.60	85.43	22.87	0.20	0.29	0.29
	C	1	24.00	7.49	0.71	0.07	11.03	11.03	47.66	173.78	4.01	2.23	2.23
	D	1	24.00	33.75	1.05	0.37	20.23	20.23	104.62	137.59	21.43	1.99	1.99
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	13.88	34.78	39.89	0.00	0.00	0.00	1.97	8.77	0.00	0.00	0.00	
	B	1	0.00	0.46	34.78	1.31	0.00	0.00	0.00	0.01	0.46	14.00	0.00	14.00	
	C	1	0.00	4.21	34.78	12.11	0.00	0.00	0.00	0.07	3.49	0.00	0.00	0.00	
	D	1	0.00	3.07	34.78	8.83	0.00	0.00	0.00	0.37	2.90	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			89.00	0.00	89.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			14.00	0.00	14.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			37.00	0.00	37.00	

Generated on 18/06/2019 16:43:48 using TRANSYT 15 (15.5.1.7048)

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

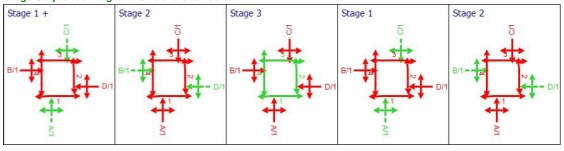
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

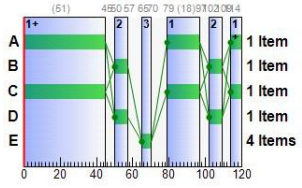
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

Stage Sequence Diagram for Controller Stream 1



Phase Timings Diagram for Controller Stream 1



A3 - 2025 DS AM
D3 - 2025 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	333	333
B	1	33	33
C	1	786	786
D	1	65	65
Ax	1	751	751
Bx	1	12	12
Cx	1	308	308
Dx	1	146	146

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

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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 (PCU/hr)	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)
07:30-08:30	A	1	26	241	333	2131	69	7.16	3.65	10.51	9.40	1.91	11.31
	B	1	13	590	33	1898	14	24.59	0.57	1.64	3.20	0.36	3.56
	C	1	64	41	786	2081	69	11.94	11.91	34.25	37.01	6.36	43.37
	D	1	24	269	65	1998	14	26.05	1.16	3.33	6.68	0.74	7.41
	Ax	1	0	Unrestricted	751	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	12	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	308	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	146	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	333	333	0		2131	1261	26		241	0.00	69	71
	B	1	33	33	0		1898	253	13		590	0.00	14	16
	C	1	786	786	0		2081	1231	64		41	0.00	69	71
	D	1	65	65	0		1998	266	24		269	0.00	14	16
	Ax	1	751	751	0		Unrestricted	Unrestricted	0		Unrestricted	0.58	120	12
	Bx	1	12	12	0		Unrestricted	Unrestricted	0		Unrestricted	0.65	120	12
	Cx	1	308	308	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Dx	1	146	146	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.16	0.61	0.05	9.40	9.40	45.73	149.45	2.83	1.91	1.91
	B	1	24.00	24.59	0.22	0.01	3.20	3.20	86.29	28.18	0.29	0.36	0.36
	C	1	24.00	11.94	2.05	0.56	37.01	37.01	64.57	490.78	16.72	6.36	6.36
	D	1	24.00	26.05	0.43	0.04	6.68	6.68	90.20	56.29	2.34	0.74	0.74
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	3.65	34.78	10.51	0.00	0.00	0.00	0.05	3.10	0.00	0.00	0.00	
	B	1	0.00	0.57	34.78	1.64	0.00	0.00	0.00	0.01	0.56	13.00	0.00	13.00	
	C	1	0.00	11.91	34.78	34.25	0.00	0.00	0.00	0.93	7.77	0.00	0.00	0.00	
	D	1	0.00	1.16	34.78	3.33	0.00	0.00	0.00	0.04	1.12	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			17.00	0.00	17.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			119.00	0.00	119.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			22.00	0.00	22.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			29.00	0.00	29.00	

A4 - 2025 DS PM
D4 - 2025 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	968	968
B	1	27	27
C	1	411	411
D	1	183	183
Ax	1	405	405
Bx	1	49	49
Cx	1	1015	1015
Dx	1	120	120

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

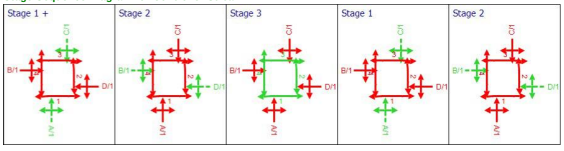
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

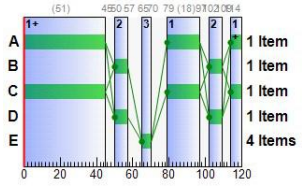
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	76	19	968	2164	69	16.74	16.21	46.62	63.91	9.09	73.00
	B	1	11	751	27	1914	14	24.33	0.46	1.31	2.59	0.29	2.88
	C	1	34	168	411	2069	69	7.74	4.77	13.70	12.55	2.50	15.05
	D	1	68	32	183	2006	14	39.51	4.07	11.71	28.52	2.63	31.15
	Ax	1	0	Unrestricted	405	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	49	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	1015	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	120	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	968	968	0		2164	1281	76		19	0.00	69	71
	B	1	27	27	0		1914	255	11		751	0.00	14	16
	C	1	411	411	0		2069	1224	34		168	0.00	69	71
	D	1	183	183	0		2006	267	68		32	0.00	14	16
	Ax	1	405	405	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12
	Bx	1	49	49	0		Unrestricted	Unrestricted	0		Unrestricted	0.99	120	12
	Cx	1	1015	1015	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	120	12
	Dx	1	120	120	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	16.74	3.34	1.16	63.91	63.91	74.92	690.82	34.39	9.09	9.09
	B	1	24.00	24.33	0.18	0.01	2.59	2.59	85.39	22.87	0.19	0.29	0.29
	C	1	24.00	7.74	0.80	0.08	12.55	12.55	48.58	194.59	5.07	2.50	2.50
	D	1	24.00	39.51	1.29	0.72	28.52	28.52	114.41	168.75	40.63	2.63	2.63
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	16.21	34.78	46.62	0.00	0.00	0.00	3.72	10.03	0.00	0.00	0.00	
	B	1	0.00	0.46	34.78	1.31	0.00	0.00	0.00	0.01	0.46	14.00	0.00	14.00	
	C	1	0.00	4.77	34.78	13.70	0.00	0.00	0.00	0.08	3.85	0.00	0.00	0.00	
	D	1	0.00	4.07	34.78	11.71	0.00	0.00	0.00	0.72	3.77	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			15.00	0.00	15.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			97.00	0.00	97.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			13.00	0.00	13.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			31.00	0.00	31.00	

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A5 - 2035 DS AM
D5 - 2035 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	369	369
B	1	36	36
C	1	871	871
D	1	91	91
Ax	1	833	833
Bx	1	13	13
Cx	1	361	361
Dx	1	160	160

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Generated on 18/06/2019 16:43:48 using TRANSYT 15 (15.5.1.7048)

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

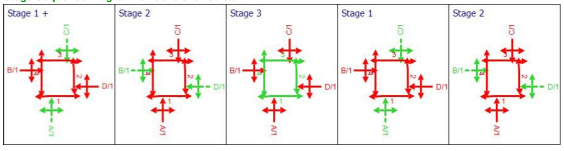
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

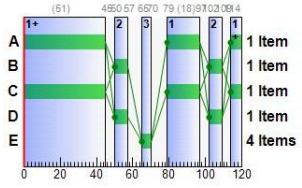
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	29	208	369	2131	69	7.37	4.06	11.67	10.73	2.17	12.90
	B	1	14	531	36	1893	14	24.75	0.62	1.79	3.52	0.39	3.91
	C	1	71	27	871	2081	69	14.66	13.91	40.00	50.36	7.72	58.08
	D	1	34	163	91	1993	14	27.70	1.66	4.76	9.94	1.07	11.01
	Ax	1	0	Unrestricted	833	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	13	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	361	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	160	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	369	369	0		2131	1261	29		208	0.00	69	71
	B	1	36	36	0		1893	252	14		531	0.00	14	16
	C	1	871	871	0		2081	1231	71		27	0.00	69	71
	D	1	91	91	0		1993	266	34		163	0.00	14	16
	Ax	1	833	833	0		Unrestricted	Unrestricted	0		Unrestricted	0.58	120	12
	Bx	1	13	13	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	120	12
	Cx	1	361	361	0		Unrestricted	Unrestricted	0		Unrestricted	0.56	120	12
	Dx	1	160	160	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.37	0.70	0.06	10.73	10.73	46.95	169.61	3.62	2.17	2.17
	B	1	24.00	24.75	0.24	0.01	3.52	3.52	86.51	30.79	0.35	0.39	0.39
	C	1	24.00	14.66	2.70	0.85	50.36	50.36	70.67	590.30	25.25	7.72	7.72
	D	1	24.00	27.70	0.61	0.09	9.94	9.94	93.57	79.90	5.25	1.07	1.07
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	4.06	34.78	11.67	0.00	0.00	0.00	0.06	3.44	0.00	0.00	0.00	
	B	1	0.00	0.62	34.78	1.79	0.00	0.00	0.00	0.01	0.61	13.00	0.00	13.00	
	C	1	0.00	13.91	34.78	40.00	0.00	0.00	0.00	2.45	8.83	0.00	0.00	0.00	
	D	1	0.00	1.66	34.78	4.76	0.00	0.00	0.00	0.09	1.61	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			120.00	0.00	120.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			18.00	0.00	18.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			27.00	0.00	27.00	

Generated on 18/06/2019 16:43:48 using TRANSYT 15 (15.5.1.7048)

A6 - 2035 DS PM
D6 - 2035 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	1073	1073
B	1	30	30
C	1	452	452
D	1	200	200
Ax	1	448	448
Bx	1	52	52
Cx	1	1124	1124
Dx	1	131	131

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Generated on 18/06/2019 16:43:48 using TRANSYT 15 (15.5.1.7048)

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

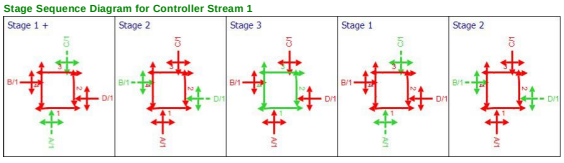
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

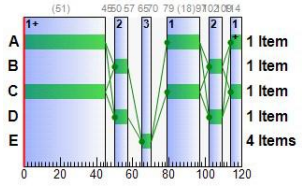
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	84	7	1073	2164	69	21.80	19.60	56.34	92.27	11.30	103.57
	B	1	12	664	30	1909	14	24.44	0.51	1.46	2.89	0.32	3.21
	C	1	37	144	452	2069	69	8.04	5.38	15.47	14.33	2.85	17.18
	D	1	75	20	200	2006	14	44.58	4.72	13.57	35.17	3.06	38.23
	Ax	1	0	Unrestricted	448	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	52	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	1124	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	131	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	1073	1073	0		2164	1281	84		7	0.00	69	71
	B	1	30	30	0		1909	255	12		664	0.00	14	16
	C	1	452	452	0		2069	1224	37		144	0.00	69	71
	D	1	200	200	0		2006	267	75		20	0.00	14	16
	Ax	1	448	448	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Bx	1	52	52	0		Unrestricted	Unrestricted	0		Unrestricted	0.97	120	12
	Cx	1	1124	1124	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	120	12
	Dx	1	131	131	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12

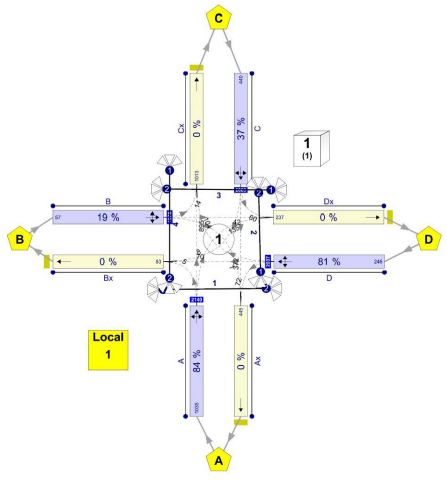
Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	21.80	4.39	2.11	92.27	92.27	84.00	839.07	62.28	11.30	11.30
	B	1	24.00	24.44	0.20	0.01	2.89	2.89	85.48	25.41	0.24	0.32	0.32
	C	1	24.00	8.04	0.90	0.11	14.33	14.33	50.23	220.59	6.45	2.85	2.85
	D	1	24.00	44.58	1.42	1.05	35.17	35.17	122.20	185.97	58.43	3.06	3.06
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	19.60	34.78	56.34	0.00	0.00	0.00	6.18	11.94	0.00	0.00	0.00	
	B	1	0.00	0.51	34.78	1.46	0.00	0.00	0.00	0.01	0.51	14.00	0.00	14.00	
	C	1	0.00	5.38	34.78	15.47	0.00	0.00	0.00	0.11	4.25	0.00	0.00	0.00	
	D	1	0.00	4.72	34.78	13.57	0.00	0.00	0.00	1.05	4.39	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			14.00	0.00	14.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			96.00	0.00	96.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			12.00	0.00	12.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			30.00	0.00	30.00	

