Project

Mixed Use Development,
1-4 East Road, East Road, Dublin

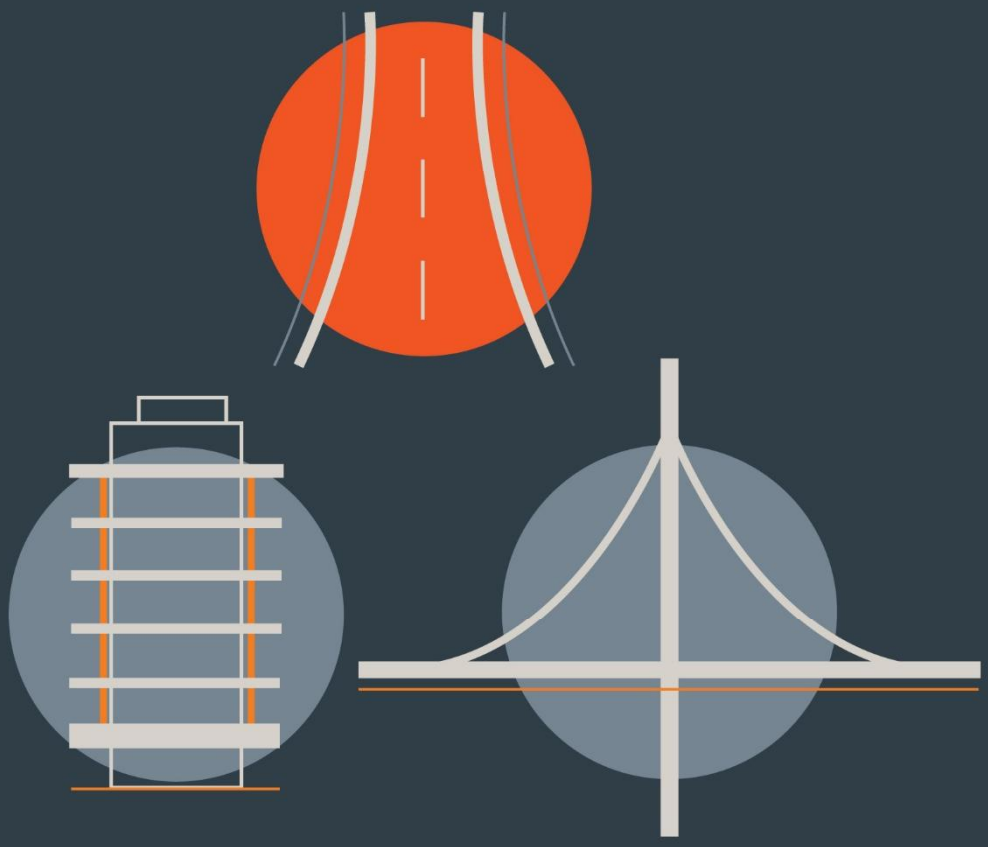
Report Title

# TRAFFIC AND TRANSPORT ASSESSMENT REPORT

Client

Glenveagh

TRANSPORTATION



DBFL CONSULTING ENGINEERS

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# CONTENTS

# APPENDICES

# 1.0 INTRODUCTION

## 1.1 BACKGROUND

1.1.1 DBFL Consulting Engineers (DBFL) have been commissioned to prepare a Traffic and Transport Assessment (TTA) for a proposed mixed-use development on a site at 1-4 East Road, as located on the eastern edge of Dublin City Centre. The subject site is currently occupied by Hireco Park (trailer hire company), with vehicular access provided directly from East Road.

1.1.2 The development proposals include the construction of a mixed-use development set out in 9 no. blocks, ranging in height from 3 to 15 storeys to accommodate 554 no. apartments, enterprise space, retail units, foodhub/café/exhibition space, residential amenity, crèche and men's shed. The site will accommodate car parking spaces, bicycle parking, storage, services and plant areas. Landscaping will include a new central public space and residential podium courtyards.

1.1.3 The report has been produced to address potential concerns that the local planning authority and/or An Bord Pleanála may have pertaining to the level of influence 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 mixed-use 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.

## 1.3 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); and
- *'Guidelines for Traffic Impact Assessments'* The Institution of Highways and Transportation.

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

- 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: Traffic counts were undertaken and analysed with the objective of establishing local traffic characteristics in the immediate area of the proposed development.
- Trip Generation: A trip generation exercise has been carried out to establish the potential level of vehicle trips generated by the proposed mixed use development.
- Trip Distribution: Based upon both the existing traffic characteristics and the network layout in addition to the spatial/land use configuration and density of the urban structure across the catchment area of the development, a distribution exercise has been undertaken to assign site generated vehicle trips across the local road network.

- Network Impact: in accordance with the Institute of Highways and Transportation; Traffic Impact Assessment guidelines, the specific level of influence generated by the proposed mixed-use development upon the local road network was ascertained and the junctions which required assessment in greater detail were identified.
- Network Assessment: Drawing upon the findings of the previous stages, an operational assessment of the local road network has been undertaken to evaluate the performance of key junctions following the implementation and occupation of the proposed development.

## 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 Two of this report describes the existing conditions at the proposed development location and surrounding area.

1.4.3 The relevant transportation policies that influence the design and appraisal of the subject development proposals are highlighted within Chapter Three.

1.4.4 Chapter Four provides a summary of the proposed development itself.

1.4.5 In Chapter Five a summary of the vehicle trip generation, vehicle distribution, and network assignment exercise is detailed, in addition to quantifying the potential level of impact, as generated by the subject proposals, upon key junctions across the local road network.

1.4.6 The operational performance of the proposed site access junction for a range of different development/traffic scenarios following the commissioning of the proposed development are investigated and reported within Chapter Six.

1.4.7 Finally, a summary of our appraisal together with the main conclusions of the assessment are provided in Chapter Seven.

# 2.0 RECEIVING ENVIRONMENT

## 2.1 LAND USE

2.1.1 The subject brownfield site is currently occupied by Hireco Park (trailer hire company), with vehicular access currently provided from East Road. The subject lands are situated to the southeast of the East Road corridor, as located on the eastern edge of Dublin City Centre. The development site is bounded to the northeast by MacNaughton's Twisteel Reinforcement Ltd and residential apartments. The western boundary is formed by East Road, whilst Merchants Square residential settlement forms the eastern boundary. The rail connection to Dublin Port forms the southern boundary of the subject site.

2.1.2 The land uses surrounding the development site are a mix of commercial and residential (comprising both individual dwellings and larger residential apartment blocks), all of which benefit from direct access to/from East Road.

2.1.3 The subject development lands are zoned Z14 *'To seek social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and "Z6" would be the predominant uses'.*

*'Land Use Zoning Objective Z6: To provide for the creation and protection of enterprise and facilitate opportunities for employment creation.'*

2.1.4 The subject development lands (Figure 2.1) are also located immediately to the north of the Docklands Strategic Development Zone (SDZ) and lie within the Dublin Docklands Development Authority (DDDA) boundary.

2.1.5 The designation of the Docklands, including the Docklands SDZ, as a strategic development and regeneration area (SDRA) provides for the continued physical and social regeneration of this part of the city, consolidating the area as a vibrant economic, cultural and amenity quarter of the city, whilst also nurturing sustainable neighbourhoods and communities.

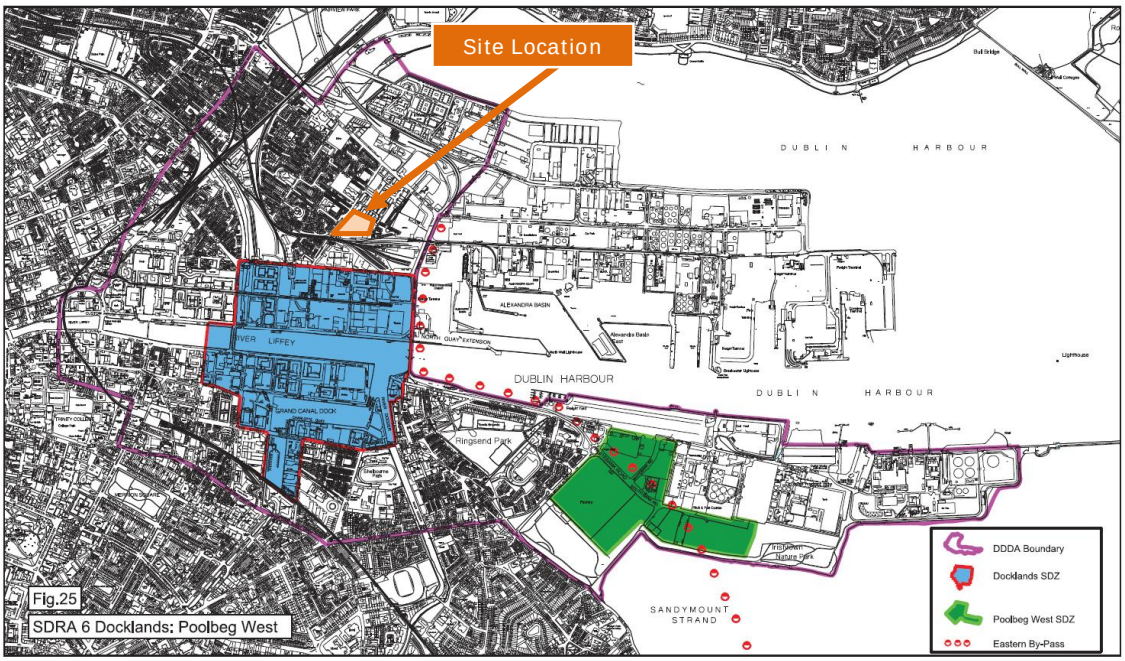



Figure 2.1: SDRA 6 Docklands (extract Map E DCC Development Plan)

## 2.2 LOCATION

2.2.1 The general location of the subject site in relation to the surrounding road network is illustrated in Figure 2.2 below whilst Figure 2.3 indicatively shows the extent of the subject site boundary and neighbouring lands.

2.2.2 The East Road development site is located in the East Wall district which forms the eastern edge of Dublin City Centre. Travelling north along East Road the route terminates at a signalised junction with East Wall Road. East Wall Road provides a direct connection to the strategic M50 Motorway via the Dublin Port Tunnel. To the west, East Wall Road provides access to Fairview and Drumcondra (via Clonliffe Road, in addition to Clontarf via Alfie Byrne Road.

2.2.3 Travelling southbound from the subject site along East Road, the route terminates at a signalised junction with Sheriff St Upper. From Sherriff St Upper there are various road links available to gain access to the North Quays and Dublin City Centre.

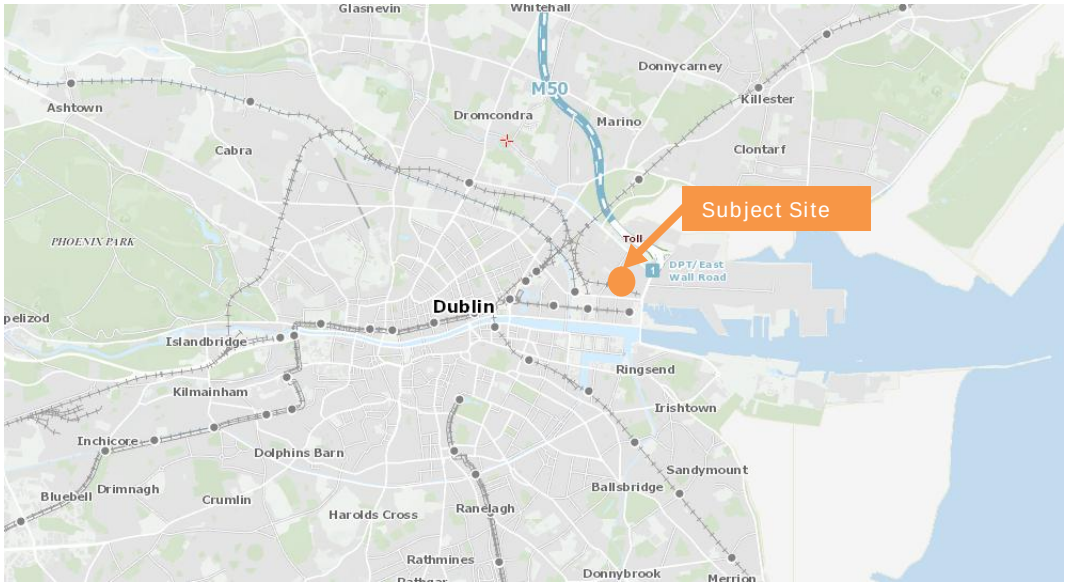



Figure 2.2: Subject Site Location (Reference: http://maps.osi.ie)

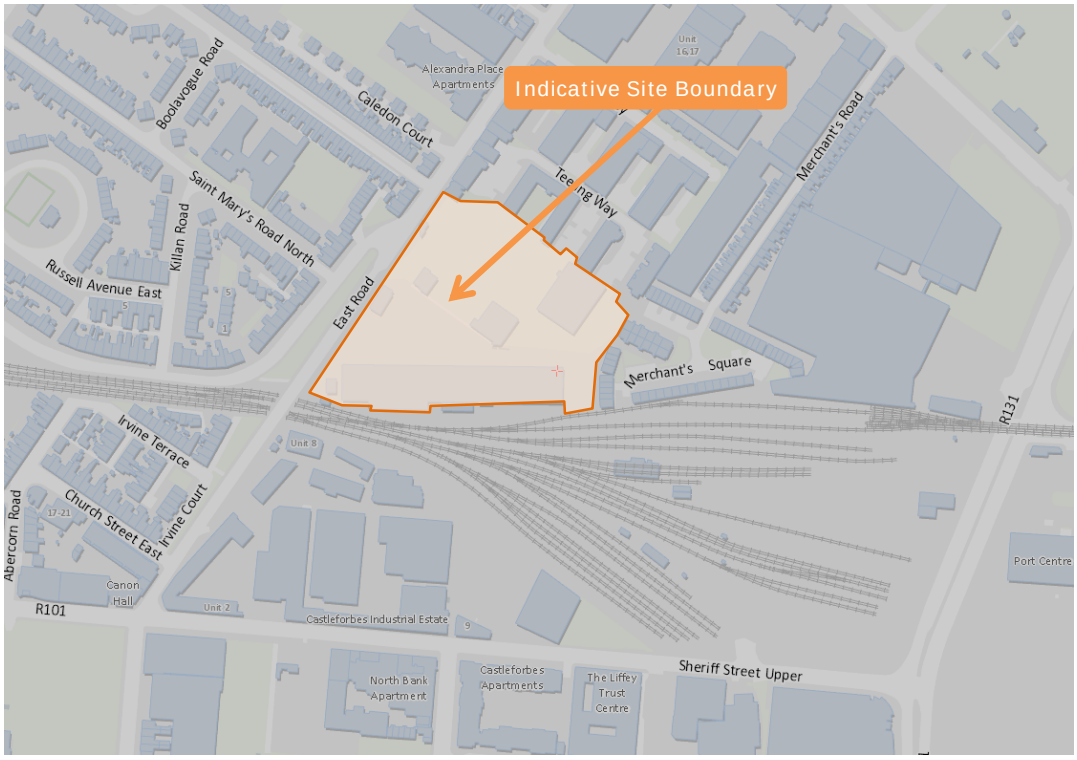



Figure 2.3: Subject Site Indicative Boundary (Reference: http://maps.osi.ie)

## 2.3 EXISTING TRANSPORTATION INFRASTRUCTURE

### *Background*

2.3.1 An important stage in the development of a Traffic and Transport Assessment is the identification and appreciation of the local network's existing transport conditions and vehicle movement characteristics.

2.3.2 An audit of the local road network has therefore been undertaken to establish the existing transport conditions and vehicle movement patterns across the existing network.

### *Existing Pedestrian Environment*

2.3.3 All pedestrian routes leading to/from the subject site benefit from the provision of street lighting in addition to good quality pedestrian footways. There are controlled pedestrian crossing facilities available adjacent to the subject site at the East Rd/Church Rd junction and to the south at the East Rd/Sheriff St Upper junction.

### *Existing Cycling Environment*

2.3.4 In the immediate vicinity of the subject site cyclists must share the road carriageway with general vehicular traffic, nonetheless cyclists traveling to/from the subject site from the surrounding area can benefit from the provision of a variety of cycle facilities (cycle lanes/tracks) along Seville Place (750m to the west), Guild Street (700m to the southwest), North Strand Rd (1.4km to the northwest) and the Quays (600m to the south). The NTA's Cycle Network Plan for the Greater Dublin Area includes proposals for the provision of a secondary cycle route along East Road adjacent to the subject (Figure 2.4).

2.3.5 There are also a number of dublinbikes stations (Figure 2.5) located surrounding the subject site area on North Wall Quay, Custom House Quay and City Quay. The bike station on North Wall Quay is accessible within approximately 650m walking distance of the subject site.


Figure 2.4: Existing Cycle Facilities (source: Sheet E1 GDA Cycle Network Plan)

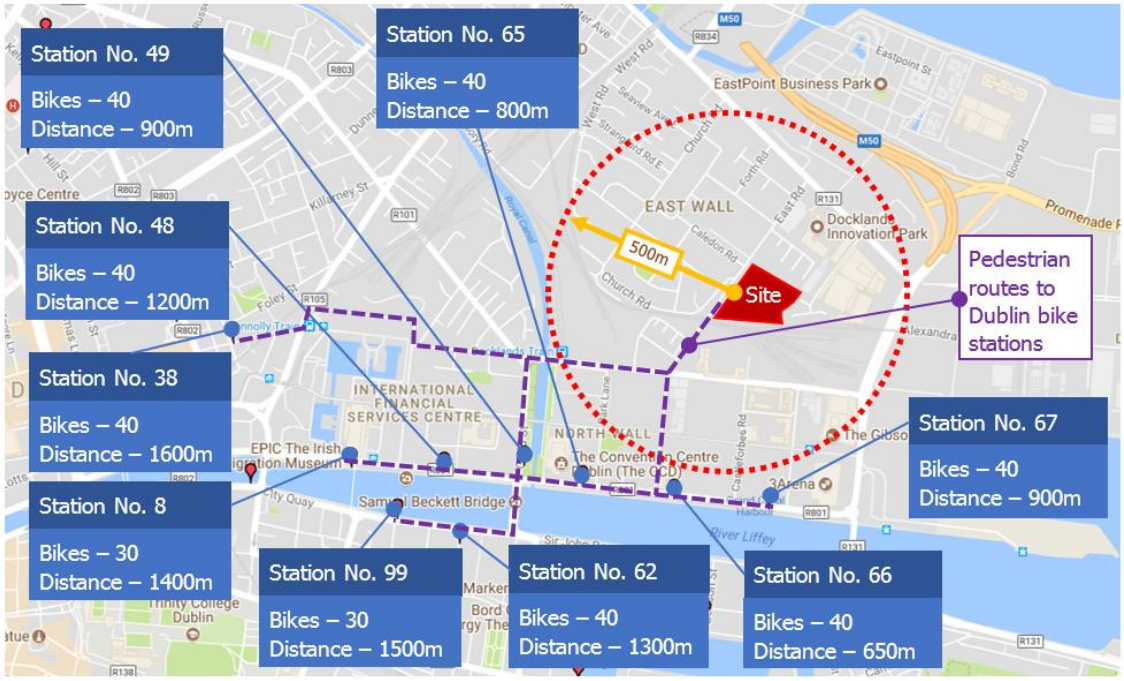



Figure 2.5: Dublinbikes Stations

### *Public Transport*

2.3.6 As graphically illustrated in Figure 2.6 below the site is ideally situated to benefit from a comprehensive range of transport connections which result in the site benefiting from excellent accessibility levels for all modes of travel. Furthermore the range and proximity of a number of existing (and emerging) public transport interchanges further enhances the sustainability characteristics of the site. These include both the Docklands Rail Station and the LUAS Red Line (Spencer Dock interchange) being only 550m and 650m, respectively, from the proposed development. In addition, Connolly Station and the proposed Clongriffin-Tallaght BRT interchange are within 1.4km from the site, whilst the proposed interchange for the Dart Underground is located at the Docklands Rail Station, approximately 550m from the subject site.

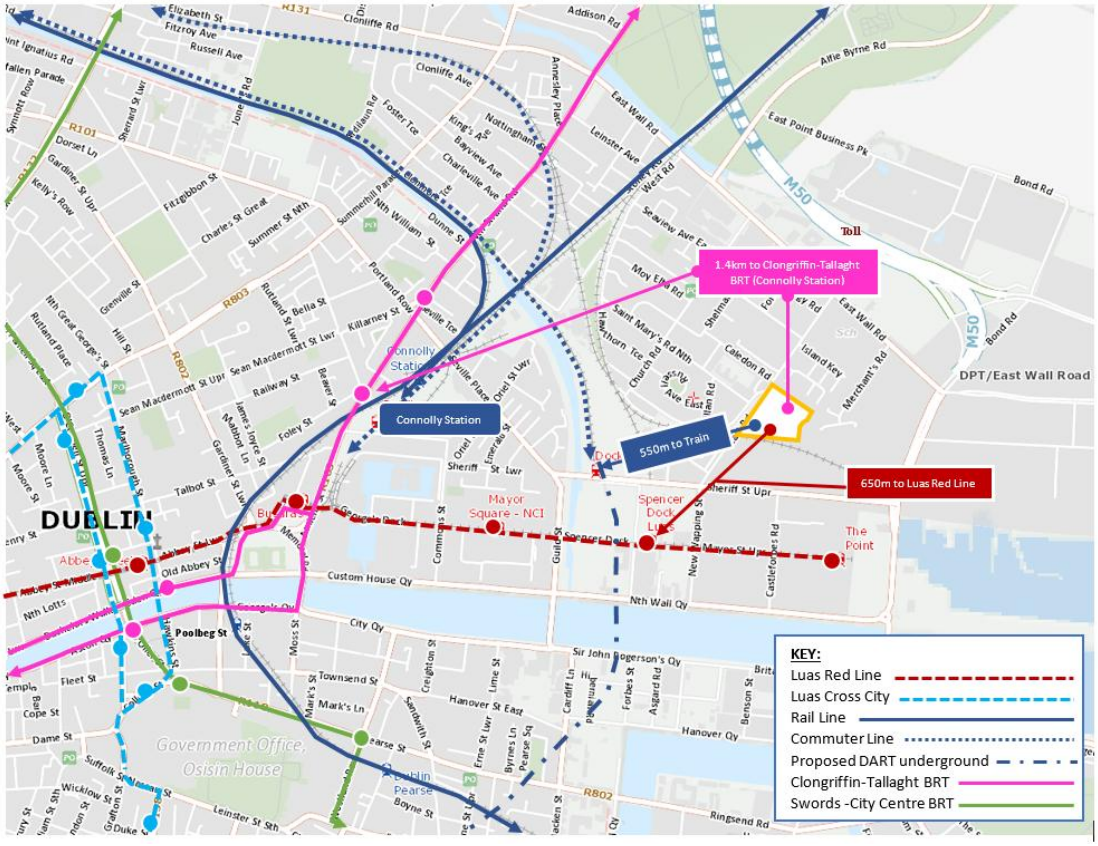



Figure 2.6: Existing & Proposed Public Transport Rail and BRT Connections

### *Public Transport – Bus*

2.3.7 Dublin Bus operates route numbers 53 and 151 along the East Road corridor, travelling in both directions providing links between Dublin City Centre and Dublin Ferry port and also Foxborough and the Docklands. Routes 33b, 33x, 41x, 142 and 151, in addition to Airlink bus routes 747 and 757 operate along East Wall Road (to the north of the subject site) providing links to/from a range of additional destinations including Dublin City centre and Dublin Airport.

2.3.8 Route numbers 53 and 151 are highly accessible with the closest interchange opportunities within 85m of the subject site access whilst route numbers 33b, 33x, 41x, 142, 747 and 757 are accessible within 450m of the subject site access as detailed in Figure 2.7 below.

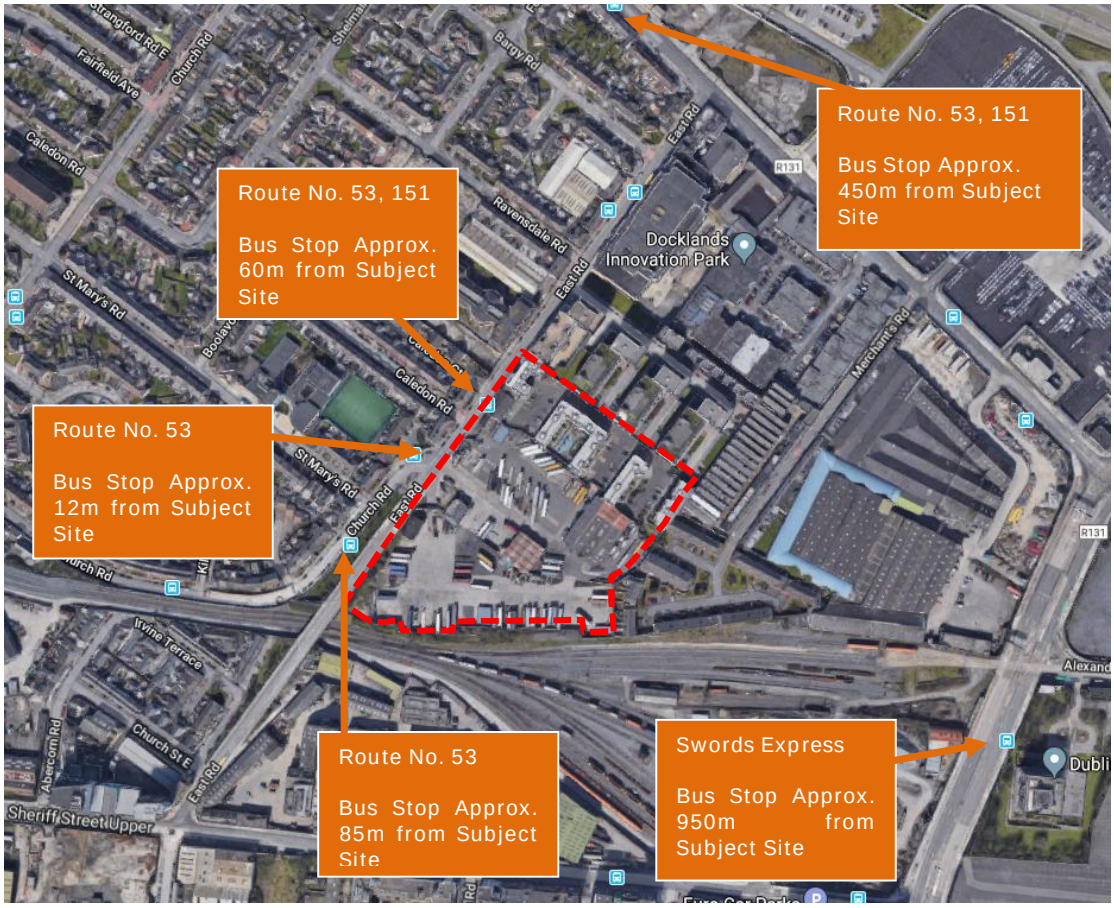



Figure 2.7: Bus Interchange Locations

2.3.9 The Swords Express, which operates daily services, is also accessible along the East Wall Road approximately 950m southeast of the subject site.

2.3.10 These Dublin Bus operated bus services operate on a daily basis and offer relatively frequent schedules as summarised in Table 2.1 below. Detailed route maps for each of the bus services and the various destinations that they serve along their routes are shown on the figures contained within Appendix A.

| Route No. | Route | Mon – Fri | Sat | Sun |
|---|---|---|---|---|
| 53 | Talbot St – Dublin Ferryport | 13 | 13 | 7 |
| 151 | Docklands (East Rd) – Foxborough (Balgaddy Rd) | 48 | 46 | 31 |
| 33b | Swords – Portrane | 24 | 22 | 18 |
| 33x | Custom House Quay/ St. Stephen's Green – Skerries | 5* | no service | no service |
| 41x | UCD Belfield – Knocksedan | 3* | no service | no service |
| | Knocksedan – UCD Belfield | 6* | no service | no service |
| 142 | Portmarnock – UCD Belfield | 11 | no service | no service |
| 747 | Heuston Station – Dublin Airport | 43 | 43 | 60 |
| 757 | Camden St (Charlotte Way) – Dublin Airport | 38 | 38 | 35 |

**excluding Bank Holidays*

Table 2.1: Dublin Bus Service Frequency – no. of services (Source www.dublinbus.ie)

### *Public Transport - Heavy Rail Network*

2.3.11 The Docklands Train Station is located approximately 550m (8-minute walk) walking distance to the south west of the subject site. This interchange provides access to DART and regional Commuter rail services. Furthermore, Connolly Station is only 1400m to the west where additional DART and regional commuter services are available in addition to intercity services. Whilst Heuston Station is accessible via s LUAS connection.

### *Public Transport – LUAS*

2.3.12 The Red Line Luas is also accessible with the 'Spencer Dock' interchange located approximately 650m (8-minute walk) walking distance to the south of the subject site. The LUAS Red Line currently provides access to Busaras, Connolly Station, Dublin City Centre, Hueston Railway Station, Tallaght and Saggart in addition to other intermediate destinations along its route.

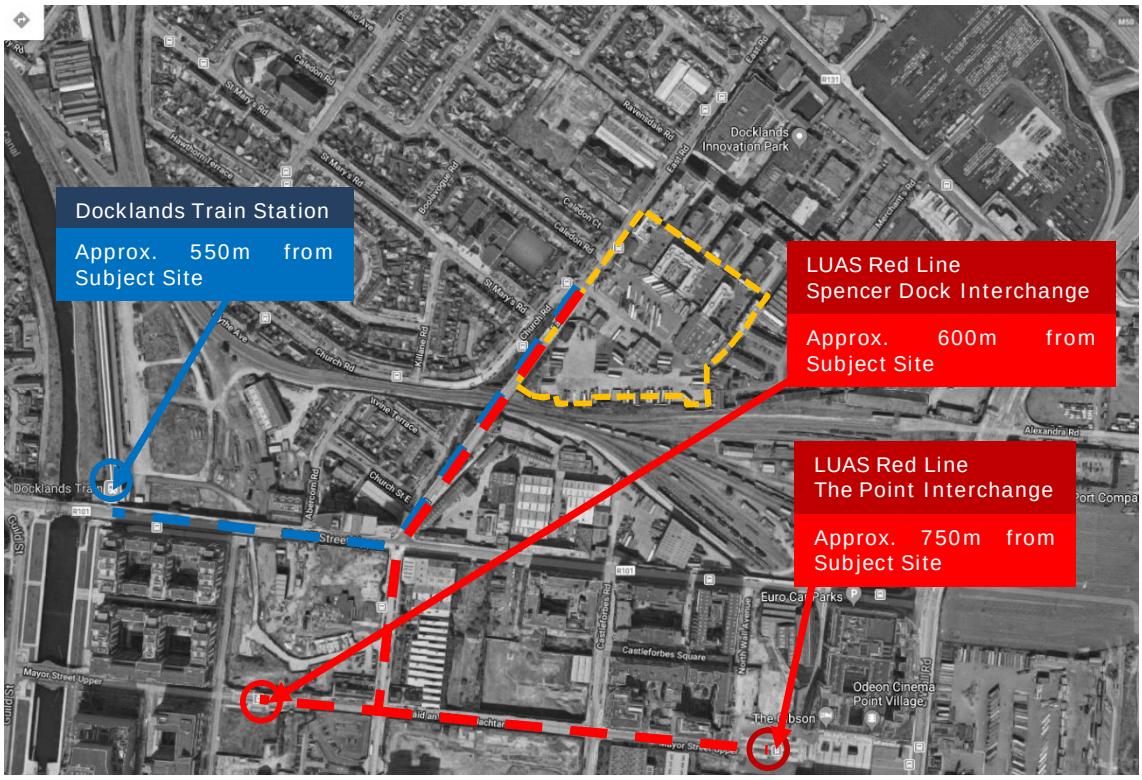



Figure 2.8: Train Station and LUAS Interchange Locations

## 2.4 EMERGING TRANSPORT DEVELOPMENTS

### *Cycle Network Proposals*

2.4.1 The subject site is located within the *'Dublin City Centre Sector'* within the Greater Dublin Area Cycle Network Plan (2013). According to the GDA Plan '*The Dublin City Centre Sector is defined by the Royal Canal and Grand Canal ring on the northern, eastern and southern side. The western boundary is taken as about 0.5km west of a north-south line between Phibsborough and Harold's Cross, and includes areas such as Pimlico, Thomas Street, Manor Street and Grangegorman. This area includes the commercial heart of the city where most employment is concentrated. It excludes the mostly residential areas within the canal ring further west, as these are in effect inner suburbs that do not attract significant numbers of non-local inward trips. On the other hand, the recently redeveloped Docklands area spreads a little way east of the canal ring and has been included in the City Centre sector as it contains significant employment'*.

2.4.2 In the vicinity of the subject site the following route additions are proposed (Figure 2.9):-

- Secondary Route 1E (adjacent to the site) - *branches off Route 1A at Clontarf Road and provides an alternative link to the Docklands area via East Wall;*
- *Primary Route 5:* Docklands to the North West Sector along the Liffey Quays to Heuston Station, and then through the Phoenix Park to Castleknock and Blanchardstown;
- *Royal Canal Greenway from Sheriff Street in the Docklands to Drumcondra Road past Croke Park stadium (partly in place west of North Strand)*
- Primary Route NO1: *North Circular Route at the outer edge of the city centre, from Route 1 at Five Lamps westwards to Phibsborough and eastwards to the Docklands; and*
- Secondary Route C8: - *North Circular Road East: From Royal Canal Bank at Phibsborough eastward to Docklands.*


Figure 2.9: Proposed Cycle Network Enhancements (extract Sheet N1a GDA CNP)

## *Public Transport Proposals*

2.4.3 Map J of the Dublin City Development Plan 2016-2022 presents both the existing and proposed public transport routes in the region. An extract of this map

illustrating the existing and proposed routes in the vicinity of the subject development site is presented in Figure 2.10 below.

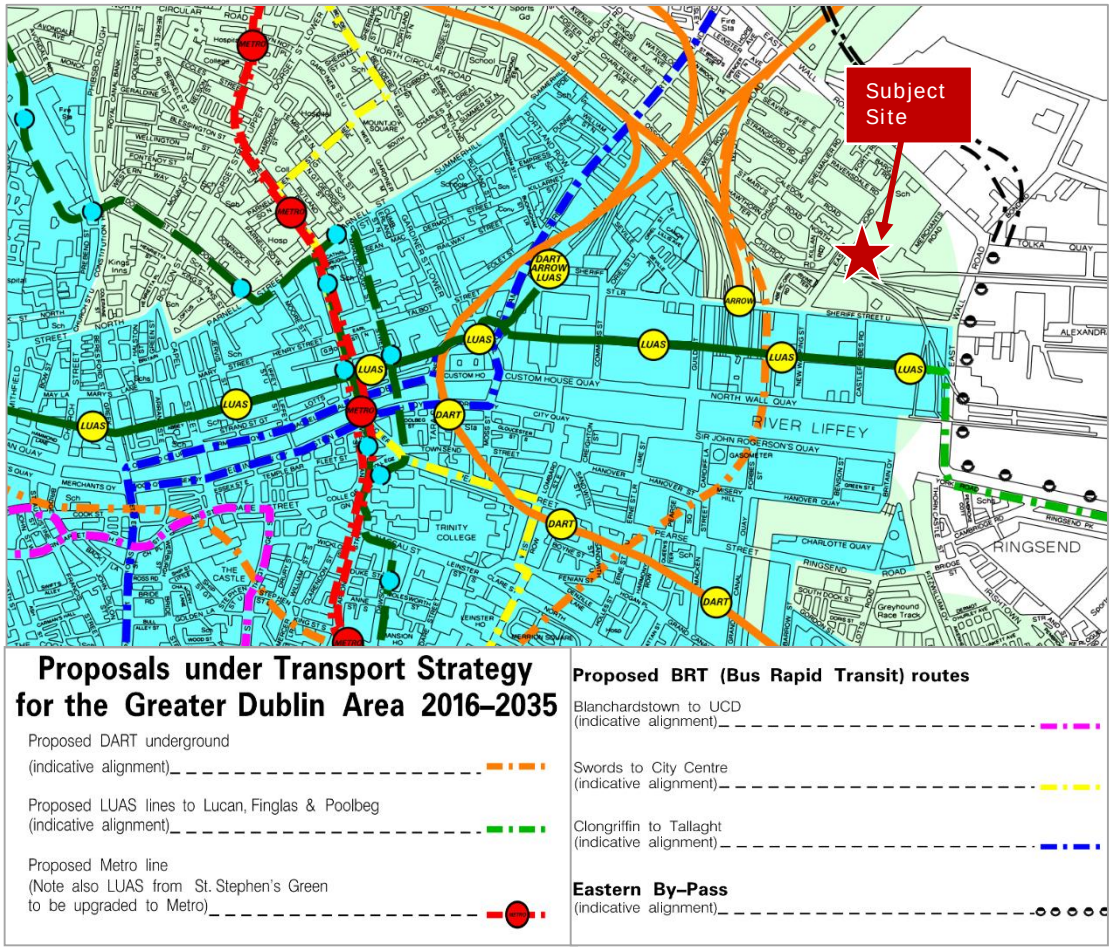



Figure 2.10: DCC Existing & Proposed Public Transport Routes in the Vicinity of the Subject Site

### *Bus Route Proposals*

2.4.4 The Transport Strategy for the Greater Dublin Area (2016-2035) introduces the following three potential Bus Rapid Transit (BRT) routes:-

- Airport/Swords – City Centre (subject to amendments in parallel with new Metro North scheme proposals),
- Clongriffin – Tallaght, and
- Blanchardstown – UCD.

2.4.5 Figure 2.11 below presents the proposed routes for these three BRT schemes. The proposed Clongriffin – Tallaght BRT will, when operational, be easily accessible from the subject site with the nearest proposed stop located within walking distance to the east at Connolly Station.

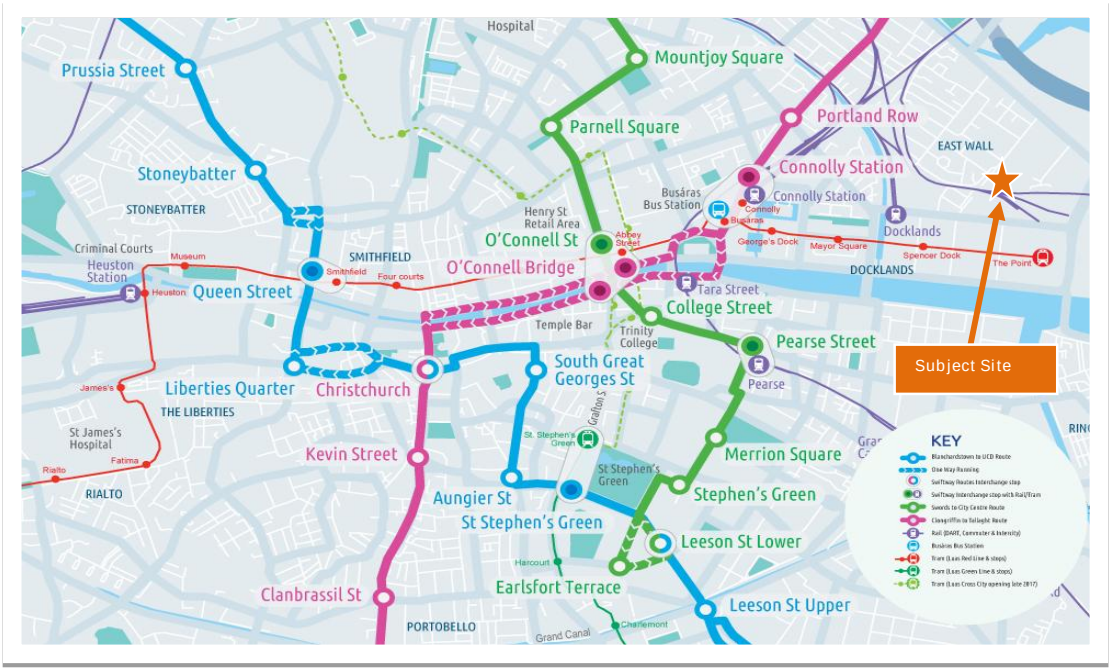



Figure 2.11: Proposed Bus Rapid Transit Schemes

### *BusConnects*

2.4.6 The National Transport Authority (NTA) has recently published a consultation report entitled 'Dublin Area Bus Network Redesign Public Consultation Report'. The report introduces a number of significant changes to the bus services within Dublin including: -

- *"Services to be arranged along seven cross-city super-frequent spines*
- *Dramatic increase in the numbers of orbital services*
- *Increase in the number of all-day high-frequency services*
- *Move to a simplified two-fare system*
- *A new route numbering system".*

*"Under the proposals, the level of bus service will increase by 27%. This includes services on 11 brand-new orbital routes that will operate on a 15-minute frequency or better, in the north, south and west of the network area."*

2.4.7 The public consultation for BusConnects ran from July to September 28th, 2018. Figure 2.12 & 2.13 below indicate the existing and the proposed bus service midday frequencies in the vicinity of the subject site, prior to and after the BusConnects network redesign.