Network Diagrams



Newcastle
Cycletime 0s / 120s , Timesteps 119 / 120
4, 4
Diagram produced using TRANSYT 15.5.1.7048

A1 - 2025 DS AM
D1 - 2025 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	337	337
B	1	61	61
C	1	705	705
D	1	96	96
Ax	1	674	674
Bx	1	34	34
Cx	1	303	303
Dx	1	188	188

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A		5		5	8
	B	5		5		8
	C		5		5	8
	D	5		5		8
	E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

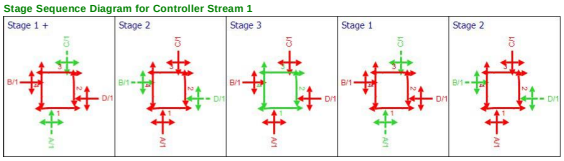
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

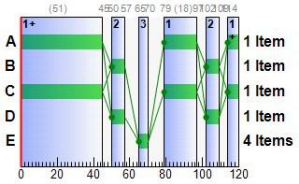
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	27	236	337	2126	69	7.19	3.70	10.64	9.55	1.94	11.50
	B	1	23	286	61	1960	14	25.94	1.07	3.07	6.24	0.69	6.93
	C	1	57	57	705	2076	69	10.45	9.98	28.70	29.07	5.37	34.44
	D	1	36	153	96	2026	14	27.88	1.75	5.03	10.56	1.13	11.69
	Ax	1	0	Unrestricted	674	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	34	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	303	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	188	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	337	337	0		2126	1258	27		236	0.00	69	71
	B	1	61	61	0		1960	261	23		286	0.00	14	16
	C	1	705	705	0		2076	1228	57		57	0.00	69	71
	D	1	96	96	0		2026	270	36		153	0.00	14	16
	Ax	1	674	674	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	120	12
	Bx	1	34	34	0		Unrestricted	Unrestricted	0		Unrestricted	1.10	120	12
	Cx	1	303	303	0		Unrestricted	Unrestricted	0		Unrestricted	0.58	120	12
	Dx	1	188	188	0		Unrestricted	Unrestricted	0		Unrestricted	0.56	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.19	0.62	0.05	9.55	9.55	46.00	152.10	2.93	1.94	1.94
	B	1	24.00	25.94	0.40	0.04	6.24	6.24	89.82	52.68	2.11	0.69	0.69
	C	1	24.00	10.45	1.66	0.39	29.07	29.07	60.75	405.33	22.93	5.37	5.37
	D	1	24.00	27.88	0.65	0.10	10.56	10.56	93.92	84.40	5.76	1.13	1.13
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	3.70	34.78	10.64	0.00	0.00	0.00	0.05	3.14	0.00	0.00	0.00	
	B	1	0.00	1.07	34.78	3.07	0.00	0.00	0.00	0.04	1.05	0.00	0.00	0.00	
	C	1	0.00	9.98	34.78	28.70	0.00	0.00	0.00	0.39	6.85	0.00	0.00	0.00	
	D	1	0.00	1.75	34.78	5.03	0.00	0.00	0.00	0.10	1.70	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			102.00	0.00	102.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			22.00	0.00	22.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			21.00	0.00	21.00	

A2 - 2025 DS PM
D2 - 2025 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	945	945
B	1	55	55
C	1	403	403
D	1	231	231
Ax	1	407	407
Bx	1	80	80
Cx	1	920	920
Dx	1	227	227

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	43, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

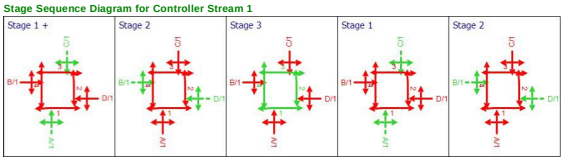
Resultant Stages

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	114	43	49	1	7
	2	✓	2	B,D	48	57	9	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

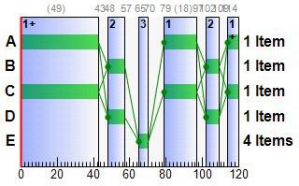
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	43	49
	B	1	✓	48	57	9
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	43	49
	D	1	✓	48	57	9
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	77	17	945	2139	67	18.46	16.48	47.38	68.82	9.19	78.02
	B	1	19	386	55	1981	16	24.15	0.92	2.65	5.24	0.60	5.84
	C	1	34	165	403	2067	67	8.45	4.90	14.09	13.43	2.56	15.98
	D	1	76	18	231	2018	16	43.15	5.34	15.35	39.31	3.50	42.82
	Ax	1	0	Unrestricted	407	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	80	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	920	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	227	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	945	945	0		2139	1230	77		17	0.00	67	69
	B	1	55	55	0		1981	297	19		386	0.00	16	18
	C	1	403	403	0		2067	1189	34		165	0.00	67	69
	D	1	231	231	0		2018	303	76		18	0.00	16	18
	Ax	1	407	407	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12
	Bx	1	80	80	0		Unrestricted	Unrestricted	0		Unrestricted	1.13	120	12
	Cx	1	920	920	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Dx	1	227	227	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	18.46	3.59	1.26	68.82	68.82	77.57	695.75	37.30	9.19	9.19
	B	1	24.00	24.15	0.35	0.02	5.24	5.24	86.97	46.58	1.25	0.60	0.60
	C	1	24.00	8.45	0.86	0.09	13.43	13.43	50.58	198.64	5.20	2.56	2.56
	D	1	24.00	43.15	1.60	1.17	39.31	39.31	121.01	214.53	65.00	3.50	3.50
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	16.48	34.78	47.38	0.00	0.00	0.00	4.14	10.44	0.00	0.00	0.00	
	B	1	0.00	0.92	34.78	2.65	0.00	0.00	0.00	0.02	0.91	14.00	0.00	14.00	
	C	1	0.00	4.90	34.78	14.09	0.00	0.00	0.00	0.09	4.00	0.00	0.00	0.00	
	D	1	0.00	5.34	34.78	15.35	0.00	0.00	0.00	1.17	4.89	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			15.00	0.00	15.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			88.00	0.00	88.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			14.00	0.00	14.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			21.00	0.00	21.00	

A3 - 2035 DS AM
D3 - 2035 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	369	369
B	1	63	63
C	1	777	777
D	1	105	105
Ax	1	746	746
Bx	1	35	35
Cx	1	333	333
Dx	1	200	200

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

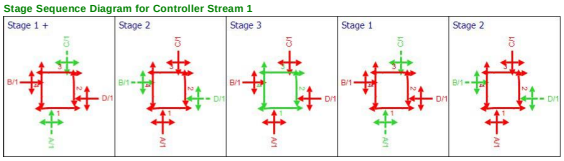
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

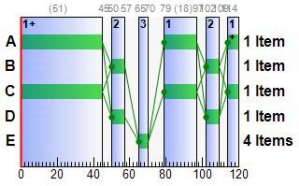
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	29	207	369	2126	69	7.38	4.06	11.67	10.74	2.17	12.92
	B	1	24	271	63	1950	14	26.08	1.12	3.23	6.48	0.71	7.19
	C	1	63	42	777	2076	69	11.73	11.77	33.82	35.95	6.23	42.18
	D	1	39	131	105	2024	14	28.59	1.96	5.64	11.84	1.26	13.10
	Ax	1	0	Unrestricted	746	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	35	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	333	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	200	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	369	369	0		2126	1258	29		207	0.00	69	71
	B	1	63	63	0		1950	260	24		271	0.00	14	16
	C	1	777	777	0		2076	1228	63		42	0.00	69	71
	D	1	105	105	0		2024	270	39		131	0.00	14	16
	Ax	1	746	746	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12
	Bx	1	35	35	0		Unrestricted	Unrestricted	0		Unrestricted	1.05	120	12
	Cx	1	333	333	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	120	12
	Dx	1	200	200	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.38	0.70	0.06	10.74	10.74	46.96	169.65	3.64	2.17	2.17
	B	1	24.00	26.08	0.42	0.04	6.48	6.48	90.05	54.43	2.30	0.71	0.71
	C	1	24.00	11.73	1.99	0.54	35.95	35.95	63.94	480.62	16.17	6.23	6.23
	D	1	24.00	28.59	0.71	0.12	11.84	11.84	95.72	93.24	7.26	1.26	1.26
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	4.06	34.78	11.67	0.00	0.00	0.00	0.06	3.44	0.00	0.00	0.00	
	B	1	0.00	1.12	34.78	3.23	0.00	0.00	0.00	0.04	1.09	0.00	0.00	0.00	
	C	1	0.00	11.77	34.78	33.82	0.00	0.00	0.00	0.81	7.66	0.00	0.00	0.00	
	D	1	0.00	1.96	34.78	5.64	0.00	0.00	0.00	0.12	1.87	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			101.00	0.00	101.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			20.00	0.00	20.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			20.00	0.00	20.00	

A4 - 2035 DS PM
D4 - 2035 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	1035	1035
B	1	57	57
C	1	440	440
D	1	246	246
Ax	1	445	445
Bx	1	83	83
Cx	1	1013	1013
Dx	1	237	237

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	43, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

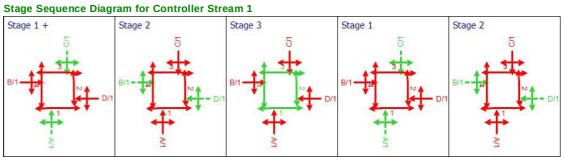
Resultant Stages

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	114	43	49	1	7
	2	✓	2	B,D	48	57	9	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

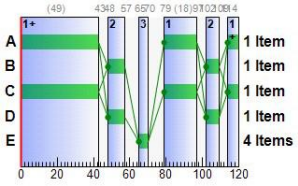
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	43	49
	B	1	✓	48	57	9
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	43	49
	D	1	✓	48	57	9
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	84	7	1035	2139	67	23.29	19.70	56.65	95.09	11.14	106.23
	B	1	19	368	57	1975	16	24.24	0.96	2.75	5.45	0.62	6.07
	C	1	37	143	440	2069	67	8.73	5.49	15.77	15.15	2.87	18.03
	D	1	81	11	246	2016	16	49.02	6.14	17.65	47.57	4.00	51.57
	Ax	1	0	Unrestricted	445	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	83	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	1013	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	237	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	1035	1035	0		2139	1230	84		7	0.00	67	69
	B	1	57	57	0		1975	296	19		368	0.00	16	18
	C	1	440	440	0		2069	1190	37		143	0.00	67	69
	D	1	246	246	0		2016	302	81		11	0.00	16	18
	Ax	1	445	445	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Bx	1	83	83	0		Unrestricted	Unrestricted	0		Unrestricted	1.11	120	12
	Cx	1	1013	1013	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	120	12
	Dx	1	237	237	0		Unrestricted	Unrestricted	0		Unrestricted	0.52	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	23.29	4.53	2.17	95.09	95.09	85.81	824.19	63.96	11.14	11.14
	B	1	24.00	24.24	0.36	0.02	5.45	5.45	87.09	48.28	1.36	0.62	0.62
	C	1	24.00	8.73	0.96	0.11	15.15	15.15	52.08	222.69	6.48	2.87	2.87
	D	1	24.00	49.02	1.72	1.63	47.57	47.57	129.65	230.22	88.73	4.00	4.00
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	19.70	34.78	56.65	0.00	0.00	0.00	6.40	12.23	0.00	0.00	0.00	
	B	1	0.00	0.96	34.78	2.75	0.00	0.00	0.00	0.02	0.94	14.00	0.00	14.00	
	C	1	0.00	5.49	34.78	15.77	0.00	0.00	0.00	0.11	4.39	0.00	0.00	0.00	
	D	1	0.00	6.14	34.78	17.65	0.00	0.00	0.00	1.63	5.59	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			15.00	0.00	15.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			88.00	0.00	88.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			13.00	0.00	13.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			21.00	0.00	21.00	

A1 - 2035 SA AM
D1 - 2035 AM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	372	372
B	1	93	93
C	1	797	797
D	1	117	117
Ax	1	756	756
Bx	1	44	44
Cx	1	339	339
Dx	1	240	240

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	45, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

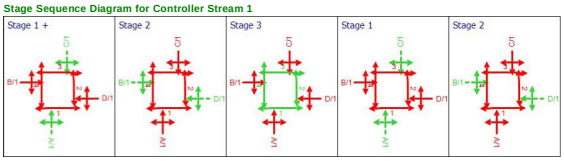
Resultant Stages

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	114	45	51	1	7
	2	✓	2	B,D	50	57	7	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

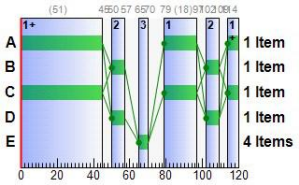
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	45	51
	B	1	✓	50	57	7
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	45	51
	D	1	✓	50	57	7
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
07:30-08:30	A	1	30	201	372	2101	69	7.43	4.20	12.07	10.91	2.21	13.11
	B	1	35	156	93	1982	14	27.90	1.70	4.88	10.23	1.10	11.33
	C	1	65	39	797	2074	69	12.36	12.11	34.82	38.87	6.57	45.44
	D	1	43	108	117	2030	14	29.53	2.21	6.36	13.63	1.42	15.05
	Ax	1	0	Unrestricted	756	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	44	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	339	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	240	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
07:30-08:30	A	1	372	372	0		2101	1243	30		201	0.00	69	71
	B	1	93	93	0		1982	264	35		156	0.00	14	16
	C	1	797	797	0		2074	1227	65		39	0.00	69	71
	D	1	117	117	0		2030	271	43		108	0.00	14	16
	Ax	1	756	756	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12
	Bx	1	44	44	0		Unrestricted	Unrestricted	0		Unrestricted	1.13	120	12
	Cx	1	339	339	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	120	12
	Dx	1	240	240	0		Unrestricted	Unrestricted	0		Unrestricted	0.56	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
07:30-08:30	A	1	24.00	7.43	0.70	0.06	10.91	10.91	47.29	172.08	3.82	2.21	2.21
	B	1	24.00	27.90	0.63	0.10	10.23	10.23	93.93	81.74	5.61	1.10	1.10
	C	1	24.00	12.36	2.14	0.60	38.87	38.87	65.73	506.01	17.86	6.57	6.57
	D	1	24.00	29.53	0.80	0.16	13.63	13.63	97.06	103.97	9.59	1.42	1.42
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
07:30-08:30	A	1	0.00	4.20	34.78	12.07	0.00	0.00	0.00	0.06	3.47	0.00	0.00	0.00	
	B	1	0.00	1.70	34.78	4.88	0.00	0.00	0.00	0.10	1.65	0.00	0.00	0.00	
	C	1	0.00	12.11	34.78	34.82	0.00	0.00	0.00	1.17	7.90	0.00	0.00	0.00	
	D	1	0.00	2.21	34.78	6.36	0.00	0.00	0.00	0.16	2.11	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			99.00	0.00	99.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			20.00	0.00	20.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	

A2 - 2035 SA PM
D2 - 2035 PM Peak Hour*

Arms and Traffic Streams

Flows

Arm	Traffic Stream	Total Flow (PCU/hr)	Normal Flow (PCU/hr)
A	1	1047	1047
B	1	77	77
C	1	453	453
D	1	294	294
Ax	1	451	451
Bx	1	119	119
Cx	1	1037	1037
Dx	1	264	264

Signal Timings

Network Default: 120s cycle time; 120 steps

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)	5	300	0	0	Pedestrian	0

Library Stages

Controller stream	Library stage	Phases in stage	User stage minimum (s)
1	1	A, C	1
	2	B, D	1
	3	E	1

Stage Sequences

Controller stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 1, 2	41, 57, 70, 97, 109

Intergreen Matrix for Controller Stream 1

From \ To	A	B	C	D	E
A		5		5	8
B	5		5		8
C		5		5	8
D	5		5		8
E	9	9	9	9	

Interstage Matrix for Controller Stream 1

From \ To	1	2	3
1	0	5	8
2	5	0	8
3	9	9	0

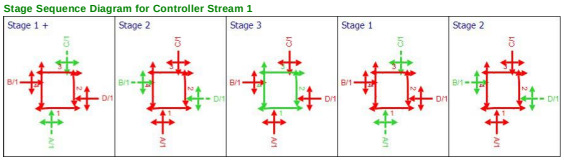
Resultant Stages

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	114	41	47	1	7
	2	✓	2	B,D	46	57	11	1	7
	3	✓	3	E	65	70	5	1	5
	4	✓	1	A,C	79	97	18	1	7
	5	✓	2	B,D	102	109	7	1	7

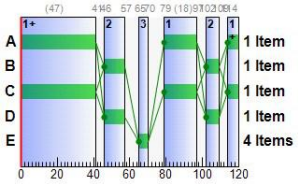
Resultant Phase Green Periods

Controller stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	79	97	18
		2	✓	114	41	47
	B	1	✓	46	57	11
		2	✓	102	109	7
	C	1	✓	79	97	18
		2	✓	114	41	47
	D	1	✓	46	57	11
		2	✓	102	109	7
	E	1	✓	65	70	5

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 (PCU/hr)	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)
17:00-18:00	A	1	88	2	1047	2123	65	28.79	22.19	63.80	118.90	12.23	131.14
	B	1	23	289	77	1996	18	23.65	1.28	3.67	7.18	0.84	8.02
	C	1	39	129	453	2064	65	9.69	6.04	17.37	17.32	3.11	20.43
	D	1	87	3	294	2027	18	55.72	7.84	22.54	64.61	5.16	69.77
	Ax	1	0	Unrestricted	451	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	0	Unrestricted	119	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	0	Unrestricted	1037	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	0	Unrestricted	264	Unrestricted	120	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 (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))	Effec gree (pe cycl
17:00-18:00	A	1	1047	1047	0		2123	1186	88		2	0.00	65	67
	B	1	77	77	0		1996	333	23		289	0.00	18	20
	C	1	453	453	0		2064	1152	39		129	0.00	65	67
	D	1	294	294	0		2027	338	87		3	0.00	18	20
	Ax	1	451	451	0		Unrestricted	Unrestricted	0		Unrestricted	0.55	120	12
	Bx	1	119	119	0		Unrestricted	Unrestricted	0		Unrestricted	1.17	120	12
	Cx	1	1037	1037	0		Unrestricted	Unrestricted	0		Unrestricted	0.54	120	12
	Dx	1	264	264	0		Unrestricted	Unrestricted	0		Unrestricted	0.51	120	12

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (PCU-hr/hr)	Random plus oversat delay (PCU-hr/hr)	Unweighted cost of delay (£ per hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Unweighted cost of stops (£ per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	24.00	28.79	5.22	3.15	118.90	118.90	93.19	883.27	92.47	12.23	12.23
	B	1	24.00	23.65	0.47	0.03	7.18	7.18	86.53	64.55	2.07	0.84	0.84
	C	1	24.00	9.69	1.09	0.13	17.32	17.32	54.84	240.82	7.60	3.11	3.11
	D	1	24.00	55.72	2.02	2.53	64.61	64.61	139.87	277.40	133.80	5.16	5.16
	Ax	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Bx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Cx	1	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dx	1	12.00	0.00	0.00	0.00	0.00	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 (%)	Average storage excess queue (PCU)	Average limit excess queue (PCU)	Excess queue penalty (£ per hr)	Max end of green queue (PCU)	Max end of red queue (PCU)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	22.19	34.78	63.80	0.00	0.00	0.00	8.23	13.91	0.00	0.00	0.00	
	B	1	0.00	1.28	34.78	3.67	0.00	0.00	0.00	0.03	1.23	0.00	0.00	0.00	
	C	1	0.00	6.04	34.78	17.37	0.00	0.00	0.00	0.13	4.78	0.00	0.00	0.00	
	D	1	0.00	7.84	34.78	22.54	0.00	0.00	0.00	2.53	7.10	0.00	0.00	0.00	
	Ax	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			16.00	0.00	16.00	
	Bx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			83.00	0.00	83.00	
	Cx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			14.00	0.00	14.00	
	Dx	1	0.00	0.00	17.39	0.00	0.00	0.00	0.00			19.00	0.00	19.00	

APPENDIX D ARCADY Output Files

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 4 ARCADY Analysis Do Nothing Rev A.j9
Path: G:\2017\p170024\calcs\arcady\June 2019
Report generation date: 18/06/2019 15:46:29

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
Do Nothing - 2020										
Arm A	0.4	3.68	0.30	A	27 %	5.2	16.70	0.85	C	10 %
Arm B	0.3	3.70	0.24	A		0.5	6.20	0.33	A	
Arm C	2.4	9.82	0.71	A	[Arm C]	0.5	3.98	0.31	A	[Arm A]
Do Nothing - 2025										
Arm A	0.5	3.81	0.32	A	17 %	9.9	30.05	0.92	D	1 %
Arm B	0.3	3.82	0.25	A		0.6	6.94	0.36	A	
Arm C	3.3	12.73	0.78	B	[Arm C]	0.5	4.19	0.34	A	[Arm A]
Do Nothing - 2035										
Arm A	0.5	3.96	0.34	A	7 %	32.1	81.10	1.02	F	-8 %
Arm B	0.4	3.97	0.27	A		0.7	7.83	0.40	A	
Arm C	5.8	20.34	0.86	C	[Arm C]	0.6	4.42	0.38	A	[Arm A]

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

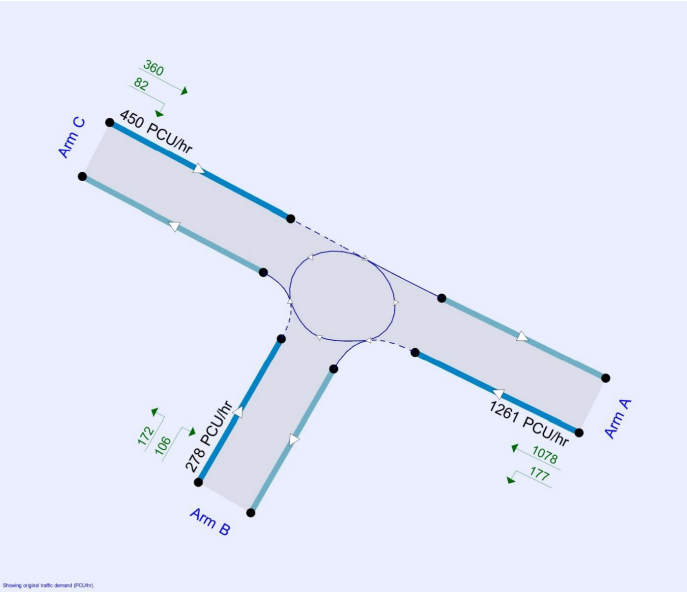
File summary

File Description

Title	Newcastle
Location	
Site number	Junction 4
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE"mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2020	AM	ONE HOUR	07:15	08:45	15
2020	PM	ONE HOUR	16:45	18:15	15
2025	AM	ONE HOUR	07:15	08:45	15
2025	PM	ONE HOUR	16:45	18:15	15
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Do Nothing - 2020, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Nothing	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	7.09	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	27	Arm C

Arms

Arms

Arm	Name	Description
A	R120 (SE)	
B	Newcastle Boulevard	
C	R120 (NW)	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)
A	0.00	99999.00
B	0.00	99999.00
C	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	3.40	5.90	11.0	12.0	30.0	29.0	
B	4.00	6.30	7.0	14.0	30.0	43.0	
C	3.00	6.40	12.0	15.0	30.0	39.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.593	1425.968
B	0.586	1449.197
C	0.578	1380.429

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	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2020	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	375.00	100.000
B		✓	277.00	100.000
C		✓	810.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	4.000	117.000	254.000
	B	189.000	0.000	88.000
	C	755.000	47.000	8.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.30	3.68	0.4	A
B	0.24	3.70	0.3	A
C	0.71	9.82	2.4	A

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	282.32	41.17	1401.56	0.201	281.32	0.3	3.210	A
B	208.54	199.53	1332.25	0.157	207.80	0.2	3.200	A
C	609.81	144.79	1296.78	0.470	606.30	0.9	5.188	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	337.12	49.33	1396.73	0.241	336.86	0.3	3.396	A
B	249.02	238.93	1309.16	0.190	248.82	0.2	3.394	A
C	728.17	173.37	1280.26	0.569	726.49	1.3	6.481	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	412.88	60.27	1390.24	0.297	412.47	0.4	3.679	A
B	304.98	292.55	1277.74	0.239	304.67	0.3	3.699	A
C	891.83	212.28	1257.78	0.709	887.61	2.4	9.613	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	412.88	60.55	1390.08	0.297	412.88	0.4	3.683	A
B	304.98	292.87	1277.55	0.239	304.98	0.3	3.700	A
C	891.83	212.49	1257.66	0.709	891.66	2.4	9.824	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	337.12	49.73	1396.49	0.241	337.52	0.3	3.400	A
B	249.02	239.45	1308.86	0.190	249.32	0.2	3.400	A
C	728.17	173.72	1280.06	0.569	732.38	1.3	6.622	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	282.32	41.53	1401.35	0.201	282.59	0.3	3.217	A
B	208.54	200.46	1331.71	0.157	208.74	0.2	3.208	A
C	609.81	145.44	1296.40	0.470	611.58	0.9	5.269	A

Do Nothing - 2020, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Nothing	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	12.26	B