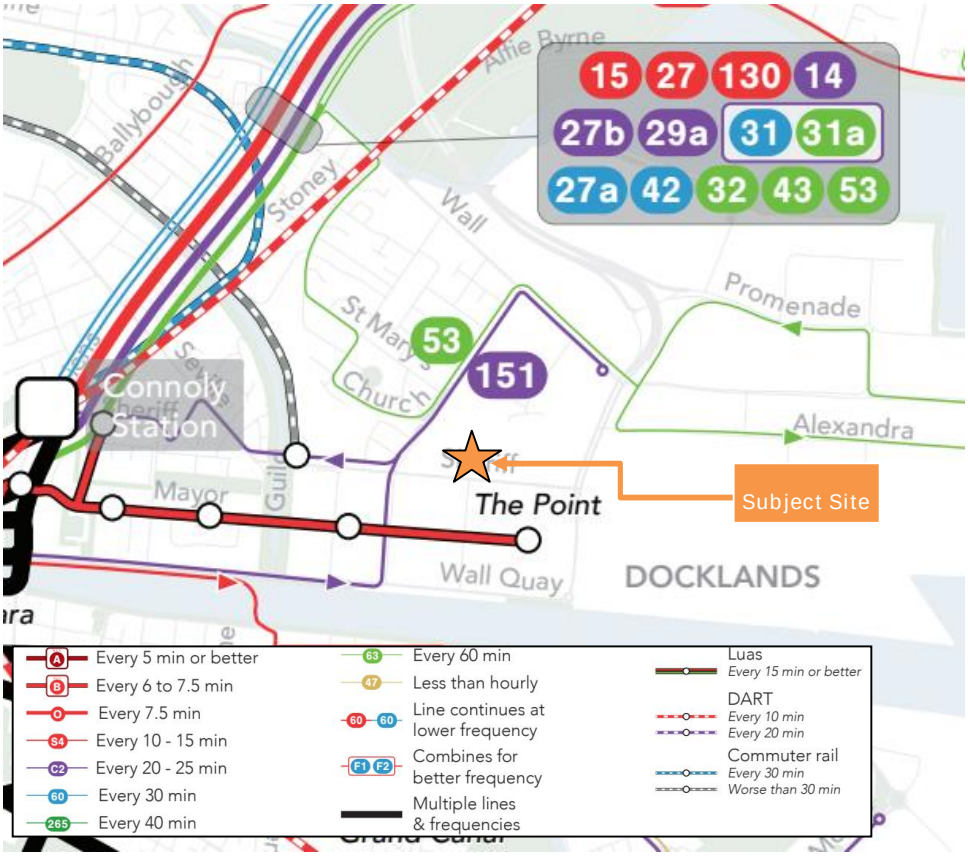



Figure 2.12: Existing Public Transport Services (weekday midday frequency)

(Extract of Map 1 - https://busconnects.ie/initiatives/dublin-area-bus-network-redesign-maps/)

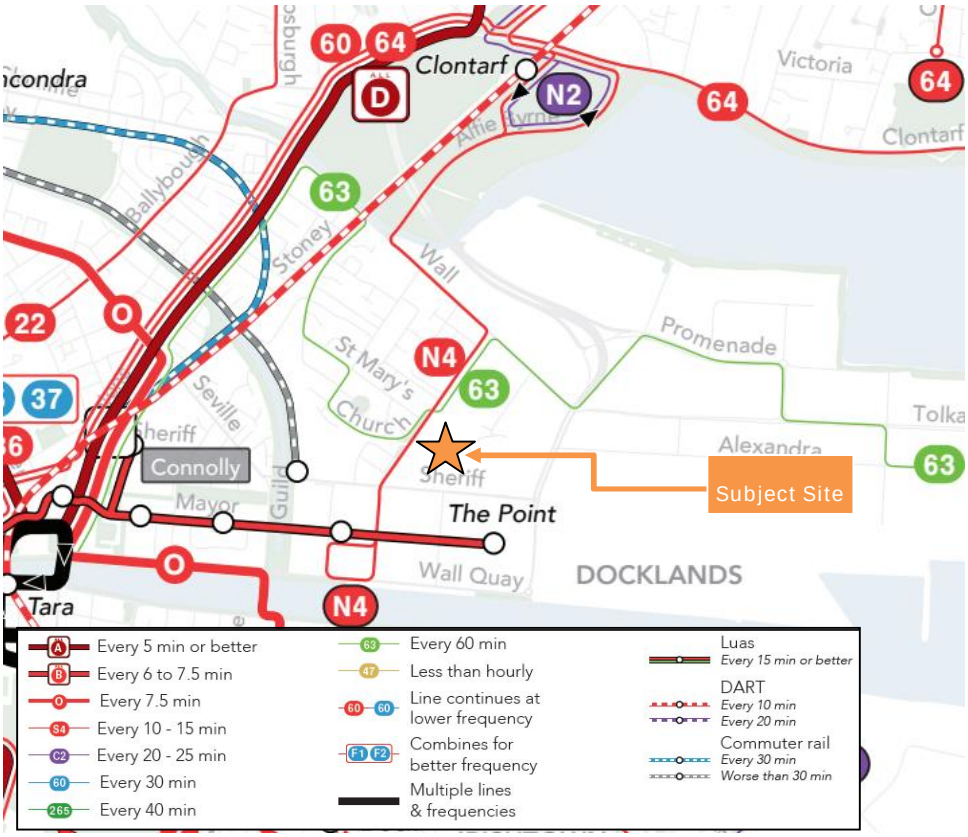



Figure 2.13: Proposed Public Transport Services (weekday midday frequency)

(Extract of Map 2 - https://busconnects.ie/initiatives/dublin-area-bus-network-redesign-maps/)

2.4.8 Under the BusConnects proposals, the following routes will be available within the immediate vicinity of the subject site:-

- Route N4: *"N4 extends from Blanchardstown to Spencer's Dock in the North Docklands, generally following Glasnevin Road and Collins Avenue. This orbital provides a new direct Docklands service from a large area of north Dublin City, and is the orbital for Dublin City University. With service every 10 minutes all day, this is expected to be the busiest of the northern orbitals."*
- Route 63: *"is an hourly route from the city centre to Citywest. This hourly route is designed to serve very small low-demand areas not reachable by other more frequent routes, generally near the Luas Red Line but not close enough to a station".*

2.4.9 As part of the BusConnects public consultation, maps are available to show how the proposed changes will affect each area. Figure 2.14 below indicates the areas reachable within 30, 45- and 60-minute journey times.

2.4.10 The travel times of 30, 45 and 60 minutes are based upon the following parameters:-

- The times/distances are based upon the public transport frequencies between 09:00-15:00 weekdays;
- There is the assumption that the waiting time for a particular service is half the time of the bus frequency (i.e. if the frequency of the bus is 20 minutes, there is an estimated 10-minute wait time); and
- There are higher frequencies available on some routes during the AM and PM peak hour periods, however this is not applicable to the routes which are within walking distance of the subject site.

2.4.11 The maps also provide information regarding how many more jobs that are accessible from a particular location within the 30, 45 and 60-minute travel time. It can be seen from Table 2.5 below, that residents of the subject site will have the benefit of being able to gain convenient access to an additional 25,400 jobs within a 30-minute travel when compared to the existing bus services.

| How Many More Jobs Can I Reach? | | | |
|---|---|---|---|
| Travel Time | Jobs in Existing | Jobs in Proposed | % Change |
| 30 mins | 232,200 | 257,600 | +11% |
| 45 mins | 373,000 | 405,600 | +9% |
| 60 mins | 547,700 | 555,400 | +1% |

Table 2.5: % Change in Number of Jobs Accessible before/after BusConnects Implementation

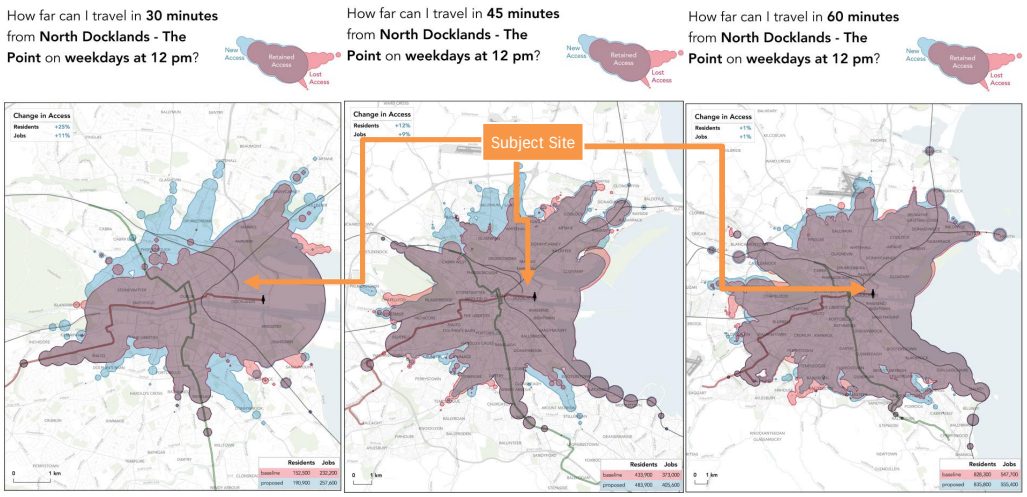



Figure 2.14: Areas Reachable Within 30, 45, and 60 minutes by Bus

2.4.12 The subject site on East Road is ideally located to benefit from the enhanced accessibility levels delivered by the BusConnects proposals.

### *DART Proposals*

2.4.13 The DART Expansion Programme will see the DART system expanded, providing fast, high-frequency electrified services to Drogheda on the Northern Line, Hazelhatch on the Kildare Line, Maynooth and M3 Parkway on the Maynooth/Sligo Line, while continuing to provide DART services on the South-Eastern Line as far south as Greystones (Figure 2.15).

2.4.14 The DART Expansion Programme also incorporates the DART Underground Project, which is an underground rail link through the City Centre, allowing DART services to operate on the Kildare line and travel through the Phoenix Park tunnel, enabling passengers to connect with DART services on the other three rail lines.

2.4.15 A location for a DART underground station has been proposed for the Docklands Train Station, located approximately within 8-minutes walking distance from the subject site.

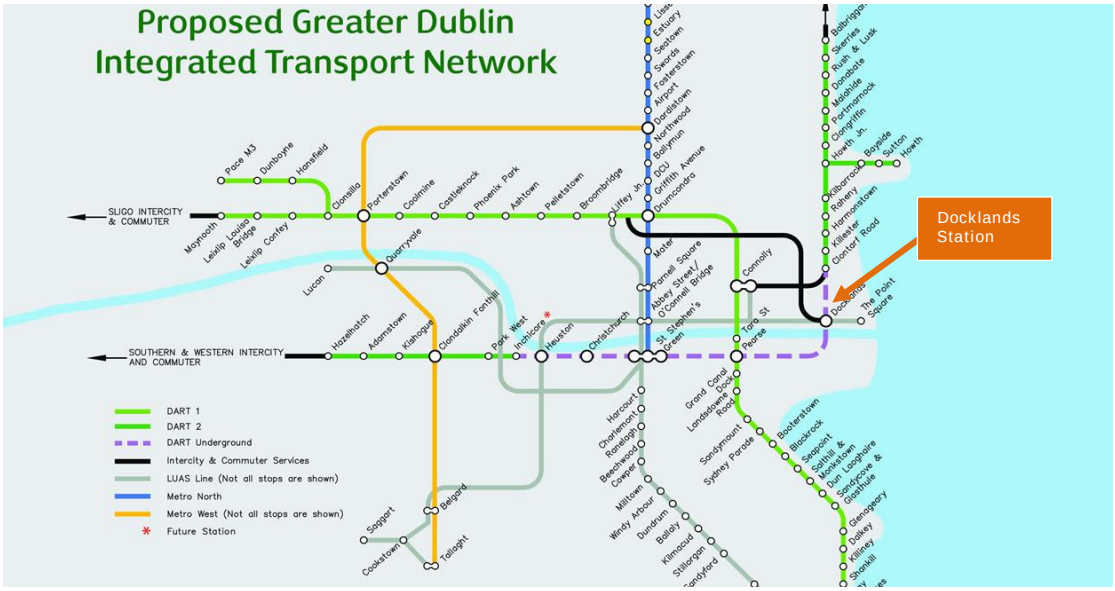



Figure 2.15: Proposed Greater Dublin Integrated Transport Network

## *Road & Bridge Infrastructure Proposals*

2.4.16 As outlined within both the Dublin City Council Development Plan (2016-2022), and the North Lotts & Grand Canal Dock Planning Scheme 2014, there are objectives for the provision of the following road and bridge infrastructure/improvement schemes within the six-year period of the Development Plan (Ref. Figure 2.16):-

- *Roads*
  - *East Wall Road/Sheriff Street to North Quays*
- *Bridges*
  - *Two new bridges proposed as part of the North Lotts and Grand Canal Dock SDZ, plus Dodder Bridge*

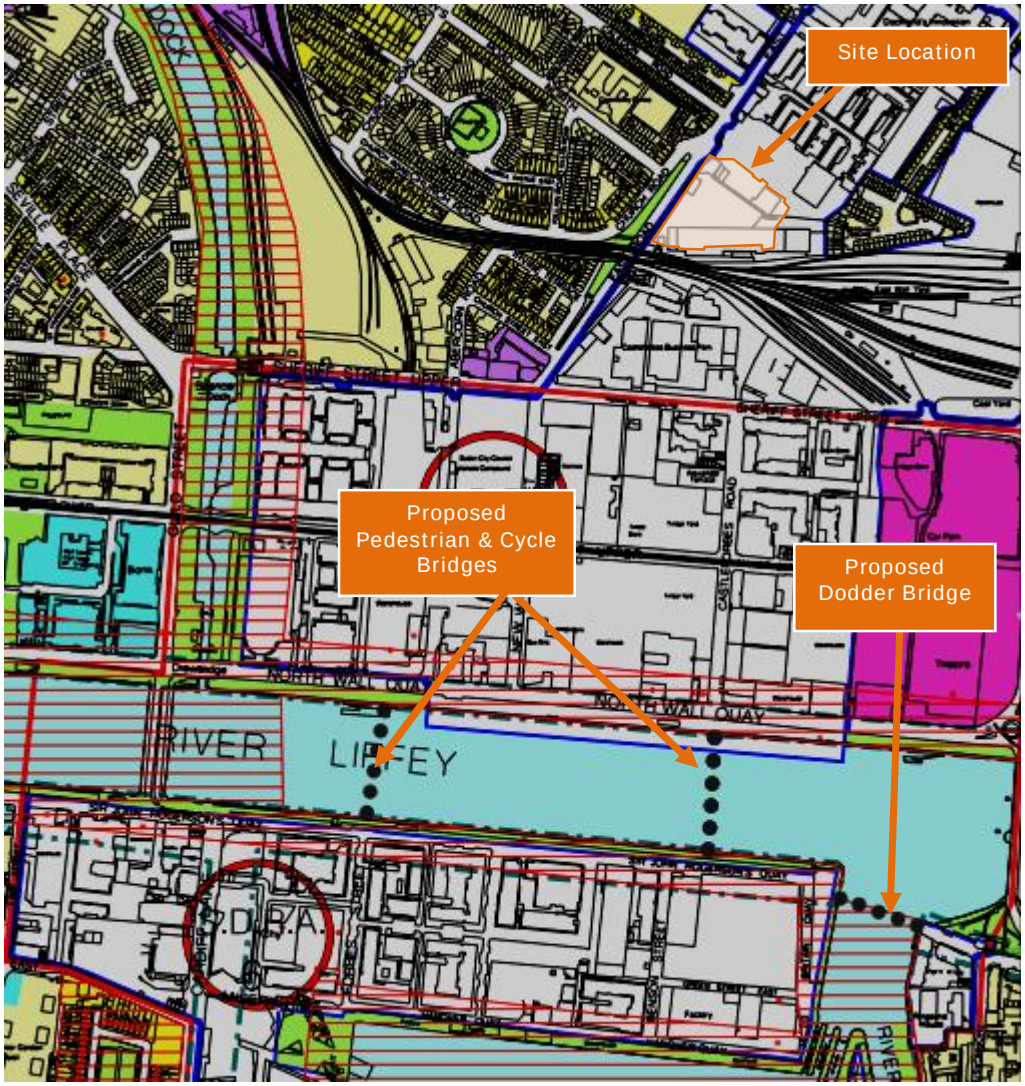



Figure 2.16: Proposed Bridge Infrastructure (Ref. DCC Development Plan Map E)

Proposed Amendments to North Lotts and Grand Canal Planning Scheme 2014 (February 2018)

2.4.17 In February 2018 Dublin City Council made a request to ABP to make amendments to the North Lotts and Grand Canal Planning Scheme 2014 stating:- *'The proposed amendments would allow for the effective relocation of two pedestrian/cycle bridges from the locations shown in the Planning Scheme document, and in response to changed circumstances'.*

2.4.18 As indicated in Figure 2.16 above, the North Lotts and Grand Canal Dock SDZ Planning Scheme contains objectives to provide two separate pedestrian/cycle bridges across the River Liffey, at Forbes Street and Castleforbes Road.

2.4.19 The proposed amendment now seeks to revise the locations of these, replacing them with bridges at (Ref. Figure 2.17):-

*'(a) New Wapping Street/Blood Stoney Road, and…*

*(b) Immediately west of, and parallel to the existing Tom Clarke (former 'East Link') Bridge, which connects North Wall Quay with the southern side of the River.'*

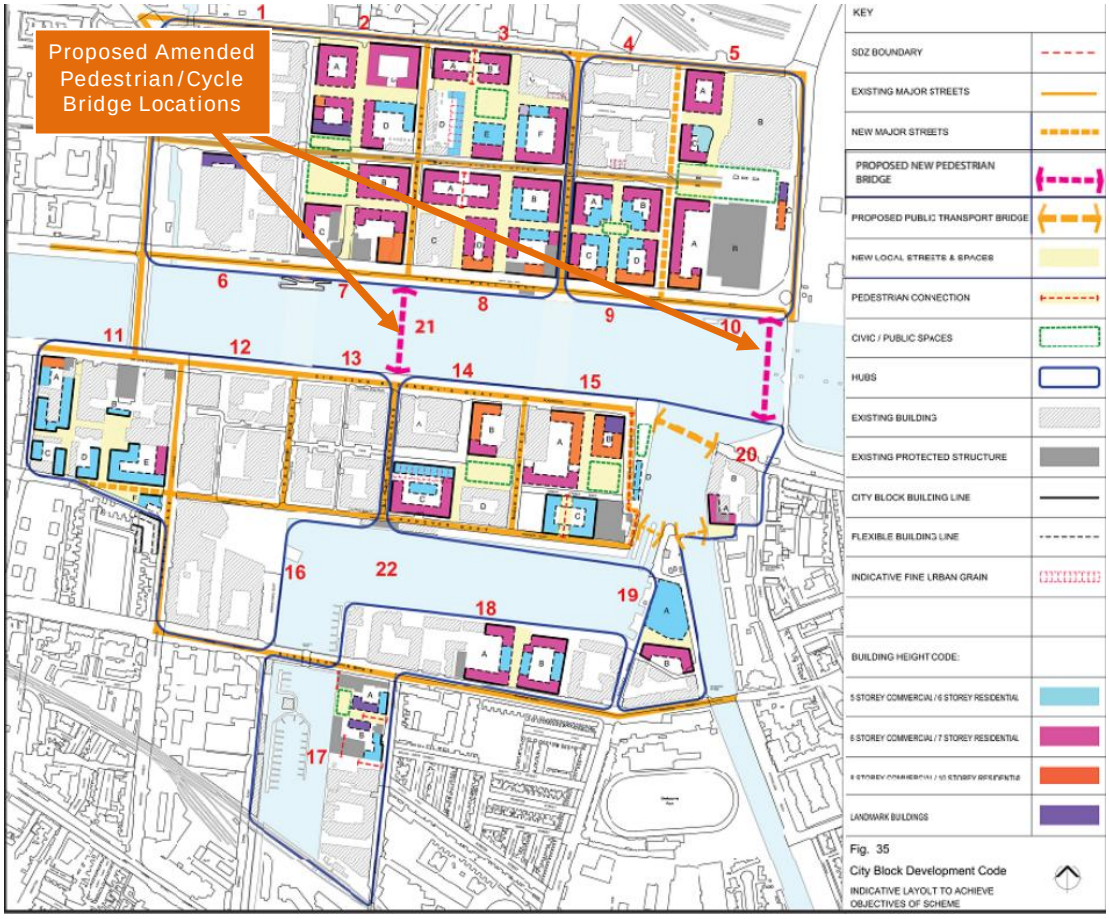



Figure 2.17: Proposed Bridge Infrastructure (source: http://www.dublindocklands.ie)

### *Timescales*

2.4.20 The implementation of the above infrastructure schemes will be subject to further design, public consultation, approval, and importantly availability of funding and resources.

## 2.5 RSA COLLISION HISTORY

2.5.1 The collision statistics on the Road Safety Authority (RSA) website were reviewed in order to ascertain the safety record of the local road network over the most recent ten-year period. This includes information for the years 2005 to 2014 inclusive and indicates basic information on all reported incidents. It should be noted that information relating to reported incidents for the years 2015, 2016, 2017 and 2018 is not yet available on the Road Safety Authority (RSA) website.

2.5.2 The RSA records detail only those occasions were the incident was officially recorded such as the Garda being present to formally record details of the incident. According to the RSA website there were thirteen reported incidents within the immediate vicinity of the subject scheme, as detailed in the following paragraphs (Figure 2.18).

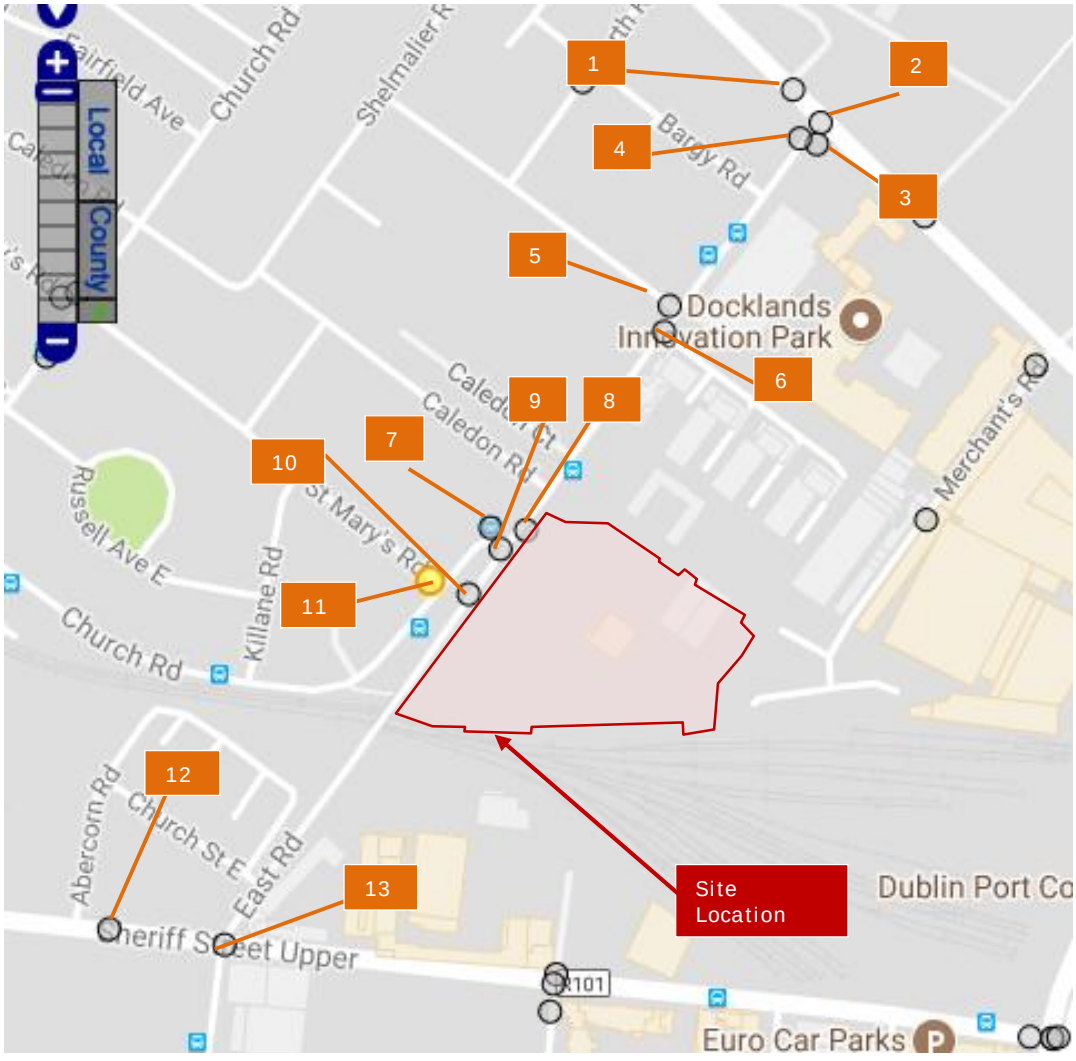



Figure 2.18: Collision Records - (source www.rsa.ie)

2.5.3 The review of the RSA data reveals that all incidents recorded along East Road have been classified as 'Minor'. Whilst there one 'Serious' incident occurred on Church Road, to the south west of the Church Rd/East Rd junction.

2.5.4 In reference to Figure 2.18 above and Table 2.2 below incident numbers 1, 2, 3 & 4 occurred in the vicinity of the East Rd/East Wall Rd junction and resulted in one minor casualty each.

2.5.5 Incident numbers 5 & 6 occurred in vicinity of the priority-controlled junction at East Rd/Ravensdale Rd, both resulting in a single minor casualty.

| Ref | Year | Vehicle | Circumstances | Day | Time | Severity | Total Casualties |
|---|---|---|---|---|---|---|---|
| 1 | 2005 | Car | Rear end, straight | Sat | 16:00-19:00 | Minor | 1 |
| 2 | 2014 | Bicycle | Other | Sat | 23:00-03:00 | Minor | 1 |
| 3 | 2008 | Car | Angle, right turn | Wed | 03:00-07:00 | Minor | 1 |
| 4 | 2009 | Car | Other | Mon | 16:00-19:00 | Minor | 1 |
| 5 | 2009 | Car | Other | Tue | 19:00-23:00 | Minor | 1 |
| 6 | 2012 | Car | Rear end, straight | Fri | 23:00-03:00 | Minor | 1 |
| 7 | 2006 | LGV | Other | Wed | 07:00-10:00 | Minor | 1 |
| 8 | 2006 | n/a | Pedestrian | Sat | 10:00-16:00 | Minor | 1 |
| 9 | 2011 | Bicycle | Other | Tue | 19:00-23:00 | Minor | 1 |
| 10 | 2006 | Car | Pedestrian | Mon | 10:00-16:00 | Minor | 1 |
| 11 | 2006 | Car | Angle, right turn | Wed | 10:00-16:00 | Serious | 1 |
| 12 | 2014 | Bicycle | Other | Sat | 07:00-10:00 | Minor | 1 |
| 13 | 2007 | Car | Angle, both straight | Mon | 10:00-16:00 | Minor | 1 |

Table 2.2: Collision Records - (source www.rsa.ie)

2.5.6 Incident numbers 7, 8, 9 & 10 occurred in the vicinity of the Church Road/East Road/Site Access junction on East Road. All 4 incidents resulted in one minor casualty each. The circumstances of two of these incidents involved pedestrians, whilst the remaining two were cited as 'other'.

2.5.7 Incident number 11 occurred in the vicinity of St Mary's Rd/Church Rd priority - controlled junction, involved a right turning car. The incident resulted in one serious casualty.

2.5.8 Incident numbers 12 & 13 occurred in the vicinity of the East Rd/Sheriff St/New Wapping St signal-controlled junction both resulting in a single minor casualty.

2.5.9 Without the provision of more detailed collision data, DBFL have concluded that there are no apparent significant trends in the collisions occurring on and in the vicinity of the proposed developments site access junction on East Road.

# 3.0 POLICY FRAMEWORK

## 3.1 THE DUBLIN CITY DEVELOPMENT PLAN

3.1.1 The Dublin City Council Development Plan 2016-2022 sets out the policies and objectives for sustainable development in the County up to 2022. It has been prepared in accordance with the requirements and various provisions of the Planning and Development Act 2000 as amended and the Planning and Development (Strategic Environmental Assessment Regulations 2004).

3.1.2 The Development Plan states that *"The ultimate purpose of the development plan is social, providing for people's needs in all aspects of their lives and across their life cycle in areas such as housing, employment, recreation, social and commercial services, in a sustainable manner. This is reflected in the three principles of the core strategy and in every chapter of the development plan. The social purpose of the development plan is complemented by the Local Economic and Community Plan."*

3.1.3 In the context of the subject proposals, the following are the relevant transport and development policies set out in the plan:

### *Integrated Land-use and Transportation Policies & Objectives*

- *MTO1: To encourage intensification and mixed-use development along existing and planned public transport corridors and at transport nodes where sufficient public transport capacity and accessibility exists to meet the sustainable transport requirements of the development, having regard to conservation policies set out elsewhere in this plan and the need to make best use of urban land …*

### *Public Transport Policies & Objectives*

- *MT3: To support and facilitate the development of an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city in association with relevant transport providers, agencies and stakeholders.*

- *MTO2: To support the development and implementation of integrated ticketing and real time passenger information systems across the public transport network in association with relevant transport providers and agencies. Progress on the integration of Dublin shared bike scheme and Leap Card schemes will be monitored.*
- *MTO4: To support improvements to the city's bus network and related services to encourage greater usage of public transport in accordance with the objectives of the NTA's strategy and the Government's 'Smarter Travel' document.*

### *Promoting Active Travel: Cycling & Walking Policies & Objectives*

- *MT7: To improve the city's environment for walking and cycling through the implementation of improvements to thoroughfares and junctions and also through the development of new and safe routes, including the provision of foot and cycle bridges. Routes within the network will be planned in conjunction with green infrastructure objectives and on foot of (inter alia) the NTA's Cycle Network Plan for the Greater Dublin Area, and the National Cycle Manual, having regard to policy GI5 and objective GIO18.*
- *MTO8: To promote and facilitate, in co-operation with key agencies and stakeholders, the provision of high density cycle parking facilities at appropriate locations, taking into consideration (inter alia) the NTAs Cycle Network Plan, Dublin City Centre Cycle Parking Strategy, and Dublin City Council's Public Realm Strategy.*
- *MTO9: To develop, within the lifetime of this plan, the Strategic Cycle Network for Dublin city - connecting key city centre destinations to the wider city and the national cycle network, and to implement the NTA's Greater Dublin Area Cycle Network Plan to bring forward planning and design of the Santry River Greenway, incorporating strongly integrative social and community development initiatives.*
- *MTO10: "To improve existing cycleways and bicycle priority measures throughout the city, and to create guarded cycle lanes, where appropriate and feasible".*

- *MTO11: To review the 30kph speed limit that applies within the city centre (i.e. area between the canals).*
- *MTO12: (i) To monitor the success of the shared bike scheme and to expand it to the entire city, in accordance with the content of the dublinbikes Strategic Planning Framework 2011-2016 or any subsequent review (ii) That developers will agree to fund the provision of a shared bike station near large developments, as community gain.*
- *MTO18: To develop a high-quality pedestrian environment at new public transport interchanges and to consider the needs of pedestrians in the design of all infrastructure projects.*
- *MTO21: To avail of opportunities to increase footpath widths particularly within the city centre where appropriate.*

### *Mobility Management & Travel Planning Polices & Objectives*

- *MT13: To promote best practice mobility management and travel planning to balance car use to capacity and provide for necessary mobility via sustainable transport modes.*
- *MTO23: To require Travel Plans and Transport Assessments for all relevant new developments and/or extensions or alterations to existing developments,*
- *MT14: To minimise loss of on-street car parking, whilst recognizing that some loss of spaces is required for, or in relation to, sustainable transport provision, access to new developments, or public realm improvements.*
- *MT15: To discourage commuter parking and to ensure adequate but not excessive parking provision for short-term shopping, business and leisure uses.*
- *MT16: To control the supply and price of all parking in the city in order to achieve sustainable transportation policy objectives.*
- *MT17: To provide for sustainable levels of car parking and car storage in residential schemes in accordance with development plan car parking standards (section 16.38) so as to promote city centre living and reduce the requirement for car parking.*

- *MT18: To encourage new ways of addressing the parking needs of residents (such as car clubs) to reduce the requirement for car parking.*
- *MT19: To safeguard the residential parking component in mixed-use developments*
- *MTO26: To progressively eliminate all 'free' onstreet parking, both within the canals and in adjacent areas where there is evidence of 'all day' commuter parking, through the imposition of appropriate parking controls, including disc parking.*

### *Road & Bridge Improvements*

- *MT20: To increase capacity of public transport, cycling and walking, where required, in order to achieve sustainable transportation policy objectives. Any works undertaken will include as an objective, enhanced provision for safety, public transportation, cyclists and pedestrians, and will be subject to environmental and conservation considerations.*
- *MTO31: To initiate and/or implement the following road improvement schemes and bridges within the six year period of the development plan, subject to the availability of funding and environmental requirements and compliance with the 'Principles of Road Development' set out in the NTA Transport Strategy.*
  - *Roads*
    - *East Wall Road/Sheriff Street to North Quays*
  - *Bridges*
    - *Dodder Bridge*
    - *Three new bridges proposed as part of the North Lotts and Grand Canal Dock SDZ.*

## 3.2 NORTH LOTTS & GRAND CANAL DOCK PLANNING SCHEME 2014

### *Proposed Infrastructure*

3.2.1 As outlined in the North Lotts & Grand Canal Dock Planning Scheme 2014, *'the following infrastructure is necessary to fill in the existing gaps in infrastructure and to improve the facilities for public transport, walking and cycling.'*

- *"the two proposed pedestrian/cyclist bridges across the Liffey are crucial to improving connectivity within the SDZ and the Docklands area.." (Figure 3.1)*
- *"The Dodder Bridge is also a crucial is also a crucial piece of infrastructure providing linkage eastwards to Poolbeg. This bridge would enable the provision of increased bus transport to serve the entire area as well as providing an important pedestrian and cyclist link eastwards to link residents with Dublin Bay."*

### *Movement Policies & Objectives*

3.2.2 *With respect to Movement, the Planning scheme identifies the following polices & objectives:-*

- *MV1 To continue to promote the modal shift from private car use towards increased use of more sustainable forms of transport such as cycling, walking and public transport and to implement the initiatives contained in the Government's 'Smarter Travel, A Sustainable Transport Future 2009-2020'.*
- *MV2 To support and facilitate the development of an integrated public transport network with efficient interchange between transport modes, to serve the existing and future needs of all ages in association with relevant transport providers, agencies and stakeholders and to facilitate the integration of walking and cycling with public transport.*
- *MV3 To provide additional cycle and pedestrian bridges across the canals and rivers in the SDZ to form part of strategic cycling and walking routes.*
- *MV4 To create and support a well-designed network of pedestrian infrastructure to promote and facilitate walking and cycling; provide priority for pedestrians and cyclists along key desire lines, developing routes within the Docklands and linking with the surrounding walking and cycling networks in Dublin City.*
- *MV5 To require provision of good quality end of trip facilities to encourage walking and cycling such as secure and weather-proof bike stands, lockers, showers, changing and drying rooms.*

- *MV6 To support the extension of the dublinbikes scheme throughout the area.*
- *MV7 To discourage commuter parking and to ensure adequate but not excessive parking provision for short-term shopping, business and leisure use.*
- *MV8 To provide appropriate levels of car parking to serve a range of uses in accordance with the City Development Plan car parking standards (Section 17.40).*
- *MV9 To provide for sustainable levels of car parking and car storage in residential schemes in accordance with the City Development Plan car parking standards (Section 17.40) so as to promote apartment living for all age groups and family types.*
- *MV10 To promote best practice mobility management and travel planning to balance car use to capacity and provide for necessary mobility via sustainable transport modes.*
- *MV11 To support the function of the strategic road network through the Docklands and support the operation of primary routes for appropriate levels and types of traffic.*
- *MV13 To encourage the use of innovative measures, such as car clubs, to reduce the requirement for car parking.*
- *MV14 To require Travel Plans and Transport Assessments for all relevant developments and/ or extensions or alterations to existing developments as outlined in Appendices 5 & 6 of the Dublin City Development Plan.*
- *MV15 Proposals for new developments shall comply with the standards for cycle parking and associated cycling facilities as set out in section 17.41 of the Dublin City Development Plan.*

3.2.3 As outlined in the North Lotts & Grand Canal Dock Planning Scheme 2014, *'the following infrastructure is necessary to fill in the existing gaps in infrastructure and to improve the facilities for public transport, walking and cycling.'*

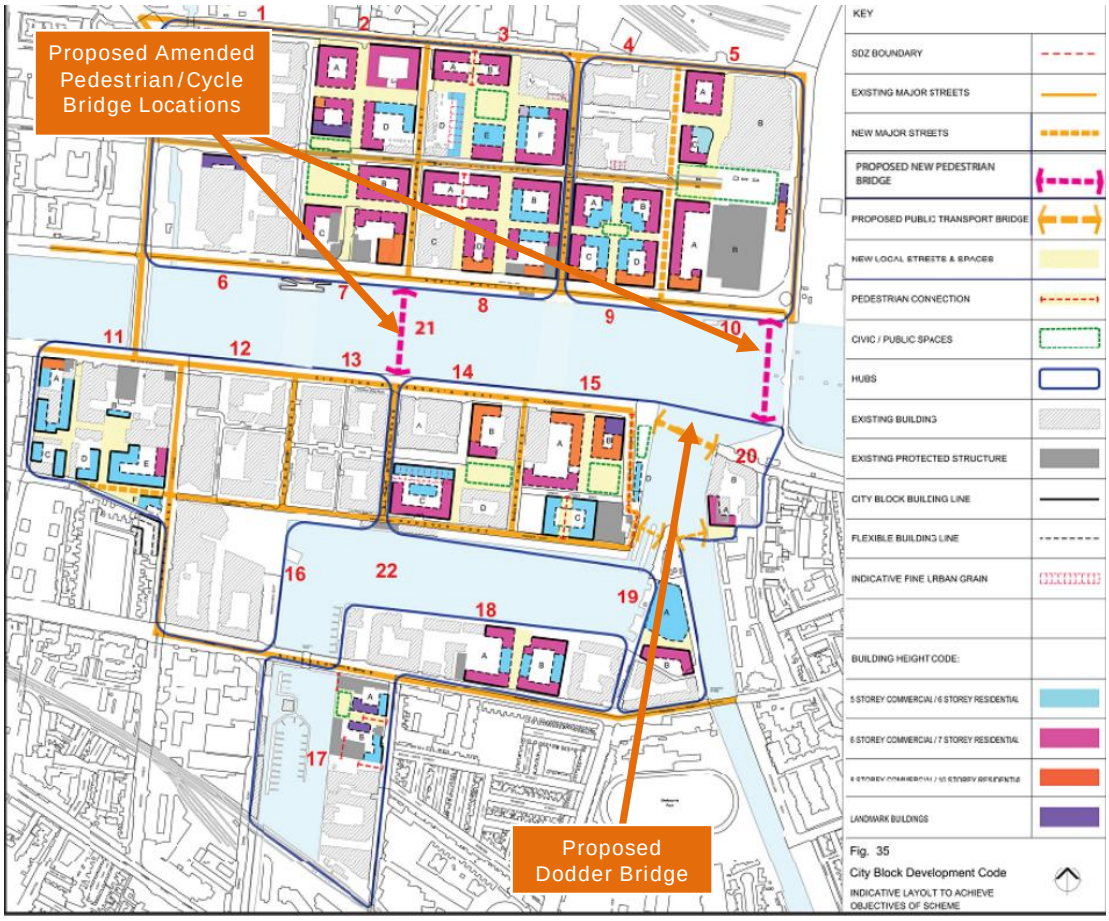



Figure 3.1: Proposed Bridge Infrastructure (source: http://www.dublindocklands.ie)

# 4.0 CHARACTERISTICS OF PROPOSALS

## 4.1 OVERVIEW

4.1.1 The development proposals include the construction of a mixed-use development set out in 9 no. blocks, ranging in height from 3 to 15 storeys to accommodate 554 no. apartments, enterprise space, retail units, foodhub/café/exhibition space, residential amenity, crèche and men's shed. The site will accommodate car parking spaces, bicycle parking, storage, services and plant areas. Landscaping will include a new central public space and residential podium courtyards.

### *Enterprise Hub*

4.1.2 The Enterprise Hub aspect of the East Road development will be run by Element78, who will be responsible for the delivery of an enterprise management plan and on-site duty management of the Enterprise Hub. The Enterprise space will feature units/space of varying sizes which will include retail, office, touchdown zones, flexible breakout areas, digital demonstration, café and exhibition zones.