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2020	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1055.00	100.000
B		✓	264.00	100.000
C		✓	372.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	5.000	165.000	885.000
	B	99.000	0.000	165.000
	C	292.000	74.000	6.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.85	16.70	5.2	C
B	0.33	6.20	0.5	A
C	0.31	3.98	0.5	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	794.26	60.00	1390.40	0.571	789.01	1.3	5.936	A
B	198.75	670.11	1056.45	0.188	197.83	0.2	4.188	A
C	280.06	77.93	1335.41	0.210	279.00	0.3	3.405	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	948.42	71.86	1383.37	0.686	945.19	2.1	8.153	A
B	237.33	802.75	978.71	0.242	236.98	0.3	4.851	A
C	334.42	93.35	1326.50	0.252	334.14	0.3	3.627	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1161.58	87.98	1373.81	0.846	1150.30	4.9	15.371	C
B	290.67	977.00	876.59	0.332	289.98	0.5	6.129	A
C	409.58	114.19	1314.45	0.312	409.12	0.4	3.975	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1161.58	88.08	1373.75	0.846	1160.62	5.2	16.696	C
B	290.67	985.71	871.48	0.334	290.65	0.5	6.197	A
C	409.58	114.49	1314.28	0.312	409.57	0.5	3.978	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	948.42	72.01	1383.28	0.686	960.16	2.2	8.733	A
B	237.33	815.40	971.30	0.244	238.02	0.3	4.913	A
C	334.42	93.81	1326.23	0.252	334.87	0.3	3.634	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	794.26	60.29	1390.23	0.571	797.82	1.4	6.112	A
B	198.75	677.56	1052.08	0.189	199.12	0.2	4.222	A
C	280.06	78.45	1335.10	0.210	280.35	0.3	4.413	A

Do Nothing - 2025, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Nothing	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	8.81	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2025	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	403.00	100.000
B		✓	288.00	100.000
C		✓	882.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	5.000	119.000	279.000
	B	196.000	0.000	92.000
	C	825.000	48.000	9.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.32	3.81	0.5	A
B	0.25	3.82	0.3	A
C	0.78	12.73	3.3	B

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	303.40	42.64	1400.69	0.217	302.30	0.3	3.274	A
B	216.82	219.77	1320.39	0.164	216.04	0.2	3.258	A
C	664.02	150.78	1293.31	0.513	659.85	1.0	5.646	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	362.29	51.10	1395.68	0.260	361.99	0.3	3.482	A
B	258.91	263.17	1294.96	0.200	258.69	0.2	3.473	A
C	792.90	180.55	1276.11	0.621	790.64	1.6	7.379	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	443.71	62.33	1389.02	0.319	443.24	0.5	3.804	A
B	317.09	322.20	1260.36	0.252	316.75	0.3	3.815	A
C	971.10	221.07	1252.70	0.775	964.50	3.3	12.213	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	443.71	62.73	1388.78	0.320	443.71	0.5	3.808	A
B	317.09	322.59	1260.13	0.252	317.09	0.3	3.816	A
C	971.10	221.30	1252.57	0.775	970.74	3.3	12.729	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	362.29	51.67	1395.34	0.260	362.75	0.4	3.489	A
B	258.91	263.79	1294.59	0.200	259.24	0.3	3.477	A
C	792.90	180.93	1275.89	0.621	799.59	1.7	7.659	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	303.40	43.07	1400.44	0.217	303.70	0.3	3.285	A
B	216.82	220.82	1319.78	0.164	217.04	0.2	3.267	A
C	664.02	151.47	1292.91	0.514	666.44	1.1	5.770	A

Do Nothing - 2025, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Nothing	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	20.83	C

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2025	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1148.00	100.000
B		✓	270.00	100.000
C		✓	411.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	6.000	170.000	972.000
B	102.000	0.000	168.000
C	326.000	78.000	7.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.92	30.05	9.9	D
B	0.36	6.94	0.6	A
C	0.34	4.19	0.5	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	864.27	63.74	1388.18	0.623	857.81	1.6	6.709	A
B	203.27	736.03	1017.82	0.200	202.28	0.2	4.408	A
C	309.42	80.90	1333.69	0.232	308.22	0.3	3.508	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1032.03	76.34	1380.71	0.747	1027.14	2.8	10.041	B
B	242.72	881.33	932.66	0.260	242.32	0.3	5.211	A
C	369.48	96.91	1324.44	0.279	369.14	0.4	3.768	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1263.97	93.47	1370.56	0.922	1240.22	8.8	24.114	C
B	297.28	1064.26	825.45	0.360	296.45	0.6	6.793	A
C	452.52	118.47	1311.98	0.345	451.97	0.5	4.183	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1263.97	93.59	1370.49	0.922	1259.53	9.9	30.048	D
B	297.28	1080.72	815.80	0.364	297.23	0.6	6.941	A
C	452.52	118.87	1311.75	0.345	452.51	0.5	4.189	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1032.03	76.53	1380.60	0.748	1059.20	3.1	12.060	B
B	242.72	908.65	916.64	0.265	243.55	0.4	5.356	A
C	369.48	97.54	1324.07	0.279	370.02	0.4	3.774	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	864.27	64.06	1387.99	0.623	869.92	1.7	7.024	A
B	203.27	746.38	1011.75	0.201	203.71	0.3	4.459	A
C	309.42	81.50	1333.34	0.232	309.76	0.3	3.520	A

Do Nothing - 2035, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Nothing	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	13.29	B

Junction Network Options
[same as above]

Arms

Arms
[same as above]

Capacity Options
[same as above]

Roundabout Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D5	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	434.00	100.000
B		✓	303.00	100.000
C		✓	976.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	5.000	120.000	309.000
	B	205.000	0.000	98.000
	C	916.000	50.000	10.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.34	3.96	0.5	A
B	0.27	3.97	0.4	A
C	0.86	20.34	5.8	C

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	326.74	44.85	1399.38	0.233	325.53	0.3	3.350	A
B	228.11	242.99	1306.78	0.175	227.27	0.2	3.335	A
C	734.78	157.52	1289.42	0.570	729.57	1.3	6.373	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	390.16	53.73	1394.12	0.280	389.82	0.4	3.584	A
B	272.39	290.99	1278.65	0.213	272.16	0.3	3.576	A
C	877.40	188.62	1271.45	0.690	873.98	2.2	8.978	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	477.84	65.25	1387.29	0.344	477.30	0.5	3.953	A
B	333.61	356.20	1240.43	0.269	333.22	0.4	3.966	A
C	1074.60	230.95	1246.99	0.862	1061.44	5.4	18.218	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	477.84	65.98	1386.86	0.345	477.84	0.5	3.960	A
B	333.61	356.71	1240.13	0.269	333.60	0.4	3.970	A
C	1074.60	231.21	1246.84	0.862	1073.23	5.8	20.338	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	390.16	54.80	1393.48	0.280	390.69	0.4	3.593	A
B	272.39	291.80	1278.18	0.213	272.77	0.3	3.583	A
C	877.40	189.05	1271.20	0.690	891.37	2.3	9.805	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	326.74	45.41	1399.05	0.234	327.08	0.3	3.358	A
B	228.11	244.21	1306.07	0.175	228.35	0.2	3.340	A
C	734.78	158.26	1288.99	0.570	738.59	1.3	6.584	A

Do Nothing - 2035, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Nothing	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	53.51	F

Junction Network Options
[same as above]

Arms

Arms
[same as above]

Capacity Options
[same as above]

Roundabout Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D6	2035	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1261.00	100.000
B		✓	278.00	100.000
C		✓	450.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	6.000	177.000	1078.000
	B	106.000	0.000	172.000
	C	360.000	82.000	8.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	1.02	81.10	32.1	F
B	0.40	7.83	0.7	A
C	0.38	4.42	0.6	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	949.35	67.49	1385.96	0.685	940.89	2.1	7.945	A
B	209.29	814.82	971.64	0.215	208.20	0.3	4.708	A
C	338.78	83.86	1331.98	0.254	337.43	0.3	3.615	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1133.61	80.83	1378.05	0.823	1124.94	4.3	13.760	B
B	249.92	974.22	878.22	0.285	249.43	0.4	5.725	A
C	404.54	100.46	1322.39	0.306	404.15	0.4	3.918	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1388.39	98.96	1367.31	1.015	1319.02	21.6	46.389	E
B	306.08	1142.67	779.49	0.393	305.11	0.6	7.573	A
C	495.46	122.61	1309.59	0.378	494.80	0.6	4.414	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1388.39	99.09	1367.23	1.015	1346.31	32.1	81.104	F
B	306.08	1166.14	765.73	0.400	306.00	0.7	7.828	A
C	495.46	123.08	1309.32	0.378	495.45	0.6	4.423	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1133.61	81.04	1377.93	0.823	1241.21	5.2	37.860	E
B	249.92	1074.19	819.63	0.305	250.78	0.4	6.337	A
C	404.54	101.53	1321.77	0.306	405.19	0.4	3.930	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	949.35	67.84	1385.75	0.685	961.38	2.2	8.710	A
B	209.29	832.47	961.30	0.218	209.94	0.3	4.796	A
C	338.78	84.63	1331.53	0.254	339.19	0.3	3.631	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 4 ARCADY Analysis Do Something Phase 1 Rev A.j9
Path: G:\2017\p170024\calcs\arcady\June 2019
Report generation date: 18/06/2019 15:57:17

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
Do Something - 2020										
Arm A	0.4	3.70	0.30	A	26 %	5.7	18.20	0.86	C	9 %
Arm B	0.3	3.76	0.25	A		0.5	6.30	0.34	A	
Arm C	2.5	10.09	0.71	B	[Arm C]	0.5	4.00	0.31	A	[Arm A]
Do Something - 2025										
Arm A	0.5	3.88	0.33	A	14 %	16.4	46.86	0.97	E	-3 %
Arm B	0.4	4.00	0.29	A		0.7	7.35	0.40	A	
Arm C	3.7	14.20	0.80	B	[Arm C]	0.5	4.29	0.35	A	[Arm A]
Do Something - 2035										
Arm A	0.6	4.04	0.36	A	4 %	55.0	125.15	1.06	F	-11 %
Arm B	0.4	4.17	0.30	A		0.7	8.03	0.43	A	
Arm C	6.8	24.09	0.88	C	[Arm C]	0.6	4.54	0.39	A	[Arm A]

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

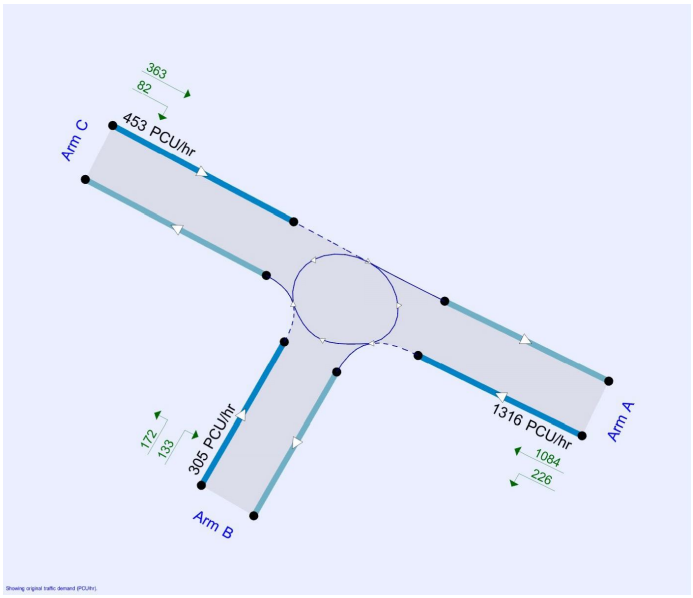
File summary

File Description

Title	Newcastle
Location	
Site number	Junction 4
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE"mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2020	AM	ONE HOUR	07:15	08:45	15
2020	PM	ONE HOUR	16:45	18:15	15
2025	AM	ONE HOUR	07:15	08:45	15
2025	PM	ONE HOUR	16:45	18:15	15
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Do Something - 2020, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	7.20	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	26	Arm C

Arms

Arms

Arm	Name	Description
A	R120 (SE)	
B	Newcastle Boulevard	
C	R120 (NW)	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)
A	0.00	99999.00
B	0.00	99999.00
C	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	3.40	5.90	11.0	12.0	30.0	29.0	
B	4.00	6.30	7.0	14.0	30.0	43.0	
C	3.00	6.40	12.0	15.0	30.0	39.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.593	1425.968
B	0.586	1449.197
C	0.578	1380.429

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	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2020	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	380.00	100.000
B		✓	292.00	100.000
C		✓	810.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	4.000	122.000	254.000
B	204.000	0.000	88.000
C	755.000	47.000	8.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.30	3.70	0.4	A
B	0.25	3.76	0.3	A
C	0.71	10.09	2.5	B

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	286.08	41.17	1401.56	0.204	285.06	0.3	3.221	A
B	219.83	199.53	1332.25	0.165	219.05	0.2	3.232	A
C	609.81	156.03	1290.28	0.473	606.27	0.9	5.236	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	341.61	49.33	1396.73	0.245	341.34	0.3	3.411	A
B	262.50	238.93	1309.16	0.201	262.29	0.2	3.438	A
C	728.17	186.84	1272.48	0.572	726.45	1.3	6.571	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	418.39	60.26	1390.25	0.301	417.96	0.4	3.700	A
B	321.50	292.54	1277.74	0.252	321.16	0.3	3.763	A
C	891.83	228.77	1248.25	0.714	887.44	2.4	9.857	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	418.39	60.54	1390.08	0.301	418.38	0.4	3.703	A
B	321.50	292.87	1277.55	0.252	321.49	0.3	3.764	A
C	891.83	229.01	1248.11	0.715	891.65	2.5	10.085	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	341.61	49.74	1396.48	0.245	342.03	0.3	3.417	A
B	262.50	239.45	1308.86	0.201	262.84	0.3	3.444	A
C	728.17	187.22	1272.26	0.572	732.55	1.4	6.722	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	286.08	41.53	1401.35	0.204	286.36	0.3	3.231	A
B	219.83	200.46	1331.71	0.165	220.05	0.2	3.240	A
C	609.81	156.75	1289.87	0.473	611.63	0.9	5.323	A