4.1.3 This type of flexible working space does not adopt the typical 9-5 working approach, instead the anticipated entrepreneurial clientele would work flexible hours (outside of normal office hours) to suit their own timescales. The reception area at the Enterprise Hub will be centrally managed on-site enabling the spaces to be used for multiple purposes on a 24/7 basis. This active management style attracts more enterprise companies into the facility allowing them to rent space by the hour, day, week or year. It also allows the space to host on-site events, and activities that directly respond to the needs of start-ups, local communities and businesses.

4.1.4 Similar examples of these types of developments internationally to date can be seen at Media City in Manchester, whilst examples of the Exhibition & Crossover space can be seen at Kraak in Berlin, Edinburgh's 'The Forest', London 'Drink, Shop & Do' and Cardiff's 'Milgi'.

4.1.5 Further details of the development proposals including the site layout and transport network arrangements are illustrated in the architects' scheme drawings as submitted with this planning application.

## 4.2 SITE ACCESS

4.2.1 The subject site will benefit from one vehicle access which will be provided on East Road as shown in Figure 4.1 below. The proposed access will be incorporated into the Church Road/East Road priority-controlled junction and will include the upgrading of the aforementioned junction to traffic signal controlled. This access will be utilised by all modes of transport travelling to/from the proposed development.

4.2.2 The existing traffic signals and carriageway arrangement at the 'metering' traffic signal arrangement on East Road at the rail bridge permit only a single lane of traffic to travel through the signals at any one time. On-site observations undertaken by DBFL have revealed this arrangement serves the dual purpose of traffic 'metering' and traffic calming on East Road, i.e. reducing the attractiveness of the East Rd-Sherriff Road as a 'through route' by the delays arising from the single lane of traffic permitted to travel through the signals.

4.2.3 The upgrading of the Church Road/East Road junction to traffic signal controlled will enable the removal of the existing traffic signal controls at the rail bridge which will be beneficial for a number of reasons including:-

(i) the allocation of dedicated traffic signal stages to the two minor arms of the junction (i.e. Church Road and the site access road), will effectively impose journey time delays to the north-south traffic movements on East Road, thereby replicating the traffic calming effects of the traffic signals at the rail bridge.

(ii) Should Dublin City Council seek to provide additional journey time delays/metering of through traffic on East Road, it will be achievable by adjusting the signal timings at the junction.

(iii) The proposed upgraded junction arrangement will provide dedicated pedestrian crossing facilities (for all travel desire lines), thereby removing the existing lengthy uncontrolled crossings and the associated safety risks that they present to pedestrians at this vehicle dominated location.

(iv) The proposed upgraded junction arrangement will improve the existing restricted visibility available for vehicle drivers exiting Church Road, caused by existing ongoing inappropriate parking practices at the junction.

(v) The proposed upgraded junction arrangement will control the speed at which vehicles can travel through the junction with the provision of reduced junction corner radii thereby providing a marked improvement over the existing situation.

(vi) The proposed upgraded junction arrangement will enable the provision of approximately 82m north-eastbound and 124m south-westbound of cycle lanes along the subject site boundary on East Road. This route is identified as a secondary cycle route in the Greater Dublin Area Cycle Network Plan.

(vii) The proposed junction arrangement allows the provision of 4 formal car parking spaces (2 of which are allocated to a car share facility) on East Road adjacent to the subject site.

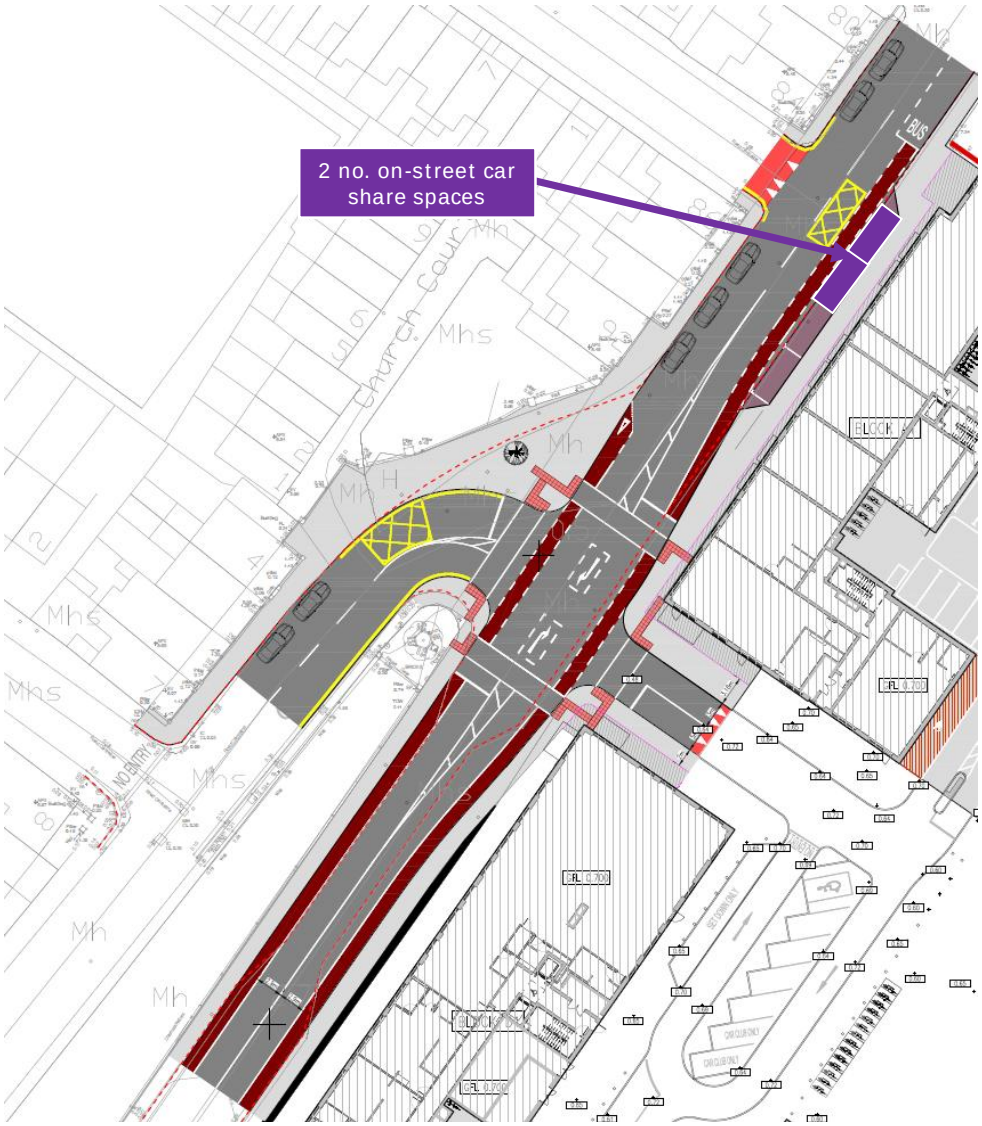



Figure 4.1: Proposed Site Access

### *Pedestrians and Cyclists Improvements*

4.2.4 The subject site will be highly accessible to pedestrians and cyclists from East Road. Pedestrians will be given priority within the internal site layout to ensure desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict with vehicles is minimised.

4.2.5 The proposed upgraded junction arrangement at the site access junction will provide dedicated pedestrian crossing facilities (for all travel desire lines).

4.2.6 The development proposals include the provision of approximately 82m north-eastbound and 124m south-westbound of cycle lanes along the subject site boundary on East Road.

## 4.3 PARKING STRATEGY

### *Car Parking*

4.3.1 The vehicle and cycle parking provision for the subject site are outlined within the separate Parking Strategy document submitted with the planning application. In summary the proposals include the provision of a total of 241 car parking spaces on-site have been allocated as follows:-

- 227 (including 1 no. car share space) number car parking spaces have been allocated to residents of the 554 number apartment units;
- 7 number parking spaces have been allocated to staff based at the Enterprise Hub (including the childcare facility staff); and
- 7 number parking spaces are allocated within the internal court yard to facilitate servicing, short duration parking and childcare facility pickup/drop off.

4.3.2 A loading bay has also been provided to facilitate servicing requirements of the Enterprise Hub.

### *Cycle Parking*

4.3.3 The appropriate level of cycle parking provision for the proposed development will also be provided in reference to both (i) the Dublin City Council requirements; and (ii) the DHPLG guidelines. The DCC cycle parking standards are detailed in Table 4.1 below: -

| Land Use Description | Dublin City Council Parking Requirement | | DHPLG Requirements | |
|---|---|---|---|---|
| | Short Stay/Visitor | Long Stay | Short Stay | Long Stay |
| Houses and Apartments (All zones) | Visitor Parking decided on a case by case basis | 1 space per unit | 1 visitor space per 2 units | 1 space per bedroom |
| Enterprise & Employment (Zone 2) | N/A | 1 per 100sqm | N/A | N/A |
| Shops/Main Street/Financial Offices (Zone 2) | N/A | 1 per 150sqm | N/A | N/A |
| Childcare | N/A | N/A | N/A | N/A |

Table 4.1: Cycle Parking Requirements

| Land Use Description | Quantity of Units/GFA | Dublin City Council Parking Requirement | | | DHPLG Requirements | | | East Road Development Provision | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Short Stay | Long Stay | Total | Short Stay | Long Stay | Total | Short Stay | Long Stay | Total |
| Apartments | 554 | - | 554 | 554 | 280 | 885 | 1165 | 84 | 666 | 750 |
| Enterprise & Employment | 2442.5sqm | N/A | 24 | 24 | N/A | N/A | N/A | 28 | 32 | 60 |
| Shops/Main Street/Financial Offices | 1025.2sqm | N/A | 7 | 7 | N/A | N/A | N/A | | | |
| Childcare | 538.1sqm | N/A | N/A | N/A | N/A | N/A | N/A | | | |
| Total | | - | 585 | 585 | 280 | 885 | 1165 | 112 | 698 | 810 |

Table 4.2: Cycle Parking Requirements & Development Provision

4.3.4 In reference to Table 4.2 above, the proposals include the provision of a total of 112 short term and 698 long term bicycle parking stands/opportunities (810 in total) on-site within the subject East Road development. The DCC bicycle parking standards are considered to be 'minimum' standards, whereas the DHPLG requirements are considered to be the preferred level of provision in situations where on-site car parking has been substantially or completely removed as permitted in certain situations by the corresponding DHPLG car parking guidance.

4.3.5 The level of bicycle parking proposed on-site for the apartment units has been provided in the context that the development car parking proposals are below the DCC development plan standards (e.g. 224 spaces opposed to 554). DBFL consider this reduction to be consistent with the 'substantial' reduction that the DHPLG guidelines recommend and at which the high DHPLG bicycle parking requirements would be of greater relevance. Accordingly, the design approach in regard to the specification of bicycle parking on-site, in the context of the site's accessibility characteristics (including the proposed car parking provision), is considered to be an appropriate number of bicycle parking opportunities on-site,

which is above the DCC cycle parking standards and leans towards the 'maximum' DHPLG requirements.

4.3.6 In reference to Table 4.3 below is can be established that the proposed on-site bicycle parking provision of 810 spaces (including Short and Long-term parking spaces) is approximately 37% more than the 585 parking opportunities required by the DCC development management standards.

| Standard/Proposed | Type | Apartments | Enterprise Hub | Sub Total |
|---|---|---|---|---|
| DCC Standards | Short | - | - | - |
| | Long | 554 | 31 | 585 |
| | Total | 554 | 31 | 585 |
| DHPLG Standards | Short | 280 | - | 280 |
| | Long | 885 | - | 885 |
| | Total | 1165 | - | 1165 |
| Proposed | Short | 84 | 28 | 112 |
| | Long | 666 | 32 | 698 |
| | Total | 750 | 60 | 810 |

Table 4.3: Comparison of Bicycle Parking Provision

4.3.7 The specific location of the proposed on-site bicycle parking facilities are graphically illustrated in DBFL Drawing 170200-2001 which accompany the planning application.

### *Car Share*

4.3.8 Further to the above car parking provision, a letter of intent has been received from the private car sharing company "GoCAR" to include 3 no. shared car spaces including 2 no. located on East Road adjacent to the subject site and 1 no. within the development site boundary. GoCar members can book cars online or via the app for as little as an hour, then unlock with their phone or GoCar; 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. The GoCar letter of support can be found in Appendix D of this report.

# 5.0 TRIP GENERATION AND DISTRIBUTION

## 5.1 INTRODUCTION

5.1.1 The following paragraphs present the process by which the potential level of person trips and associated vehicle trips, potentially generated by the subject mixed-use development have been quantified and subsequently assigned across the local road network.

5.1.2 In order to assess the operation of the proposed road network and its future capacity, a traffic model of the existing local road network and proposed links was created. Existing traffic levels were obtained from counts carried out in the vicinity of the subject site access in April 2018 therefore peak hour flows were established i.e. base flows for 2018.

## 5.2 TRAFFIC SURVEYS

5.2.1 A vehicle turning count survey (classified junction turning count) was conducted between 07:30 to 09:30 and 16:30 to 18:30 on Wednesday 25th April 2018 at the following locations (Figure 5.1):-

- Junction 1: East Wall Road/East Road signal-controlled junction;
- Junction 2: East Road/Church Road/Site Access junction; and
- Junction 3: East Road/Sherriff Street Upper/New Wapping St Junction.

5.2.2 A 24-hour automatic traffic counter (ATC) survey was also undertaken on the same day, located between the existing East Road/Church St East junction and the rail bridge (Figure 5.1).

5.2.3 The traffic survey established that the local AM and PM peak hours occur between 07:30-08:30 and 17:00-18:00.

5.2.4 The recorded 2018 peak hour traffic flows are presented in Figure 1 as included within Appendix B.

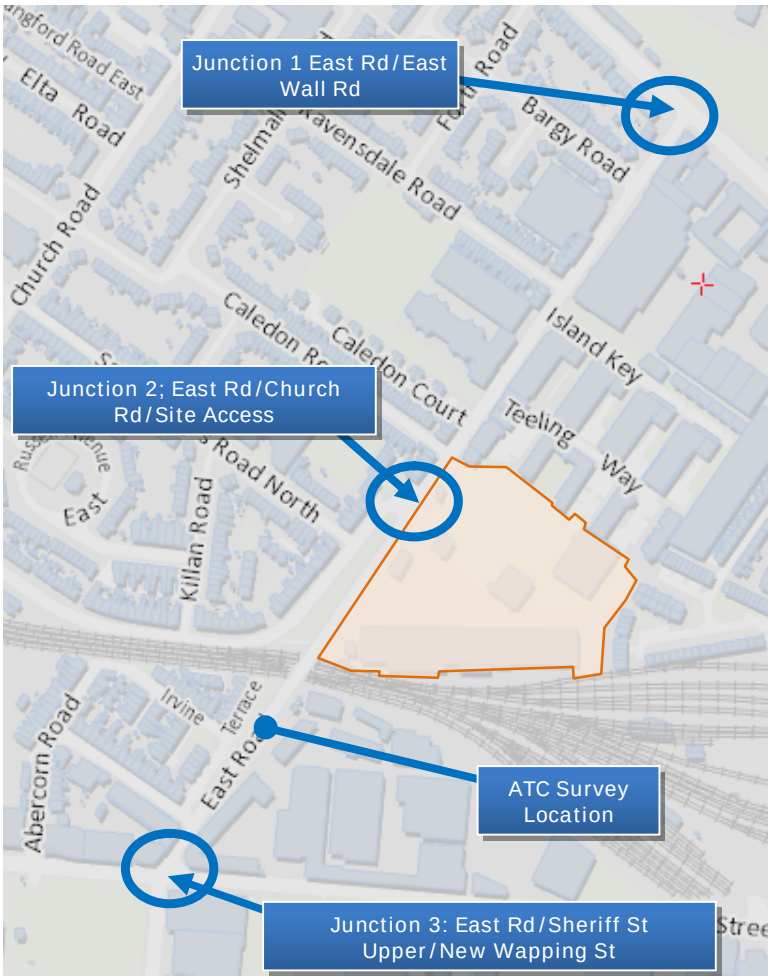



Figure 5.1: Traffic Survey Locations

## 5.3 TRIP GENERATION AND MODAL SPLIT

5.3.1 The following paragraphs present the process by which the potential level of person trips and subsequently vehicle trips, associated with the proposed development have been generated.

*Proposed Development – Apartments*

Modal Split

5.3.2 The modal choice for the proposed residential aspect of the development has been assessed by quantifying the number and nature of trips that would be generated. These trips are assessed based on the area of influence and the available infrastructure and accessibility levels. The predicted 2019 modal split (short term) are presented in Figure 5.2 to 5.3 below. These have been split between trips made by purpose of trip (i.e. work or school/college). It is

expected that in time the number of trips undertaken by sustainable modes of travel will increase with a corresponding drop in the number of vehicle trips.

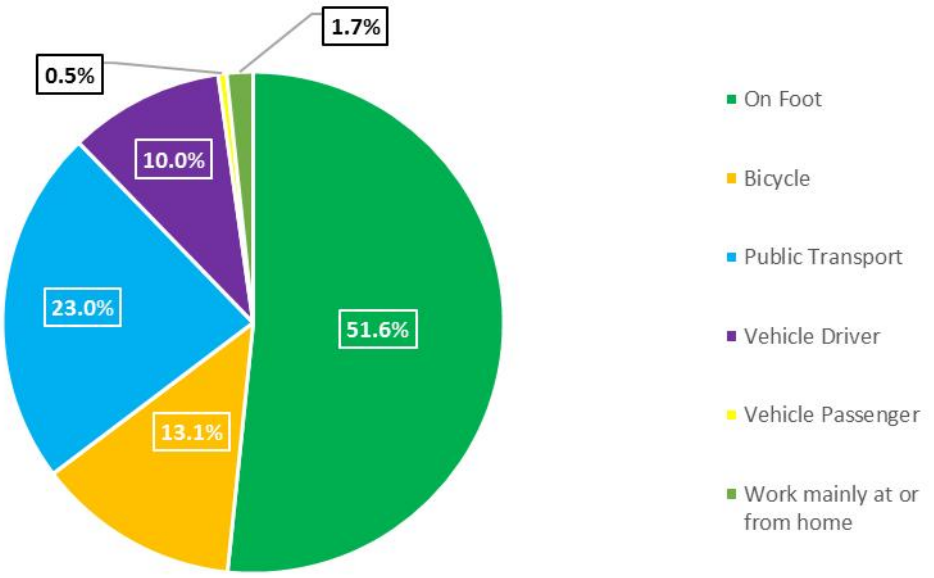



Figure 5.2: Proposed Apartment Modal Split (Short Term) – Travel to Work

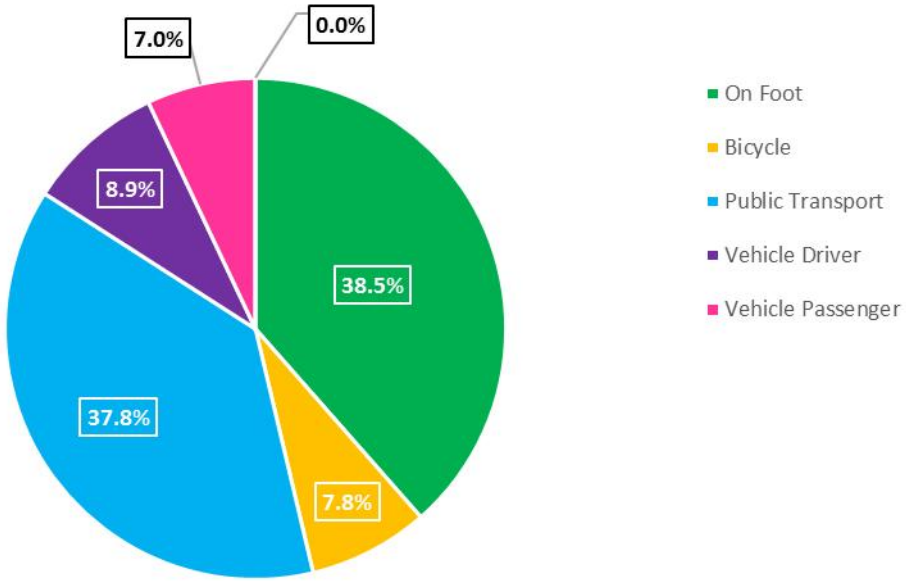



Figure 5.3: Proposed Apartment Modal Split (Short Term) – Travel to School/ College

Traffic Generation

5.3.3 Due to the subject site's convenient location to Dublin City Centre, its high levels of accessibility to public transport, and the development proposals for a reduction in the quantum of vehicle parking spaces, DBFL have undertaken a 'First Principles' exercise in order to determine the most realistic vehicle trip generation levels for the proposed residential element of the development. As outlined in Table 5.1 below, the following parameters have been utilised to deduce the trip generation rates for the subject development.

5.3.4 In order to determine the typical weekday daily profile for a residential development comprising solely of apartments, we have made reference to the TRICS database. Table 5.1 below summarises the predicted daily profile of vehicle movements as generated by the residential element of the development. Based on the daily profile of trip rates as provided by TRICS, the potential daily profile of traffic generation for the residential element of the subject development is calculated based on the provision of 227 number parking spaces allocated to residents of the subject development.

| No of Units | | | 554 | |
|---|---|---|---|---|
| No of Parking Spaces (0.41 per unit) | | | 227 | |
| Residential - Apartments | Arrivals (% of total) | Departures (% of total) | Arrivals | Departures |
| 07:00-08:00 | 4% | 15% | 10 | 34 |
| 08:00-09:00 | 5% | 19% | 11 | 42 |
| 09:00-10:00 | 6% | 9% | 14 | 20 |
| 10:00-11:00 | 4% | 6% | 10 | 13 |
| 11:00-12:00 | 6% | 5% | 13 | 12 |
| 12:00-13:00 | 7% | 6% | 16 | 14 |
| 13:00-14:00 | 7% | 7% | 16 | 16 |
| 14:00-15:00 | 7% | 7% | 17 | 15 |
| 15:00-16:00 | 9% | 6% | 20 | 13 |
| 16:00-17:00 | 11% | 6% | 24 | 14 |
| 17:00-18:00 | 19% | 6% | 42 | 14 |
| 18:00-19:00 | 15% | 8% | 33 | 17 |
| Total | 100% | 100% | 227 | 227 |

Table 5.1: Proposed Residential Trip Rates & – Daily Profile

5.3.5 The traffic survey established that the local AM and PM peak hours occur between 07:30-08:30 and 17:00-18:00. Accordingly, the AM and PM peak hour traffic generation for the residential element of the development are shown in Table 5.2 below.

| AM Peak 07:30-08:30 | | PM Peak 17:00-18:00 | |
|---|---|---|---|
| Arrivals | Departures | Arrivals | Departures |
| 11 | 38 | 42 | 14 |

Table 5.2: Proposed Residential Peak Hour Traffic Generation

### *Proposed Development – Childcare facility*

5.3.6 Due to the childcare facility being situated within a 554-unit residential development, and the sites location within a primarily residential area, it is forecast that the childcare facility element of the subject development will primarily attract a walk-in catchment. Accordingly, we have assumed that 25% of children travelling to/from the childcare facility will travel by car, with the remaining 75% travelling by sustainable modes (walking, cycling, public transport). DBFL have again undertaken a 'First Principles' exercise in order to determine the most realistic trip generation levels for the childcare facility aspect of the development. It is estimated that parents/guardians dropping off and collecting children from the cheche will take approximately 5-10 minutes, as such the arrival/departure profile has been broken down into 5-minute periods. The arrival/departure times have also been staggered to reflect the standard opening hours of a childcare facility with a capacity for 65 children.

| 65 no. Children | AM Profile | | Travel By All Modes | | Travelling By Car (25% Mode Share) | |
|---|---|---|---|---|---|---|
| Time | Arrivals | Departures | Arrivals | Departures | Arrivals | Departures |
| 07:25 | 2% | 0% | 1 | 0 | 0 | 0 |
| 07:30 | 2% | 2% | 1 | 1 | 0 | 0 |
| 07:35 | 2% | 2% | 1 | 1 | 0 | 0 |
| 07:40 | 2% | 2% | 1 | 1 | 0 | 0 |
| 07:45 | 2% | 2% | 1 | 1 | 0 | 0 |
| 07:50 | 3% | 2% | 2 | 1 | 0 | 0 |
| 07:55 | 4% | 3% | 3 | 2 | 1 | 0 |
| 08:00 | 6% | 4% | 4 | 3 | 1 | 1 |
| 08:05 | 6% | 6% | 4 | 4 | 1 | 1 |
| 08:10 | 6% | 6% | 4 | 4 | 1 | 1 |
| 08:15 | 6% | 6% | 4 | 4 | 1 | 1 |
| 08:20 | 6% | 6% | 4 | 4 | 1 | 1 |
| 08:25 | 6% | 6% | 4 | 4 | 1 | 1 |
| 08:30 | 6% | 6% | 4 | 4 | 1 | 1 |
| 08:35 | 8% | 6% | 5 | 4 | 1 | 1 |
| 08:40 | 9% | 8% | 6 | 5 | 1 | 1 |
| 08:45 | 7% | 9% | 5 | 6 | 1 | 1 |
| 08:50 | 7% | 7% | 5 | 5 | 1 | 1 |
| 08:55 | 7% | 7% | 5 | 5 | 1 | 1 |
| 09:00 | 3% | 7% | 2 | 5 | 0 | 1 |
| 09:05 | 0% | 3% | 0 | 2 | 0 | 0 |

Table 5.2: Proposed Childcare facility AM Arrival/Departure Profile & Traffic Generation

| 65 no. Children | PM Profile | | Travel By All Modes | | Travelling By Car (25% Mode Share) | |
|---|---|---|---|---|---|---|
| Time | Arrivals | Departures | Arrivals | Departures | Arrivals | Departures |
| 17:00 | 2% | 0% | 1 | 0 | 0 | 0 |
| 17:05 | 2% | 2% | 1 | 1 | 0 | 0 |
| 17:10 | 2% | 2% | 1 | 1 | 0 | 0 |
| 17:15 | 2% | 2% | 1 | 1 | 0 | 0 |
| 17:20 | 2% | 2% | 1 | 1 | 0 | 0 |
| 17:25 | 3% | 2% | 2 | 1 | 0 | 0 |
| 17:30 | 4% | 3% | 3 | 2 | 1 | 0 |
| 17:35 | 6% | 4% | 4 | 3 | 1 | 1 |
| 17:40 | 6% | 6% | 4 | 4 | 1 | 1 |
| 17:45 | 6% | 6% | 4 | 4 | 1 | 1 |
| 17:50 | 6% | 6% | 4 | 4 | 1 | 1 |
| 17:55 | 6% | 6% | 4 | 4 | 1 | 1 |
| 18:00 | 6% | 6% | 4 | 4 | 1 | 1 |
| 18:05 | 6% | 6% | 4 | 4 | 1 | 1 |
| 18:10 | 8% | 6% | 5 | 4 | 1 | 1 |
| 18:15 | 9% | 8% | 6 | 5 | 1 | 1 |
| 18:20 | 7% | 9% | 5 | 6 | 1 | 1 |
| 18:25 | 10% | 7% | 7 | 5 | 2 | 1 |
| 18:30 | 7% | 17% | 5 | 11 | 1 | 3 |

Table 5.3: Proposed Childcare facility PM Arrival/Departure Profile & Traffic Generation

5.3.7 Accordingly, the AM and PM peak hour traffic generation for the childcare facility element of the development are shown in Table 5.4 below.

| AM Peak 07:30-08:30 | | PM Peak 17:00-18:00 | |
|---|---|---|---|
| Arrivals | Departures | Arrivals | Departures |
| 8 | 8 | 8 | 7 |

Table 5.4: Proposed Childcare facility Peak Hour Traffic Generation

*Proposed Development – Enterprise Hub (Office/Retail/Enterprise Units)*

5.3.8 Influenced by the fact that (i) there will only be 7 number short stay duration vehicle parking provided within the internal court yard area; (ii) there are nominal 'long-term' off-street car parking opportunities in the general area of the site; (iii) the local streets are subject to Pay Parking controls; and (iv) only 7 number parking spaces have been allocated to staff based at the Enterprise Hub, the level of vehicle trip generation by the Enterprise Hub (Office/Retail/Enterprise Units) element of the development is anticipated to be modest.

5.3.9 The proposed Enterprise Hub will generate a very small level of 'servicing' activities. Unlike a retail scheme no goods are being transferred for onward sale/returns. Accordingly, the majority of 'servicing' activities including inbound delivery and outward collections will constitute waste collections, general maintenance (indoor and outdoor), and general office servicing activities.

5.3.10 These servicing activities will be encouraged to be undertaken outside of peak traffic periods and will not be permitted to coincide with the network AM and PM peak hour periods.

5.3.11 Nonetheless, in order to provide a robust assessment, it is assumed that the co-working space will be serviced by a delivery vehicle in both the AM and PM peak hour periods thereby generating 2 two-way vehicle trips (1 arrival and 1 departure). Furthermore, it has been assumed that the staff of the Enterprise Hub that have been allocated a parking space (7no.), will all arrive during the AM and depart during the PM peak hour periods. Table 5.5 below indicates the total vehicle trip generation for the Enterprise Hub during the AM and PM peak hour periods.

| Enterprise Hub | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | Arr | Dep | Arr | Dep |
| Staff | 7 | 0 | 0 | 7 |
| Service/Delivery Vehicles | 1 | 1 | 1 | 1 |
| Total | 8 | 1 | 1 | 8 |

Table 5.5: Enterprise Hub Peak Hour Vehicle Trip Generation

### *Foodhub/Café*

5.3.12 The foodhub/café element of the subject developments Enterprise Hub will only be focussing upon (a) a local external 'walk-in' catchment, (b) passing trade already travelling across the local transport network, and (c) the internal 'walk-in' catchment from the Enterprise Hub and residential apartments. Therefore, the only vehicle traffic that could be generated from the café would be delivery vehicles or refuse vehicles. As such this foodhub/café is not expected to generate a material impact in terms of vehicle trip generation.

5.3.13 However, in order to provide a robust assessment and to analyse a worst-case scenario, it has been assumed that the café/foodhub will be serviced by a delivery vehicle in both the AM and PM peak hour periods thereby generating 2 two-way vehicle trips (1 arrival and 1 departure).

| Land Use | Peak Hour | Traffic generation | |
|---|---|---|---|
| | | Arr | Dep |
| Foodhub/Cafe | AM | 1 | 1 |
| | PM | 1 | 1 |

Table 5.6: Foodhub/Cafe Traffic Generation

### *Proposed Development – Total Traffic Generation*

5.3.14 In conclusion the total vehicle trip generation for the subject site development is indicated in Table 5.7 below.

| Development Use/Area | AM Peak Hour | | PM Peak Hour | |
|---|---|---|---|---|
| | Arr | Dep | Arr | Dep |
| Residential Apartments | 11 | 38 | 42 | 14 |
| Childcare facility | 8 | 8 | 8 | 7 |
| Foodhub/cafe | 1 | 1 | 1 | 1 |
| Enterprise Hub | 8 | 1 | 1 | 8 |
| Total | 28 | 48 | 52 | 30 |

Table 5.7: Subject Development Total Vehicle Trip Generation

## 5.4 COMMITTED DEVELOPMENT

5.4.1 There are several third party committed developments (Figure 5.2) with existing planning permission located within the area of influence of the subject site. DBFL believe these third-party developments may generate an impact on the local road network and as such DBFL have included them as committed development. The following paragraphs examine the planning applications for these developments in greater detail.


Figure 5.4: Third Party Committed Development Indicative Locations

### *(1) Commercial Development, City Block 3, North Docklands (Ref. DSDZ2135/18)*

5.4.2 The City Block 3 Commercial development located at North Docklands (Figure 5.4 above) was granted planning permission by Dublin City Council in May 2018. The development proposals include the provision of 43,445sqm of office space, 91 vehicle parking spaces and 450 bicycle parking spaces.

5.4.3 In order to quantify the traffic generation from this third-party development, reference has been made to the Traffic Impact Assessment Report (dated 22nd January 2018) that was prepared by Roughan & O'Donovan. The TIA report states:-

*'The North Lotts SDZ Planning Scheme identifies that it is neither feasible nor desirable that demand for movement into or through this area is met by private car travel. Travel by private car will be suppressed by lack of parking supply, and lack of road network capacity. It was therefore agreed that it is not necessary to undertake a detailed assessment of traffic generation for the proposed development.'*

5.4.4 The TIA goes on to state:-

*'Only 91 car parking spaces will be provided within the proposed development. The development may give rise to a handful of vehicular traffic movements during peak hours during peak hours, but these would have a negligible impact on the surrounding road network.'*

5.4.5 As per the assumptions made within the Traffic Impact Assessment Report, DBFL have not included traffic generation from this third party development in the subject East Road developments' Traffic & Transport Assessment.

### *(2) Student Accommodation, City Block 5, North Docklands (Ref. DSDZ3689/15 as amended under Ref. DSDZ2155/18, Ref. DSDZ4385/16 and Reg.Ref. DSDZ2460/17)*

5.4.6 The City Block 5 Student Accommodation development located at North Docklands (Figure 5.2 above), was originally granted planning permission by Dublin City Council in March 2016. The development proposals include the provision of 2 student accommodation blocks encompassing 970 bed spaces,

ancillary ground floor uses, and 454 bicycle parking spaces. There are no car parking spaces proposed with the exception of 2 no. mobility impaired parking spaces.

5.4.7 As there is no general vehicle parking provided, and consequently there will be no vehicle traffic generation (during the network peak hours) from this third-party development, DBFL have therefore not included any vehicle traffic generation from this third-party development in the subject East Road developments' Traffic & Transport Assessment.

### *(3) Commercial Development, City Block 8, North Docklands (Ref. DSDZ2496/17, Ref. DSDZ2749/16, Ref. DSDZ3350/15)*

5.4.8 The City Block 8 Commercial development as located at North Docklands (Figure 5.2 above) was granted planning permission by Dublin City Council in November 2015. The development was subsequently amended under Ref. DSDZ2749/16 (September 2016), and Ref DSDZ2496/17 (May 2017), and now includes the provision of 170 residential units.

5.4.9 In order to quantify the traffic generation from this third-party development, reference has been made to the Traffic Impact Assessment Report (dated 19th April 2016) that was prepared by O'Connor Sutton Cronin.

5.4.10 The TIA report included estimated traffic generation for the development, which are indicated on Figure 8 contained within Appendix B.

### *(4) Hotel & Office Development, Spencer Place, North Wall Quay (Ref. DSDZ2661/17)*

5.4.11 This third-party hotel and office development as located at Spencer Place (Figure 5.2 above) was granted planning permission by Dublin City Council in September 2017. The development proposals included the provision of 9,205sqm Hotel and circa 46,184sqm office space; and retail/cafe/restaurant (873sqm).

5.4.12 In order to quantify the traffic generation from this third-party development, reference has been made to the Traffic Impact Assessment Report (dated March 2017) that was prepared by CS Consulting Group.

5.4.13 The TIA report included estimated traffic generation for the development, which are indicated on Figure 9 contained within Appendix B.

### *(5) Residential Development, Block 3 (eastern section), North Lotts (Ref. DSDZ3357/17, Ref. DSDZ2387/18)*

5.4.14 The City Block 3 Residential development located at North Docklands (Figure 5.2 above) was granted planning permission by Dublin City Council in August 2017 (amended under Ref. DSDZ2387/18). The development proposals include the provision of 360 residential units, 283 vehicle parking spaces and 483 bicycle parking spaces.

5.4.15 In order to quantify the traffic generation from this third-party development, reference has been made to the Traffic Impact Assessment Report (dated October 2016) that was prepared by Roughan & O'Donovan. The TIA report states:-

*'Pre-planning discussions were held with Ms. Mary Conway of DCC Planning Department and Mr. Kiaran Sweeney of the Transportation department. The discussions identified that the road network in te North Lotts cannot accommodate further peak hour vehicular traffic and that it is not necessary to undertake a detailed assessment of traffic generation The North Lotts SDZ Planning Scheme identifies that the rate of car ownership in the docklands is low and that commuting tends to be by other modes.'*

5.4.16 The TIA goes on to state:-

*'A limited quantum of car parking is proposed on site – but it is not envisaged that the cars will be used for commuting. Rather it is anticipated that the excellent accessibility of the site by foot, bicycle and public transport will result in these modes being preferred for commuting – as is the case in the rest of the docklands area. The development may give rise to a handful of vehicular traffic movements during the peak hours, but these would have a negligible impact on the surrounding road network'.*

5.4.17 As per the assumptions made within the Traffic Impact Assessment Report, DBFL have not included traffic generation from this third-party development in the subject East Road developments' Traffic & Transport Assessment.

### *(6) Spencer Dock Development (Ref. DSDZ3367/15)*

5.4.18 The Spencer Dock development as located at Block 2B of the North Lotts and Grand Canal Dock Planning Scheme 2014 (Figure 5.2 above) was granted planning permission by Dublin City Council in December 2015. The development

proposals include the provision of 165 residential units, 90 vehicle parking spaces and 186 bicycle parking spaces.

5.4.19 In order to quantify the traffic generation from this third-party development, reference has been made to the Transport Assessment Report (dated July 2015) that was prepared by Waterman Moylan Engineering Consultants. The TA report states:-

*'A pre-planning consultation was held with Roads and Traffic at the offices of Dublin City Council on Tuesday 9th June 2015. During the course of the meeting the DCC representatives advised that*

*(a) The overall draft proposals for access and circulation prepared by Waterman Moylan looked satisfactory from the traffic point of view. However, it was not possible to confirm that the proposals would be in compliance with the as yet undefined public realm strategy for Docklands…'*

5.4.20 The TIA goes on to state:-

*'A limited quantum of car parking is proposed on site – but it is not envisaged that the cars will be used for commuting. Rather it is anticipated that the excellent accessibility of the site by foot, bicycle and public transport will result in these modes being preferred for commuting – as is the case in the rest of the docklands area. The development may give rise to a handful of vehicular traffic movements during the peak hours, but these would have a negligible impact on the surrounding road network'.*

*Having regard to the fact that the existing road network infrastructure is running at capacity during peak hours, it is not reasonable to expect free flow traffic conditions in Docklands and surrounding area. It is reasonable to expect that individual transport choices will factor-in issues such as congestion and ease of access to alternative modes. Notwithstanding these capacity issues, the lands within the Planning Scheme including Spencer Dock has been deemed suitable for development being centrally located, with high quality existing and future public transport links.'*

5.4.21 As per the assumptions made within the Traffic Impact Assessment Report, DBFL have not included traffic generation from this third-party development in the subject East Road developments' Traffic & Transport Assessment.

5.4.22 As per the assumptions made within the Transport Assessment Report, DBFL have not included traffic generation from this third-party development in the subject East Road developments' Traffic & Transport Assessment.

### *(7) Commercial Development, City Block 5 & 10, North Docklands (Ref. DSDZ3632/15, DSDZ3686/16, DSDZ 3776/17)*

5.4.23 The Commercial development as located at City Blocks 5 & 10 of the North Lotts & Grand Canal Dock SDZ Planning Scheme (Figure 5.2 above) was granted planning permission by Dublin City Council in October 2017. The development proposals include the provision of 19,263sqm GFA of commercial space connecting to the existing constructed basement beneath the Point Village Square'. 48 vehicle parking spaces and 300 bicycle parking spaces will be provided.

5.4.24 In order to quantify the traffic generation from this third-party development, reference has been made to the Mobility Management Plan (dated September 2015) that was prepared by O'Connor Sutton Cronin.

5.4.25 The traffic generation for this third-party development is are indicated on Figure 10 contained within Appendix B.

### *(8) Residential Development, City Block 9, Dublin Docklands (Ref. DSDZ3779/17)*

5.4.26 This third-party residential development as located at City Block 9, Dublin Docklands (Figure 5.2 above) was granted planning permission by Dublin City Council in December 2017. The development proposals included the provision 420 residential units, a crèche (circa 281sqm), and 4 no. café/restaurant/retail units.

5.4.27 In order to quantify the traffic generation from this third party development, reference has been made to the Traffic and Transport Assessment Report (dated August 2017) that was prepared by Punch Consulting Engineers..

5.4.28 The TTA report included estimated traffic generation for the development, which are indicated on Figure 11 contained within Appendix B.

#### *(9) Commercial Development, City Block 9, North Docklands (Ref. DSDZ3780/17)*

5.4.29 This commercial development as located at City Block 9, Dublin Docklands (Figure 5.2 above) was granted planning permission by Dublin City Council in December 2017. The development proposals included the provision 35,883sqm commercial office space, 90 vehicle parking spaces and 360 bicycle parking spaces.

5.4.30 In order to quantify the traffic generation from this third-party development, reference has been made to the Traffic and Transport Assessment Report (dated August 2017) that was prepared by Punch Consulting Engineers.