Do Something - 2020, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	13.24	B

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2020	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1072.00	100.000
B		✓	273.00	100.000
C		✓	372.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	5.000	182.000	885.000
B	108.000	0.000	165.000
C	292.000	74.000	6.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.86	18.20	5.7	C
B	0.34	6.30	0.5	A
C	0.31	4.00	0.5	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	807.06	60.00	1390.40	0.580	801.61	1.4	6.059	A
B	205.53	670.02	1056.51	0.195	204.57	0.2	4.221	A
C	280.06	84.67	1331.51	0.210	279.00	0.3	3.417	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	963.71	71.86	1383.37	0.697	960.23	2.2	8.437	A
B	245.42	802.60	978.80	0.251	245.05	0.3	4.904	A
C	334.42	101.42	1321.83	0.253	334.13	0.3	3.644	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1180.29	87.98	1373.81	0.859	1167.58	5.4	16.507	C
B	300.58	975.95	877.20	0.343	299.84	0.5	6.227	A
C	409.58	124.07	1308.75	0.313	409.12	0.5	4.000	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1180.29	88.08	1373.75	0.859	1179.08	5.7	18.204	C
B	300.58	985.51	871.60	0.345	300.55	0.5	6.303	A
C	409.58	124.40	1308.55	0.313	409.57	0.5	4.004	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	963.71	72.02	1383.28	0.697	977.09	2.4	9.137	A
B	245.42	816.60	970.60	0.253	246.15	0.3	4.973	A
C	334.42	101.93	1321.53	0.253	334.87	0.3	3.649	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	807.06	60.29	1390.23	0.581	810.90	1.4	6.254	A
B	205.53	677.75	1051.97	0.195	205.92	0.2	4.256	A
C	280.06	85.24	1331.18	0.210	280.35	0.3	3.426	A

Do Something - 2025, AM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	9.51	A

Junction Network Options
[same as above]

Arms

Arms
[same as above]

Capacity Options
[same as above]

Roundabout Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2025	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	418.00	100.000
B		✓	326.00	100.000
C		✓	887.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	5.000	132.000	281.000
	B	234.000	0.000	92.000
	C	830.000	48.000	9.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.33	3.88	0.5	A
B	0.29	4.00	0.4	A
C	0.80	14.20	3.7	B

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	314.69	42.63	1400.69	0.225	313.54	0.3	3.308	A
B	245.43	221.26	1319.52	0.186	244.52	0.2	3.345	A
C	667.78	179.26	1276.85	0.523	663.45	1.1	5.829	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	375.77	51.08	1395.69	0.269	375.46	0.4	3.528	A
B	293.07	264.96	1293.91	0.227	292.81	0.3	3.596	A
C	797.39	214.67	1256.40	0.635	794.93	1.7	7.758	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	460.23	62.26	1389.06	0.331	459.72	0.5	3.872	A
B	358.93	324.38	1259.08	0.285	358.51	0.4	3.995	A
C	976.61	262.84	1228.57	0.795	968.92	3.6	13.474	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	460.23	62.73	1388.78	0.331	460.22	0.5	3.876	A
B	358.93	324.79	1258.84	0.285	358.93	0.4	4.000	A
C	976.61	263.14	1228.39	0.795	976.12	3.7	14.196	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	375.77	51.75	1395.29	0.269	376.27	0.4	3.533	A
B	293.07	265.62	1293.52	0.227	293.48	0.3	3.603	A
C	797.39	215.16	1256.12	0.635	805.24	1.8	8.117	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	314.69	43.08	1400.43	0.225	315.01	0.3	3.319	A
B	245.43	222.34	1318.89	0.186	245.69	0.2	3.354	A
C	667.78	180.12	1276.36	0.523	670.45	1.1	5.966	A

Do Something - 2025, PM

Data Errors and Warnings
No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	31.51	D

Junction Network Options
[same as above]

Arms

Arms
[same as above]

Capacity Options
[same as above]

Roundabout Geometry
[same as above]

Slope / Intercept / Capacity
[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2025	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1202.00	100.000
B		✓	297.00	100.000
C		✓	414.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	5.000	219.000	978.000
B	129.000	0.000	168.000
C	329.000	78.000	7.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.97	46.86	16.4	E
B	0.40	7.35	0.7	A
C	0.35	4.29	0.5	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	904.93	63.74	1388.18	0.652	897.61	1.8	7.236	A
B	223.60	739.32	1015.89	0.220	222.48	0.3	4.530	A
C	311.68	100.36	1322.44	0.236	310.45	0.3	3.552	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1080.57	76.34	1380.71	0.783	1074.26	3.4	11.508	B
B	267.00	884.82	930.61	0.287	266.52	0.4	5.417	A
C	372.18	120.23	1310.96	0.284	371.83	0.4	3.833	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1323.43	93.47	1370.56	0.966	1284.57	13.1	32.486	D
B	327.00	1058.22	828.98	0.394	326.03	0.6	7.146	A
C	455.82	146.95	1295.52	0.352	455.24	0.5	4.281	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1323.43	93.59	1370.49	0.966	1310.50	16.4	46.857	E
B	327.00	1079.44	816.55	0.400	326.93	0.7	7.349	A
C	455.82	147.45	1295.24	0.352	455.81	0.5	4.288	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1080.57	76.53	1380.60	0.783	1130.64	3.8	16.899	C
B	267.00	930.95	903.58	0.295	267.95	0.4	5.673	A
C	372.18	121.09	1310.47	0.284	372.75	0.4	3.841	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	904.93	64.07	1387.99	0.652	912.61	1.9	7.690	A
B	223.60	751.61	1008.69	0.222	224.14	0.3	4.593	A
C	311.68	101.15	1321.99	0.236	312.04	0.3	3.564	A

Do Something - 2035, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	15.16	C

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D5	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	450.00	100.000
B		✓	341.00	100.000
C		✓	981.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	5.000	134.000	311.000
B	243.000	0.000	98.000
C	921.000	50.000	10.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.36	4.04	0.6	A
B	0.30	4.17	0.4	A
C	0.88	24.09	6.8	C

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	338.78	44.84	1399.39	0.242	337.51	0.3	3.385	A
B	256.72	244.48	1305.91	0.197	255.75	0.2	3.425	A
C	738.55	186.00	1272.96	0.580	733.12	1.4	6.603	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	404.54	53.71	1394.13	0.290	404.19	0.4	3.636	A
B	306.55	292.78	1277.60	0.240	306.27	0.3	3.706	A
C	881.90	222.74	1251.74	0.705	878.11	2.3	9.537	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	495.46	65.08	1387.39	0.357	494.88	0.6	4.031	A
B	375.45	358.36	1239.17	0.303	374.98	0.4	4.164	A
C	1080.10	272.71	1222.86	0.883	1064.04	6.3	20.820	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	495.46	65.93	1386.88	0.357	495.45	0.6	4.038	A
B	375.45	358.91	1238.85	0.303	375.44	0.4	4.169	A
C	1080.10	273.05	1222.67	0.883	1078.03	6.8	24.088	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	404.54	55.01	1393.36	0.290	405.11	0.4	3.646	A
B	306.55	293.65	1277.09	0.240	307.02	0.3	3.711	A
C	881.90	223.28	1251.42	0.705	899.36	2.5	10.697	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	338.78	45.43	1399.04	0.242	339.14	0.3	3.396	A
B	256.72	245.73	1305.18	0.197	257.01	0.2	3.434	A
C	738.55	186.92	1272.43	0.580	742.81	1.4	6.850	A

Do Something - 2035, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	81.58	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D6	2035	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1316.00	100.000
B		✓	305.00	100.000
C		✓	453.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	6.000	226.000	1084.000
	B	133.000	0.000	172.000
	C	363.000	82.000	8.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	1.06	125.15	55.0	F
B	0.43	8.03	0.7	A
C	0.39	4.54	0.6	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	990.75	67.48	1385.97	0.715	981.06	2.4	8.695	A
B	229.62	818.58	969.44	0.237	228.39	0.3	4.850	A
C	341.04	104.06	1320.30	0.258	339.66	0.3	3.666	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1183.06	80.83	1378.05	0.859	1171.18	5.4	16.503	C
B	274.19	977.24	876.45	0.313	273.62	0.5	5.967	A
C	407.24	124.65	1308.41	0.311	406.83	0.4	3.991	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1448.94	98.95	1367.31	1.060	1339.46	32.8	62.618	F
B	335.81	1118.23	793.81	0.423	334.73	0.7	7.823	A
C	498.76	152.07	1292.57	0.386	498.07	0.6	4.527	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1448.94	99.09	1367.23	1.060	1360.05	55.0	125.154	F
B	335.81	1135.29	783.82	0.428	335.74	0.7	8.032	A
C	498.76	152.60	1292.26	0.386	498.75	0.6	4.536	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1183.06	81.04	1377.93	0.859	1353.31	12.4	94.998	F
B	274.19	1128.11	788.02	0.348	275.00	0.5	7.030	A
C	407.24	126.09	1307.58	0.311	407.92	0.5	4.005	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	990.75	67.84	1385.75	0.715	1030.03	2.6	11.179	B
B	229.62	859.17	945.64	0.243	230.49	0.3	5.039	A
C	341.04	105.20	1319.65	0.258	341.46	0.4	3.683	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 4 ARCADY Analysis Do Something Rev A.j9
Path: G:\2017\p170024\calcs\arcady\June 2019
Report generation date: 18/06/2019 16:02:29

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	Do Something - 2025									
Arm A	0.5	3.92	0.34	A	19 %	25.8	68.09	1.00	F	-6 %
Arm B	0.6	4.54	0.38	A		0.6	6.44	0.38	A	
Arm C	2.8	12.16	0.74	B	[Arm C]	0.5	4.25	0.33	A	[Arm A]
	Do Something - 2035									
Arm A	0.6	4.09	0.37	A	8 %	75.4	164.22	1.09	F	-14 %
Arm B	0.7	4.84	0.41	A		0.7	6.82	0.41	A	
Arm C	4.6	18.45	0.83	C	[Arm C]	0.6	4.47	0.36	A	[Arm A]

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

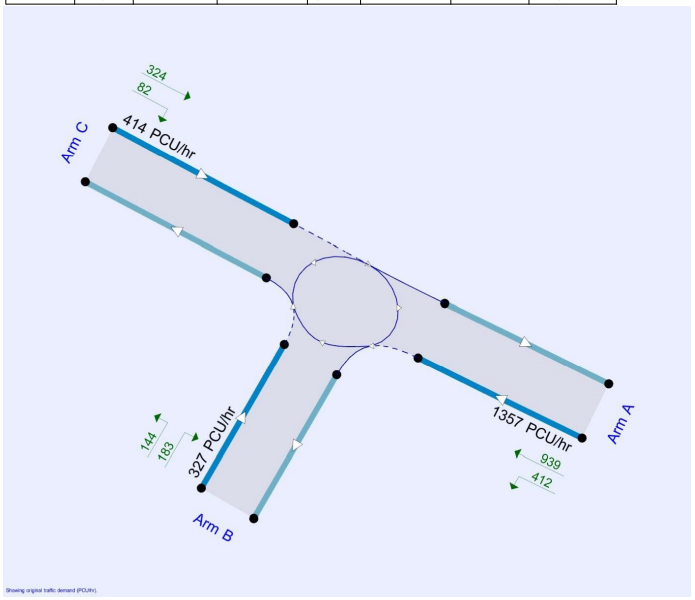
File summary

File Description

Title	Newcastle
Location	
Site number	Junction 4
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE"mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2025	AM	ONE HOUR	07:15	08:45	15
2025	PM	ONE HOUR	16:45	18:15	15
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Do Something - 2025, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	7.97	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	19	Arm C

Arms

Arms

Arm	Name	Description
A	R120 (SE)	
B	Newcastle Boulevard	
C	R120 (NW)	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)
A	0.00	99999.00
B	0.00	99999.00
C	0.00	99999.00

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
A	3.40	5.90	11.0	12.0	30.0	29.0	
B	4.00	6.30	7.0	14.0	30.0	43.0	
C	3.00	6.40	12.0	15.0	30.0	39.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.593	1425.968
B	0.586	1449.197
C	0.578	1380.429

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	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2025	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	428.00	100.000
B		✓	442.00	100.000
C		✓	776.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	5.000	173.000	250.000
	B	358.000	0.000	84.000
	C	719.000	48.000	9.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.34	3.92	0.5	A
B	0.38	4.54	0.6	A
C	0.74	12.16	2.8	B