5.4.31 The TTA report included estimated traffic generation for the development, which are indicated on Figure 11 contained within Appendix B.

#### *Committed Development Summary*

5.4.32 Beyond the above 9 number third party committed developments considered in this appraisal, DBFL have determined there are no other significant off-site committed developments that would generate a notable impact upon the local road network serving the subject site within the adopted 2035 design year.

## 5.5 TRIP DISTRIBUTION & ASSIGNMENT

#### *Proposed Development Trip Distribution*

5.5.1 For the adopted Opening Year of 2020 and Future Horizon Years of 2025 (+5 years) and 2035 (+15 years), the distribution of proposed development traffic as proposed by DBFL is presented in Figure 2 as included in Appendix B of this report. The associated residential vehicle trips have been assigned to the network based on the surveyed traffic movements passing the site on East Road.

## 5.6 TRAFFIC GROWTH

5.6.1 The TTA adopts an Opening Design Year of 2020. In accordance with TII (NRA) Guidance, Future Design years (+5 and +15 years) of 2025 and 2035 have therefore been adopted.

5.6.2 The TII Project Appraisal Guidelines (PAG) have been utilised to determine the traffic growth forecast rates. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for. Table 5.3.2 within the PAG provides Annual National Traffic Growth Factors for the different regions within Ireland. The subject Dunboyne site lies within 'Region 1 Dublin with the growth factors as outlined within Table 5.8 below.

| Region | Name | Low Growth | | | | Medium Growth | | | | High Growth | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2013-2030 | | 2030-2050 | | 2013-2030 | | 2030-2050 | | 2013-2030 | | 2030-2050 | |
| | | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV | LV | HV |
| 1 | Dublin | 1.0089 | 1.0221 | 1.0004 | 1.0135 | 1.0134 | 1.0237 | 1.0038 | 1.0176 | 1.0149 | 1.0242 | 1.0054 | 1.0195 |

Table 5.8 National Traffic Growth Forecasts: Annual Growth Factors
(Extract from Table 5.3.2 PAG)

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

- 2018 to 2020 – 1.027 (or 2.7%);
- 2018 to 2025 – 1.098 (or 9.8%); and
- 2018 to 2035 – 1.190 (or 19.0%).

5.6.4 The 'baseline' Do-Nothing traffic movements for the period 2020, 2025 and 2035 are presented in Appendix B.

## 5.7 ASSESSMENT SCOPE

### *Assessment Scenarios*

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

5.7.2 The 'Base' 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.

5.7.3 The proposed development traffic flows are then added to the network's 'Base' (Base + Committed Development) traffic flows to establish the new 'Post Development' traffic flows.

5.7.4 In summary the following scenarios are considered:-

*Do Nothing:*

- A1 – 2020 Base Flows + Committed Development;
- A2 – 2025 Base Flows + Committed Development; and
- A3 – 2035 Base Flows + Committed Development

*Do Something:*

- B1 - 2020 Do Nothing (A1) + Proposed Development Flows;
- B2 - 2025 Do Nothing (A2) + Proposed Development Flows; and
- B3 - 2035 Do Nothing (A3) + Proposed Development Flows.

*Assessment Periods*

5.7.5 The AM and PM peak hour flows have been identified as occurring between 07:30-08:30 and 17:00-18:00 respectively.

*Network Vehicle Flows*

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

- Figure 16 – 2020 Do Nothing (Scenario A1);
- Figure 17 – 2025 Do Nothing (Scenario A2);
- Figure 18 – 2035 Do Nothing (Scenario A3);
- Figure 19 – 2020 Do Something; (Scenario B1);
- Figure 20 - 2025 Do Something (Scenario B2); and
- Figure 21 - 2035 Something (Scenario B3).

## 5.8 NETWORK IMPACT

5.8.1 Figure 5.5 below details the amount of two-way vehicle trips to/from the proposed development site that will travel along East Road in the 2035 design year as result of the proposed subject development.

5.8.2 The resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development is established as below the 10% threshold (5% for congested networks) at the adjacent local key junctions.

5.8.3 It can be seen that the proposed subject development would result in the following during the 2035 Future Year (Opening Year +15): -

- Junction 1: East Wall Road/East Road signal-controlled junction - an increase of 0.2% (3 New Vehicle Trips) in the AM peak period, and 1.4% (27 New Vehicle Trips) in the PM peak period.
- Junction 2: East Road/Church Road/Site Access junction - an increase of 3.1% (38 New Vehicle Trips) in the AM peak period, and 5.2% (51 New Vehicle Trips) in the PM peak period; and
- Junction 3: East Road/Sherriff Street Upper/New Wapping St Junction - an increase of 1.77% (31 New Vehicle Trips) in the AM peak period, and 1.4% (22 New Vehicle Trips) in the PM peak period.

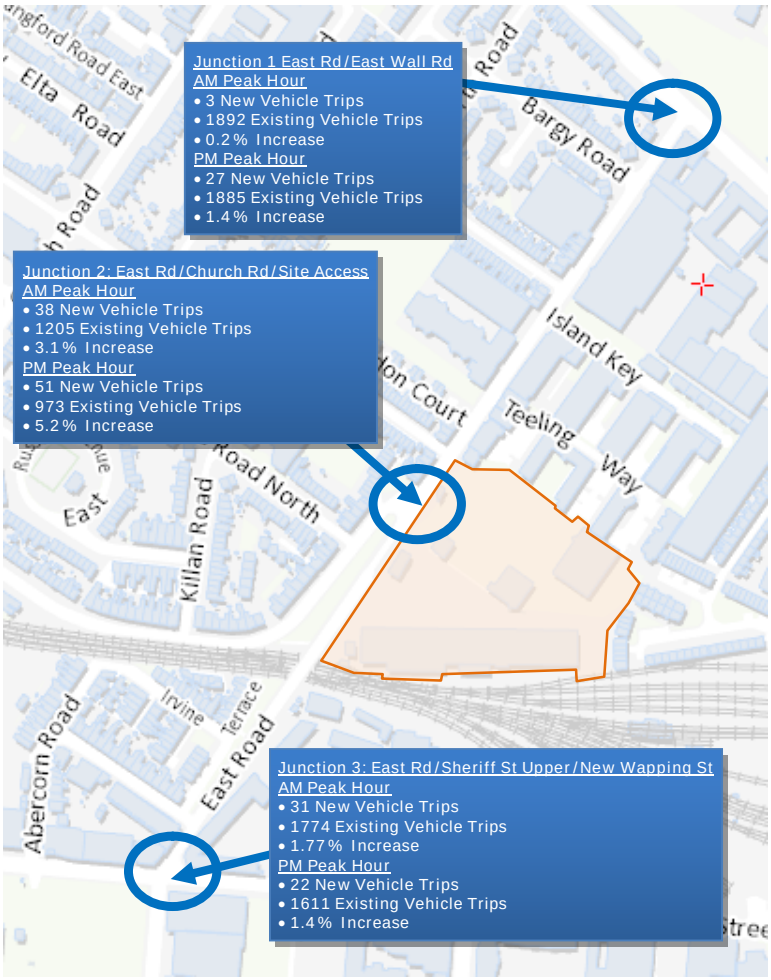



Figure 5.5: Increase in Vehicle Trips Generated at Key Local Junctions 2035

## 5.9 MITIGATION STRATEGY

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

### *Construction Stage*

5.9.2 The Construction Management Plan and the associated Construction Traffic Management Plan (CTMP), in addition to the subject 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.

5.9.3 The CTMP will be prepared prior to the commencement of construction work on site. This plan will be prepared in consultation with DCC and will be submitted for approval in order to agree on traffic management and monitoring measures some of which are outlined below:

- During the pre-construction phase, the site will be securely fenced off from adjacent properties, public footpaths and roads.
- The surrounding road network will be signed to define the access and egress routes for the development.
- The traffic generated by the construction phase of the development will be strictly controlled in order to minimise the impact of this traffic on the surrounding road network.
- All road works will be adequately signposted and enclosed to ensure the safety of all road users and construction personnel.

5.9.4 A programme of street cleaning (at site frontage and junction with Ballyogan Road) will be implemented.

### *Operational Stage*

5.9.5 With the objective of mitigating the potential impact of the proposed development as predicted in Section 5.8 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 number of management measures will be implemented prior to the subject scheme opening which include:-
    - A Mobility Management (MMP) is to be rolled out 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 site. It is proposed that two land use specific MMP's are developed under the framework of a 'parent' MMP for the entire site. These two associated MMP's will be developed in partnership with DCC to specifically consider the opportunities of shaping all journeys and promoting sustainable transport habits at both the proposed (i) apartments, and (ii) the Enterprise Hub.
    - The accesses to the under-croft parking areas will be barrier controlled to ensure unpermitted vehicles cannot gain entry. In order to be allocated a dedicated parking space within these under croft parking areas, both tenants and employees based at the site will have to apply to the management company to gain a parking permit and an assigned dedicated parking space, i.e. a tenant/employee is not automatically allocated a parking space when they take up residency or employment at the site.
    - The 7 number parking spaces within the internal court yard area will be restricted to short duration parking only (i.e. 30-60 minutes). A clamping enforcement regime will be in place within the site to ensure these parking restrictions are adhered to.
- Service – The facilitation of a dedicated car share facility (2 spaces) and associated service (by others) on East Road adjacent to the site will reduce the need to own a private motor car thereby contributing to reducing the overall number of vehicle trips generated by the proposed development.
- Facilities – The provision of a total of 112 short term and 698 long term bicycle parking stands/opportunities (810 in total).
- Infrastructure – Prior to 2020 Opening Year Upgrading of the East Road/Church Road/Site Access junction to traffic signal controlled.

# 6.0 NETWORK ANALYSIS

## 6.1 INTRODUCTION

6.1.1 The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package TRANSYT for signal-controlled junctions.

6.1.2 When considering signalised junctions, a Degree of Saturation (DoS) of greater than 90% (0.90) would indicate a junction to be approaching operational capacity. A 90-minute AM and PM period has been simulated, from 07:15 to 08:45 and 16:45 to 18:15. Traffic flows were entered using an Origin-Destination table for the peak hours.

6.1.3 In order to determine if the proposed upgraded site access junction will cater for the predicted level of traffic generation, a traffic modal of the site access junction was analysed for the schemes 2020 opening year and subsequent 2025 and 2035 future design years.

## 6.2 CHURCH ROAD/EAST ROAD/SITE ACCESS JUNCTION

6.2.1 The results of the operational assessment of this proposed upgraded four-arm signal-controlled 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: East Road North
Arm B: Site Access
Arm C: East Road South
Arm D: Church Road

6.2.2 The assessment has assumed that the 'all red' pedestrian stage is called every cycle during both the AM and PM Peak period. We believe this demand will actually overestimate the number of times the 'Pedestrian' stage will be called. As a result, the following results represent a worst-case assessment, with the junction actually performing better to that recorded within the following TRANSYT analysis.

6.2.3 A 100 second cycle time has been assessed, however as previously referred to in Section 4.2 of this report, should Dublin City Council seek to provide additional journey time delays/metering of through traffic on East Road, it will be achievable by adjusting the signal timings at the junction.

### *2020 Opening Year*

6.2.4 During the 2020 "Do Something" AM peak hour, with the inclusion of the subject development traffic, the junction simulation model (Table 6.1) results indicate the maximum degree of saturation (DOS) of 72% and a corresponding queue of 12.65 pcus will occur on the East Road northern arm of the junction.

6.2.5 For the 2020 "Do Something" PM peak hour, with the inclusion of the subject development traffic, the junction simulation model (Table 6.1) results indicate the maximum degree of saturation (DOS) of 62% and a corresponding queue of 11.67 pcus will occur on the East Road southern arm of the junction. The full output data is included in Appendix C.

| Periods | | AM | | PM | |
|---|---|---|---|---|---|
| Arm | Traffic Stream | Do Something | | Do Something | |
| | | DOS (%) | Mean Max Queue (pcu) | DOS (%) | Mean Max Queue (pcu) |
| A | | 72 | 12.65 | 22 | 3.06 |
| B | | 39 | 1.37 | 24 | 0.81 |
| C | | 31 | 4.25 | 62 | 11.67 |
| D | | 71 | 7.63 | 38 | 1.44 |

Table 6.1: TRANSYT Results: 2020 Opening Year – Do Something

### *2025 Future Year*

6.2.6 During the 2025 "Do Something" AM peak hour, with the inclusion of the subject development traffic, the junction simulation model (Table 6.2) results indicate the maximum degree of saturation (DOS) of 83% and a corresponding queue of 16.21 pcus will occur on the East Road northern arm of the junction.

6.2.7 For the 2025 "Do Something" PM peak hour, with the inclusion of the subject development traffic, the junction simulation model (Table 6.2) results indicate the maximum degree of saturation (DOS) of 68% and a corresponding queue of 13.64 pcus will occur on the East Road southern arm of the junction. The full output data is included in Appendix C.

| Periods | | AM | | PM | |
|---|---|---|---|---|---|
| Arm | Traffic Stream | Do Something | | Do Something | |
| | | DOS (%) | Mean Max Queue (pcu) | DOS (%) | Mean Max Queue (pcu) |
| A | | 83 | 16.21 | 25 | 3.60 |
| B | | 39 | 1.37 | 24 | 0.81 |
| C | | 34 | 4.66 | 68 | 13.64 |
| D | | 82 | 9.90 | 44 | 1.73 |

Table 6.2: TRANSYT Results: 2025 Future Year – Do Something

### *2035 Future Year*

6.2.8 During the 2035 "Do Something" AM peak hour, with the inclusion of the subject development traffic, the junction simulation model (Table 6.3) results indicate the maximum degree of saturation (DOS) of 88% and a corresponding queue of 18.61 pcus will occur on the East Road northern arm of the junction.

6.2.9 For the 2035 "Do Something" PM peak hour, with the inclusion of the subject development traffic, the junction simulation model (Table 6.3) results indicate the maximum degree of saturation (DOS) of 72% and a corresponding queue of 15.08 pcus will occur on the East Road southern arm of the junction. The full output data is included in Appendix C.

| Periods | | AM | | PM | |
|---|---|---|---|---|---|
| Arm | Traffic Stream | Do Something | | Do Something | |
| | | DOS (%) | Mean Max Queue (pcu) | DOS (%) | Mean Max Queue (pcu) |
| A | | 88 | 18.61 | 26 | 3.80 |
| B | | 39 | 1.37 | 24 | 0.71 |
| C | | 36 | 4.98 | 72 | 15.08 |
| D | | 88 | 11.55 | 48 | 1.90 |

Table 6.3: TRANSYT Results: 2035 Future Year – Do Something

6.2.10 The TRANSYT results (Tables 6.1-6.3) indicate that the site access junction will operate within capacity for the 2020 opening year and the 2025 and 2035 future horizon years. The highest degrees of saturation (Dos) and corresponding queues are being experienced on the East Road northern arm during the AM peak period, and the East Road southern arm during the PM peak period, respectively. DBFL believe these results are consistent with the existing AM and PM travel demands (i.e. in the AM peak period the majority of vehicles are travelling southbound/inbound, whilst in the PM peak period the demand is reversed.

# 7.0 SUMMARY AND CONCLUSIONS

## 7.1 SUMMARY

7.1.1 This Traffic and Transport Assessment has been undertaken to quantify the potential influence of the proposed mixed-use development on lands at East Road, upon the operational performance of the local area road network. Our methodology incorporated a number of key inter-related stages, including:-

- Site Audit;
- Planning File Review;
- Policy Review;
- Traffic Surveys;
- Trip Generation, Distribution and Assignment;
- Network Impact; and
- Network Assessment.

## 7.2 CONCLUSION

7.2.1 The principal findings that can be drawn from this TTA are as follows:

- The site is ideally situated to benefit from a comprehensive range of transport connections which result in the site benefiting from excellent accessibility levels for all modes of travel. Furthermore, the range and proximity of a number of existing (and emerging) public transport interchanges further enhances the sustainability characteristics of the site. These include both the Docklands Rail Station and the LUAS Red Line (Spencer Dock interchange) being only 550m and 650m, respectively, from the proposed development. In addition, Connolly Station and the proposed Clongriffin-Tallaght BRT interchange are within 1.4km from the site, whilst the proposed interchange for the proposed Dart Underground is located at the Docklands Rail Station, approximately 550m from the subject site.
- The subject site on East Road is ideally located to benefit from the enhanced accessibility levels delivered by the emerging BusConnects proposals.

- The NTA's Cycle Network Plan for the Greater Dublin Area includes proposals for the provision of a secondary cycle route along East Road adjacent to the subject.
- The upgrading of the Church Road/East Road/Site Access junction to traffic signal controlled will enable the removal of the traffic signal controls at the rail bridge which will be beneficial for a number of reasons including:-

    a. the allocation of dedicated traffic signal stages to the two minor arms of the junction (i.e. Church Road and the site access road), will effectively impose journey time delays to the north-south traffic movements on East Road, thereby replicating the traffic calming effects of the traffic signals at the rail bridge.

    b. Should Dublin City Council seek to provide additional journey time delays/metering of through traffic on East Road, it will be achievable by adjusting the signal timings at the junction.

    c. The proposed upgraded junction arrangement will provide dedicated pedestrian crossing facilities (for all travel desire lines), thereby removing the existing lengthy uncontrolled crossings and the associated safety risks that they present to pedestrians at this vehicle dominated location.

    d. The proposed upgraded junction arrangement will improve the existing restricted visibility available for vehicle drivers exiting Church Road, caused by existing ongoing inappropriate parking practices at the junction.

    e. The proposed upgraded junction arrangement will control the speed at which vehicles can travel through the junction with the provision of reduced junction corner radii thereby providing a marked improvement over the existing situation.

    f. The proposed upgraded junction arrangement will enable the provision of approximately 82m north-eastbound and 124m south-westbound of cycle lanes along the subject site boundary on East Road. This route is identified as a secondary cycle route in the Greater Dublin Area Cycle Network Plan.

g. The proposed junction arrangement allows the provision 4 car parking spaces on East Road adjacent to the subject site.

- The resulting percentage increase in traffic flows as a result of the traffic generated by the proposed development is established as below the 10% threshold (5% for congested networks) at the adjacent local key junctions.
- It can be seen (Figure 7.1) that the proposed subject development would result in the following during the 2035 Future Year (Opening Year +15): -

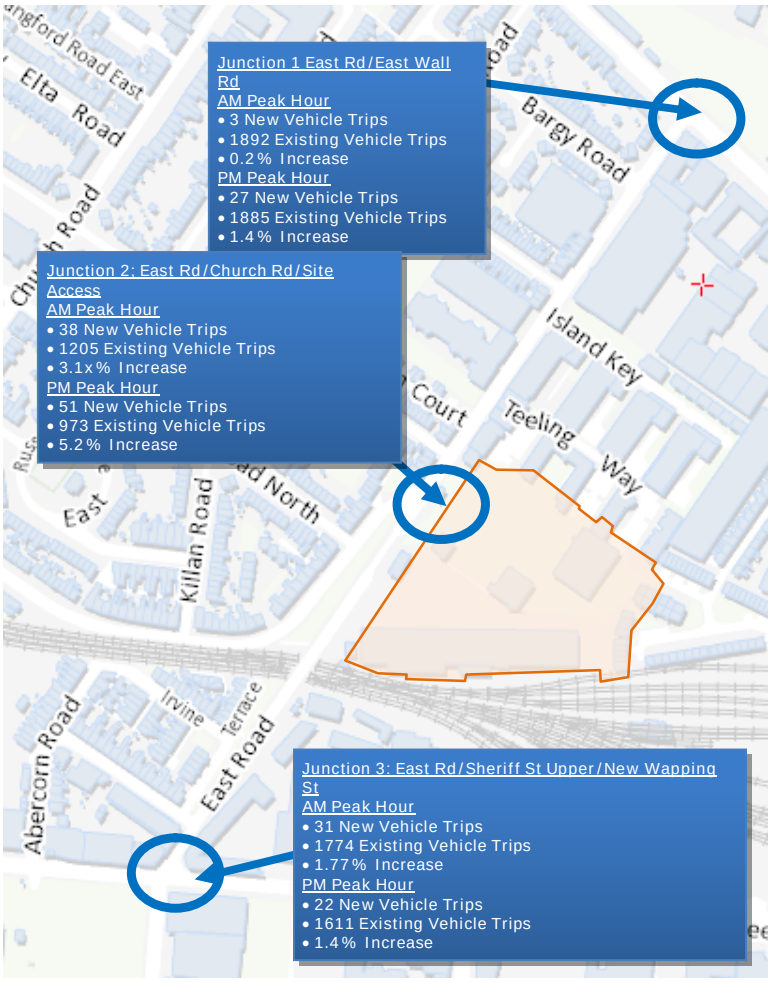



Figure 7.1: Increase in Vehicle Trips Generated at Key Local Junctions 2035

o Junction 1: East Wall Road/East Road signal-controlled junction - an increase of 0.2% (3 New Vehicle Trips) in the AM peak period, and 1.4% (27 New Vehicle Trips) in the PM peak period.

o Junction 2: East Road/Church Road/Site Access junction - an increase of 3.1% (38 New Vehicle Trips) in the AM peak period, and 5.2% (51 New Vehicle Trips) in the PM peak period; and

- Junction 3: East Road/Sherriff Street Upper/New Wapping St Junction - an increase of 1.77% (31 New Vehicle Trips) in the AM peak period, and 1.4% (22 New Vehicle Trips) in the PM peak period.

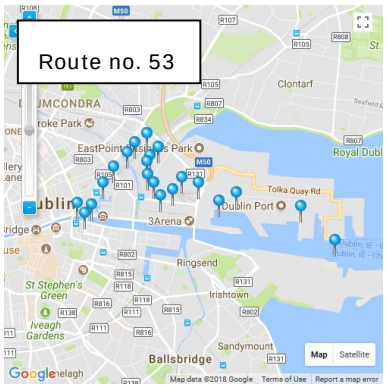
- The junction analysis of the proposed Site Access junction, operating with a signal-controlled arrangement, reveals that this junction will operate with reserve capacity in the 2020 Opening Year, 2025 and 2035 Future Design years.
- A mitigation strategy has been identified which includes a package of measures/initiatives aimed at reducing the impact of the development on the surrounding local road network.

7.2.2 In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed development on the East Road lands will be minimal. This is based on the anticipated levels of traffic generated by the proposed development, the existing and future road infrastructure and the information and analysis summarised in the above report. It is concluded that there are no traffic or transportation related reasons that should prevent the granting of planning permission for the proposed development.

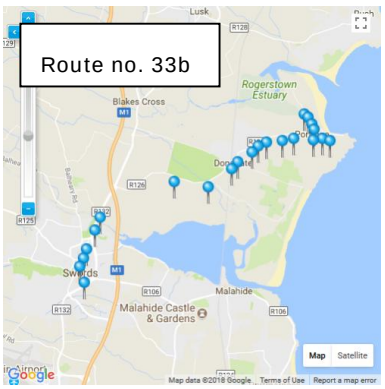
# APPENDICES

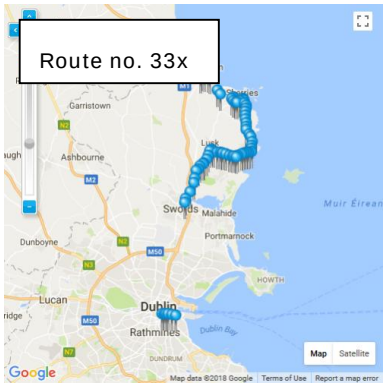
# APPENDIX A

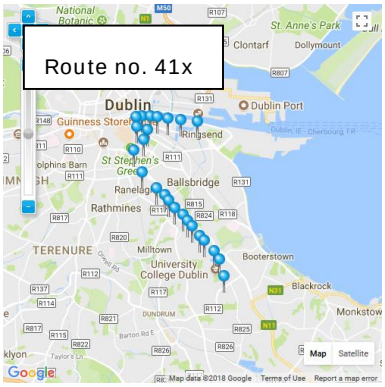
## Public Transport Bus Routes

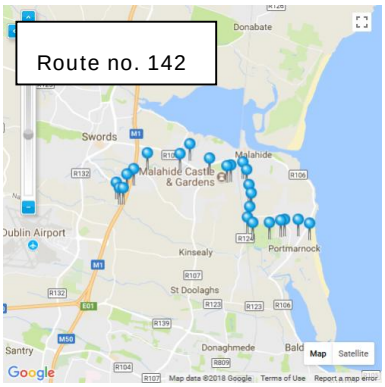

Route no. 53


Route no. 151


Route no. 33b


Route no. 33x


Route no. 41x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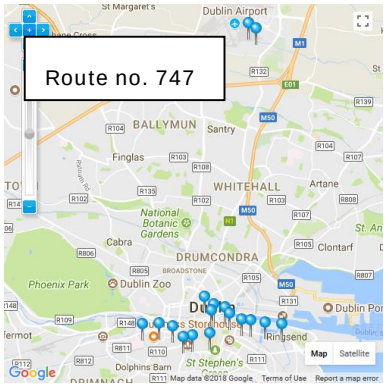
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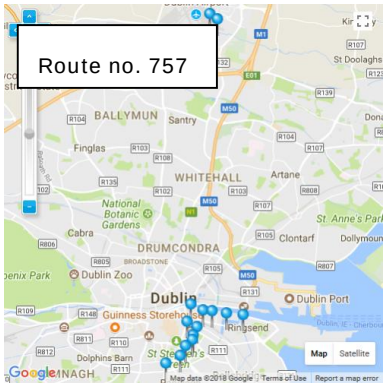
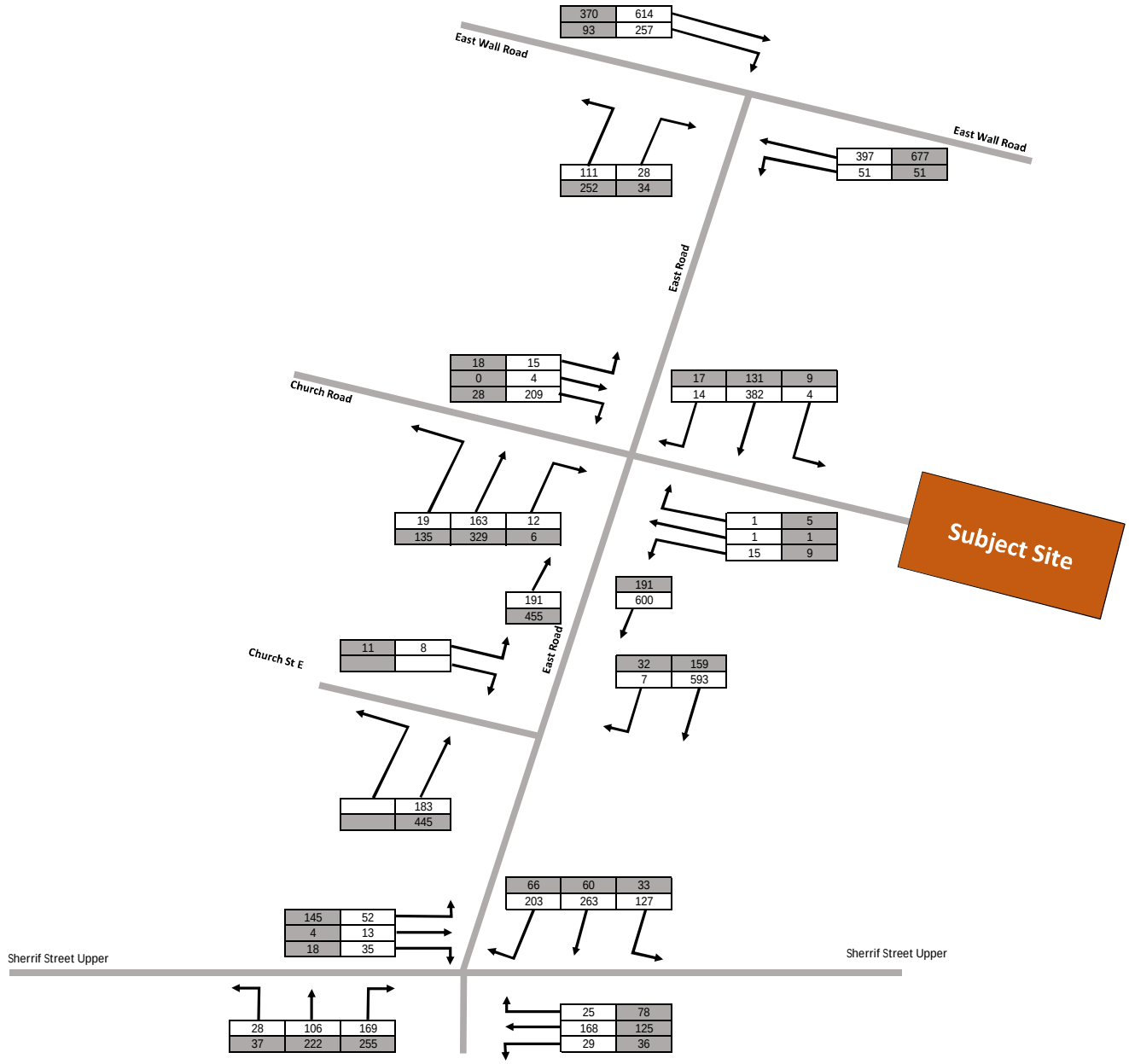

Route no. 757

# APPENDIX B

## Traffic Flow Diagrams

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website: www.dbfl.ie

Project:
1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
2018 Surveyed Flows

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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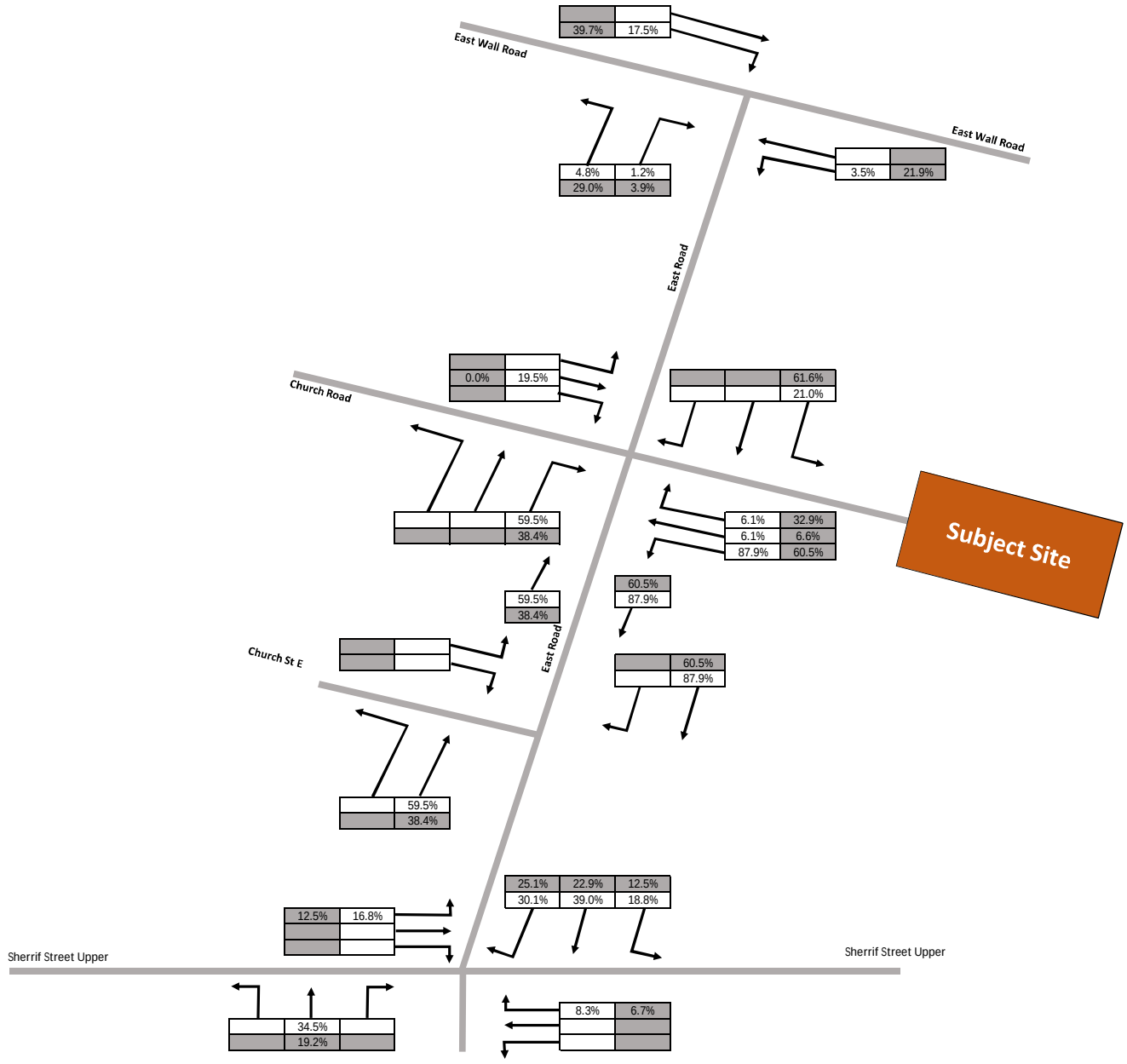


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Project:
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DRG. Title:
Network Traffic Flows
Existing Site % Distribution

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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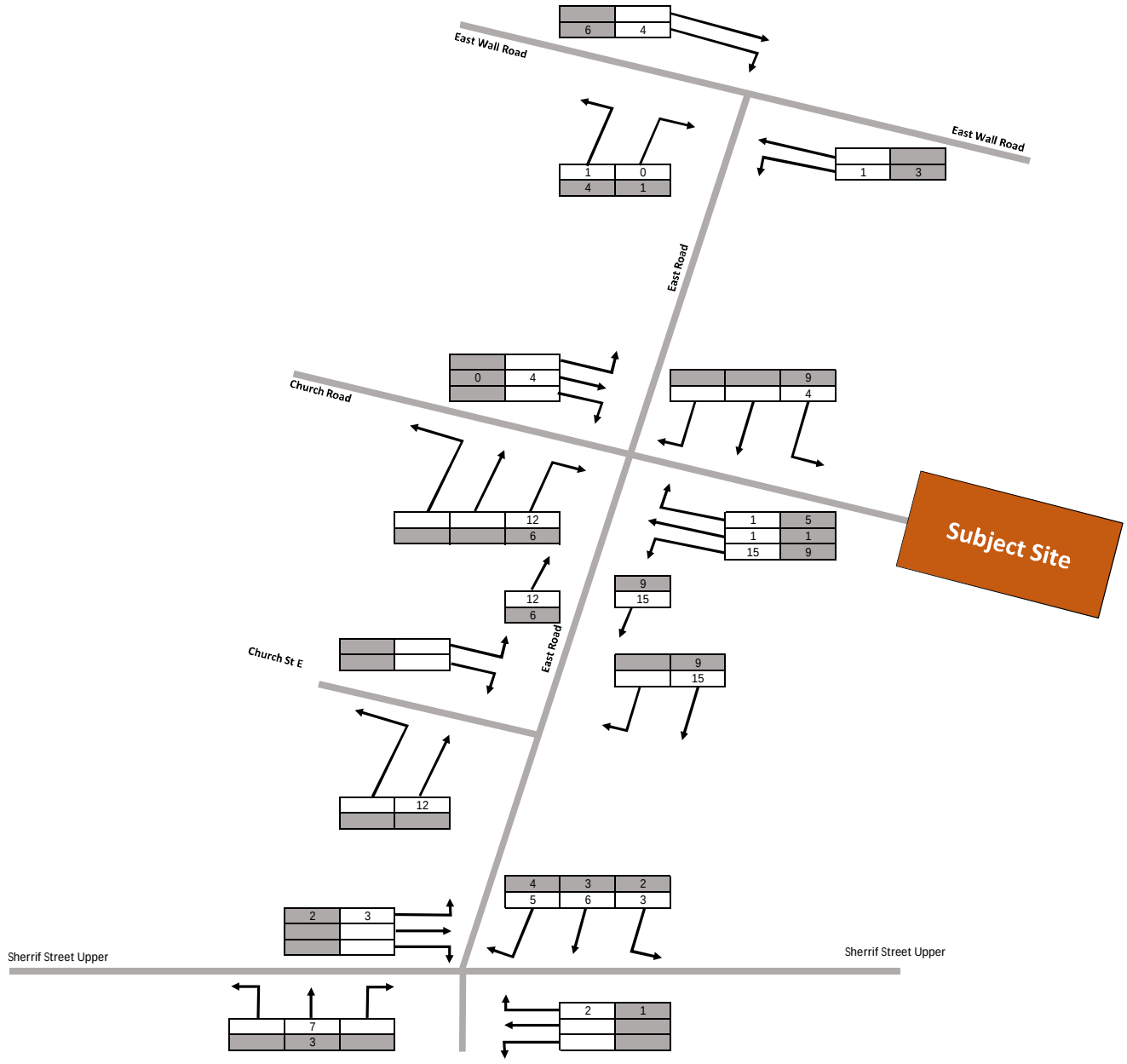
Rev:

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Project:
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DRG. Title:
Network Traffic Flows
Existing Site Flows

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| AM | | PM | |
|---|---|---|---|
| Arr | Dep | Arr | Dep |
| 21 | 17 | 15 | 15 |

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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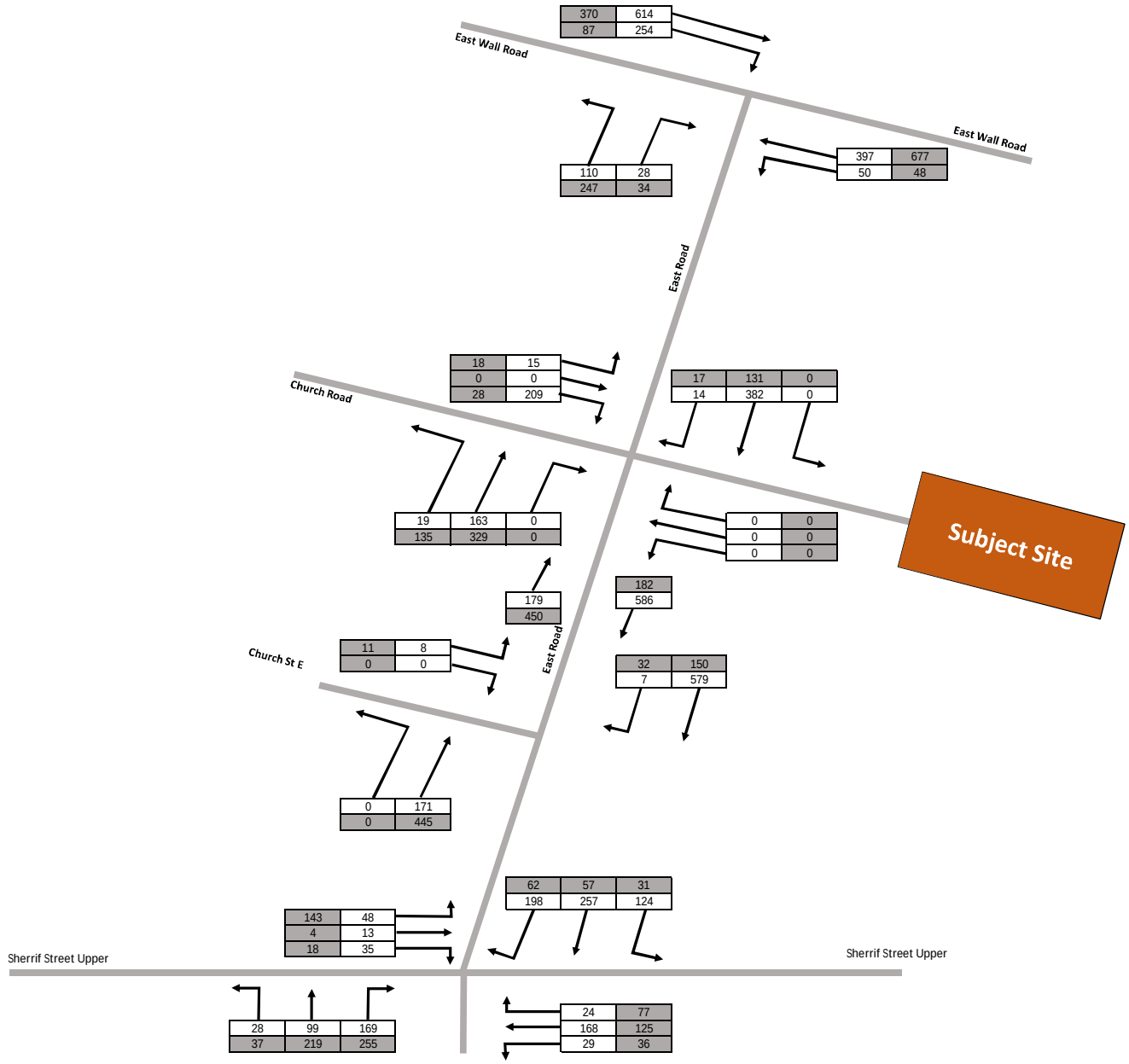


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DRG. Title:
Network Traffic Flows
Base 2018 Flows

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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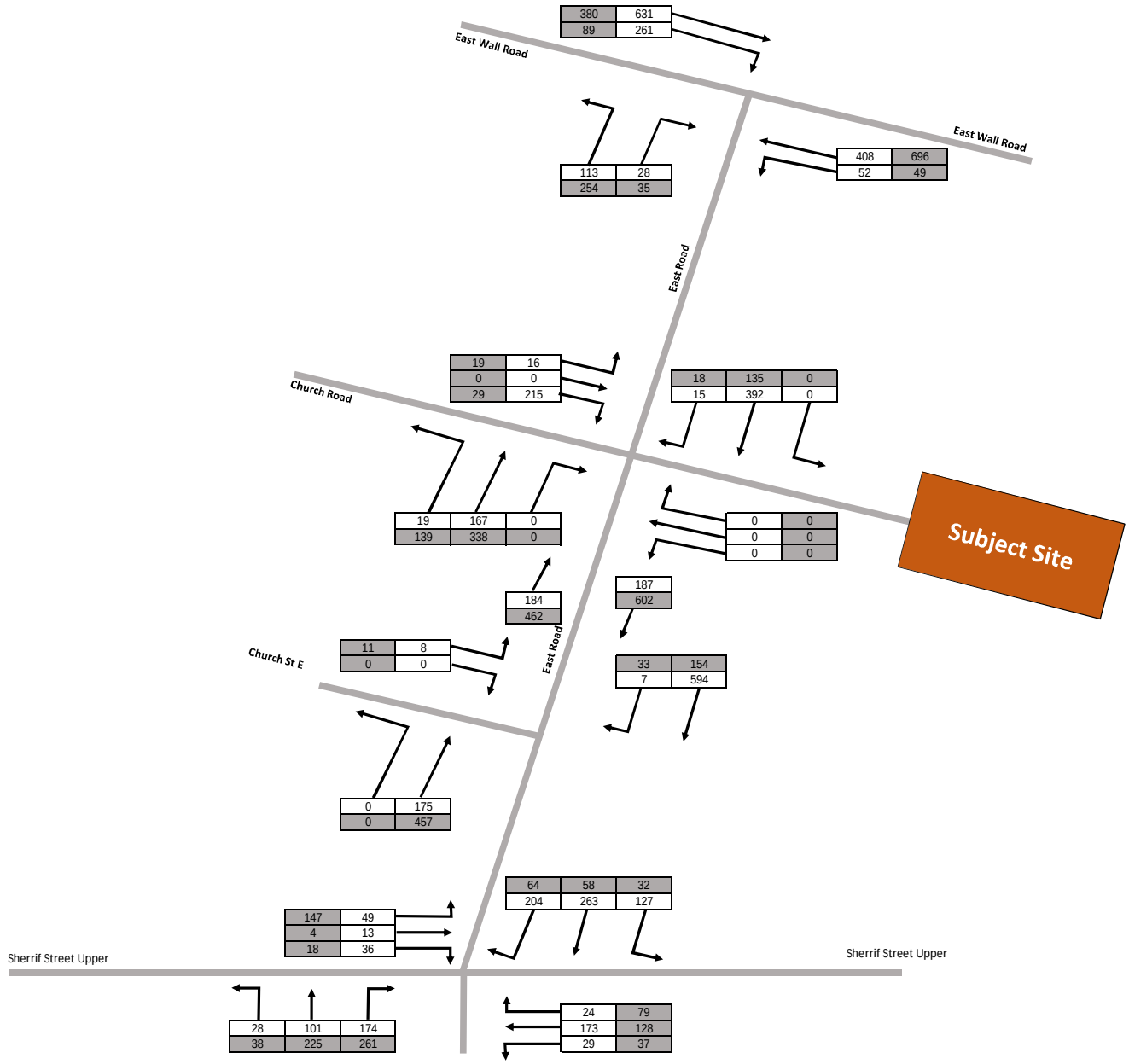


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Project:
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DRG. Title:
Network Traffic Flows
Base 2020 Flows

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

GR 1.02698

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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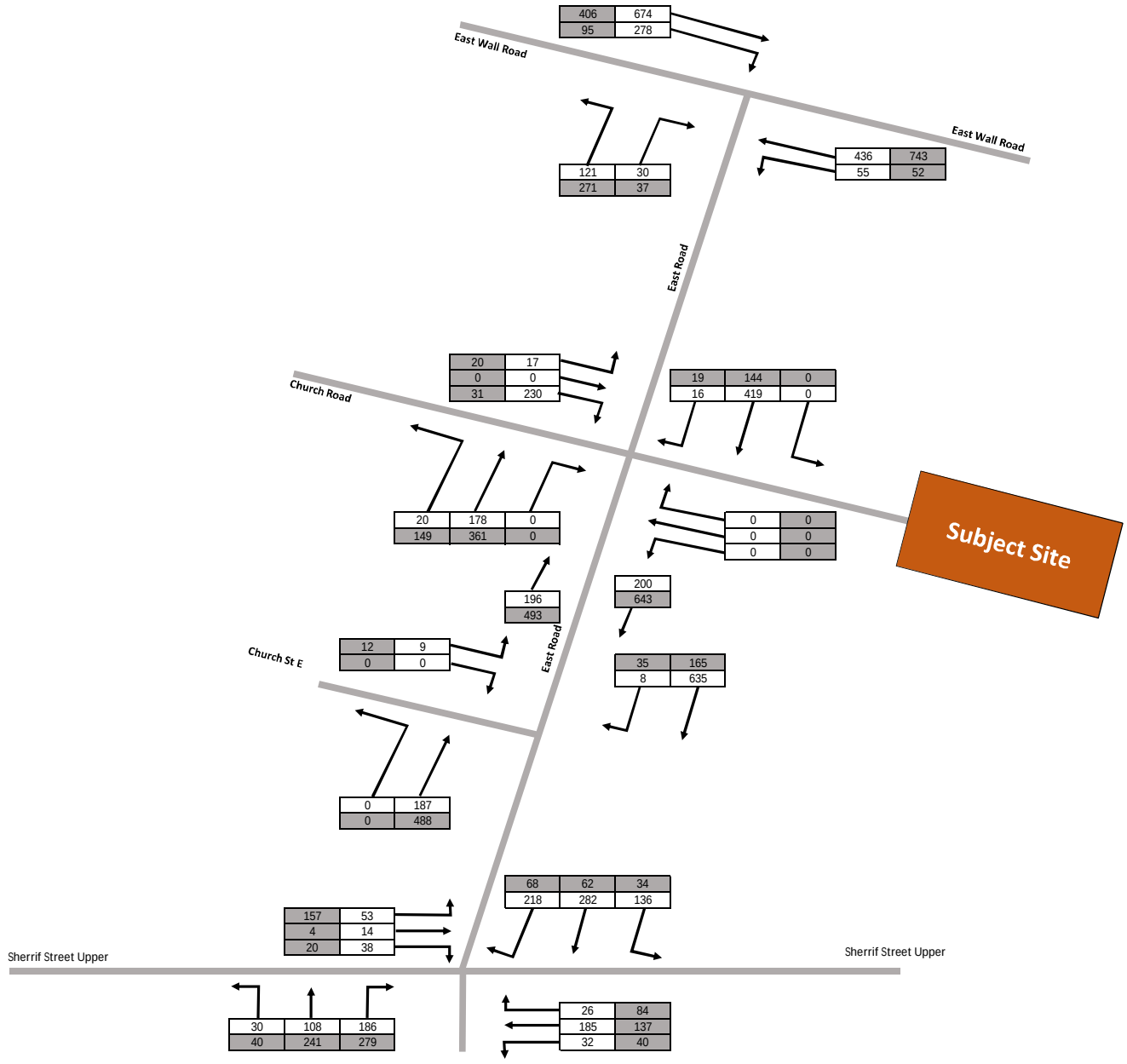


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DRG. Title:
Network Traffic Flows
Base 2025 Flows

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

GR 1.097656

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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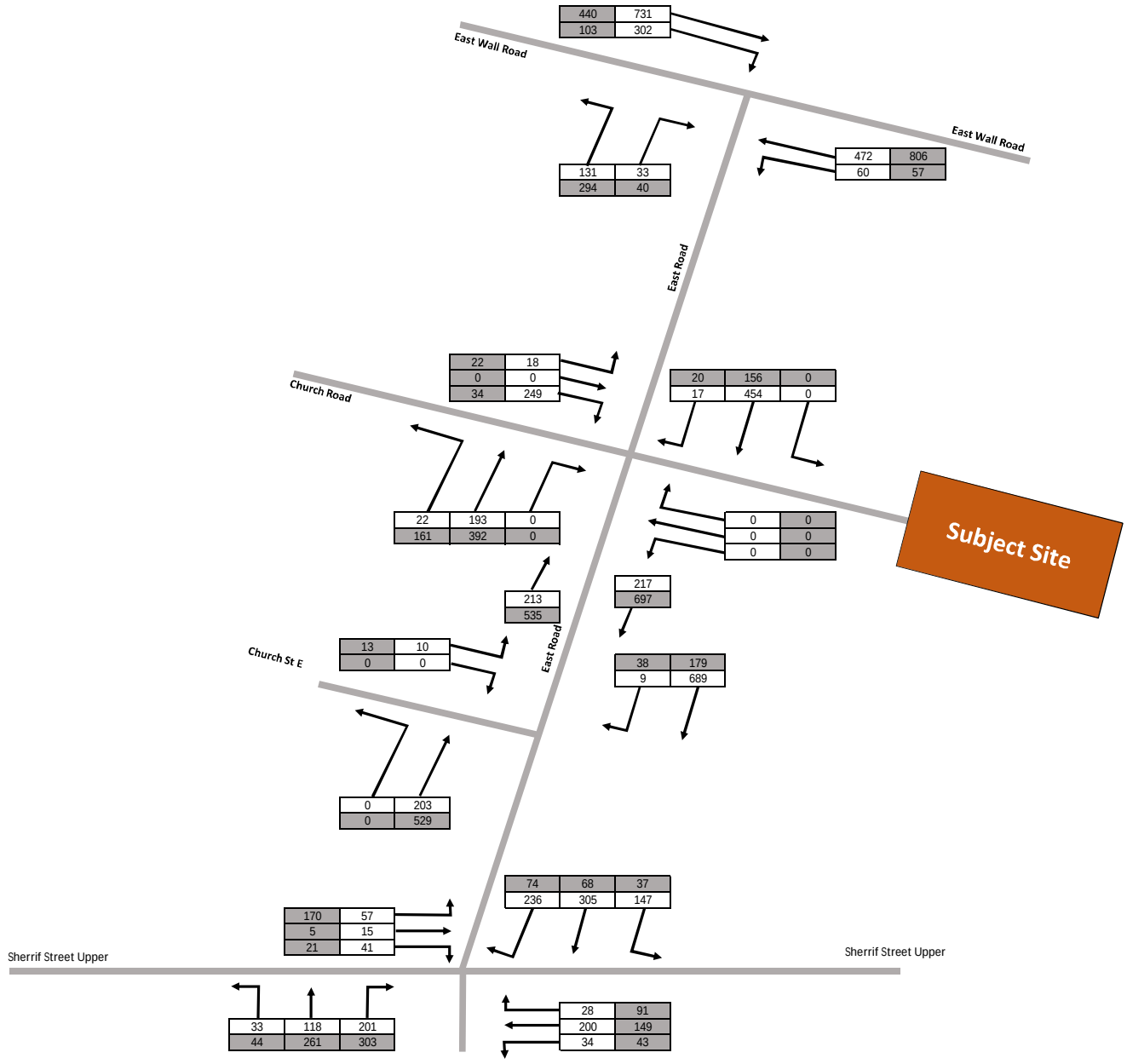


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Project:
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DRG. Title:
Network Traffic Flows
Base 2035 Flows

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

GR 1.190242

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

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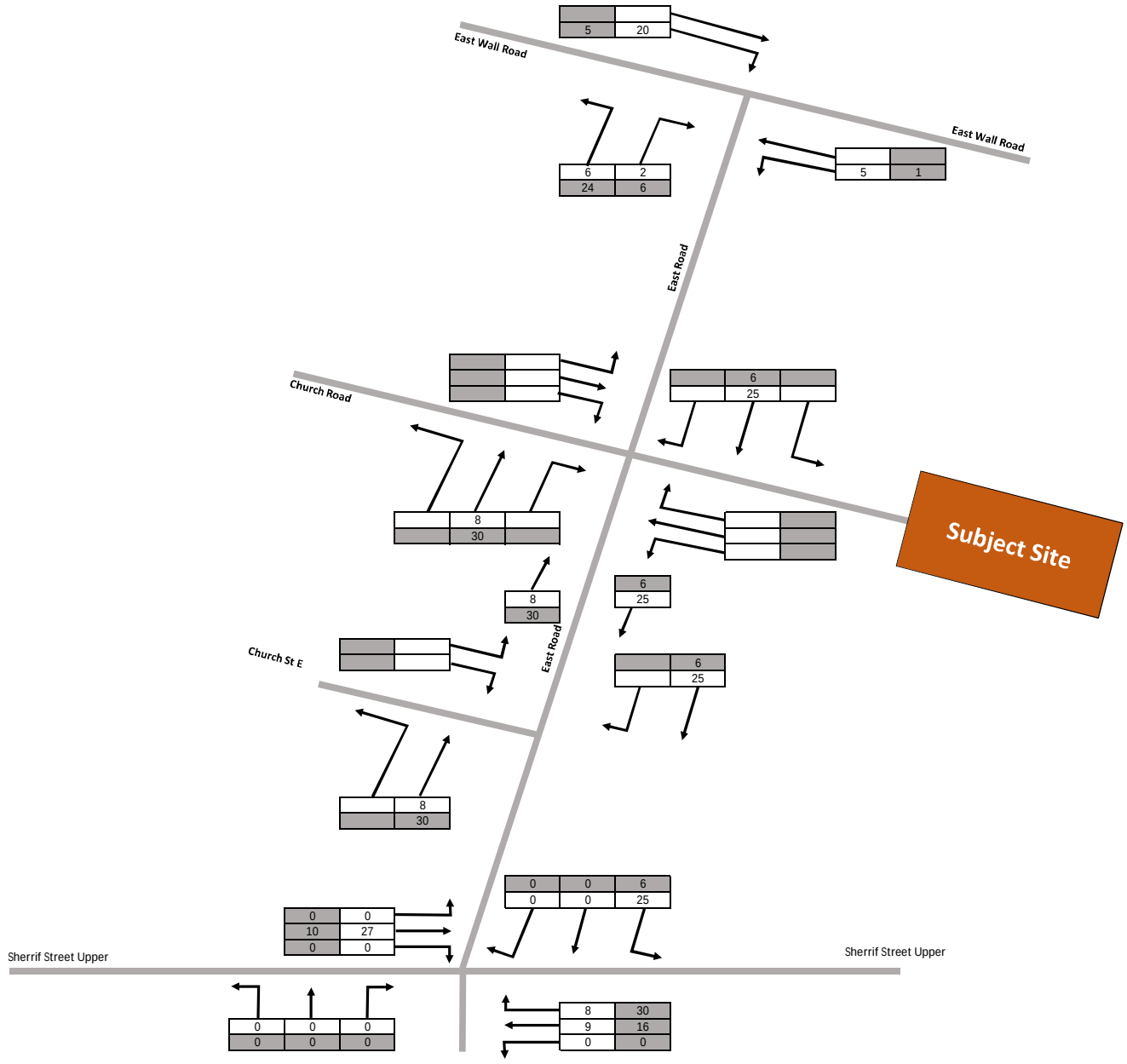


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DRG. Title:
Network Traffic Flows
Committed Development 3

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

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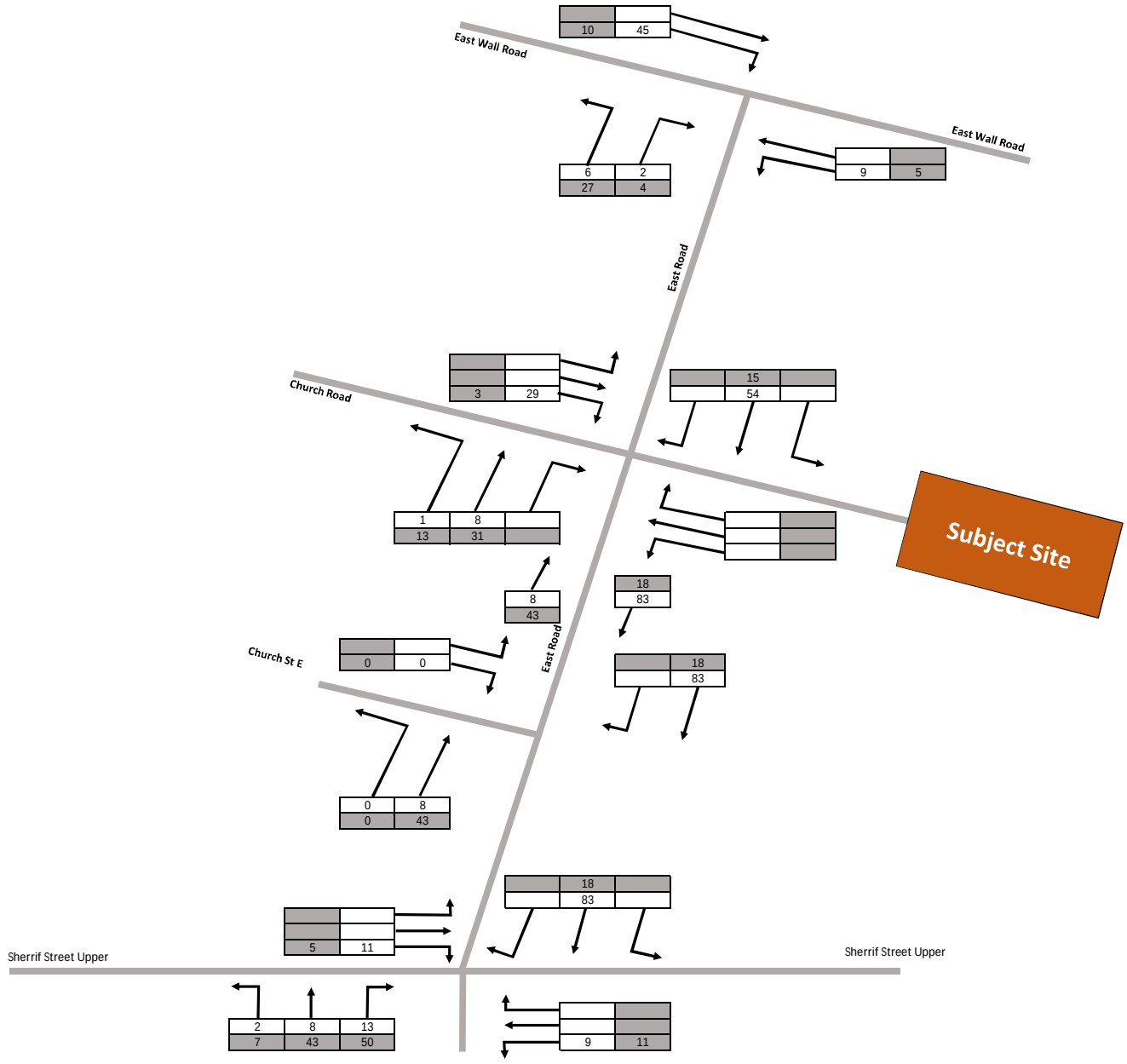


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DRG. Title:
Network Traffic Flows
Committed Development 4

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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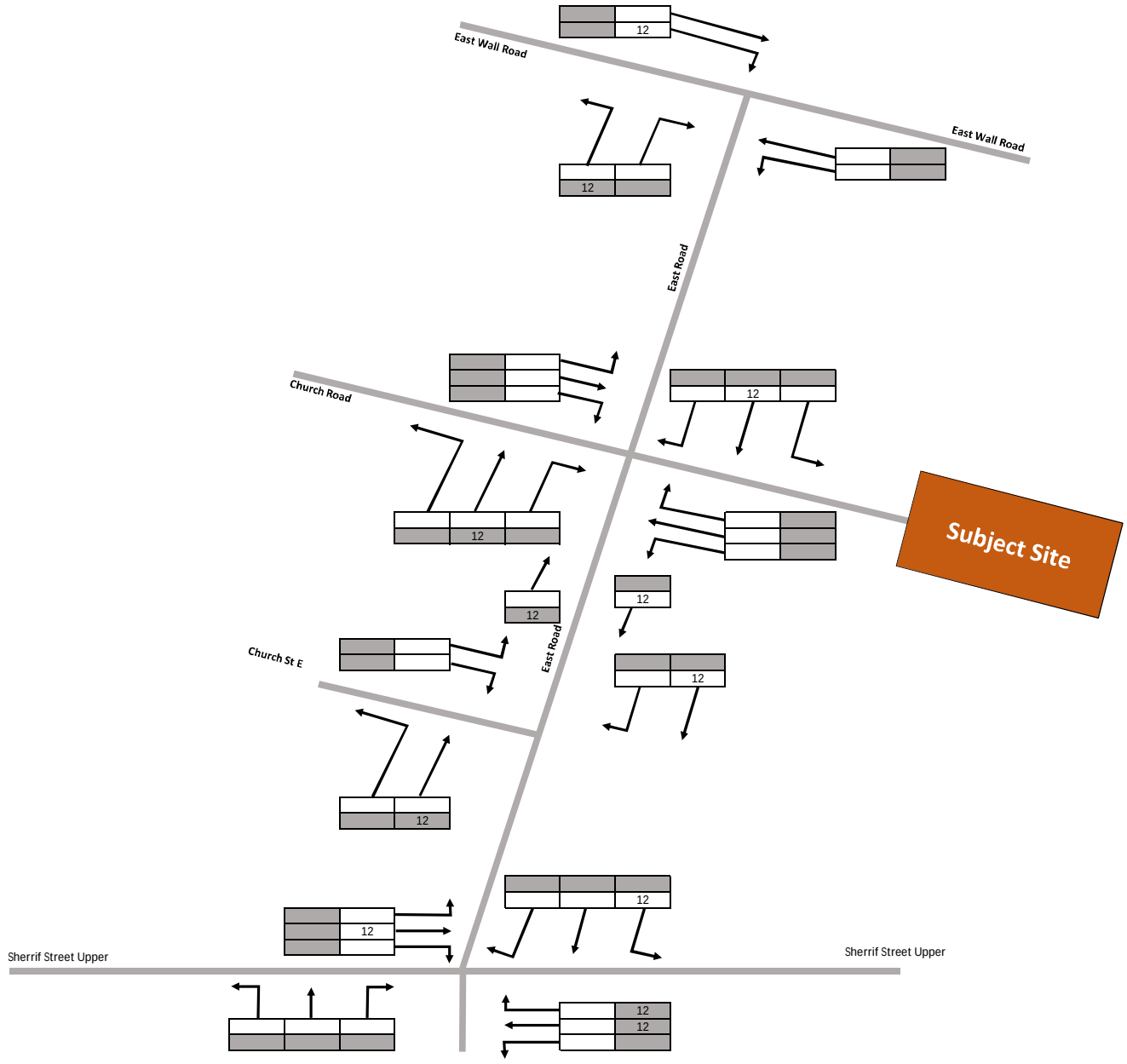


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1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
Committed Development 7

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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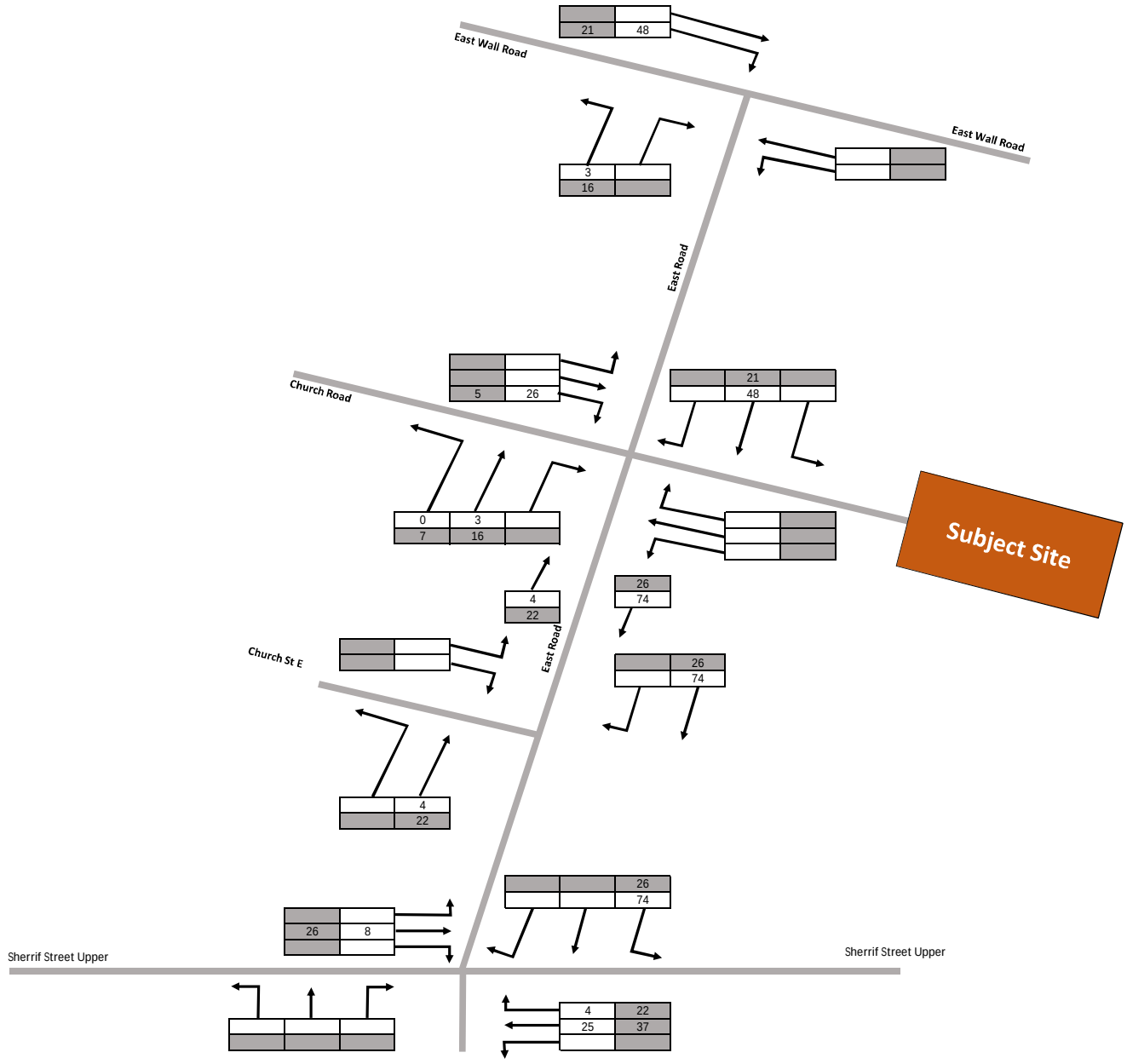


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Project:
1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
Committed Developments 8 & 9

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

2021 Opening Year

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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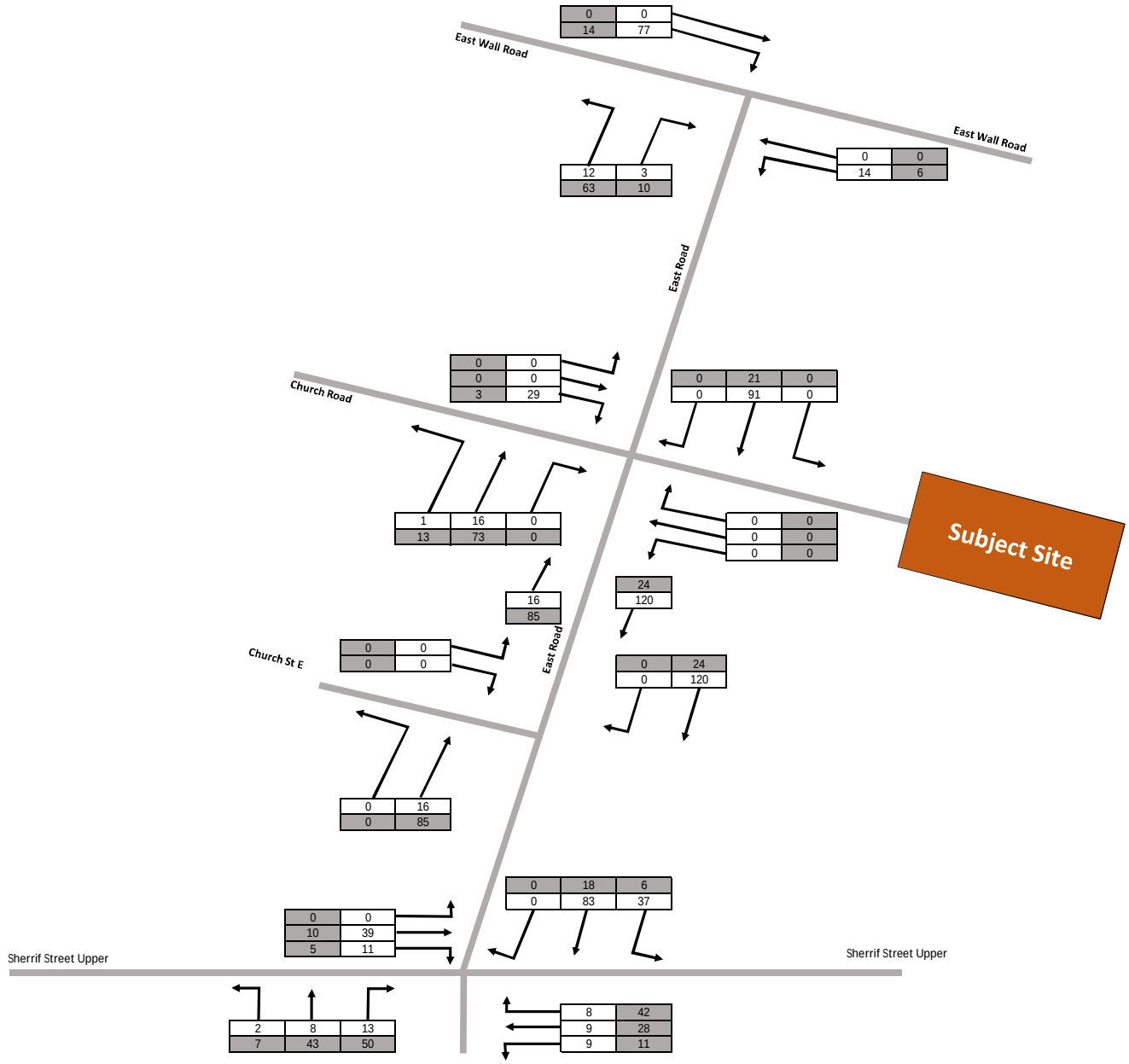


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1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
Committed Development Total 2020

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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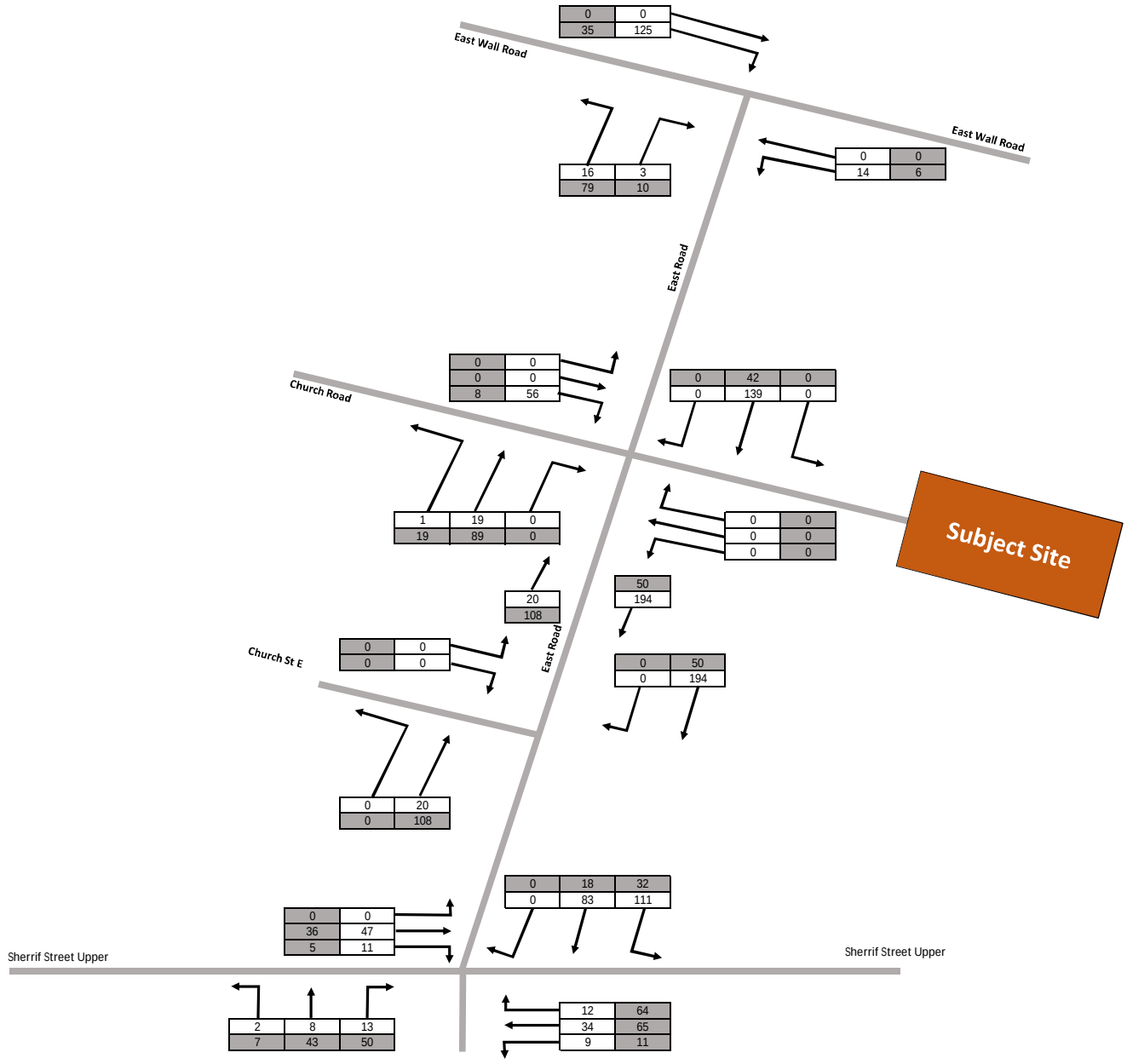


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Project:
1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
Committed Development Total Future Year

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

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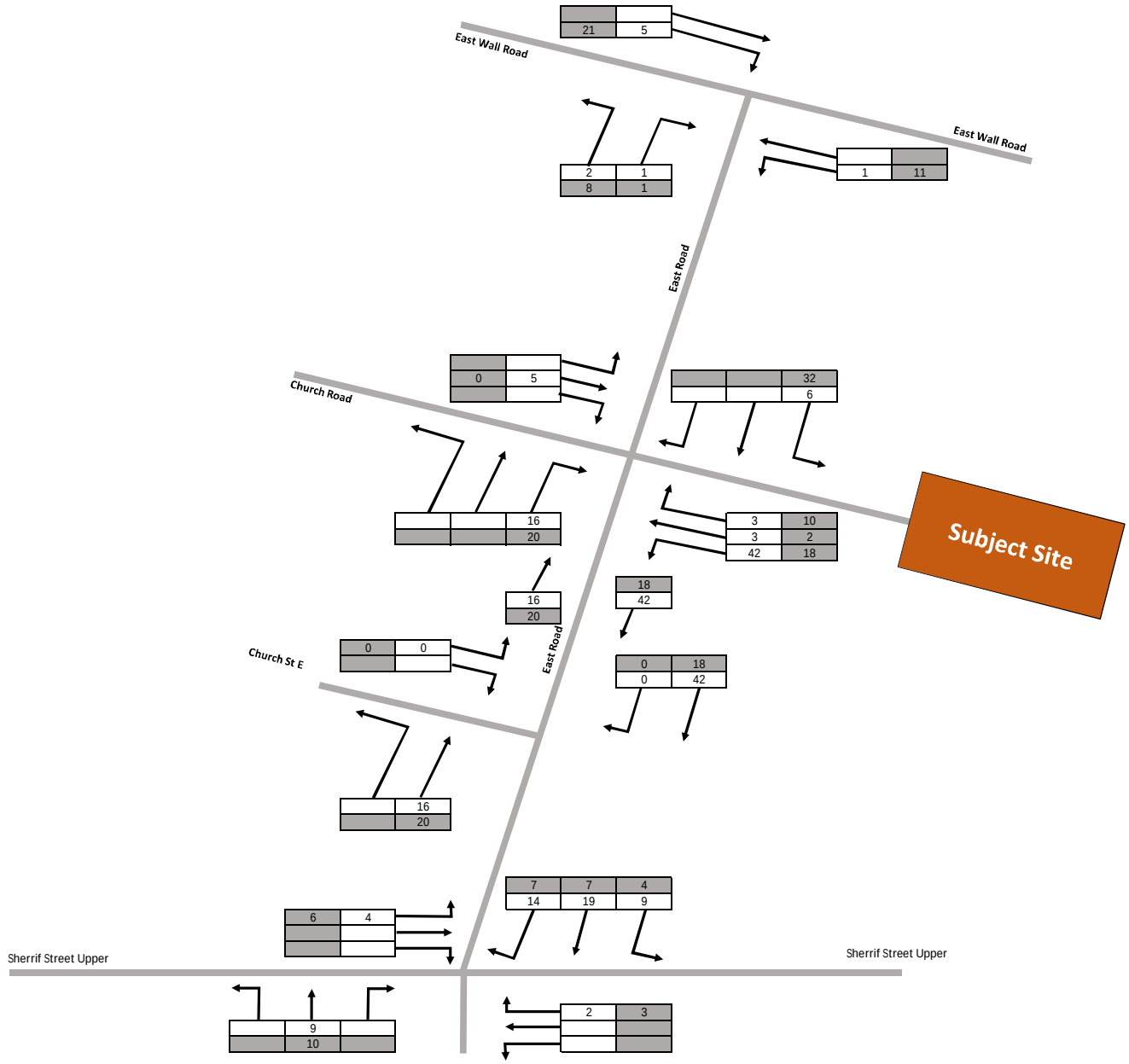


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email: info@dbfl.ie
website: www.dbfl.ie

Project:

1-3 East Road Dublin

DRG. Title:

Network Traffic Flows
Development Flows 2020

Key:

AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

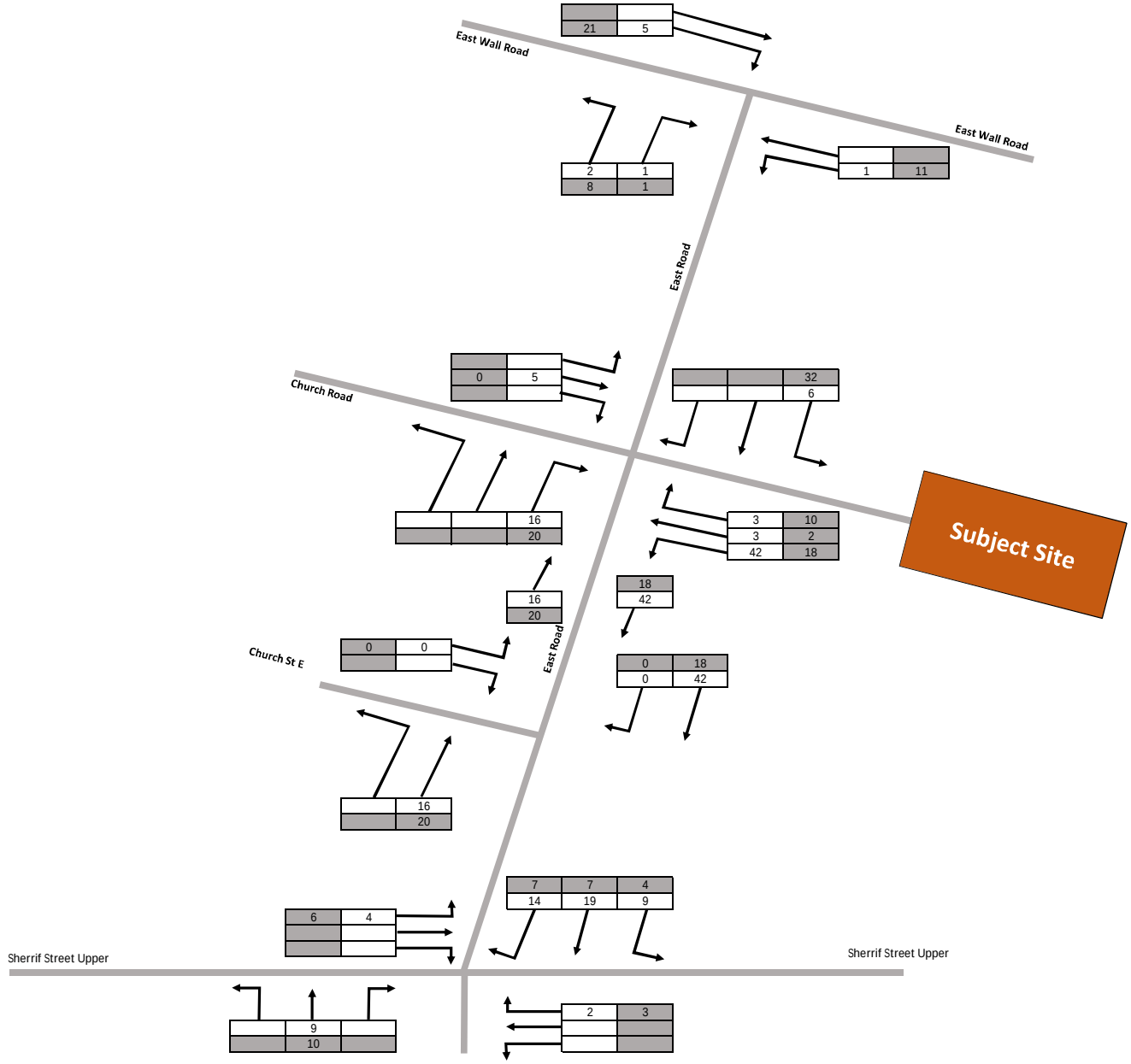
| AM Peak | | PM Peak | |
|---|---|---|---|
| Arr | Dep | Arr | Dep |
| 27 | 48 | 52 | 29 |