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	322.22	42.65	1400.69	0.230	321.03	0.3	3.332	A
B	332.76	198.00	1333.15	0.250	331.44	0.3	3.589	A
C	584.21	272.20	1223.16	0.478	580.60	0.9	5.572	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	384.76	51.10	1395.68	0.276	384.44	0.4	3.560	A
B	397.35	237.11	1310.23	0.303	396.94	0.4	3.940	A
C	697.61	326.00	1192.08	0.585	695.68	1.4	7.222	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	471.24	62.36	1389.00	0.339	470.71	0.5	3.919	A
B	486.65	290.29	1279.06	0.380	485.94	0.6	4.535	A
C	854.39	399.09	1149.85	0.743	848.91	2.8	11.750	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	471.24	62.74	1388.78	0.339	471.23	0.5	3.923	A
B	486.65	290.66	1278.84	0.381	486.64	0.6	4.543	A
C	854.39	399.66	1149.52	0.743	854.13	2.8	12.157	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	384.76	51.65	1395.35	0.276	385.28	0.4	3.565	A
B	397.35	237.70	1309.88	0.303	398.04	0.4	3.952	A
C	697.61	326.90	1191.56	0.585	703.14	1.4	7.453	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	322.22	43.06	1400.44	0.230	322.55	0.3	3.340	A
B	332.76	198.97	1332.58	0.250	333.18	0.3	3.602	A
C	584.21	273.62	1222.34	0.478	586.26	0.9	5.677	A

Do Something - 2025, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	45.56	E

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2025	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1244.00	100.000
B		✓	315.00	100.000
C		✓	380.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	6.000	390.000	848.000
B	175.000	0.000	140.000
C	295.000	78.000	7.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	1.00	68.09	25.8	F
B	0.38	6.44	0.6	A
C	0.33	4.25	0.5	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	936.55	63.74	1388.18	0.675	928.47	2.0	7.703	A
B	237.15	642.64	1072.55	0.221	236.02	0.3	4.298	A
C	286.08	135.60	1302.08	0.220	284.96	0.3	3.536	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1118.33	76.34	1380.71	0.810	1110.52	4.0	12.953	B
B	283.18	768.65	998.70	0.284	282.74	0.4	5.024	A
C	341.61	162.43	1286.58	0.266	341.29	0.4	3.808	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1369.67	93.47	1370.56	0.999	1311.86	18.4	41.354	E
B	346.82	908.29	916.86	0.378	345.99	0.6	6.297	A
C	418.39	198.54	1265.72	0.331	417.86	0.5	4.243	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1369.67	93.59	1370.49	0.999	1340.02	25.8	68.087	F
B	346.82	927.62	905.53	0.383	346.77	0.6	6.442	A
C	418.39	199.11	1265.39	0.331	418.38	0.5	4.249	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1118.33	76.53	1380.60	0.810	1202.93	4.7	27.369	D
B	283.18	832.11	961.51	0.295	283.96	0.4	5.318	A
C	341.61	163.56	1285.93	0.266	342.13	0.4	3.818	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	936.55	64.06	1387.99	0.675	946.78	2.1	8.340	A
B	237.15	655.23	1065.17	0.223	237.68	0.3	4.352	A
C	286.08	136.61	1301.50	0.220	286.41	0.3	3.546	A

Do Something - 2035, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	11.17	B

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	460.00	100.000
B		✓	470.00	100.000
C		✓	857.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	5.000	178.000	277.000
B	380.000	0.000	90.000
C	797.000	50.000	10.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.37	4.09	0.6	A
B	0.41	4.84	0.7	A
C	0.83	18.45	4.6	C

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	346.31	44.86	1399.38	0.247	345.00	0.3	3.409	A
B	353.84	218.98	1320.86	0.268	352.39	0.4	3.713	A
C	645.19	288.66	1213.65	0.532	640.72	1.1	6.235	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	413.53	53.74	1394.11	0.297	413.16	0.4	3.670	A
B	422.52	262.24	1295.50	0.326	422.05	0.5	4.120	A
C	770.43	345.72	1180.68	0.653	767.58	1.8	8.654	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	506.47	65.33	1387.24	0.365	505.86	0.6	4.082	A
B	517.48	321.00	1261.06	0.410	516.64	0.7	4.831	A
C	943.57	423.21	1135.91	0.831	933.20	4.4	16.943	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	506.47	66.00	1386.84	0.365	506.46	0.6	4.088	A
B	517.48	321.48	1260.78	0.410	517.47	0.7	4.842	A
C	943.57	423.88	1135.52	0.831	942.69	4.6	18.450	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	413.53	54.70	1393.54	0.297	414.13	0.4	3.679	A
B	422.52	262.99	1295.06	0.326	423.34	0.5	4.135	A
C	770.43	346.78	1180.07	0.653	781.28	1.9	9.261	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	346.31	45.39	1399.06	0.248	346.69	0.3	3.421	A
B	353.84	220.10	1320.20	0.268	354.32	0.4	3.730	A
C	645.19	290.24	1212.74	0.532	648.31	1.2	6.412	A

Do Something - 2035, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	108.16	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2035	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1357.00	100.000
B		✓	327.00	100.000
C		✓	414.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	6.000	412.000	939.000
B	183.000	0.000	144.000
C	324.000	82.000	8.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	1.09	164.22	75.4	F
B	0.41	6.82	0.7	A
C	0.36	4.47	0.6	A

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1021.62	67.48	1385.96	0.737	1010.84	2.7	9.347	A
B	246.18	709.94	1033.11	0.238	244.94	0.3	4.553	A
C	311.68	141.55	1298.65	0.240	310.42	0.3	3.638	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1219.92	80.83	1378.05	0.885	1204.57	6.5	19.209	C
B	293.97	846.04	953.34	0.308	293.44	0.4	5.450	A
C	372.18	169.55	1282.47	0.290	371.81	0.4	3.951	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1494.08	98.96	1367.31	1.093	1348.86	42.8	76.948	F
B	360.03	948.12	893.51	0.403	359.13	0.7	6.726	A
C	455.82	206.95	1260.86	0.362	455.20	0.6	4.468	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1494.08	99.09	1367.23	1.093	1363.75	75.4	164.217	F
B	360.03	958.51	887.42	0.406	359.99	0.7	6.825	A
C	455.82	207.49	1260.55	0.362	455.81	0.6	4.473	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1219.92	81.04	1377.93	0.885	1359.90	40.4	155.566	F
B	293.97	954.22	889.94	0.330	294.68	0.5	6.056	A
C	372.18	170.93	1281.67	0.290	372.79	0.4	3.963	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1021.62	67.84	1385.75	0.737	1171.37	3.0	29.288	D
B	246.18	821.76	967.57	0.254	246.80	0.3	5.000	A
C	311.68	143.30	1297.64	0.240	312.06	0.3	3.653	A

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Junction 4 ARCADY Sensitivity Analysis Rev A.j9
Path: G:\2017\p170024\calcs\arcady\June 2019
Report generation date: 18/06/2019 16:06:14

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	Sensitivity Analysis - 2035									
Arm A	0.6	4.25	0.39	A	3 %	138.4	348.16	1.18	F	-20 %
Arm B	0.9	5.52	0.48	A	[Arm C]	0.8	7.16	0.46	A	[Arm A]
Arm C	6.6	26.20	0.88	D		0.6	4.72	0.38	A	

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

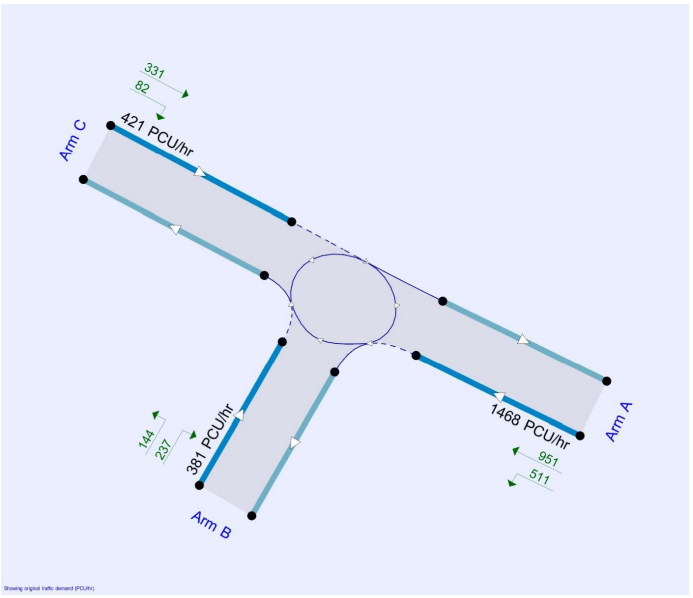
File summary

File Description

Title	Newcastle
Location	
Site number	Junction 4
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE\mckennam
Description	Sensitivity Analysis

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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Sensitivity Analysis - 2035, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Sensitivity Analysis	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	14.58	B

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	3	Arm C

Arms

Arms

Arm	Name	Description
A	R120 (SE)	
B	Newcastle Boulevard	
C	R120 (NW)	

Capacity Options

Arm	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)
A	0.00	99999.00
B	0.00	99999.00
C	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A	3.40	5.90	11.0	12.0	30.0	29.0	
B	4.00	6.30	7.0	14.0	30.0	43.0	
C	3.00	6.40	12.0	15.0	30.0	39.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A	0.593	1425.968
B	0.586	1449.197
C	0.578	1380.429

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	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	490.00	100.000
B		✓	551.00	100.000
C		✓	866.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	5.000	205.000	280.000
	B	461.000	0.000	90.000
	C	806.000	50.000	10.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	0.39	4.25	0.6	A
B	0.48	5.52	0.9	A
C	0.88	26.20	6.6	D

Main Results for each time segment

Main results: (07:15-07:30)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	368.90	44.83	1399.39	0.264	367.47	0.4	3.484	A
B	414.82	221.21	1319.55	0.314	413.00	0.5	3.963	A
C	651.97	349.29	1178.62	0.553	647.10	1.2	6.714	A

Main results: (07:30-07:45)

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	440.50	53.70	1394.14	0.316	440.09	0.5	3.771	A
B	495.34	264.92	1293.93	0.383	494.70	0.6	4.500	A
C	778.52	418.39	1138.70	0.684	775.02	2.1	9.803	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	539.50	64.97	1387.45	0.389	538.81	0.6	4.238	A
B	606.66	324.22	1259.18	0.482	605.45	0.9	5.497	A
C	953.48	512.05	1084.58	0.879	937.74	6.0	22.439	C

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	539.50	65.92	1386.89	0.389	539.49	0.6	4.247	A
B	606.66	324.77	1258.85	0.482	606.64	0.9	5.519	A
C	953.48	513.06	1084.00	0.880	951.38	6.6	26.200	D

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	440.50	55.13	1393.29	0.316	441.18	0.5	3.782	A
B	495.34	265.79	1293.42	0.383	496.53	0.6	4.524	A
C	778.52	419.93	1137.80	0.684	795.76	2.2	11.020	B

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	368.90	45.44	1399.03	0.264	369.32	0.4	3.496	A
B	414.82	222.38	1318.86	0.315	415.48	0.5	3.987	A
C	651.97	351.38	1177.41	0.554	655.89	1.3	6.955	A

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1468.00	100.000
B		✓	381.00	100.000
C		✓	421.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	6.000	511.000	951.000
	B	237.000	0.000	144.000
	C	331.000	82.000	8.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
A	1.18	348.16	138.4	F
B	0.46	7.16	0.8	A
C	0.38	4.72	0.6	A

Sensitivity Analysis - 2035, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Sensitivity Analysis	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	untitled	Standard Roundabout	227.23	F

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Capacity Options

[same as above]

Roundabout Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2035	PM	ONE HOUR	16:45	18:15	15

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

Main Results for each time segment

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1105.19	67.48	1385.97	0.797	1090.43	3.7	11.661	B
B	286.84	716.86	1029.05	0.279	285.30	0.4	4.830	A
C	316.95	181.93	1275.32	0.249	315.64	0.3	3.746	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1319.70	80.82	1378.06	0.958	1285.62	12.2	31.053	D
B	342.51	845.29	953.78	0.359	341.83	0.6	5.877	A
C	378.47	217.89	1254.54	0.302	378.07	0.4	4.105	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1616.30	98.94	1367.31	1.182	1361.42	75.9	126.120	F
B	419.49	896.31	923.88	0.454	418.43	0.8	7.108	A
C	463.53	265.85	1226.83	0.378	462.84	0.6	4.708	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1616.30	99.09	1367.23	1.182	1366.48	138.4	288.142	F
B	419.49	899.63	921.93	0.455	419.46	0.8	7.164	A
C	463.53	266.51	1226.45	0.378	463.52	0.6	4.718	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1319.70	81.05	1377.92	0.958	1368.03	126.3	348.161	F
B	342.51	899.04	922.28	0.371	343.44	0.6	6.228	A
C	378.47	219.22	1253.77	0.302	379.15	0.4	4.119	A

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

Arm	Total Demand (PCU/hr)	Circulating flow (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
A	1105.19	67.84	1385.75	0.798	1374.86	58.9	244.385	F
B	286.84	902.32	920.36	0.312	287.40	0.5	5.692	A
C	316.95	184.39	1273.89	0.249	317.36	0.3	3.767	A

APPENDIX E PICADY Output Files

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Northern Site Access PICADY Analysis Do Something Phase 1 Rev A.j9
Path: G:\2017\p170024\calcs\picady\June 2019
Report generation date: 18/06/2019 16:11:03

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
Do-Something - 2025										
Stream B-AC	0.1	9.27	0.07	A	130 %	0.2	15.22	0.14	C	40 %
Stream C-AB	0.0	5.52	0.01	A	[Stream B-AC]	0.1	8.17	0.05	A	[Stream B-AC]
Do-Something - 2035										
Stream B-AC	0.1	9.69	0.07	A	110 %	0.2	17.46	0.16	C	28 %
Stream C-AB	0.0	5.60	0.01	A	[Stream B-AC]	0.1	8.76	0.06	A	[Stream B-AC]

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

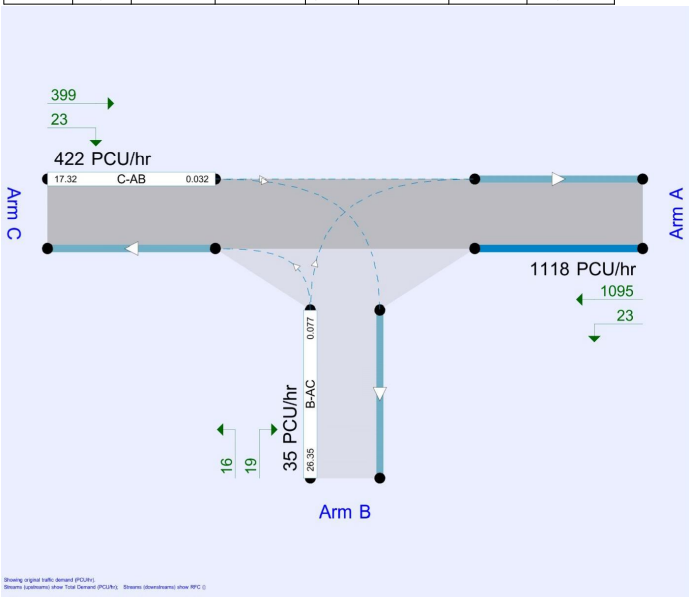
File summary

File Description

Title	Newcastle
Location	Northern Site Access
Site number	Junction 6
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE\mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2025	AM	ONE HOUR	07:15	08:45	15
2025	PM	ONE HOUR	16:45	18:15	15
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Do-Something - 2025, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.26	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	130	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	R120 (E)		Major
B	Subject Site		Minor
C	R120 (W)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	9.00		✓	3.00	193.0	✓	6.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	10	15

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	488.282	0.077	0.195	0.123	0.279
1	B-C	633.380	0.084	0.213	-	-
1	C-B	745.436	0.251	0.251	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2025	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	311.00	100.000
B		✓	27.00	100.000
C		✓	771.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	7.000	304.000
	B	12.000	0.000	15.000
	C	764.000	7.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.07	9.27	0.1	A
C-AB	0.01	5.52	0.0	A

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	20.33	465.27	0.044	20.15	0.0	8.084	A
C-AB	5.27	686.64	0.008	5.24	0.0	5.282	A
C-A	575.18			575.18			
A-B	5.27			5.27			
A-C	228.87			228.87			

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	24.27	445.73	0.054	24.23	0.1	8.539	A
C-AB	6.29	675.23	0.009	6.29	0.0	5.381	A
C-A	686.82			686.82			
A-B	6.29			6.29			
A-C	273.29			273.29			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	29.73	417.84	0.071	29.65	0.1	9.270	A
C-AB	7.71	659.45	0.012	7.70	0.0	5.523	A
C-A	841.18			841.18			
A-B	7.71			7.71			
A-C	334.71			334.71			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	29.73	417.84	0.071	29.73	0.1	9.275	A
C-AB	7.71	659.45	0.012	7.71	0.0	5.523	A
C-A	841.18			841.18			
A-B	7.71			7.71			
A-C	334.71			334.71			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	24.27	445.73	0.054	24.34	0.1	8.544	A
C-AB	6.29	675.23	0.009	6.30	0.0	5.383	A
C-A	686.82			686.82			
A-B	6.29			6.29			
A-C	273.29			273.29			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	20.33	465.27	0.044	20.38	0.0	8.092	A
C-AB	5.27	686.64	0.008	5.28	0.0	5.283	A
C-A	575.18			575.18			
A-B	5.27			5.27			
A-C	228.87			228.87			

Do-Something - 2025, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.50	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2025	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1010.00	100.000
B		✓	35.00	100.000
C		✓	384.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	23.000	987.000
	B	19.000	0.000	16.000
	C	361.000	23.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.14	15.22	0.2	C
C-AB	0.05	8.17	0.1	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26.35	363.02	0.073	26.04	0.1	10.673	B
C-AB	17.32	554.49	0.031	17.19	0.0	6.698	A
C-A	271.78			271.78			
A-B	17.32			17.32			
A-C	743.07			743.07			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.46	326.52	0.096	31.35	0.1	12.196	B
C-AB	20.68	517.42	0.040	20.64	0.0	7.246	A
C-A	324.53			324.53			
A-B	20.68			20.68			
A-C	887.29			887.29			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	38.54	275.06	0.140	38.32	0.2	15.192	C
C-AB	25.32	466.18	0.054	25.26	0.1	8.164	A
C-A	397.47			397.47			
A-B	25.32			25.32			
A-C	1086.71			1086.71			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	38.54	275.04	0.140	38.53	0.2	15.220	C
C-AB	25.32	466.18	0.054	25.32	0.1	8.165	A
C-A	397.47			397.47			
A-B	25.32			25.32			
A-C	1086.71			1086.71			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.46	326.50	0.096	31.68	0.1	12.221	B
C-AB	20.68	517.42	0.040	20.74	0.0	7.248	A
C-A	324.53			324.53			
A-B	20.68			20.68			
A-C	887.29			887.29			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26.35	362.99	0.073	26.47	0.1	10.702	B
C-AB	17.32	554.49	0.031	17.35	0.0	6.704	A
C-A	271.78			271.78			
A-B	17.32			17.32			
A-C	743.07			743.07			

Do-Something - 2035, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.25	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	343.00	100.000
B		✓	27.00	100.000
C		✓	854.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	7.000	336.000
	B	12.000	0.000	15.000
	C	847.000	7.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.07	9.69	0.1	A
C-AB	0.01	5.60	0.0	A

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	20.33	454.73	0.045	20.14	0.0	8.280	A
C-AB	5.27	680.59	0.008	5.24	0.0	5.330	A
C-A	637.67			637.67			
A-B	5.27			5.27			
A-C	252.96			252.96			

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	24.27	432.78	0.056	24.22	0.1	8.810	A
C-AB	6.29	668.00	0.009	6.29	0.0	5.439	A
C-A	761.44			761.44			
A-B	6.29			6.29			
A-C	302.06			302.06			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	29.73	401.30	0.074	29.65	0.1	9.684	A
C-AB	7.71	650.60	0.012	7.70	0.0	5.599	A
C-A	932.56			932.56			
A-B	7.71			7.71			
A-C	369.94			369.94			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	29.73	401.30	0.074	29.73	0.1	9.688	A
C-AB	7.71	650.60	0.012	7.71	0.0	5.599	A
C-A	932.56			932.56			
A-B	7.71			7.71			
A-C	369.94			369.94			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	24.27	432.78	0.056	24.35	0.1	8.815	A
C-AB	6.29	668.00	0.009	6.30	0.0	5.442	A
C-A	761.44			761.44			
A-B	6.29			6.29			
A-C	302.06			302.06			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	20.33	454.72	0.045	20.38	0.0	8.289	A
C-AB	5.27	680.59	0.008	5.28	0.0	5.330	A
C-A	637.67			637.67			
A-B	5.27			5.27			
A-C	252.96			252.96			

Do-Something - 2035, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.52	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2035	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1118.00	100.000
B		✓	35.00	100.000
C		✓	422.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	23.000	1095.000
	B	19.000	0.000	16.000
	C	399.000	23.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.16	17.46	0.2	C
C-AB	0.06	8.76	0.1	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26.35	343.22	0.077	26.02	0.1	11.338	B
C-AB	17.32	534.07	0.032	17.18	0.0	6.963	A
C-A	300.39			300.39			
A-B	17.32			17.32			
A-C	824.37			824.37			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.46	302.50	0.104	31.34	0.1	13.271	B
C-AB	20.68	493.04	0.042	20.64	0.0	7.620	A
C-A	358.69			358.69			
A-B	20.68			20.68			
A-C	984.38			984.38			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	38.54	244.72	0.157	38.26	0.2	17.413	C
C-AB	25.32	436.32	0.058	25.25	0.1	8.757	A
C-A	439.31			439.31			
A-B	25.32			25.32			
A-C	1205.62			1205.62			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	38.54	244.70	0.157	38.53	0.2	17.459	C
C-AB	25.32	436.32	0.058	25.32	0.1	8.758	A
C-A	439.31			439.31			
A-B	25.32			25.32			
A-C	1205.62			1205.62			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.46	302.47	0.104	31.73	0.1	13.309	B
C-AB	20.68	493.04	0.042	20.75	0.0	7.622	A
C-A	358.69			358.69			
A-B	20.68			20.68			
A-C	984.38			984.38			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	26.35	343.18	0.077	26.48	0.1	11.374	B
C-AB	17.32	534.07	0.032	17.36	0.0	6.966	A
C-A	300.39			300.39			
A-B	17.32			17.32			
A-C	824.37			824.37			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Northern Site Access PICADY Analysis Do Something Rev A.j9
Path: G:\2017\p170024\calcs\picady\June 2019
Report generation date: 18/06/2019 16:15:44

»Do-Something - 2025, AM
»Do-Something - 2025, PM
»Do-Something - 2035, AM
»Do-Something - 2035, PM

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
Do-Something - 2025										
Stream B-AC	0.1	9.36	0.12	A	130 %	0.2	13.32	0.15	B	52 %
Stream C-AB	0.0	5.53	0.02	A	[Stream B-AC]	0.1	7.95	0.08	A	[Stream B-AC]
Do-Something - 2035										
Stream B-AC	0.1	9.71	0.12	A	113 %	0.2	14.75	0.16	B	40 %
Stream C-AB	0.0	5.60	0.02	A	[Stream B-AC]	0.1	8.43	0.09	A	[Stream B-AC]

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

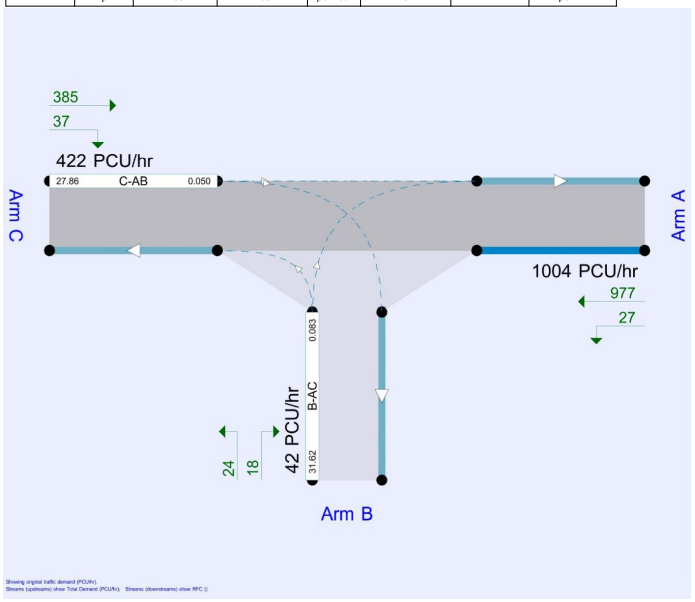
File summary

File Description

Title	Newcastle
Location	Northern Site Access
Site number	Junction 6
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE"mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2025	AM	ONE HOUR	07:15	08:45	15
2025	PM	ONE HOUR	16:45	18:15	15
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	488.282	0.077	0.195	0.123	0.279
1	B-C	633.380	0.084	0.213	-	-
1	C-B	745.436	0.251	0.251	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D1	2025	AM	ONEHOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	304.00	100.000
B		✓	46.00	100.000
C		✓	685.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	7.000	297.000
	B	19.000	0.000	27.000
	C	675.000	10.000	0.000

Vehicle Mix

Generated on 18/06/2019 16:18:46 using Junctions 9 (9.0.0.4211)

Do-Something - 2025, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.47	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	130	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	R120 (E)		Major
B	Subject Site		Minor
C	R120 (W)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	9.00		✓	3.00	193.0	✓	6.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	10	15

Generated on 18/06/2019 16:18:46 using Junctions 9 (9.0.0.4211)

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.12	9.36	0.1	A
C-AB	0.02	5.53	0.0	A

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	34.63	478.22	0.072	34.32	0.1	8.104	A
C-AB	7.53	687.96	0.011	7.48	0.0	5.290	A
C-A	508.18			508.18			
A-B	5.27			5.27			
A-C	223.60			223.60			