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure 14

Rev:

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email: info@dbfl.ie
website: www.dbfl.ie

Project:

1-3 East Road Dublin

DRG. Title:

Network Traffic Flows
Development Flows 2025 & 2035

Key:

AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

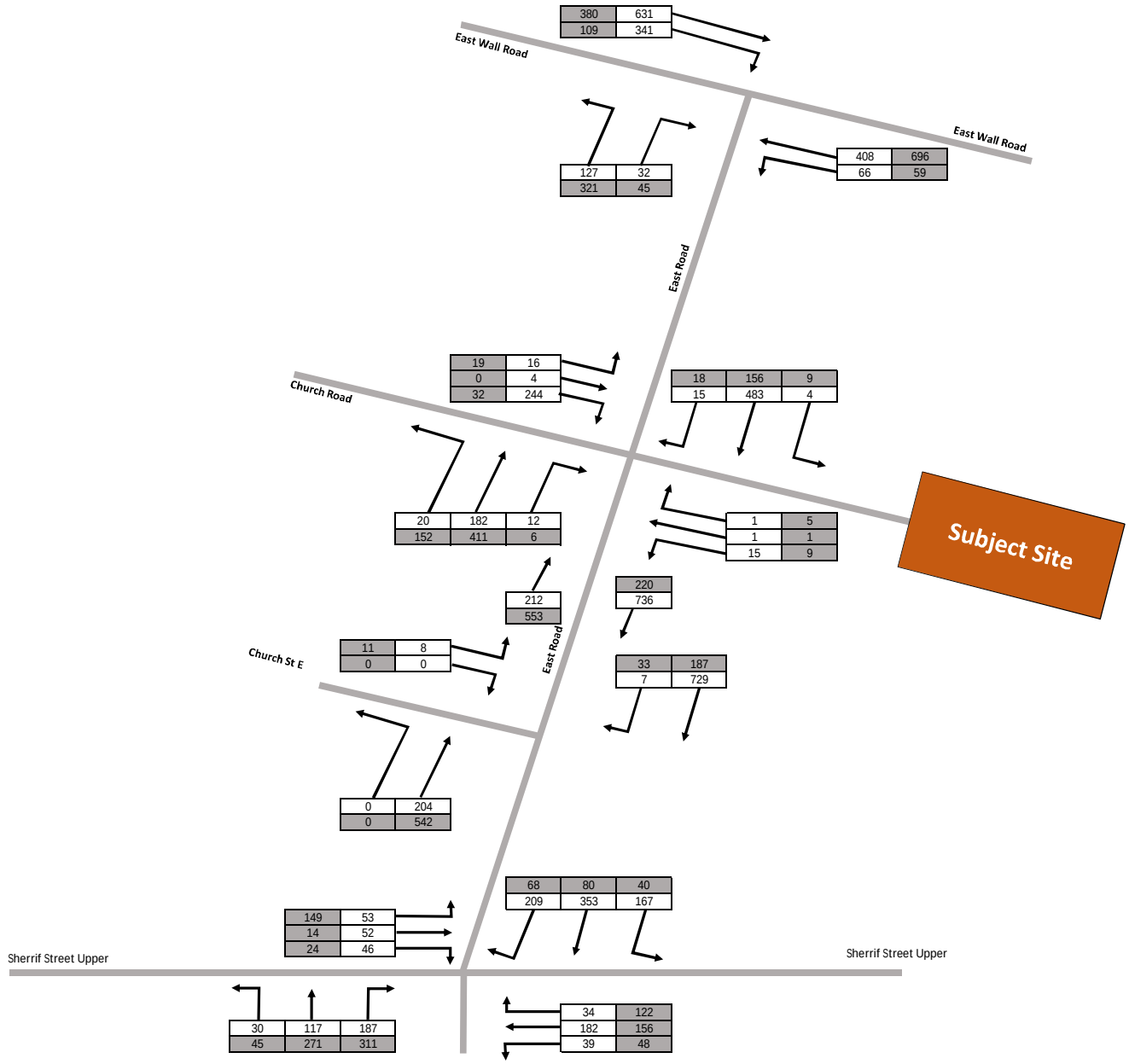
| AM Peak | | PM Peak | |
|---|---|---|---|
| Arr | Dep | Arr | Dep |
| 27 | 48 | 52 | 29 |

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure 15

Rev:

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Project:
1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
2020 Do Nothing

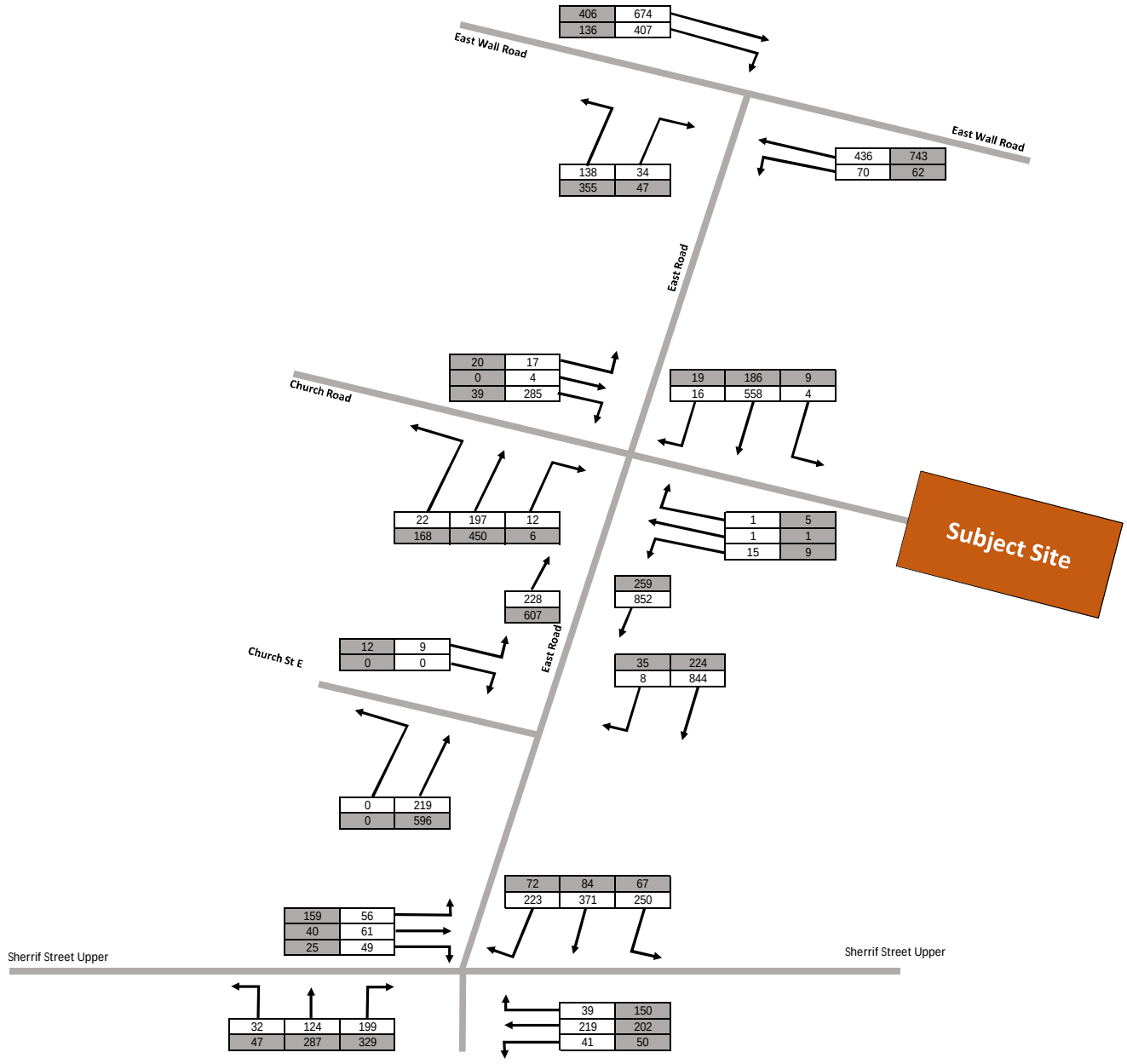
Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure: 16

Rev:

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Project:
1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
2025 Do Nothing

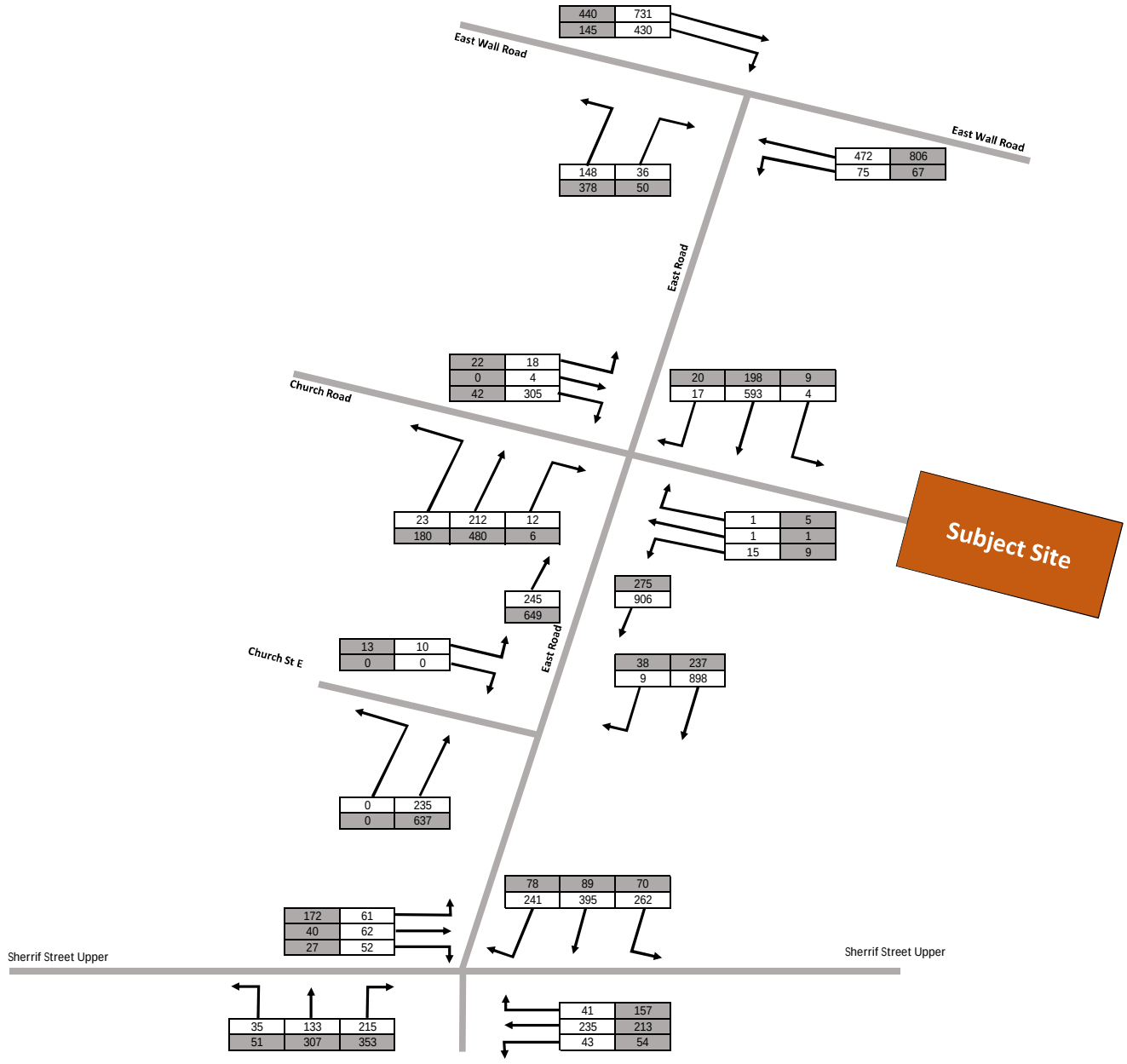
Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure: 17

Rev:

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Project:
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DRG. Title:
Network Traffic Flows
2035 Do Nothing

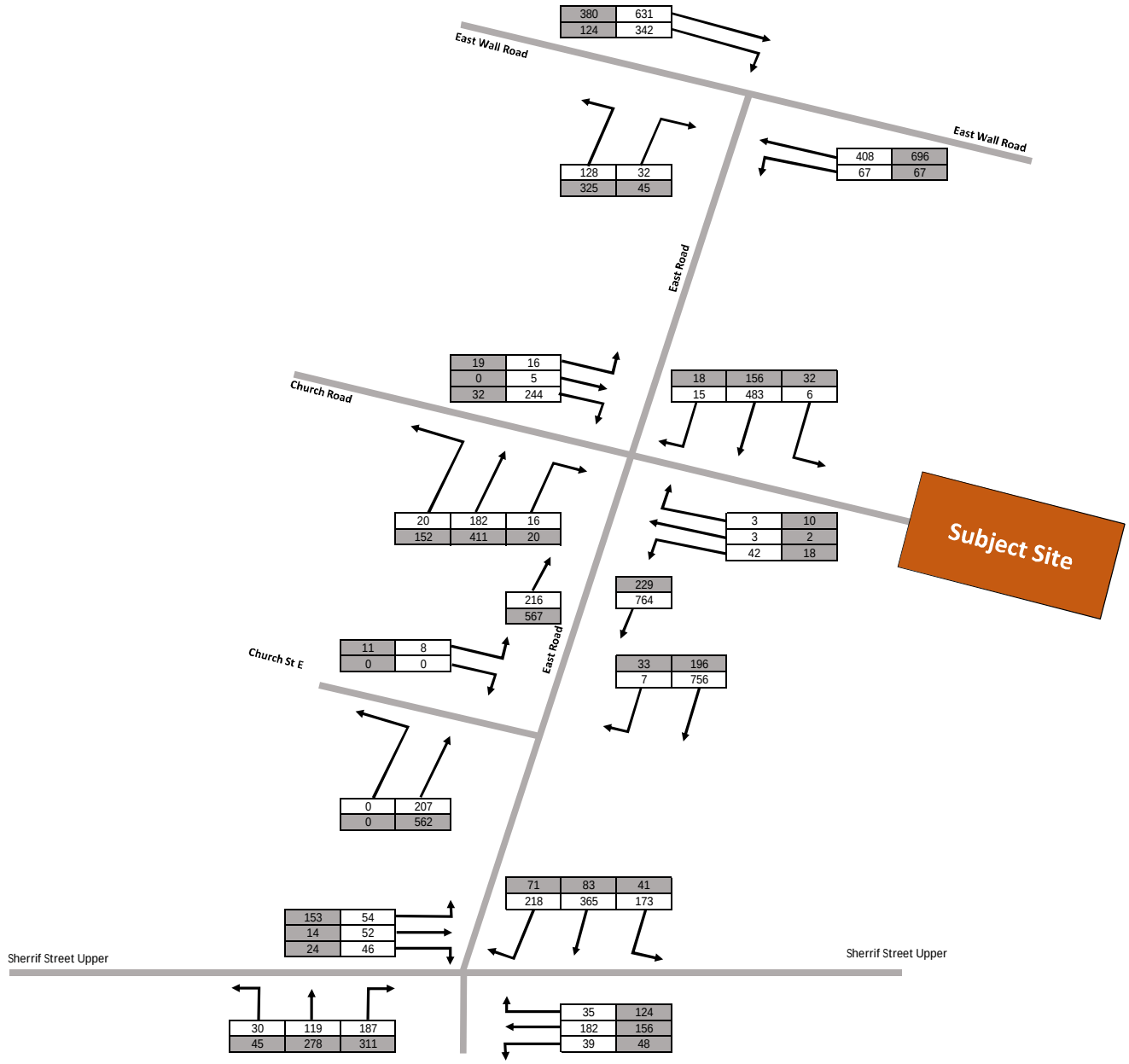
Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure: 18

Rev:

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Project:
1-3 East Road Dublin

DRG. Title:
Network Traffic Flows
2020 Do Something

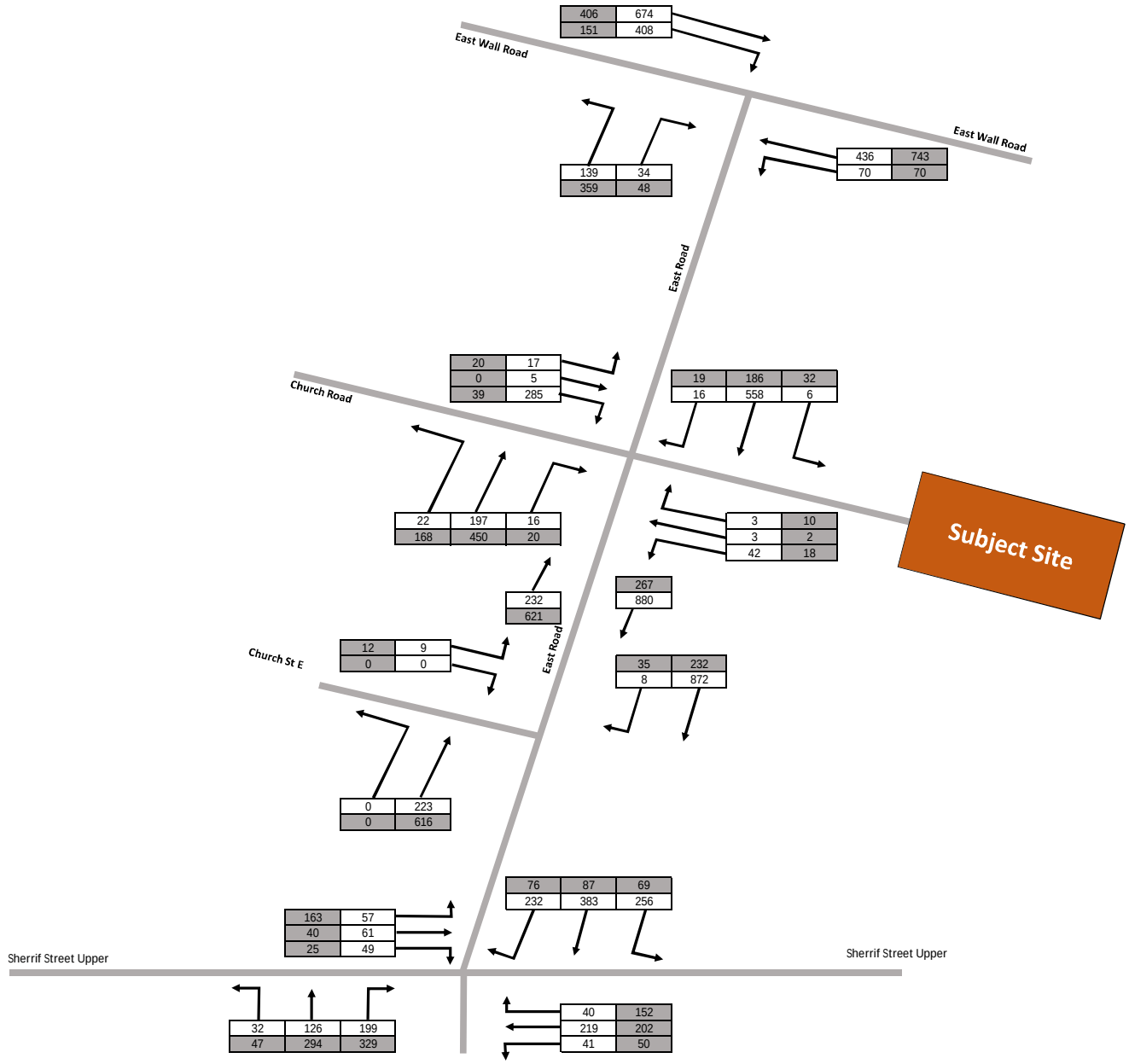
Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure: 19

Rev:

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Project: 1-3 East Road Dublin

DRG. Title: Network Traffic Flows
2025 Do Something

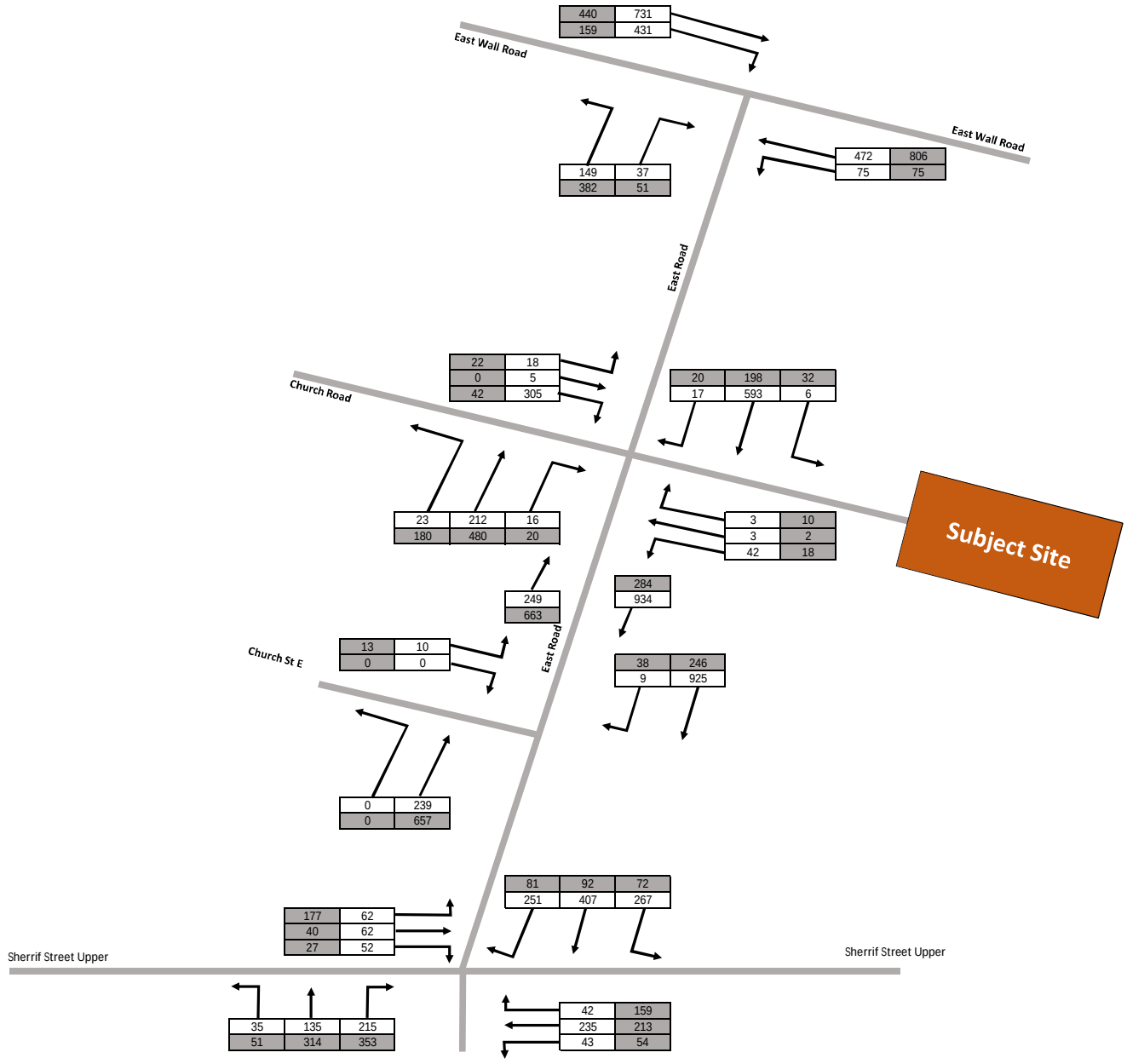
Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure: 20

Rev:

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DRG. Title:
Network Traffic Flows
2035 Do Something

Key:
AM Peak Hour (0730 - 0830)
PM Peak Hour (1700 - 1800)

| Dwn: | Ckd: | Date: |
|---|---|---|
| TM | TJ | 01/05/2018 |

Ref: 170200

Figure: 21

Rev:

# APPENDIX C

## TRANSYT Output Files

# TRANSYT 15

Version: 15.5.1.7048


For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 770558 software@trl.co.uk www.trlsoftware.co.uk



**Filename:** Site Access Junction (No flares with storage)_Nov 2018 Planning.t15
**Path:** G:\2017\p170200\Calcs\Traffic Calcs\Transyt
**Report generation date:** 13/12/2018 08:59:02



## File summary

### File description

| | |
|---|---|
| File title | (untitled) |
| Location | |
| Site number | |
| UTCRegion | |
| Driving side | Left |
| Date | 28/05/2018 |
| Version | |
| Status | (new file) |
| Identifier | |
| Client | |
| Jobnumber | |
| Enumerator | HEADOFFICE\haleyj |
| Description | |

## Model and Results

| Enable controller offsets | Enable fuel consumption | Enable quick flares | Display journey time results | Display level of service results | Display blocking and starvation results | Display end of red and green queue results | Display excess queue results | Display separate uniform and random results | Display unweighted results | Display TRANSYT 12 style timings | Display effective greens in results | Display Red-With-Amber | Display End-Of-Green Amber |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

## Units

| Cost units | Speed units | Distance units | Fuel economy units | Fuel rate units | Mass units | Traffic units input | Traffic units results | Flow units | Average delay units | Total delay units | Rate of delay units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| £ | kph | m | mpg | l/h | kg | PCU | PCU | perHour | s | -Hour | perHour |

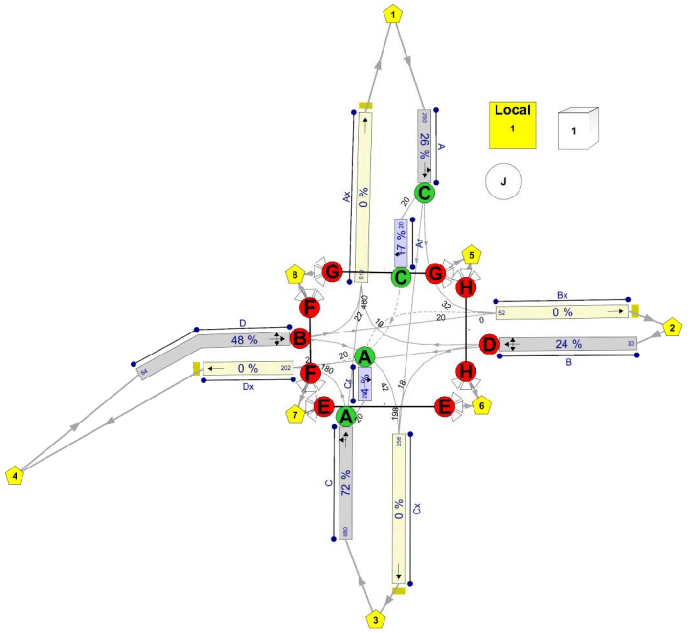
## Sorting

| Show names instead of IDs | Sorting direction | Sorting type | Ignore prefixes when sorting | Analysis/demand set sorting | Link grouping | Source grouping | Colour Analysis/Demand Sets |
|---|---|---|---|---|---|---|---|
| | Ascending | Numerical | | ID | Normal | Normal | ✓ |



Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

## Network Diagrams




(untitled)
Cyclotime 0s / 100s , Timestepe 99 / 100
0, 0
Diagram procuced using TRANSYT 15.5.1.7048

# A1 - AM 2020 DS
# D1 - AM 2020 DS*

## Summary

### Data Errors and Warnings

*No errors or warnings*

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13/12/2018 08:58:35 | 13/12/2018 08:58:35 | 07:30 | 100 | 169.65 | 11.13 | 71.72 | A/1 | 0 | 0 | A/1 | Cx/1 | A/ |

### Analysis Set Details

| Name | Description | Demand set | Include in report | Locked |
|---|---|---|---|---|
| AM 2020 DS | | D1 | ✓ | |

### Demand Set Details

| Name | Description | Composite | Demand sets | Start time (HH:mm) | Locked |
|---|---|---|---|---|---|
| AM 2020 DS | | | | 07:30 | |

## Network Options

### Network timings

| Network cycle time (s) | Restrict to SCOOT cycle times | Time segment length (min) | Number of time segments | Modelled time period (min) |
|---|---|---|---|---|
| 100 | | 60 | 1 | 60 |

### Signals options

| Start displacement (s) | End displacement (s) |
|---|---|
| 2 | 3 |

### Advanced

| Phase minimum broken penalty (£) | Phase maximum broken penalty (£) | Intergreen broken penalty (£) | Starting Red-with-Amber (s) |
|---|---|---|---|
| 10000.00 | 10000.00 | 10000.00 | 2 |

### Traffic options

| Traffic model | Vehicle flow scaling factor (%) | Pedestrian flow scaling factor (%) | Cruise times or speeds |
|---|---|---|---|
| Platoon Dispersion (PDM) | 100 | 100 | Cruise Speeds |

### Advanced

| Resolution | DOS Threshold (%) | Cruise scaling factor (%) | Use link stop weightings | Use link delay weightings | Exclude pedestrians from results calculation | Random delay mode | Type of Vehicle-in-Service | Type of random parameter | PCU Length (m) | Calculate results for Path Segments | Generate PDM Profile Data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 100 | ✓ | ✓ | | Complex | Uniform (TRANSYT) | Uniform (TRANSYT) | 5.75 | | ✓ |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

### Normal Traffic parameters

| Dispersion type | Dispersion coefficient |
|---|---|
| Default | 35 |

### Normal Traffic Types

| Name | PCU Factor |
|---|---|
| Normal | 1.00 |

### Bus parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Bus | 1.00 | 70 | 15 | 0.94 | 30 | 85 |

### Tram parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Tram | 1.00 | 0 | 0 | 0.94 | 100 | 100 |

### Pedestrian parameters

| Dispersion type |
|---|
| Default |

### Optimisation options

| Enable optimisation | Auto redistribute | Optimisation level | Enable OUT Profile accuracy |
|---|---|---|---|
| ✓ | ✓ | Offsets And Green Splits | ✓ |

### Advanced

| Optimisation type | Hill climb increments | OUTProfile accuracy | Use enhanced optimisation | Auto optimisation order | Optimisation order | Master controller | Offsets relative to master controller | Master controller offset after each run |
|---|---|---|---|---|---|---|---|---|
| Hill Climb (Fast) | 15, 40, -1, 15, 40, 1, -1, 1 | 50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05 | | ✓ | 1 | | | Do nothing |

### Economics

| Vehicle Monetary Value Of Delay (£ per PCU-hr) | Vehicle Monetary Value Of Stops (£ per 100 stops) | Pedestrian monetary value of delay (£ per Ped-hr) |
|---|---|---|
| 14.20 | 2.60 | 14.20 |

## Traffic Nodes

### Traffic Nodes

| Traffic node | Name | Description |
|---|---|---|
| J | (untitled) | |

# Arms and Traffic Streams

## Arms

| Arm | Name | Description | Traffic node |
|---|---|---|---|
| A | (untitled) | | J |
| B | (untitled) | | J |
| C | (untitled) | | J |
| D | (untitled) | | J |
| Ar | (untitled) | | J |
| Ax | (untitled) | | J |
| Bx | (untitled) | | |
| Cr | (untitled) | | J |
| Cx | (untitled) | | |
| Dx | (untitled) | | |

## Traffic Streams

| Arm | Traffic Stream | Name | Description | Auto length | Length (m) | Has Saturation Flow | Saturation flow source | Saturation flow (PCU/hr) | Is signal controlled | Is give way | Traffic type | Allow Nearside Turn On Red |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1802 | ✓ | | Normal | |
| B | 1 | (untitled) | | | 150.00 | ✓ | Sum of lanes | 1547 | ✓ | | Normal | |
| C | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1781 | ✓ | | Normal | |
| D | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1692 | ✓ | | Normal | |
| Ar | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Ax | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Bx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Cr | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Cx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Dx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |

## Lanes

| Arm | Traffic Stream | Lane | Name | Description | Use RR67 | Surface condition | Site quality factor | Gradient (%) | Width (m) | Use connector turning radius | Proportion that turn (%) | Turning radius (m) | Nearside lane | Saturation flow (PCU/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 25 | 6.00 | ✓ | 1802 |
| B | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 95 | 6.00 | ✓ | 1547 |
| C | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 30 | 6.00 | ✓ | 1781 |
| D | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 93 | 10.60 | ✓ | 1692 |
| Ar | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 6.00 | | 2005 |
| Ax | 1 | 1 | (untitled) | | | | | | | | | | | |
| Bx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Cr | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 8.50 | | 2005 |
| Cx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Dx | 1 | 1 | (untitled) | | | | | | | | | | | |



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## Modelling

| Arm | Traffic Stream | Traffic model | Stop weighting multiplier (%) | Delay weighting multiplier (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (PCU) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|---|---|
| A | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| B | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| C | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| D | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Ar | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Ax | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Bx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Cr | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Cx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Dx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |

## Modelling - Advanced

| Arm | Traffic Stream | Initial queue (PCU) | Type of Vehicle-in-Service | Vehicle-in-Service | Type of random parameter | Random parameter | Auto cycle time | Cycle time |
|---|---|---|---|---|---|---|---|---|
| (ALL) | 1 | 0.00 | NetworkDefault | Not-Included | NetworkDefault | 0.50 | ✓ | 100 |

## Normal - Modelling

| Arm | Traffic Stream | Stop weighting (%) | Delay weighting (%) |
|---|---|---|---|
| (ALL) | 1 | 100 | 100 |

## Flows

| Arm | Traffic Stream | Total Flow (PCU/hr) | Normal Flow (PCU/hr) |
|---|---|---|---|
| A | 1 | 504 | 504 |
| B | 1 | 48 | 48 |
| C | 1 | 218 | 218 |
| D | 1 | 265 | 265 |
| Ar | 1 | 15 | 15 |
| Ax | 1 | 201 | 201 |
| Bx | 1 | 27 | 27 |
| Cr | 1 | 16 | 16 |
| Cx | 1 | 769 | 769 |
| Dx | 1 | 38 | 38 |

## Signals

| Arm | Traffic Stream | Controller stream | Phase | Second phase enabled |
|---|---|---|---|---|
| A | 1 | 1 | C | |
| B | 1 | 1 | D | |
| C | 1 | 1 | A | |
| D | 1 | 1 | B | |
| Ar | 1 | 1 | C | |
| Cr | 1 | 1 | A | |

## Entry Sources

| Arm | Traffic Stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) |
|---|---|---|---|
| A | 1 | 36.00 | 30.00 |
| B | 1 | 18.00 | 30.00 |
| C | 1 | 36.00 | 30.00 |
| D | 1 | 36.00 | 30.00 |

### Sources

| Arm | Traffic Stream | Source | Source traffic stream | Destination traffic stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) | Auto turning radius | Traffic turn style | Turning radius (m) |
|---|---|---|---|---|---|---|---|---|---|
| Ar | 1 | 1 | A/1 | Ar/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 1 | C/1 | Ax/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Bx | 1 | 1 | D/1 | Bx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cr | 1 | 1 | C/1 | Cr/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cx | 1 | 1 | A/1 | Cx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Dx | 1 | 1 | B/1 | Dx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 2 | B/1 | Ax/1 | 36.00 | 30.00 | ✓ | Offside | 57.17 |
| Bx | 1 | 2 | A/1 | Bx/1 | 36.00 | 30.00 | ✓ | Nearside | 67.46 |
| Cx | 1 | 2 | B/1 | Cx/1 | 36.00 | 30.00 | ✓ | Nearside | 87.33 |
| Dx | 1 | 2 | C/1 | Dx/1 | 36.00 | 30.00 | ✓ | Nearside | 50.78 |
| Ax | 1 | 3 | D/1 | Ax/1 | 36.00 | 30.00 | ✓ | Nearside | 56.71 |
| Bx | 1 | 3 | Cr/1 | Bx/1 | 36.00 | 30.00 | ✓ | Offside | 52.48 |
| Cx | 1 | 3 | D/1 | Cx/1 | 36.00 | 30.00 | ✓ | Offside | 92.66 |
| Dx | 1 | 3 | Ar/1 | Dx/1 | 36.00 | 30.00 | ✓ | Offside | 97.63 |

### Give Way Data

| Arm | Traffic Stream | Opposed traffic | Use Step-wise Opposed Turn Model | Number of storage spaces | Use connector turning radius | Radius of turn (m) | Visibility restricted |
|---|---|---|---|---|---|---|---|
| Ar | 1 | AllTraffic | ✓ | 1 | | 10.00 | |
| Cr | 1 | AllTraffic | ✓ | 1 | | 8.00 | |

### Give Way Data - All Movements - Conflicts

| Traffic Stream | Description | Controlling type | Controlling from traffic stream | Controlling to traffic stream | Percentage opposing (%) | Upstream signals visible | Conflict shift | Conflict duration |
|---|---|---|---|---|---|---|---|---|
| 1 | | TrafficStreamMovement | C/1 | Dx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | C/1 | Ax/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Cx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Bx/1 | 100 | | 2 | 6 |

## Pedestrian Crossings

### Pedestrian Crossings

| Crossing | Name | Description | Traffic node | Allow walk on red | Crossing type | Length (m) | Cruise time (seconds) | Cruise speed (kph) |
|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | | | | Farside | 11.00 | 7.33 | 5.40 |
| 2 | (untitled) | | | | Farside | 6.40 | 4.27 | 5.40 |
| 3 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |
| 4 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |

### Pedestrian Crossings - Signals

| Crossing | Controller stream | Phase | Second phase enabled |
|---|---|---|---|
| 1 | 1 | G | |
| 2 | 1 | H | |
| 3 | 1 | E | |
| 4 | 1 | F | |

### Pedestrian Crossings - Sides

| Crossing | Side | Saturation flow (Ped/hr) |
|---|---|---|
| (ALL) | (ALL) | 11000 |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

### Pedestrian Crossings - Modelling

| Crossing | Side | Delay weighting (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (Ped) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|
| (ALL) | (ALL) | 100 | 100 | | 0.00 | | |

## Local OD Matrix - Local Matrix: 1

### Local Matrix Options

| OD Matrix | Name | Use for point to point table | Auto calculate | Allocation mode | Allow paths past exit locations | Allow looped paths on arms | Allow looped paths on traffic nodes | Copy flows | Matrix to copy flows from | Limit paths by length | Path length limit multiplier | Limit paths by number | Path number limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | ✓ | ✓ | Path Equalisation | | | ✓ | | | ✓ | 1.25 | | |

### Normal Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 6 | 483 | 15 | 0 | 0 | 0 | 0 |
| | 2 | 3 | 0 | 42 | 3 | 0 | 0 | 0 | 0 |
| | 3 | 182 | 16 | 0 | 20 | 0 | 0 | 0 | 0 |
| | 4 | 16 | 5 | 244 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

### Pedestrian Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Locations

| OD Matrix | Location | Name | Entries | Exits | Colour |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | A/1 | Ax/1 | #0000FF |
| | 2 | (untitled) | B/1 | Bx/1 | #00FF00 |
| | 3 | (untitled) | C/1 | Cx/1 | #FFFF00 |
| | 4 | (untitled) | D/1 | Dx/1 | #FFFF00 |
| | 5 | (untitled) | 1:2E, 2:1E | 1:2X, 2:1X | #00FFFF |
| | 6 | (untitled) | 2:2E, 3:2E | 2:2X, 3:2X | #FF00FF |
| | 7 | (untitled) | 3:1E, 4:2E | 3:1X, 4:2X | #008000 |
| | 8 | (untitled) | 4:1E, 1:1E | 4:1X, 1:1X | #FFA500 |

### Normal Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Normal Calculated Flow (PCU/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 4 | | 2 | 3 | B/1, Cx/1 | Normal | 42 |
| | 12 | | 2 | 4 | B/1, Dx/1 | Normal | 3 |
| | 26 | | 1 | 3 | A/1, Cx/1 | Normal | 483 |
| | 28 | | 1 | 2 | A/1, Bx/1 | Normal | 6 |
| | 29 | | 3 | 4 | C/1, Dx/1 | Normal | 20 |
| | 32 | | 3 | 2 | C/1, Cr/1, Bx/1 | Normal | 16 |
| | 33 | | 1 | 4 | A/1, Ar/1, Dx/1 | Normal | 15 |
| | 34 | | 4 | 3 | D/1, Cx/1 | Normal | 244 |
| | 35 | | 4 | 2 | D/1, Bx/1 | Normal | 5 |
| | 36 | | 2 | 1 | B/1, Ax/1 | Normal | 3 |
| | 37 | | 4 | 1 | D/1, Ax/1 | Normal | 16 |
| | 38 | | 3 | 1 | C/1, Ax/1 | Normal | 182 |

### Pedestrian Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Pedestrian calculated flow (Ped/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | | 6 | 7 | 3:2E, 3:1X | Normal | 20 |
| | 17 | | 7 | 6 | 3:1E, 3:2X | Normal | 20 |
| | 18 | | 7 | 8 | 4:2E, 4:1X | Normal | 0 |
| | 19 | | 8 | 7 | 4:1E, 4:2X | Normal | 0 |
| | 20 | | 5 | 8 | 1:2E, 1:1X | Normal | 20 |
| | 21 | | 8 | 5 | 1:1E, 1:2X | Normal | 0 |
| | 22 | | 5 | 6 | 2:1E, 2:2X | Normal | 20 |
| | 23 | | 6 | 5 | 2:2E, 2:1X | Normal | 0 |

## Signal Timings

**Network Default: 100s cycle time; 100 steps**

### Controller Stream 1

| Controller Stream | Name | Description | Use sequence | Cycle time source | Cycle time (s) |
|---|---|---|---|---|---|
| 1 | (untitled) | | 1 | NetworkDefault | 100 |

### Controller Stream 1 - Properties

| Controller Stream | Manufacturer name | Type | Model number | (Telephone) Line Number | Site number | Grid reference | Gaining delay type |
|---|---|---|---|---|---|---|---|
| 1 | Unspecified | | | | | | Absolute |

### Controller Stream 1 - Optimisation

| Controller Stream | Allow offset optimisation | Allow green split optimisation | Optimisation level | Auto redistribute | Enable stage constraint |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | Offsets And Green Splits | ✓ | |

### Phases

| Controller Stream | Phase | Name | Minimum green (s) | Maximum green (s) | Relative start displacement (s) | Relative end displacement (s) | Type | Blackout Time (s) |
|---|---|---|---|---|---|---|---|---|
| 1 | A | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | B | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | C | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | D | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | E | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | F | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | G | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | H | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |



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### Library Stages

| Controller Stream | Library Stage | Phases in stage | User stage minimum (s) |
|---|---|---|---|
| 1 | 1 | A, C | 1 |
| | 2 | B | 1 |
| | 3 | D | 1 |
| | 4 | E, F, G, H | 1 |

### Stage Sequences

| Controller Stream | Sequence | Name | Multiple cycling | Stage IDs | Stage ends |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | Single | 1, 2, 3, 4 | 35, 62, 74, 88 |
| | 2 | (untitled) | Single | 1, 4, 2, 3 | 0, 31, 63, 91 |
| | 3 | (untitled) | Single | 1, 3, 4, 2 | 0, 29, 59, 91 |
| | 4 | (untitled) | Single | 1, 2, 4, 3 | 0, 29, 59, 91 |
| | 5 | (untitled) | Single | 1, 4, 3, 2 | 0, 31, 63, 91 |
| | 6 | (untitled) | Single | 1, 3, 2, 4 | 0, 29, 57, 87 |

### Intergreen Matrix for Controller Stream 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| From | A | | 6 | | 5 | 5 | 6 | 7 | 7 |
| | B | 5 | | 5 | 5 | 7 | 5 | 6 | 6 |
| | C | | 5 | | 6 | 6 | 7 | 5 | 5 |
| | D | 5 | 5 | 5 | | 6 | 7 | 7 | 5 |
| | E | 9 | 9 | 9 | 9 | | | | |
| | F | 9 | 9 | 9 | 9 | | | | |
| | G | 9 | 9 | 9 | 9 | | | | |
| | H | 5 | 5 | 5 | 6 | | | | |

### Banned Stage transitions for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

### Interstage Matrix for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | 0 | 6 | 6 | 7 |
| | 2 | 5 | 0 | 5 | 7 |
| | 3 | 5 | 5 | 0 | 7 |
| | 4 | 9 | 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 | 97 | 35 | 38 | 1 | 7 |
| | 2 | ✓ | 2 | B | 41 | 62 | 21 | 1 | 7 |
| | 3 | ✓ | 3 | D | 67 | 74 | 7 | 1 | 7 |
| | 4 | ✓ | 4 | E,F,G,H | 81 | 88 | 7 | 1 | 7 |

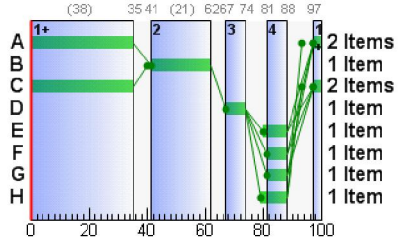
### Resultant Phase Green Periods

| Controller Stream | Phase | Green period | Is base green period | Start time (s) | End time (s) | Duration (s) |
|---|---|---|---|---|---|---|
| 1 | A | 1 | ✓ | 97 | 35 | 38 |
| | B | 1 | ✓ | 41 | 62 | 21 |
| | C | 1 | ✓ | 97 | 35 | 38 |
| | D | 1 | ✓ | 67 | 74 | 7 |
| | E | 1 | ✓ | 80 | 88 | 8 |
| | F | 1 | ✓ | 81 | 88 | 7 |
| | G | 1 | ✓ | 81 | 88 | 7 |
| | H | 1 | ✓ | 79 | 88 | 9 |

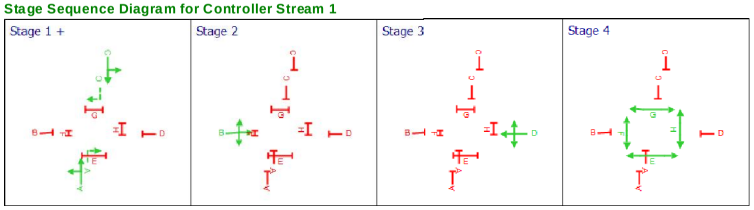
### Traffic Stream Green Times

| Arm | Traffic Stream | Traffic Node | Controller Stream | Phase | Green Period 1 | | |
|---|---|---|---|---|---|---|---|
| | | | | | Start | End | Duration |
| A | 1 | J | 1 | C | 97 | 35 | 38 |
| B | 1 | J | 1 | D | 67 | 74 | 7 |
| C | 1 | J | 1 | A | 97 | 35 | 38 |
| D | 1 | J | 1 | B | 41 | 62 | 21 |
| Ar | 1 | J | 1 | C | 97 | 35 | 38 |
| Cr | 1 | J | 1 | A | 97 | 35 | 38 |

### Phase Timings Diagram for Controller Stream 1




### Stage Sequence Diagram for Controller Stream 1




### Resultant penalties

| Time Segment | Controller stream | Phase min max penalty (£ per hr) | Intergreen broken penalty (£ per hr) | Stage constraint broken penalty (£ per hr) | Cost of controller stream penalties (£ per hr) |
|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 0.00 | 0.00 | 0.00 | 0.00 |



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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 | 72 | 25 | 504 | 1802 | 38 | 32.22 | 12.65 | 24.25 | 64.06 | 5.60 | 69.66 |
| | B | 1 | 39 | 132 | 48 | 1547 | 7 | 52.78 | 1.37 | 5.27 | 9.99 | 0.61 | 10.60 |
| | C | 1 | 31 | 187 | 218 | 1781 | 38 | 22.39 | 4.25 | 8.15 | 19.25 | 1.88 | 21.14 |
| | D | 1 | 71 | 26 | 265 | 1692 | 21 | 47.69 | 7.63 | 14.62 | 49.85 | 3.38 | 53.23 |
| | Ar | 1 | 4 | 2259 | 15 | 1008 | 38 | 2.75 | 0.22 | 22.33 | 0.16 | 0.04 | 0.20 |
| | Ax | 1 | 0 | Unrestricted | 201 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 0 | Unrestricted | 27 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 14 | 525 | 16 | 285 | 38 | 19.53 | 0.39 | 39.14 | 1.23 | 0.08 | 1.32 |
| | Cx | 1 | 0 | Unrestricted | 769 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 0 | Unrestricted | 38 | Unrestricted | 100 | 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)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 504 | 504 | 0 | | 1802 | 703 | 72 | | 25 | 0.00 | 38 |
| | B | 1 | 48 | 48 | 0 | | 1547 | 124 | 39 | | 132 | 0.00 | 7 |
| | C | 1 | 218 | 218 | 0 | | 1781 | 695 | 31 | | 187 | 0.00 | 38 |
| | D | 1 | 265 | 265 | 0 | | 1692 | 372 | 71 | | 26 | 0.00 | 21 |
| | Ar | 1 | 15 | 15 | 0 | | 1008 | 393 | 4 | | 2259 | 1.21 | 38 |
| | Ax | 1 | 201 | 201 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.82 | 100 |
| | Bx | 1 | 27 | 27 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.62 | 100 |
| | Cr | 1 | 16 | 16 | 0 | | 285 | 111 | 14 | | 525 | 1.21 | 38 |
| | Cx | 1 | 769 | 769 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.47 | 100 |
| | Dx | 1 | 38 | 38 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.83 | 100 |

### Traffic Stream Results: Stops and delays

| Time Segment | Arm | Traffic Stream | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 36.00 | 32.22 | 4.51 | 64.06 | 88.66 | 446.83 | 5.60 |
| | B | 1 | 18.00 | 52.78 | 0.70 | 9.99 | 101.71 | 48.82 | 0.61 |
| | C | 1 | 36.00 | 22.39 | 1.36 | 19.25 | 68.85 | 150.10 | 1.88 |
| | D | 1 | 36.00 | 47.69 | 3.51 | 49.85 | 101.86 | 269.94 | 3.38 |
| | Ar | 1 | 1.00 | 2.75 | 0.01 | 0.16 | 45.27 | 6.79 | 0.04 |
| | Ax | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 1.00 | 19.53 | 0.09 | 1.23 | 87.32 | 13.97 | 0.08 |
| | Cx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 36.00 | 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 (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) | Estimated blocking |
|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 0.00 | 12.65 | 52.17 | 24.25 | 0.00 | 0.00 | |
| | B | 1 | 0.00 | 1.37 | 26.09 | 5.27 | 0.00 | 5.00 | |
| | C | 1 | 0.00 | 4.25 | 52.17 | 8.15 | 0.00 | 0.00 | |
| | D | 1 | 0.00 | 7.63 | 52.17 | 14.62 | 0.00 | 0.00 | |
| | Ar | 1 | 0.00 | 0.22 | 1.00 | 22.33 | 0.00 | 23.00 | |
| | Ax | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 34.00 | |
| | Bx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 91.00 | |
| | Cr | 1 | 0.00 | 0.39 | 1.00 | 39.14 | 0.00 | 7.00 | |
| | Cx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 1.00 | |
| | Dx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 70.00 | |

### Traffic Stream Results: Advanced

| Time Segment | Arm | Traffic Stream | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | Mean Max Queue EoTS (PCU) | Max End of Green Queue EoTS (PCU) | Max End of Red Queue EoTS (PCU) | PCU Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 0.00 | 0.00 | ✓ | 0.00 | 12.66 | 0.90 | 9.44 | 1.00 | 0.00 | 69.66 |
| | B | 1 | 0.00 | 0.00 | ✓ | 0.00 | 1.38 | 0.12 | 1.35 | 1.00 | 0.00 | 10.60 |
| | C | 1 | 0.00 | 0.00 | ✓ | 0.00 | 4.25 | 0.07 | 3.77 | 1.00 | 0.00 | 21.14 |
| | D | 1 | 0.00 | 0.00 | ✓ | 0.00 | 7.64 | 0.87 | 6.61 | 1.00 | 0.00 | 53.23 |
| | Ar | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.22 | 0.00 | 0.01 | 1.00 | 0.00 | 0.20 |
| | Ax | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Bx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Cr | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.39 | 0.01 | 0.02 | 1.00 | 0.00 | 1.32 |
| | Cx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Dx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

### Pedestrian Crossings: Pedestrian summary

| Time Segment | Crossing | Side | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Mean max queue (Ped) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3 | 20 | 11000 | 7 | 43.71 | 0.52 | 3.45 | 3.45 |
| | 2 | 1 | 2 | 20 | 11000 | 9 | 41.86 | 0.51 | 3.30 | 3.30 |
| | | 2 | 0 | 0 | 11000 | 9 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | | 2 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | 4 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Flows and signals

| Time Segment | Crossing | Side | Calculated flow entering (Ped/hr) | Calculated flow out (Ped/hr) | Flow discrepancy (Ped/hr) | Adjusted flow warning | Calculated sat flow (Ped/hr) | Calculated capacity (Ped/hr) | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity | Mean modulus of error | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 20 | 20 | 0 | | 11000 | 770 | 3 | | 3365 | 0.00 | 7 |
| | 2 | 1 | 20 | 20 | 0 | | 11000 | 990 | 2 | | 4355 | 0.00 | 9 |
| | | 2 | 0 | 0 | 0 | | 11000 | 990 | 0 | | Unrestricted | 0.00 | 9 |
| | 3 | 1 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | | 2 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | 4 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |



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### Pedestrian Crossings: Stops and delays

| Time Segment | Crossing | Side | Mean Cruise Time per Ped (s) | Mean Delay per Ped (s) | Total delay (Ped-hr/hr) | Weighted cost of delay (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 8.33 | 43.71 | 0.24 | 3.45 |
| | 2 | 1 | 5.27 | 41.86 | 0.23 | 3.30 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 8.40 | 42.78 | 0.24 | 3.37 |
| | | 2 | 8.40 | 42.78 | 0.24 | 3.37 |
| | 4 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Queues and blocking

| Time Segment | Crossing | Side | Mean max queue (Ped) | Max queue storage (Ped) | Utilised storage (%) | Excess queue penalty (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.52 | 10.00 | 5.17 | 0.00 |
| | 2 | 1 | 0.51 | 10.00 | 5.06 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.51 | 10.00 | 5.11 | 0.00 |
| | | 2 | 0.51 | 10.00 | 5.11 | 0.00 |
| | 4 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Advanced

| Time Segment | Crossing | Side | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Mean Max Queue EoTS (Ped) | Ped Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.52 | 1.00 | 0.00 | 3.45 |
| | 2 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.30 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | | 2 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | 4 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |

## Network Results

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13/12/2018 08:58:35 | 13/12/2018 08:58:35 | 07:30 | 100 | 169.65 | 11.13 | 71.72 | A/1 | 0 | 0 | A/1 | Cx/1 | A/ |

### Network Results: Vehicle summary

| Time Segment | Degree of saturation (%) | Practical reserve capacity (%) | Calculated flow entering (PCU/hr) | Actual green (s (per cycle)) | Mean Delay per Veh (s) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 72 | 0 | 2101 | 580 | 17.44 | 144.55 | 11.61 | 156.15 |

### Network Results: Pedestrian summary

| Time Segment | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 3 | 80 | 62 | 42.78 | 13.50 | 13.50 |

### Network Results: Flows and signals

| Time Segment | Calculated flow entering (PCU/hr) | Calculated flow out (PCU/hr) | Flow discrepancy (PCU/hr) | Adjusted flow warning | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity (%) | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 2181 | 2181 | 0 | | 72 | | 25 | 642 |

### Network Results: Stops and delays

| Time Segment | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 34.06 | 18.37 | 11.13 | 158.05 | 42.94 | 936.45 | 11.61 |

### Network Results: Queues and blocking

| Time Segment | Utilised storage (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) |
|---|---|---|---|
| 07:30-08:30 | 39.14 | 0.00 | 231.00 |

### Network Results: Advanced

| Time Segment | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | PCU Factor | Cost of traffic penalties (£ per hr) | Controller stream penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 0.00 | 0.00 | ✓ | 0.00 | 1.00 | 0.00 | 0.00 | 169.65 |

## Point to Point Journey Time

### Average Journey Time (s) for Local Matrix: 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0.0 | 104.2 | 104.2 | 108.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2 | 106.8 | 0.0 | 106.8 | 106.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 3 | 94.4 | 114.9 | 0.0 | 94.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4 | 119.7 | 119.7 | 119.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.1 | 0.0 | 52.0 |
| | 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 |
| | 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 | 0.0 |
| | 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Path Journey Time

| Path | From Location | To Location | Normal Calculated Flow (PCU/hr) | Pedestrian calculated flow (Ped/hr) | Normal journey time (s) | Pedestrian journey time (s) | Calculated Total Flow (PCU/hr) | Avg journey time (s) |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 3 | 42 | | 106.78 | | 42 | 106.78 |
| 12 | 2 | 4 | 3 | | 106.78 | | 3 | 106.78 |
| 16 | 6 | 7 | | 20 | | 51.18 | 20 | 51.18 |
| 17 | 7 | 6 | | 20 | | 51.18 | 20 | 51.18 |
| 18 | 7 | 8 | | 0 | | 0.00 | 0 | 0.00 |
| 19 | 8 | 7 | | 0 | | 0.00 | 0 | 0.00 |
| 20 | 5 | 8 | | 20 | | 52.04 | 20 | 52.04 |
| 21 | 8 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 22 | 5 | 6 | | 20 | | 47.13 | 20 | 47.13 |
| 23 | 6 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 26 | 1 | 3 | 483 | | 104.22 | | 483 | 104.22 |
| 28 | 1 | 2 | 6 | | 104.22 | | 6 | 104.22 |
| 29 | 3 | 4 | 20 | | 94.39 | | 20 | 94.39 |
| 32 | 3 | 2 | 16 | | 114.93 | | 16 | 114.93 |
| 33 | 1 | 4 | 15 | | 107.97 | | 15 | 107.97 |
| 34 | 4 | 3 | 244 | | 119.69 | | 244 | 119.69 |
| 35 | 4 | 2 | 5 | | 119.69 | | 5 | 119.69 |
| 36 | 2 | 1 | 3 | | 106.78 | | 3 | 106.78 |
| 37 | 4 | 1 | 16 | | 119.69 | | 16 | 119.69 |
| 38 | 3 | 1 | 182 | | 94.39 | | 182 | 94.39 |



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## Final Prediction Table

### Traffic Stream Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | | PER PCU | | | QUEUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arm | Traffic Stream | Name | Traffic node | Controller stream | Phase | Calculated flow entering (PCU/hr) | Calculated sat flow (PCU/hr) | Actual green (s (per cycle)) | Wasted time total (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity (%) | JourneyTime (s) | Mean Delay per Veh (s) | Mean stops per Veh (%) | Mean max queue (PCU) |
| A | 1 | (untitled) | J | 1 | C | 504 | 1802 | 38 | 0.00 | 72 | 25 | 68.22 | 32.22 | 88.66 | 12.65 |
| B | 1 | (untitled) | J | 1 | D | 48 | 1547 | 7 | 5.00 | 39 | 132 | 70.78 | 52.78 | 101.71 | 1.37 |
| C | 1 | (untitled) | J | 1 | A | 218 | 1781 | 38 | 0.00 | 31 | 187 | 58.39 | 22.39 | 68.85 | 4.25 |
| D | 1 | (untitled) | J | 1 | B | 265 | 1692 | 21 | 0.00 | 71 | 26 | 83.69 | 47.69 | 101.86 | 7.63 |
| Ar | 1 | (untitled) | J | 1 | C | 15 | 1008 | 38 | 23.00 | 4 | 2259 | 3.75 | 2.75 | 45.27 | 0.22 |
| Ax | 1 | (untitled) | J | | | 201 | Unrestricted | 100 | 34.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Bx | 1 | (untitled) | | | | 27 | Unrestricted | 100 | 91.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Cr | 1 | (untitled) | J | 1 | A | 16 | 285 | 38 | 7.00 | 14 | 525 | 20.53 | 19.53 | 87.32 | 0.39 |
| Cx | 1 | (untitled) | | | | 769 | Unrestricted | 100 | 1.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Dx | 1 | (untitled) | | | | 38 | Unrestricted | 100 | 70.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossing Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | PER PED | | QUEUES | WEIGHTS | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian | Side | Name | Traffic node | Controller stream | Phase | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity | JourneyTime (s) | Mean Delay per Ped (s) | Mean max queue (Ped) | Delay weighting (%) | |
| 1 | 1 | (untitled) | | 1 | G | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | G | 20 | 11000 | 7 | 3 | 3365 | 52.04 | 43.71 | 0.52 | 100 | |
| 2 | 1 | (untitled) | | 1 | H | 20 | 11000 | 9 | 2 | 4355 | 47.13 | 41.86 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | H | 0 | 11000 | 9 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| 3 | 1 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| 4 | 1 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |

### Network Results

| | Distance travelled (PCU-km/hr) | Time spent (PCU-hr/hr) | Mean journey speed (kph) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Excess queue penalty (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| Normal traffic | 613.98 | 30.65 | 20.03 | 10.18 | 144.55 | 11.61 | 0.00 | 156.15 |
| Bus | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pedestrians | 0.87 | 1.12 | 0.78 | 0.95 | 13.50 | 0.00 | 0.00 | 13.50 |
| TOTAL | 614.85 | 31.77 | 19.35 | 11.13 | 158.05 | 11.61 | 0.00 | 169.65 |

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

# A2 - PM 2020 DS
# D2 - PM 2020 DS*

## Summary

### Data Errors and Warnings

*No errors or warnings*

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 13/12/2018 08:58:35 | 13/12/2018 08:58:37 | 17:00 | 100 | 93.59 | 6.06 | 61.76 | C/1 | 0 | 0 | C/1 | Cx/1 | C/ |

### Analysis Set Details

| Name | Description | Demand set | Include in report | Locked |
|---|---|---|---|---|
| PM 2020 DS | | D2 | ✓ | |

### Demand Set Details

| Name | Description | Composite | Demand sets | Start time (HH:mm) | Locked |
|---|---|---|---|---|---|
| PM 2020 DS | | | | 17:00 | |

## Network Options

### Network timings

| Network cycle time (s) | Restrict to SCOOT cycle times | Time segment length (min) | Number of time segments | Modelled time period (min) |
|---|---|---|---|---|
| 100 | | 60 | 1 | 60 |

### Signals options

| Start displacement (s) | End displacement (s) |
|---|---|
| 2 | 3 |

### Advanced

| Phase minimum broken penalty (£) | Phase maximum broken penalty (£) | Intergreen broken penalty (£) | Starting Red-with-Amber (s) |
|---|---|---|---|
| 10000.00 | 10000.00 | 10000.00 | 2 |

### Traffic options

| Traffic model | Vehicle flow scaling factor (%) | Pedestrian flow scaling factor (%) | Cruise times or speeds |
|---|---|---|---|
| Platoon Dispersion (PDM) | 100 | 100 | Cruise Speeds |

### Advanced

| Resolution | DOS Threshold (%) | Cruise scaling factor (%) | Use link stop weightings | Use link delay weightings | Exclude pedestrians from results calculation | Random delay mode | Type of Vehicle-in-Service | Type of random parameter | PCU Length (m) | Calculate results for Path Segments | Generate PDM Profile Data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 100 | ✓ | ✓ | | Complex | Uniform (TRANSYT) | Uniform (TRANSYT) | 5.75 | | ✓ |





### Normal Traffic parameters

| Dispersion type | Dispersion coefficient |
|---|---|
| Default | 35 |

### Normal Traffic Types

| Name | PCU Factor |
|---|---|
| Normal | 1.00 |

### Bus parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Bus | 1.00 | 70 | 15 | 0.94 | 30 | 85 |

### Tram parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Tram | 1.00 | 0 | 0 | 0.94 | 100 | 100 |

### Pedestrian parameters

| Dispersion type |
|---|
| Default |

### Optimisation options

| Enable optimisation | Auto redistribute | Optimisation level | Enable OUT Profile accuracy |
|---|---|---|---|
| ✓ | ✓ | Offsets And Green Splits | ✓ |

### Advanced

| Optimisation type | Hill climb increments | OUTProfile accuracy | Use enhanced optimisation | Auto optimisation order | Optimisation order | Master controller | Offsets relative to master controller | Master controller offset after each run |
|---|---|---|---|---|---|---|---|---|
| Hill Climb (Fast) | 15, 40, -1, 15, 40, 1, -1, 1 | 50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05 | | ✓ | 1 | | | Do nothing |

### Economics

| Vehicle Monetary Value Of Delay (£ per PCU-hr) | Vehicle Monetary Value Of Stops (£ per 100 stops) | Pedestrian monetary value of delay (£ per Ped-hr) |
|---|---|---|
| 14.20 | 2.60 | 14.20 |

## Traffic Nodes

### Traffic Nodes

| Traffic node | Name | Description |
|---|---|---|
| J | (untitled) | |

# Arms and Traffic Streams

## Arms

| Arm | Name | Description | Traffic node |
|---|---|---|---|
| A | (untitled) | | J |
| B | (untitled) | | J |
| C | (untitled) | | J |
| D | (untitled) | | J |
| Ar | (untitled) | | J |
| Ax | (untitled) | | J |
| Bx | (untitled) | | |
| Cr | (untitled) | | J |
| Cx | (untitled) | | |
| Dx | (untitled) | | |

## Traffic Streams

| Arm | Traffic Stream | Name | Description | Auto length | Length (m) | Has Saturation Flow | Saturation flow source | Saturation flow (PCU/hr) | Is signal controlled | Is give way | Traffic type | Allow Nearside Turn On Red |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1802 | ✓ | | Normal | |
| B | 1 | (untitled) | | | 150.00 | ✓ | Sum of lanes | 1547 | ✓ | | Normal | |
| C | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1781 | ✓ | | Normal | |
| D | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1692 | ✓ | | Normal | |
| Ar | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Ax | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Bx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Cr | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Cx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Dx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |

## Lanes

| Arm | Traffic Stream | Lane | Name | Description | Use RR67 | Surface condition | Site quality factor | Gradient (%) | Width (m) | Use connector turning radius | Proportion that turn (%) | Turning radius (m) | Nearside lane | Saturation flow (PCU/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 25 | 6.00 | ✓ | 1802 |
| B | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 95 | 6.00 | ✓ | 1547 |
| C | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 30 | 6.00 | ✓ | 1781 |
| D | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 93 | 10.60 | ✓ | 1692 |
| Ar | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 6.00 | | 2005 |
| Ax | 1 | 1 | (untitled) | | | | | | | | | | | |
| Bx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Cr | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 8.50 | | 2005 |
| Cx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Dx | 1 | 1 | (untitled) | | | | | | | | | | | |



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## Modelling

| Arm | Traffic Stream | Traffic model | Stop weighting multiplier (%) | Delay weighting multiplier (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (PCU) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|---|---|
| A | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| B | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| C | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| D | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Ar | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Ax | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Bx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Cr | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Cx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Dx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |

## Modelling - Advanced

| Arm | Traffic Stream | Initial queue (PCU) | Type of Vehicle-in-Service | Vehicle-in-Service | Type of random parameter | Random parameter | Auto cycle time | Cycle time |
|---|---|---|---|---|---|---|---|---|
| (ALL) | 1 | 0.00 | NetworkDefault | Not-Included | NetworkDefault | 0.50 | ✓ | 100 |

## Normal - Modelling

| Arm | Traffic Stream | Stop weighting (%) | Delay weighting (%) |
|---|---|---|---|
| (ALL) | 1 | 100 | 100 |

## Flows

| Arm | Traffic Stream | Total Flow (PCU/hr) | Normal Flow (PCU/hr) |
|---|---|---|---|
| A | 1 | 206 | 206 |
| B | 1 | 30 | 30 |
| C | 1 | 583 | 583 |
| D | 1 | 51 | 51 |
| Ar | 1 | 18 | 18 |
| Ax | 1 | 440 | 440 |
| Bx | 1 | 52 | 52 |
| Cr | 1 | 20 | 20 |
| Cx | 1 | 206 | 206 |
| Dx | 1 | 172 | 172 |

## Signals

| Arm | Traffic Stream | Controller stream | Phase | Second phase enabled |
|---|---|---|---|---|
| A | 1 | 1 | C | |
| B | 1 | 1 | D | |
| C | 1 | 1 | A | |
| D | 1 | 1 | B | |
| Ar | 1 | 1 | C | |
| Cr | 1 | 1 | A | |

## Entry Sources

| Arm | Traffic Stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) |
|---|---|---|---|
| A | 1 | 36.00 | 30.00 |
| B | 1 | 18.00 | 30.00 |
| C | 1 | 36.00 | 30.00 |
| D | 1 | 36.00 | 30.00 |

### Sources

| Arm | Traffic Stream | Source | Source traffic stream | Destination traffic stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) | Auto turning radius | Traffic turn style | Turning radius (m) |
|---|---|---|---|---|---|---|---|---|---|
| Ar | 1 | 1 | A/1 | Ar/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 1 | C/1 | Ax/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Bx | 1 | 1 | D/1 | Bx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cr | 1 | 1 | C/1 | Cr/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cx | 1 | 1 | A/1 | Cx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Dx | 1 | 1 | B/1 | Dx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 2 | B/1 | Ax/1 | 36.00 | 30.00 | ✓ | Offside | 57.17 |
| Bx | 1 | 2 | A/1 | Bx/1 | 36.00 | 30.00 | ✓ | Nearside | 67.46 |
| Cx | 1 | 2 | B/1 | Cx/1 | 36.00 | 30.00 | ✓ | Nearside | 87.33 |
| Dx | 1 | 2 | C/1 | Dx/1 | 36.00 | 30.00 | ✓ | Nearside | 50.78 |
| Ax | 1 | 3 | D/1 | Ax/1 | 36.00 | 30.00 | ✓ | Nearside | 56.71 |
| Bx | 1 | 3 | Cr/1 | Bx/1 | 36.00 | 30.00 | ✓ | Offside | 52.48 |
| Cx | 1 | 3 | D/1 | Cx/1 | 36.00 | 30.00 | ✓ | Offside | 92.66 |
| Dx | 1 | 3 | Ar/1 | Dx/1 | 36.00 | 30.00 | ✓ | Offside | 97.63 |

### Give Way Data

| Arm | Traffic Stream | Opposed traffic | Use Step-wise Opposed Turn Model | Number of storage spaces | Use connector turning radius | Radius of turn (m) | Visibility restricted |
|---|---|---|---|---|---|---|---|
| Ar | 1 | AllTraffic | ✓ | 1 | | 10.00 | |
| Cr | 1 | AllTraffic | ✓ | 1 | | 8.00 | |

### Give Way Data - All Movements - Conflicts

| Traffic Stream | Description | Controlling type | Controlling from traffic stream | Controlling to traffic stream | Percentage opposing (%) | Upstream signals visible | Conflict shift | Conflict duration |
|---|---|---|---|---|---|---|---|---|
| 1 | | TrafficStreamMovement | C/1 | Dx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | C/1 | Ax/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Cx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Bx/1 | 100 | | 2 | 6 |

## Pedestrian Crossings

### Pedestrian Crossings

| Crossing | Name | Description | Traffic node | Allow walk on red | Crossing type | Length (m) | Cruise time (seconds) | Cruise speed (kph) |
|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | | | | Farside | 11.00 | 7.33 | 5.40 |
| 2 | (untitled) | | | | Farside | 6.40 | 4.27 | 5.40 |
| 3 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |
| 4 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |

### Pedestrian Crossings - Signals

| Crossing | Controller stream | Phase | Second phase enabled |
|---|---|---|---|
| 1 | 1 | G | |
| 2 | 1 | H | |
| 3 | 1 | E | |
| 4 | 1 | F | |

### Pedestrian Crossings - Sides

| Crossing | Side | Saturation flow (Ped/hr) |
|---|---|---|
| (ALL) | (ALL) | 11000 |



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### Pedestrian Crossings - Modelling

| Crossing | Side | Delay weighting (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (Ped) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|
| (ALL) | (ALL) | 100 | 100 | | 0.00 | | |

## Local OD Matrix - Local Matrix: 1

### Local Matrix Options

| OD Matrix | Name | Use for point to point table | Auto calculate | Allocation mode | Allow paths past exit locations | Allow looped paths on arms | Allow looped paths on traffic nodes | Copy flows | Matrix to copy flows from | Limit paths by length | Path length limit multiplier | Limit paths by number | Path number limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | ✓ | ✓ | Path Equalisation | | | ✓ | | | ✓ | 1.25 | | |

### Normal Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 32 | 156 | 18 | 0 | 0 | 0 | 0 |
| | 2 | 10 | 0 | 18 | 2 | 0 | 0 | 0 | 0 |
| | 3 | 411 | 20 | 0 | 152 | 0 | 0 | 0 | 0 |
| | 4 | 19 | 0 | 32 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

### Pedestrian Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Locations

| OD Matrix | Location | Name | Entries | Exits | Colour |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | A/1 | Ax/1 | #0000FF |
| | 2 | (untitled) | B/1 | Bx/1 | #00FF00 |
| | 3 | (untitled) | C/1 | Cx/1 | #FFFF00 |
| | 4 | (untitled) | D/1 | Dx/1 | #FFFF00 |
| | 5 | (untitled) | 1:2E, 2:1E | 1:2X, 2:1X | #00FFFF |
| | 6 | (untitled) | 2:2E, 3:2E | 2:2X, 3:2X | #FF00FF |
| | 7 | (untitled) | 3:1E, 4:2E | 3:1X, 4:2X | #008000 |
| | 8 | (untitled) | 4:1E, 1:1E | 4:1X, 1:1X | #FFA500 |

### Normal Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Normal Calculated Flow (PCU/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 4 | | 2 | 3 | B/1, Cx/1 | Normal | 18 |
| | 12 | | 2 | 4 | B/1, Dx/1 | Normal | 2 |
| | 26 | | 1 | 3 | A/1, Cx/1 | Normal | 156 |
| | 28 | | 1 | 2 | A/1, Bx/1 | Normal | 32 |
| | 29 | | 3 | 4 | C/1, Dx/1 | Normal | 152 |
| | 32 | | 3 | 2 | C/1, Cr/1, Bx/1 | Normal | 20 |
| | 33 | | 1 | 4 | A/1, Ar/1, Dx/1 | Normal | 18 |
| | 34 | | 4 | 3 | D/1, Cx/1 | Normal | 32 |
| | 35 | | 4 | 2 | D/1, Bx/1 | Normal | 0 |
| | 36 | | 2 | 1 | B/1, Ax/1 | Normal | 10 |
| | 37 | | 4 | 1 | D/1, Ax/1 | Normal | 19 |
| | 38 | | 3 | 1 | C/1, Ax/1 | Normal | 411 |

### Pedestrian Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Pedestrian calculated flow (Ped/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | | 6 | 7 | 3:2E, 3:1X | Normal | 20 |
| | 17 | | 7 | 6 | 3:1E, 3:2X | Normal | 20 |
| | 18 | | 7 | 8 | 4:2E, 4:1X | Normal | 0 |
| | 19 | | 8 | 7 | 4:1E, 4:2X | Normal | 0 |
| | 20 | | 5 | 8 | 1:2E, 1:1X | Normal | 20 |
| | 21 | | 8 | 5 | 1:1E, 1:2X | Normal | 0 |
| | 22 | | 5 | 6 | 2:1E, 2:2X | Normal | 20 |
| | 23 | | 6 | 5 | 2:2E, 2:1X | Normal | 0 |

## Signal Timings

**Network Default: 100s cycle time; 100 steps**

### Controller Stream 1

| Controller Stream | Name | Description | Use sequence | Cycle time source | Cycle time (s) |
|---|---|---|---|---|---|
| 1 | (untitled) | | 1 | NetworkDefault | 100 |

### Controller Stream 1 - Properties

| Controller Stream | Manufacturer name | Type | Model number | (Telephone) Line Number | Site number | Grid reference | Gaining delay type |
|---|---|---|---|---|---|---|---|
| 1 | Unspecified | | | | | | Absolute |

### Controller Stream 1 - Optimisation

| Controller Stream | Allow offset optimisation | Allow green split optimisation | Optimisation level | Auto redistribute | Enable stage constraint |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | Offsets And Green Splits | ✓ | |

### Phases

| Controller Stream | Phase | Name | Minimum green (s) | Maximum green (s) | Relative start displacement (s) | Relative end displacement (s) | Type | Blackout Time (s) |
|---|---|---|---|---|---|---|---|---|
| 1 | A | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | B | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | C | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | D | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | E | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | F | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | G | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | H | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |



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### Library Stages

| Controller Stream | Library Stage | Phases in stage | User stage minimum (s) |
|---|---|---|---|
| 1 | 1 | A, C | 1 |
| | 2 | B | 1 |
| | 3 | D | 1 |
| | 4 | E, F, G, H | 1 |

### Stage Sequences

| Controller Stream | Sequence | Name | Multiple cycling | Stage IDs | Stage ends |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | Single | 1, 2, 3, 4 | 48, 61, 73, 87 |
| | 2 | (untitled) | Single | 1, 4, 2, 3 | 0, 31, 63, 91 |
| | 3 | (untitled) | Single | 1, 3, 4, 2 | 0, 29, 59, 91 |
| | 4 | (untitled) | Single | 1, 2, 4, 3 | 0, 29, 59, 91 |
| | 5 | (untitled) | Single | 1, 4, 3, 2 | 0, 31, 63, 91 |
| | 6 | (untitled) | Single | 1, 3, 2, 4 | 0, 29, 57, 87 |

### Intergreen Matrix for Controller Stream 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| From | A | | 6 | | 5 | 5 | 6 | 7 | 7 |
| | B | 5 | | 5 | 5 | 7 | 5 | 6 | 6 |
| | C | | 5 | | 6 | 6 | 7 | 5 | 5 |
| | D | 5 | 5 | 5 | | 6 | 7 | 7 | 5 |
| | E | 9 | 9 | 9 | 9 | | | | |
| | F | 9 | 9 | 9 | 9 | | | | |
| | G | 9 | 9 | 9 | 9 | | | | |
| | H | 5 | 5 | 5 | 6 | | | | |

### Banned Stage transitions for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

### Interstage Matrix for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | 0 | 6 | 6 | 7 |
| | 2 | 5 | 0 | 5 | 7 |
| | 3 | 5 | 5 | 0 | 7 |
| | 4 | 9 | 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 | 96 | 48 | 52 | 1 | 7 |
| | 2 | ✓ | 2 | B | 54 | 61 | 7 | 1 | 7 |
| | 3 | ✓ | 3 | D | 66 | 73 | 7 | 1 | 7 |
| | 4 | ✓ | 4 | E,F,G,H | 80 | 87 | 7 | 1 | 7 |

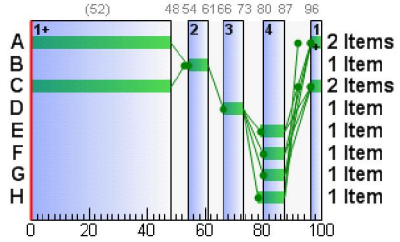
### Resultant Phase Green Periods

| Controller Stream | Phase | Green period | Is base green period | Start time (s) | End time (s) | Duration (s) |
|---|---|---|---|---|---|---|
| 1 | A | 1 | ✓ | 96 | 48 | 52 |
| | B | 1 | ✓ | 54 | 61 | 7 |
| | C | 1 | ✓ | 96 | 48 | 52 |
| | D | 1 | ✓ | 66 | 73 | 7 |
| | E | 1 | ✓ | 79 | 87 | 8 |
| | F | 1 | ✓ | 80 | 87 | 7 |
| | G | 1 | ✓ | 80 | 87 | 7 |
| | H | 1 | ✓ | 78 | 87 | 9 |

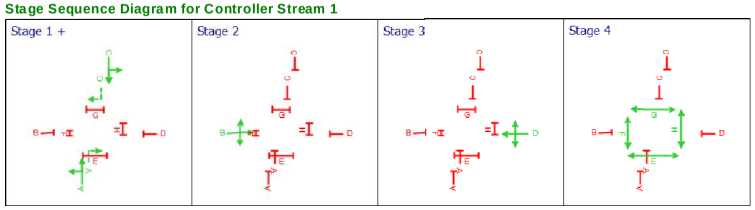
### Traffic Stream Green Times

| Arm | Traffic Stream | Traffic Node | Controller Stream | Phase | Green Period 1 | | |
|---|---|---|---|---|---|---|---|
| | | | | | Start | End | Duration |
| A | 1 | J | 1 | C | 96 | 48 | 52 |
| B | 1 | J | 1 | D | 66 | 73 | 7 |
| C | 1 | J | 1 | A | 96 | 48 | 52 |
| D | 1 | J | 1 | B | 54 | 61 | 7 |
| Ar | 1 | J | 1 | C | 96 | 48 | 52 |
| Cr | 1 | J | 1 | A | 96 | 48 | 52 |