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	41.35	460.52	0.090	41.27	0.1	8.583	A
C-AB	8.99	676.81	0.013	8.98	0.0	5.390	A
C-A	606.81			606.81			
A-B	6.29			6.29			
A-C	267.00			267.00			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.65	435.36	0.116	50.52	0.1	9.351	A
C-AB	11.01	661.38	0.017	11.00	0.0	5.534	A
C-A	743.19			743.19			
A-B	7.71			7.71			
A-C	327.00			327.00			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.65	435.36	0.116	50.64	0.1	9.357	A
C-AB	11.01	661.38	0.017	11.01	0.0	5.534	A
C-A	743.19			743.19			
A-B	7.71			7.71			
A-C	327.00			327.00			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	41.35	460.51	0.090	41.48	0.1	8.595	A
C-AB	8.99	676.81	0.013	9.00	0.0	5.390	A
C-A	606.81			606.81			
A-B	6.29			6.29			
A-C	267.00			267.00			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	34.63	478.21	0.072	34.71	0.1	8.118	A
C-AB	7.53	687.96	0.011	7.54	0.0	5.292	A
C-A	508.18			508.18			
A-B	5.27			5.27			
A-C	223.60			223.60			

Do-Something - 2025, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.64	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D2	2025	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	911.00	100.000
B		✓	42.00	100.000
C		✓	388.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	0.000	27.000	884.000
B	18.000	0.000	24.000
C	351.000	37.000	0.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.15	13.32	0.2	B
C-AB	0.08	7.95	0.1	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.62	396.56	0.080	31.28	0.1	9.846	A
C-AB	27.86	573.20	0.049	27.65	0.1	6.597	A
C-A	264.25			264.25			
A-B	20.33			20.33			
A-C	665.52			665.52			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	37.76	363.34	0.104	37.64	0.1	11.049	B
C-AB	33.26	539.77	0.062	33.20	0.1	7.106	A
C-A	315.54			315.54			
A-B	24.27			24.27			
A-C	794.70			794.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	46.24	316.43	0.146	46.03	0.2	13.302	B
C-AB	40.74	493.55	0.083	40.64	0.1	7.946	A
C-A	386.46			386.46			
A-B	29.73			29.73			
A-C	973.30			973.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	46.24	316.41	0.146	46.24	0.2	13.324	B
C-AB	40.74	493.55	0.083	40.74	0.1	7.950	A
C-A	386.46			386.46			
A-B	29.73			29.73			
A-C	973.30			973.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	37.76	363.31	0.104	37.97	0.1	11.071	B
C-AB	33.26	539.77	0.062	33.36	0.1	7.109	A
C-A	315.54			315.54			
A-B	24.27			24.27			
A-C	794.70			794.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.62	396.51	0.080	31.74	0.1	9.872	A
C-AB	27.86	573.20	0.049	27.91	0.1	6.604	A
C-A	264.25			264.25			
A-B	20.33			20.33			
A-C	665.52			665.52			

Do-Something - 2035, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.44	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	333.00	100.000
B		✓	46.00	100.000
C		✓	755.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	7.000	326.000
	B	19.000	0.000	27.000
	C	745.000	10.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.12	9.71	0.1	A
C-AB	0.02	5.60	0.0	A

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	34.63	469.29	0.074	34.32	0.1	8.270	A
C-AB	7.53	682.48	0.011	7.48	0.0	5.333	A
C-A	560.88			560.88			
A-B	5.27			5.27			
A-C	245.43			245.43			

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	41.35	449.60	0.092	41.27	0.1	8.814	A
C-AB	8.99	670.26	0.013	8.98	0.0	5.443	A
C-A	669.74			669.74			
A-B	6.29			6.29			
A-C	293.07			293.07			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.65	421.48	0.120	50.51	0.1	9.704	A
C-AB	11.01	653.36	0.017	11.00	0.0	5.603	A
C-A	820.26			820.26			
A-B	7.71			7.71			
A-C	358.93			358.93			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	50.65	421.48	0.120	50.64	0.1	9.707	A
C-AB	11.01	653.36	0.017	11.01	0.0	5.603	A
C-A	820.26			820.26			
A-B	7.71			7.71			
A-C	358.93			358.93			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	41.35	449.60	0.092	41.49	0.1	8.825	A
C-AB	8.99	670.26	0.013	9.00	0.0	5.443	A
C-A	669.74			669.74			
A-B	6.29			6.29			
A-C	293.07			293.07			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	34.63	469.28	0.074	34.72	0.1	8.287	A
C-AB	7.53	682.48	0.011	7.54	0.0	5.333	A
C-A	560.88			560.88			
A-B	5.27			5.27			
A-C	245.43			245.43			

Do-Something - 2035, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Do-Something	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.63	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2035	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1004.00	100.000
B		✓	42.00	100.000
C		✓	422.00	100.000

Origin-Destination Data

Demand (PCU/hr)

From \ To	A	B	C
A	0.000	27.000	977.000
B	18.000	0.000	24.000
C	385.000	37.000	0.000

Vehicle Mix

Heavy Vehicle proportion

From \ To	A	B	C
A	0	0	0
B	0	0	0
C	0	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.16	14.75	0.2	B
C-AB	0.09	8.43	0.1	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.62	379.57	0.083	31.26	0.1	10.325	B
C-AB	27.86	555.62	0.050	27.65	0.1	6.813	A
C-A	289.85			289.85			
A-B	20.33			20.33			
A-C	735.54			735.54			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	37.76	342.72	0.110	37.63	0.1	11.794	B
C-AB	33.26	518.78	0.064	33.20	0.1	7.413	A
C-A	346.11			346.11			
A-B	24.27			24.27			
A-C	878.30			878.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	46.24	290.38	0.159	45.99	0.2	14.716	B
C-AB	40.74	467.84	0.087	40.63	0.1	8.425	A
C-A	423.89			423.89			
A-B	29.73			29.73			
A-C	1075.70			1075.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	46.24	290.35	0.159	46.24	0.2	14.746	B
C-AB	40.74	467.84	0.087	40.74	0.1	8.428	A
C-A	423.89			423.89			
A-B	29.73			29.73			
A-C	1075.70			1075.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	37.76	342.69	0.110	38.01	0.1	11.824	B
C-AB	33.26	518.78	0.064	33.37	0.1	7.417	A
C-A	346.11			346.11			
A-B	24.27			24.27			
A-C	878.30			878.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	31.62	379.52	0.083	31.75	0.1	10.357	B
C-AB	27.86	555.62	0.050	27.92	0.1	6.822	A
C-A	289.85			289.85			
A-B	20.33			20.33			
A-C	735.54			735.54			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Northern Site Access PICADY Sensitivity Analysis Rev A.j9
Path: G:\2017\p170024\calcs\picady\June 2019
Report generation date: 18/06/2019 16:21:21

Summary of junction performance

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	LOS	Network Residual Capacity
	Sensitivity Analysis - 2035									
Stream B-AC	0.3	11.35	0.25	B	76 % [Stream B-AC]	0.4	18.30	0.30	C	23 % [Stream B-AC]
Stream C-AB	0.0	5.72	0.03	A		0.2	9.45	0.17	A	

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

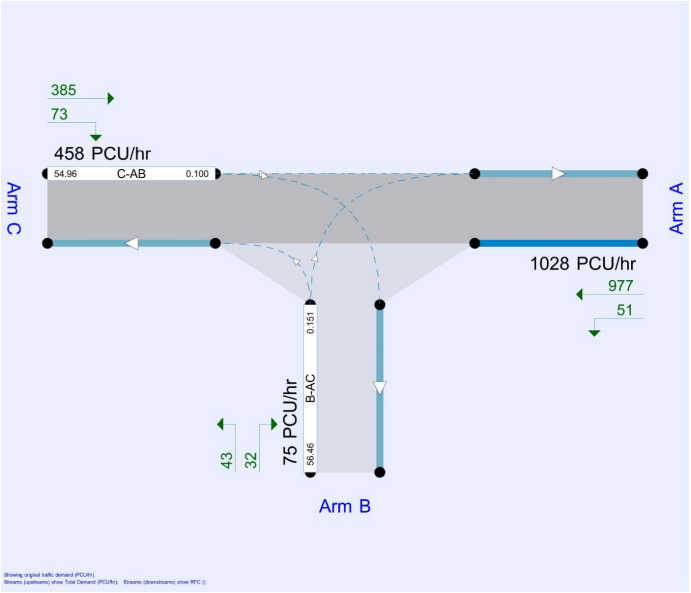
File summary

File Description

Title	Newcastle
Location	Northern Site Access
Site number	Junction 6
Date	05/11/2018
Version	
Status	Pre Planning
Identifier	
Client	Cairn
Jobnumber	170024
Enumerator	HEADOFFICE\mckennam
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



The junction diagram reflects the last run of Junctions.

Analysis Options

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

Demand Set Summary

Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
2035	AM	ONE HOUR	07:15	08:45	15
2035	PM	ONE HOUR	16:45	18:15	15

Sensitivity Analysis - 2035, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Sensitivity Analysis	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.99	A

Junction Network Options

Driving side	Lighting	Network residual capacity (%)	First arm reaching threshold
Left	Normal/unknown	76	Stream B-AC

Arms

Arms

Arm	Name	Description	Arm type
A	R120 (E)		Major
B	Subject Site		Minor
C	R120 (W)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	9.00		✓	3.00	193.0	✓	6.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	10	15

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	488.282	0.077	0.195	0.123	0.279
1	B-C	633.380	0.084	0.213	-	-
1	C-B	745.436	0.251	0.251	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D3	2035	AM	ONE HOUR	07:15	08:45	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	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	340.00	100.000
B		✓	95.00	100.000
C		✓	765.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	14.000	326.000
	B	38.000	0.000	57.000
	C	745.000	20.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.25	11.35	0.3	B
C-AB	0.03	5.72	0.0	A

Main Results for each time segment

Main results: (07:15-07:30)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	71.52	470.33	0.152	70.81	0.2	8.997	A
C-AB	15.06	681.16	0.022	14.97	0.0	5.404	A
C-A	560.88			560.88			
A-B	10.54			10.54			
A-C	245.43			245.43			

Main results: (07:30-07:45)

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	85.40	450.36	0.190	85.19	0.2	9.852	A
C-AB	17.98	668.68	0.027	17.96	0.0	5.531	A
C-A	669.74			669.74			
A-B	12.59			12.59			
A-C	293.07			293.07			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	104.60	421.78	0.248	104.22	0.3	11.322	B
C-AB	22.02	651.43	0.034	21.99	0.0	5.719	A
C-A	820.26			820.26			
A-B	15.41			15.41			
A-C	358.93			358.93			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	104.60	421.78	0.248	104.59	0.3	11.349	B
C-AB	22.02	651.43	0.034	22.02	0.0	5.719	A
C-A	820.26			820.26			
A-B	15.41			15.41			
A-C	358.93			358.93			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	85.40	450.35	0.190	85.76	0.2	9.885	A
C-AB	17.98	668.68	0.027	18.01	0.0	5.532	A
C-A	669.74			669.74			
A-B	12.59			12.59			
A-C	293.07			293.07			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	71.52	470.30	0.152	71.74	0.2	9.037	A
C-AB	15.06	681.16	0.022	15.08	0.0	5.404	A
C-A	560.88			560.88			
A-B	10.54			10.54			
A-C	245.43			245.43			

Sensitivity Analysis - 2035, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Sensitivity Analysis	100.000

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	1.32	A

Junction Network Options

[same as above]

Arms

Arms

[same as above]

Major Arm Geometry

[same as above]

Minor Arm Geometry

[same as above]

Slope / Intercept / Capacity

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Model start time (HH:mm)	Model finish time (HH:mm)	Time segment length (min)
D4	2035	PM	ONE HOUR	16:45	18:15	15

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

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1028.00	100.000
B		✓	75.00	100.000
C		✓	458.00	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0.000	51.000	977.000
	B	32.000	0.000	43.000
	C	385.000	73.000	0.000

Vehicle Mix

Heavy Vehicle proportion

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

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.30	18.30	0.4	C
C-AB	0.17	9.45	0.2	A

Main Results for each time segment

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	56.46	373.13	0.151	55.76	0.2	11.318	B
C-AB	54.96	551.08	0.100	54.52	0.1	7.243	A
C-A	289.85			289.85			
A-B	38.40			38.40			
A-C	735.54			735.54			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	67.42	334.50	0.202	67.13	0.2	13.449	B
C-AB	65.63	513.36	0.128	65.48	0.1	8.035	A
C-A	346.11			346.11			
A-B	45.85			45.85			
A-C	878.30			878.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	82.58	279.26	0.296	81.93	0.4	18.183	C
C-AB	80.38	461.21	0.174	80.12	0.2	9.441	A
C-A	423.89			423.89			
A-B	56.15			56.15			
A-C	1075.70			1075.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	82.58	279.20	0.296	82.55	0.4	18.301	C
C-AB	80.38	461.21	0.174	80.37	0.2	9.452	A
C-A	423.89			423.89			
A-B	56.15			56.15			
A-C	1075.70			1075.70			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	67.42	334.42	0.202	68.05	0.3	13.545	B
C-AB	65.63	513.36	0.128	65.87	0.1	8.050	A
C-A	346.11			346.11			
A-B	45.85			45.85			
A-C	878.30			878.30			

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

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	LOS
B-AC	56.46	373.01	0.151	56.77	0.2	11.394	B
C-AB	54.96	551.08	0.100	55.10	0.1	7.259	A
C-A	289.85			289.85			
A-B	38.40			38.40			
A-C	735.54			735.54			