### Phase Timings Diagram for Controller Stream 1




### Stage Sequence Diagram for Controller Stream 1




### Resultant penalties

| Time Segment | Controller stream | Phase min max penalty (£ per hr) | Intergreen broken penalty (£ per hr) | Stage constraint broken penalty (£ per hr) | Cost of controller stream penalties (£ per hr) |
|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 0.00 | 0.00 | 0.00 | 0.00 |



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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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 22 | 317 | 206 | 1802 | 52 | 12.99 | 3.06 | 5.87 | 10.56 | 1.33 | 11.89 |
| | B | 1 | 24 | 271 | 30 | 1547 | 7 | 47.82 | 0.81 | 3.12 | 5.66 | 0.36 | 6.02 |
| | C | 1 | 62 | 46 | 583 | 1781 | 52 | 19.48 | 11.67 | 22.37 | 44.80 | 5.14 | 49.94 |
| | D | 1 | 38 | 139 | 51 | 1692 | 7 | 51.60 | 1.44 | 2.77 | 10.38 | 0.64 | 11.02 |
| | Ar | 1 | 8 | 1020 | 18 | 423 | 52 | 13.59 | 0.36 | 35.79 | 0.97 | 0.08 | 1.04 |
| | Ax | 1 | 0 | Unrestricted | 440 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 0 | Unrestricted | 52 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 3 | 2934 | 20 | 1272 | 52 | 1.67 | 0.20 | 20.31 | 0.13 | 0.04 | 0.17 |
| | Cx | 1 | 0 | Unrestricted | 206 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 0 | Unrestricted | 172 | Unrestricted | 100 | 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)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 206 | 206 | 0 | | 1802 | 955 | 22 | | 317 | 0.00 | 52 |
| | B | 1 | 30 | 30 | 0 | | 1547 | 124 | 24 | | 271 | 0.00 | 7 |
| | C | 1 | 583 | 583 | 0 | | 1781 | 944 | 62 | | 46 | 0.00 | 52 |
| | D | 1 | 51 | 51 | 0 | | 1692 | 135 | 38 | | 139 | 0.00 | 7 |
| | Ar | 1 | 18 | 18 | 0 | | 423 | 224 | 8 | | 1020 | 0.93 | 52 |
| | Ax | 1 | 440 | 440 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.64 | 100 |
| | Bx | 1 | 52 | 52 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.74 | 100 |
| | Cr | 1 | 20 | 20 | 0 | | 1272 | 674 | 3 | | 2934 | 0.93 | 52 |
| | Cx | 1 | 206 | 206 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.45 | 100 |
| | Dx | 1 | 172 | 172 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.72 | 100 |

### Traffic Stream Results: Stops and delays

| Time Segment | Arm | Traffic Stream | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 36.00 | 12.99 | 0.74 | 10.56 | 51.61 | 106.32 | 1.33 |
| | B | 1 | 18.00 | 47.82 | 0.40 | 5.66 | 96.39 | 28.92 | 0.36 |
| | C | 1 | 36.00 | 19.48 | 3.16 | 44.80 | 70.35 | 410.17 | 5.14 |
| | D | 1 | 36.00 | 51.60 | 0.73 | 10.38 | 100.61 | 51.31 | 0.64 |
| | Ar | 1 | 1.00 | 13.59 | 0.07 | 0.97 | 70.71 | 12.73 | 0.08 |
| | Ax | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 1.00 | 1.67 | 0.01 | 0.13 | 29.96 | 5.99 | 0.04 |
| | Cx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 36.00 | 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 (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) | Estimated blocking |
|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 0.00 | 3.06 | 52.17 | 5.87 | 0.00 | 0.00 | |
| | B | 1 | 0.00 | 0.81 | 26.09 | 3.12 | 0.00 | 6.00 | |
| | C | 1 | 0.00 | 11.67 | 52.17 | 22.37 | 0.00 | 0.00 | |
| | D | 1 | 0.00 | 1.44 | 52.17 | 2.77 | 0.00 | 5.00 | |
| | Ar | 1 | 0.00 | 0.36 | 1.00 | 35.79 | 0.00 | 21.00 | |
| | Ax | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 15.00 | |
| | Bx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 58.00 | |
| | Cr | 1 | 0.00 | 0.20 | 1.00 | 20.31 | 0.00 | 32.00 | |
| | Cx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 12.00 | |
| | Dx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 36.00 | |

### Traffic Stream Results: Advanced

| Time Segment | Arm | Traffic Stream | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | Mean Max Queue EoTS (PCU) | Max End of Green Queue EoTS (PCU) | Max End of Red Queue EoTS (PCU) | PCU Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 0.00 | 0.00 | ✓ | 0.00 | 3.06 | 0.03 | 2.72 | 1.00 | 0.00 | 11.89 |
| | B | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.81 | 0.04 | 0.81 | 1.00 | 0.00 | 6.02 |
| | C | 1 | 0.00 | 0.00 | ✓ | 0.00 | 11.67 | 0.50 | 8.11 | 1.00 | 0.00 | 49.94 |
| | D | 1 | 0.00 | 0.00 | ✓ | 0.00 | 1.44 | 0.11 | 1.42 | 1.00 | 0.00 | 11.02 |
| | Ar | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.36 | 0.00 | 0.01 | 1.00 | 0.00 | 1.04 |
| | Ax | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Bx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Cr | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.20 | 0.00 | 0.01 | 1.00 | 0.00 | 0.17 |
| | Cx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Dx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

### Pedestrian Crossings: Pedestrian summary

| Time Segment | Crossing | Side | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Mean max queue (Ped) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3 | 20 | 11000 | 7 | 43.71 | 0.52 | 3.45 | 3.45 |
| | 2 | 1 | 2 | 20 | 11000 | 9 | 41.86 | 0.51 | 3.30 | 3.30 |
| | | 2 | 0 | 0 | 11000 | 9 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | | 2 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | 4 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Flows and signals

| Time Segment | Crossing | Side | Calculated flow entering (Ped/hr) | Calculated flow out (Ped/hr) | Flow discrepancy (Ped/hr) | Adjusted flow warning | Calculated sat flow (Ped/hr) | Calculated capacity (Ped/hr) | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity | Mean modulus of error | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 20 | 20 | 0 | | 11000 | 770 | 3 | | 3365 | 0.00 | 7 |
| | 2 | 1 | 20 | 20 | 0 | | 11000 | 990 | 2 | | 4355 | 0.00 | 9 |
| | | 2 | 0 | 0 | 0 | | 11000 | 990 | 0 | | Unrestricted | 0.00 | 9 |
| | 3 | 1 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | | 2 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | 4 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |



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Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

### Pedestrian Crossings: Stops and delays

| Time Segment | Crossing | Side | Mean Cruise Time per Ped (s) | Mean Delay per Ped (s) | Total delay (Ped-hr/hr) | Weighted cost of delay (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 8.33 | 43.71 | 0.24 | 3.45 |
| | 2 | 1 | 5.27 | 41.86 | 0.23 | 3.30 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 8.40 | 42.78 | 0.24 | 3.37 |
| | | 2 | 8.40 | 42.78 | 0.24 | 3.37 |
| | 4 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Queues and blocking

| Time Segment | Crossing | Side | Mean max queue (Ped) | Max queue storage (Ped) | Utilised storage (%) | Excess queue penalty (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.52 | 10.00 | 5.17 | 0.00 |
| | 2 | 1 | 0.51 | 10.00 | 5.06 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.51 | 10.00 | 5.11 | 0.00 |
| | | 2 | 0.51 | 10.00 | 5.11 | 0.00 |
| | 4 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Advanced

| Time Segment | Crossing | Side | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Mean Max Queue EoTS (Ped) | Ped Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.52 | 1.00 | 0.00 | 3.45 |
| | 2 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.30 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | | 2 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | 4 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |

## Network Results

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 13/12/2018 08:58:35 | 13/12/2018 08:58:37 | 17:00 | 100 | 93.59 | 6.06 | 61.76 | C/1 | 0 | 0 | C/1 | Cx/1 | C/ |

### Network Results: Vehicle summary

| Time Segment | Degree of saturation (%) | Practical reserve capacity (%) | Calculated flow entering (PCU/hr) | Actual green (s (per cycle)) | Mean Delay per Veh (s) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 62 | 0 | 1778 | 622 | 10.34 | 72.49 | 7.59 | 80.09 |

### Network Results: Pedestrian summary

| Time Segment | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 3 | 80 | 62 | 42.78 | 13.50 | 13.50 |

### Network Results: Flows and signals

| Time Segment | Calculated flow entering (PCU/hr) | Calculated flow out (PCU/hr) | Flow discrepancy (PCU/hr) | Adjusted flow warning | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity (%) | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1858 | 1858 | 0 | | 62 | | 46 | 684 |

### Network Results: Stops and delays

| Time Segment | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 33.77 | 11.73 | 6.06 | 85.99 | 33.12 | 615.44 | 7.59 |

### Network Results: Queues and blocking

| Time Segment | Utilised storage (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) |
|---|---|---|---|
| 17:00-18:00 | 35.79 | 0.00 | 185.00 |

### Network Results: Advanced

| Time Segment | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | PCU Factor | Cost of traffic penalties (£ per hr) | Controller stream penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 0.00 | 0.00 | ✓ | 0.00 | 1.00 | 0.00 | 0.00 | 93.59 |

## Point to Point Journey Time

### Average Journey Time (s) for Local Matrix: 1

| From \ To | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.0 | 85.0 | 85.0 | 99.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2 | 101.8 | 0.0 | 101.8 | 101.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3 | 91.5 | 94.1 | 0.0 | 91.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4 | 123.6 | 0.0 | 123.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.1 | 0.0 | 52.0 |
| 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 |
| 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 | 0.0 |
| 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Path Journey Time

| Path | From Location | To Location | Normal Calculated Flow (PCU/hr) | Pedestrian calculated flow (Ped/hr) | Normal journey time (s) | Pedestrian journey time (s) | Calculated Total Flow (PCU/hr) | Avg journey time (s) |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 3 | 18 | | 101.82 | | 18 | 101.82 |
| 12 | 2 | 4 | 2 | | 101.82 | | 2 | 101.82 |
| 16 | 6 | 7 | | 20 | | 51.18 | 20 | 51.18 |
| 17 | 7 | 6 | | 20 | | 51.18 | 20 | 51.18 |
| 18 | 7 | 8 | | 0 | | 0.00 | 0 | 0.00 |
| 19 | 8 | 7 | | 0 | | 0.00 | 0 | 0.00 |
| 20 | 5 | 8 | | 20 | | 52.04 | 20 | 52.04 |
| 21 | 8 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 22 | 5 | 6 | | 20 | | 47.13 | 20 | 47.13 |
| 23 | 6 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 26 | 1 | 3 | 156 | | 84.99 | | 156 | 84.99 |
| 28 | 1 | 2 | 32 | | 84.99 | | 32 | 84.99 |
| 29 | 3 | 4 | 152 | | 91.48 | | 152 | 91.48 |
| 32 | 3 | 2 | 20 | | 94.15 | | 20 | 94.15 |
| 33 | 1 | 4 | 18 | | 99.59 | | 18 | 99.59 |
| 34 | 4 | 3 | 32 | | 123.60 | | 32 | 123.60 |
| 35 | 4 | 2 | 0 | | 0.00 | | 0 | 0.00 |
| 36 | 2 | 1 | 10 | | 101.82 | | 10 | 101.82 |
| 37 | 4 | 1 | 19 | | 123.60 | | 19 | 123.60 |
| 38 | 3 | 1 | 411 | | 91.48 | | 411 | 91.48 |



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Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

## Final Prediction Table

### Traffic Stream Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | | PER PCU | | | QUEUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arm | Traffic Stream | Name | Traffic node | Controller stream | Phase | Calculated flow entering (PCU/hr) | Calculated sat flow (PCU/hr) | Actual green (s (per cycle)) | Wasted time total (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity (%) | JourneyTime (s) | Mean Delay per Veh (s) | Mean stops per Veh (%) | Mean max queue (PCU) |
| A | 1 | (untitled) | J | 1 | C | 206 | 1802 | 52 | 0.00 | 22 | 317 | 48.99 | 12.99 | 51.61 | 3.06 |
| B | 1 | (untitled) | J | 1 | D | 30 | 1547 | 7 | 6.00 | 24 | 271 | 65.82 | 47.82 | 96.39 | 0.81 |
| C | 1 | (untitled) | J | 1 | A | 583 | 1781 | 52 | 0.00 | 62 | 46 | 55.48 | 19.48 | 70.35 | 11.67 |
| D | 1 | (untitled) | J | 1 | B | 51 | 1692 | 7 | 5.00 | 38 | 139 | 87.60 | 51.60 | 100.61 | 1.44 |
| Ar | 1 | (untitled) | J | 1 | C | 18 | 423 | 52 | 21.00 | 8 | 1020 | 14.59 | 13.59 | 70.71 | 0.36 |
| Ax | 1 | (untitled) | J | | | 440 | Unrestricted | 100 | 15.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Bx | 1 | (untitled) | | | | 52 | Unrestricted | 100 | 58.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Cr | 1 | (untitled) | J | 1 | A | 20 | 1272 | 52 | 32.00 | 3 | 2934 | 2.67 | 1.67 | 29.96 | 0.20 |
| Cx | 1 | (untitled) | | | | 206 | Unrestricted | 100 | 12.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Dx | 1 | (untitled) | | | | 172 | Unrestricted | 100 | 36.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossing Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | PER PED | | QUEUES | WEIGHTS | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian | Side | Name | Traffic node | Controller stream | Phase | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity | JourneyTime (s) | Mean Delay per Ped (s) | Mean max queue (Ped) | Delay weighting (%) | |
| 1 | 1 | (untitled) | | 1 | G | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | G | 20 | 11000 | 7 | 3 | 3365 | 52.04 | 43.71 | 0.52 | 100 | |
| 2 | 1 | (untitled) | | 1 | H | 20 | 11000 | 9 | 2 | 4355 | 47.13 | 41.86 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | H | 0 | 11000 | 9 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| 3 | 1 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| 4 | 1 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |

### Network Results

| | Distance travelled (PCU-km/hr) | Time spent (PCU-hr/hr) | Mean journey speed (kph) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Excess queue penalty (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| Normal traffic | 517.72 | 22.37 | 23.15 | 5.11 | 72.49 | 7.59 | 0.00 | 80.09 |
| Bus | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pedestrians | 0.87 | 1.12 | 0.78 | 0.95 | 13.50 | 0.00 | 0.00 | 13.50 |
| TOTAL | 518.59 | 23.49 | 22.08 | 6.06 | 85.99 | 7.59 | 0.00 | 93.59 |

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

# A3 - AM 2025 DS
# D3 - AM 2025 DS*

## Summary

### Data Errors and Warnings

*No errors or warnings*

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 13/12/2018 08:58:37 | 13/12/2018 08:58:38 | 07:30 | 100 | 220.97 | 14.55 | 82.53 | A/1 | 0 | 0 | A/1 | Cx/1 | A/ |

### Analysis Set Details

| Name | Description | Demand set | Include in report | Locked |
|---|---|---|---|---|
| AM 2025 DS | | D3 | ✓ | |

### Demand Set Details

| Name | Description | Composite | Demand sets | Start time (HH:mm) | Locked |
|---|---|---|---|---|---|
| AM 2025 DS | | | | 07:30 | |

## Network Options

### Network timings

| Network cycle time (s) | Restrict to SCOOT cycle times | Time segment length (min) | Number of time segments | Modelled time period (min) |
|---|---|---|---|---|
| 100 | | 60 | 1 | 60 |

### Signals options

| Start displacement (s) | End displacement (s) |
|---|---|
| 2 | 3 |

### Advanced

| Phase minimum broken penalty (£) | Phase maximum broken penalty (£) | Intergreen broken penalty (£) | Starting Red-with-Amber (s) |
|---|---|---|---|
| 10000.00 | 10000.00 | 10000.00 | 2 |

### Traffic options

| Traffic model | Vehicle flow scaling factor (%) | Pedestrian flow scaling factor (%) | Cruise times or speeds |
|---|---|---|---|
| Platoon Dispersion (PDM) | 100 | 100 | Cruise Speeds |

### Advanced

| Resolution | DOS Threshold (%) | Cruise scaling factor (%) | Use link stop weightings | Use link delay weightings | Exclude pedestrians from results calculation | Random delay mode | Type of Vehicle-in-Service | Type of random parameter | PCU Length (m) | Calculate results for Path Segments | Generate PDM Profile Data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 100 | ✓ | ✓ | | Complex | Uniform (TRANSYT) | Uniform (TRANSYT) | 5.75 | | ✓ |





### Normal Traffic parameters

| Dispersion type | Dispersion coefficient |
|---|---|
| Default | 35 |

### Normal Traffic Types

| Name | PCU Factor |
|---|---|
| Normal | 1.00 |

### Bus parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Bus | 1.00 | 70 | 15 | 0.94 | 30 | 85 |

### Tram parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Tram | 1.00 | 0 | 0 | 0.94 | 100 | 100 |

### Pedestrian parameters

| Dispersion type |
|---|
| Default |

### Optimisation options

| Enable optimisation | Auto redistribute | Optimisation level | Enable OUT Profile accuracy |
|---|---|---|---|
| ✓ | ✓ | Offsets And Green Splits | ✓ |

### Advanced

| Optimisation type | Hill climb increments | OUTProfile accuracy | Use enhanced optimisation | Auto optimisation order | Optimisation order | Master controller | Offsets relative to master controller | Master controller offset after each run |
|---|---|---|---|---|---|---|---|---|
| Hill Climb (Fast) | 15, 40, -1, 15, 40, 1, -1, 1 | 50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05 | | ✓ | 1 | | | Do nothing |

### Economics

| Vehicle Monetary Value Of Delay (£ per PCU-hr) | Vehicle Monetary Value Of Stops (£ per 100 stops) | Pedestrian monetary value of delay (£ per Ped-hr) |
|---|---|---|
| 14.20 | 2.60 | 14.20 |

## Traffic Nodes

### Traffic Nodes

| Traffic node | Name | Description |
|---|---|---|
| J | (untitled) | |

# Arms and Traffic Streams

## Arms

| Arm | Name | Description | Traffic node |
|---|---|---|---|
| A | (untitled) | | J |
| B | (untitled) | | J |
| C | (untitled) | | J |
| D | (untitled) | | J |
| Ar | (untitled) | | J |
| Ax | (untitled) | | J |
| Bx | (untitled) | | |
| Cr | (untitled) | | J |
| Cx | (untitled) | | |
| Dx | (untitled) | | |

## Traffic Streams

| Arm | Traffic Stream | Name | Description | Auto length | Length (m) | Has Saturation Flow | Saturation flow source | Saturation flow (PCU/hr) | Is signal controlled | Is give way | Traffic type | Allow Nearside Turn On Red |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1802 | ✓ | | Normal | |
| B | 1 | (untitled) | | | 150.00 | ✓ | Sum of lanes | 1547 | ✓ | | Normal | |
| C | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1781 | ✓ | | Normal | |
| D | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1692 | ✓ | | Normal | |
| Ar | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Ax | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Bx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Cr | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Cx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Dx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |

## Lanes

| Arm | Traffic Stream | Lane | Name | Description | Use RR67 | Surface condition | Site quality factor | Gradient (%) | Width (m) | Use connector turning radius | Proportion that turn (%) | Turning radius (m) | Nearside lane | Saturation flow (PCU/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 25 | 6.00 | ✓ | 1802 |
| B | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 95 | 6.00 | ✓ | 1547 |
| C | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 30 | 6.00 | ✓ | 1781 |
| D | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 93 | 10.60 | ✓ | 1692 |
| Ar | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 6.00 | | 2005 |
| Ax | 1 | 1 | (untitled) | | | | | | | | | | | |
| Bx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Cr | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 8.50 | | 2005 |
| Cx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Dx | 1 | 1 | (untitled) | | | | | | | | | | | |



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## Modelling

| Arm | Traffic Stream | Traffic model | Stop weighting multiplier (%) | Delay weighting multiplier (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (PCU) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|---|---|
| A | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| B | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| C | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| D | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Ar | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Ax | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Bx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Cr | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Cx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Dx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |

## Modelling - Advanced

| Arm | Traffic Stream | Initial queue (PCU) | Type of Vehicle-in-Service | Vehicle-in-Service | Type of random parameter | Random parameter | Auto cycle time | Cycle time |
|---|---|---|---|---|---|---|---|---|
| (ALL) | 1 | 0.00 | NetworkDefault | Not-Included | NetworkDefault | 0.50 | ✓ | 100 |

## Normal - Modelling

| Arm | Traffic Stream | Stop weighting (%) | Delay weighting (%) |
|---|---|---|---|
| (ALL) | 1 | 100 | 100 |

## Flows

| Arm | Traffic Stream | Total Flow (PCU/hr) | Normal Flow (PCU/hr) |
|---|---|---|---|
| A | 1 | 580 | 580 |
| B | 1 | 48 | 48 |
| C | 1 | 235 | 235 |
| D | 1 | 307 | 307 |
| Ar | 1 | 16 | 16 |
| Ax | 1 | 217 | 217 |
| Bx | 1 | 27 | 27 |
| Cr | 1 | 16 | 16 |
| Cx | 1 | 885 | 885 |
| Dx | 1 | 41 | 41 |

## Signals

| Arm | Traffic Stream | Controller stream | Phase | Second phase enabled |
|---|---|---|---|---|
| A | 1 | 1 | C | |
| B | 1 | 1 | D | |
| C | 1 | 1 | A | |
| D | 1 | 1 | B | |
| Ar | 1 | 1 | C | |
| Cr | 1 | 1 | A | |

## Entry Sources

| Arm | Traffic Stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) |
|---|---|---|---|
| A | 1 | 36.00 | 30.00 |
| B | 1 | 18.00 | 30.00 |
| C | 1 | 36.00 | 30.00 |
| D | 1 | 36.00 | 30.00 |

### Sources

| Arm | Traffic Stream | Source | Source traffic stream | Destination traffic stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) | Auto turning radius | Traffic turn style | Turning radius (m) |
|---|---|---|---|---|---|---|---|---|---|
| Ar | 1 | 1 | A/1 | Ar/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 1 | C/1 | Ax/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Bx | 1 | 1 | D/1 | Bx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cr | 1 | 1 | C/1 | Cr/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cx | 1 | 1 | A/1 | Cx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Dx | 1 | 1 | B/1 | Dx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 2 | B/1 | Ax/1 | 36.00 | 30.00 | ✓ | Offside | 57.17 |
| Bx | 1 | 2 | A/1 | Bx/1 | 36.00 | 30.00 | ✓ | Nearside | 67.46 |
| Cx | 1 | 2 | B/1 | Cx/1 | 36.00 | 30.00 | ✓ | Nearside | 87.33 |
| Dx | 1 | 2 | C/1 | Dx/1 | 36.00 | 30.00 | ✓ | Nearside | 50.78 |
| Ax | 1 | 3 | D/1 | Ax/1 | 36.00 | 30.00 | ✓ | Nearside | 56.71 |
| Bx | 1 | 3 | Cr/1 | Bx/1 | 36.00 | 30.00 | ✓ | Offside | 52.48 |
| Cx | 1 | 3 | D/1 | Cx/1 | 36.00 | 30.00 | ✓ | Offside | 92.66 |
| Dx | 1 | 3 | Ar/1 | Dx/1 | 36.00 | 30.00 | ✓ | Offside | 97.63 |

### Give Way Data

| Arm | Traffic Stream | Opposed traffic | Use Step-wise Opposed Turn Model | Number of storage spaces | Use connector turning radius | Radius of turn (m) | Visibility restricted |
|---|---|---|---|---|---|---|---|
| Ar | 1 | AllTraffic | ✓ | 1 | | 10.00 | |
| Cr | 1 | AllTraffic | ✓ | 1 | | 8.00 | |

### Give Way Data - All Movements - Conflicts

| Traffic Stream | Description | Controlling type | Controlling from traffic stream | Controlling to traffic stream | Percentage opposing (%) | Upstream signals visible | Conflict shift | Conflict duration |
|---|---|---|---|---|---|---|---|---|
| 1 | | TrafficStreamMovement | C/1 | Dx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | C/1 | Ax/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Cx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Bx/1 | 100 | | 2 | 6 |

## Pedestrian Crossings

### Pedestrian Crossings

| Crossing | Name | Description | Traffic node | Allow walk on red | Crossing type | Length (m) | Cruise time (seconds) | Cruise speed (kph) |
|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | | | | Farside | 11.00 | 7.33 | 5.40 |
| 2 | (untitled) | | | | Farside | 6.40 | 4.27 | 5.40 |
| 3 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |
| 4 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |

### Pedestrian Crossings - Signals

| Crossing | Controller stream | Phase | Second phase enabled |
|---|---|---|---|
| 1 | 1 | G | |
| 2 | 1 | H | |
| 3 | 1 | E | |
| 4 | 1 | F | |

### Pedestrian Crossings - Sides

| Crossing | Side | Saturation flow (Ped/hr) |
|---|---|---|
| (ALL) | (ALL) | 11000 |



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### Pedestrian Crossings - Modelling

| Crossing | Side | Delay weighting (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (Ped) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|
| (ALL) | (ALL) | 100 | 100 | | 0.00 | | |

## Local OD Matrix - Local Matrix: 1

### Local Matrix Options

| OD Matrix | Name | Use for point to point table | Auto calculate | Allocation mode | Allow paths past exit locations | Allow looped paths on arms | Allow looped paths on traffic nodes | Copy flows | Matrix to copy flows from | Limit paths by length | Path length limit multiplier | Limit paths by number | Path number limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | ✓ | ✓ | Path Equalisation | | | ✓ | | | ✓ | 1.25 | | |

### Normal Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 6 | 558 | 16 | 0 | 0 | 0 | 0 |
| | 2 | 3 | 0 | 42 | 3 | 0 | 0 | 0 | 0 |
| | 3 | 197 | 16 | 0 | 22 | 0 | 0 | 0 | 0 |
| | 4 | 17 | 5 | 285 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

### Pedestrian Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Locations

| OD Matrix | Location | Name | Entries | Exits | Colour |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | A/1 | Ax/1 | #0000FF |
| | 2 | (untitled) | B/1 | Bx/1 | #00FF00 |
| | 3 | (untitled) | C/1 | Cx/1 | #FFFF00 |
| | 4 | (untitled) | D/1 | Dx/1 | #FFFF00 |
| | 5 | (untitled) | 1:2E, 2:1E | 1:2X, 2:1X | #00FFFF |
| | 6 | (untitled) | 2:2E, 3:2E | 2:2X, 3:2X | #FF00FF |
| | 7 | (untitled) | 3:1E, 4:2E | 3:1X, 4:2X | #008000 |
| | 8 | (untitled) | 4:1E, 1:1E | 4:1X, 1:1X | #FFA500 |

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Normal Calculated Flow (PCU/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 4 | | 2 | 3 | B/1, Cx/1 | Normal | 42 |
| | 12 | | 2 | 4 | B/1, Dx/1 | Normal | 3 |
| | 26 | | 1 | 3 | A/1, Cx/1 | Normal | 558 |
| | 28 | | 1 | 2 | A/1, Bx/1 | Normal | 6 |
| | 29 | | 3 | 4 | C/1, Dx/1 | Normal | 22 |
| | 32 | | 3 | 2 | C/1, Cr/1, Bx/1 | Normal | 16 |
| | 33 | | 1 | 4 | A/1, Ar/1, Dx/1 | Normal | 16 |
| | 34 | | 4 | 3 | D/1, Cx/1 | Normal | 285 |
| | 35 | | 4 | 2 | D/1, Bx/1 | Normal | 5 |
| | 36 | | 2 | 1 | B/1, Ax/1 | Normal | 3 |
| | 37 | | 4 | 1 | D/1, Ax/1 | Normal | 17 |
| | 38 | | 3 | 1 | C/1, Ax/1 | Normal | 197 |

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Pedestrian calculated flow (Ped/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | | 6 | 7 | 3:2E, 3:1X | Normal | 20 |
| | 17 | | 7 | 6 | 3:1E, 3:2X | Normal | 20 |
| | 18 | | 7 | 8 | 4:2E, 4:1X | Normal | 0 |
| | 19 | | 8 | 7 | 4:1E, 4:2X | Normal | 0 |
| | 20 | | 5 | 8 | 1:2E, 1:1X | Normal | 20 |
| | 21 | | 8 | 5 | 1:1E, 1:2X | Normal | 0 |
| | 22 | | 5 | 6 | 2:1E, 2:2X | Normal | 20 |
| | 23 | | 6 | 5 | 2:2E, 2:1X | Normal | 0 |

## Network Default: 100s cycle time: 100 steps

| Controller Stream | Name | Description | Use sequence | Cycle time source | Cycle time (s) |
|---|---|---|---|---|---|
| 1 | (untitled) | | 1 | NetworkDefault | 100 |

| Controller Stream | Manufacturer name | Type | Model number | (Telephone) Line Number | Site number | Grid reference | Gaining delay type |
|---|---|---|---|---|---|---|---|
| 1 | Unspecified | | | | | | Absolute |

| Controller Stream | Allow offset optimisation | Allow green split optimisation | Optimisation level | Auto redistribute | Enable stage constraint |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | Offsets And Green Splits | ✓ | |

| Controller Stream | Phase | Name | Minimum green (s) | Maximum green (s) | Relative start displacement (s) | Relative end displacement (s) | Type | Blackout Time (s) |
|---|---|---|---|---|---|---|---|---|
| 1 | A | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | B | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | C | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | D | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | E | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | F | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | G | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | H | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |





| Controller Stream | Library Stage | Phases in stage | User stage minimum (s) |
|---|---|---|---|
| 1 | 1 | A, C | 1 |
| | 2 | B | 1 |
| | 3 | D | 1 |
| | 4 | E, F, G, H | 1 |

| Controller Stream | Sequence | Name | Multiple cycling | Stage IDs | Stage ends |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | Single | 1, 2, 3, 4 | 35, 62, 74, 88 |
| | 2 | (untitled) | Single | 1, 4, 2, 3 | 0, 31, 63, 91 |
| | 3 | (untitled) | Single | 1, 3, 4, 2 | 0, 29, 59, 91 |
| | 4 | (untitled) | Single | 1, 2, 4, 3 | 0, 29, 59, 91 |
| | 5 | (untitled) | Single | 1, 4, 3, 2 | 0, 31, 63, 91 |
| | 6 | (untitled) | Single | 1, 3, 2, 4 | 0, 29, 57, 87 |

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| From | A | | 6 | | 5 | 5 | 6 | 7 | 7 |
| | B | 5 | | 5 | 5 | 7 | 5 | 6 | 6 |
| | C | | 5 | | 6 | 6 | 7 | 5 | 5 |
| | D | 5 | 5 | 5 | | 6 | 7 | 7 | 5 |
| | E | 9 | 9 | 9 | 9 | | | | |
| | F | 9 | 9 | 9 | 9 | | | | |
| | G | 9 | 9 | 9 | 9 | | | | |
| | H | 5 | 5 | 5 | 6 | | | | |

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | 0 | 6 | 6 | 7 |
| | 2 | 5 | 0 | 5 | 7 |
| | 3 | 5 | 5 | 0 | 7 |
| | 4 | 9 | 9 | 9 | 0 |

| 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 | 97 | 35 | 38 | 1 | 7 |
| | 2 | ✓ | 2 | B | 41 | 62 | 21 | 1 | 7 |
| | 3 | ✓ | 3 | D | 67 | 74 | 7 | 1 | 7 |
| | 4 | ✓ | 4 | E,F,G,H | 81 | 88 | 7 | 1 | 7 |

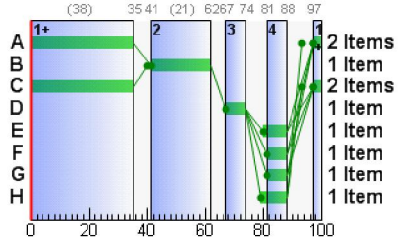
### Resultant Phase Green Periods

| Controller Stream | Phase | Green period | Is base green period | Start time (s) | End time (s) | Duration (s) |
|---|---|---|---|---|---|---|
| 1 | A | 1 | ✓ | 97 | 35 | 38 |
| | B | 1 | ✓ | 41 | 62 | 21 |
| | C | 1 | ✓ | 97 | 35 | 38 |
| | D | 1 | ✓ | 67 | 74 | 7 |
| | E | 1 | ✓ | 80 | 88 | 8 |
| | F | 1 | ✓ | 81 | 88 | 7 |
| | G | 1 | ✓ | 81 | 88 | 7 |
| | H | 1 | ✓ | 79 | 88 | 9 |

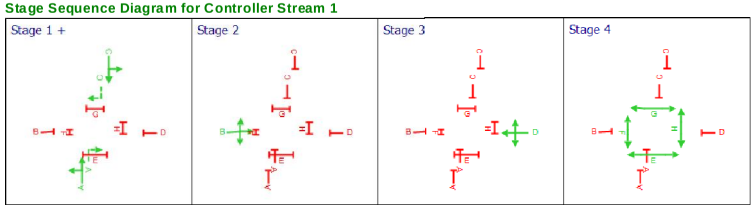
### Traffic Stream Green Times

| Arm | Traffic Stream | Traffic Node | Controller Stream | Phase | Green Period 1 | | |
|---|---|---|---|---|---|---|---|
| | | | | | Start | End | Duration |
| A | 1 | J | 1 | C | 97 | 35 | 38 |
| B | 1 | J | 1 | D | 67 | 74 | 7 |
| C | 1 | J | 1 | A | 97 | 35 | 38 |
| D | 1 | J | 1 | B | 41 | 62 | 21 |
| Ar | 1 | J | 1 | C | 97 | 35 | 38 |
| Cr | 1 | J | 1 | A | 97 | 35 | 38 |

### Phase Timings Diagram for Controller Stream 1




### Stage Sequence Diagram for Controller Stream 1




### Resultant penalties

| Time Segment | Controller stream | Phase min max penalty (£ per hr) | Intergreen broken penalty (£ per hr) | Stage constraint broken penalty (£ per hr) | Cost of controller stream penalties (£ per hr) |
|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 0.00 | 0.00 | 0.00 | 0.00 |



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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 | 83 | 9 | 580 | 1802 | 38 | 39.03 | 16.21 | 31.06 | 89.29 | 7.17 | 96.46 |
| | B | 1 | 39 | 132 | 48 | 1547 | 7 | 52.78 | 1.37 | 5.27 | 9.99 | 0.61 | 10.60 |
| | C | 1 | 34 | 166 | 235 | 1781 | 38 | 22.76 | 4.66 | 8.92 | 21.10 | 2.06 | 23.16 |
| | D | 1 | 82 | 9 | 307 | 1692 | 21 | 58.23 | 9.90 | 18.97 | 70.52 | 4.36 | 74.88 |
| | Ar | 1 | 4 | 2005 | 16 | 960 | 38 | 2.76 | 0.21 | 20.72 | 0.17 | 0.04 | 0.21 |
| | Ax | 1 | 0 | Unrestricted | 217 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 0 | Unrestricted | 27 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 28 | 222 | 16 | 147 | 38 | 32.59 | 0.46 | 46.14 | 2.06 | 0.10 | 2.15 |
| | Cx | 1 | 0 | Unrestricted | 885 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 0 | Unrestricted | 41 | Unrestricted | 100 | 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)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 580 | 580 | 0 | | 1802 | 703 | 83 | | 9 | 0.00 | 38 |
| | B | 1 | 48 | 48 | 0 | | 1547 | 124 | 39 | | 132 | 0.00 | 7 |
| | C | 1 | 235 | 235 | 0 | | 1781 | 695 | 34 | | 166 | 0.00 | 38 |
| | D | 1 | 307 | 307 | 0 | | 1692 | 372 | 82 | | 9 | 0.00 | 21 |
| | Ar | 1 | 16 | 16 | 0 | | 960 | 374 | 4 | | 2005 | 1.21 | 38 |
| | Ax | 1 | 217 | 217 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.83 | 100 |
| | Bx | 1 | 27 | 27 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.61 | 100 |
| | Cr | 1 | 16 | 16 | 0 | | 147 | 57 | 28 | | 222 | 1.21 | 38 |
| | Cx | 1 | 885 | 885 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.45 | 100 |
| | Dx | 1 | 41 | 41 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.82 | 100 |

### Traffic Stream Results: Stops and delays

| Time Segment | Arm | Traffic Stream | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 36.00 | 39.03 | 6.29 | 89.29 | 98.64 | 572.11 | 7.17 |
| | B | 1 | 18.00 | 52.78 | 0.70 | 9.99 | 101.71 | 48.82 | 0.61 |
| | C | 1 | 36.00 | 22.76 | 1.49 | 21.10 | 69.81 | 164.05 | 2.06 |
| | D | 1 | 36.00 | 58.23 | 4.97 | 70.52 | 113.36 | 348.03 | 4.36 |
| | Ar | 1 | 1.00 | 2.76 | 0.01 | 0.17 | 41.02 | 6.56 | 0.04 |
| | Ax | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 1.00 | 32.59 | 0.14 | 2.06 | 102.84 | 16.45 | 0.10 |
| | Cx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 36.00 | 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 (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) | Estimated blocking |
|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 0.00 | 16.21 | 52.17 | 31.06 | 0.00 | 0.00 | |
| | B | 1 | 0.00 | 1.37 | 26.09 | 5.27 | 0.00 | 5.00 | |
| | C | 1 | 0.00 | 4.66 | 52.17 | 8.92 | 0.00 | 0.00 | |
| | D | 1 | 0.00 | 9.90 | 52.17 | 18.97 | 0.00 | 0.00 | |
| | Ar | 1 | 0.00 | 0.21 | 1.00 | 20.72 | 0.00 | 23.00 | |
| | Ax | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 31.00 | |
| | Bx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 91.00 | |
| | Cr | 1 | 0.00 | 0.46 | 1.00 | 46.14 | 0.00 | 1.00 | |
| | Cx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 0.00 | |
| | Dx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 65.00 | |

### Traffic Stream Results: Advanced

| Time Segment | Arm | Traffic Stream | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | Mean Max Queue EoTS (PCU) | Max End of Green Queue EoTS (PCU) | Max End of Red Queue EoTS (PCU) | PCU Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 0.00 | 0.00 | ✓ | 0.00 | 16.25 | 1.91 | 11.73 | 1.00 | 0.00 | 96.46 |
| | B | 1 | 0.00 | 0.00 | ✓ | 0.00 | 1.38 | 0.12 | 1.35 | 1.00 | 0.00 | 10.60 |
| | C | 1 | 0.00 | 0.00 | ✓ | 0.00 | 4.66 | 0.09 | 4.07 | 1.00 | 0.00 | 23.16 |
| | D | 1 | 0.00 | 0.00 | ✓ | 0.00 | 9.97 | 1.86 | 8.52 | 1.00 | 0.00 | 74.88 |
| | Ar | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.21 | 0.00 | 0.01 | 1.00 | 0.00 | 0.21 |
| | Ax | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Bx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Cr | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.46 | 0.05 | 0.06 | 1.00 | 0.00 | 2.15 |
| | Cx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Dx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

### Pedestrian Crossings: Pedestrian summary

| Time Segment | Crossing | Side | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Mean max queue (Ped) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3 | 20 | 11000 | 7 | 43.71 | 0.52 | 3.45 | 3.45 |
| | 2 | 1 | 2 | 20 | 11000 | 9 | 41.86 | 0.51 | 3.30 | 3.30 |
| | | 2 | 0 | 0 | 11000 | 9 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | | 2 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | 4 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Flows and signals

| Time Segment | Crossing | Side | Calculated flow entering (Ped/hr) | Calculated flow out (Ped/hr) | Flow discrepancy (Ped/hr) | Adjusted flow warning | Calculated sat flow (Ped/hr) | Calculated capacity (Ped/hr) | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity | Mean modulus of error | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 20 | 20 | 0 | | 11000 | 770 | 3 | | 3365 | 0.00 | 7 |
| | 2 | 1 | 20 | 20 | 0 | | 11000 | 990 | 2 | | 4355 | 0.00 | 9 |
| | | 2 | 0 | 0 | 0 | | 11000 | 990 | 0 | | Unrestricted | 0.00 | 9 |
| | 3 | 1 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | | 2 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | 4 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |



TRL THE FUTURE OF TRANSPORT


### Pedestrian Crossings: Stops and delays

| Time Segment | Crossing | Side | Mean Cruise Time per Ped (s) | Mean Delay per Ped (s) | Total delay (Ped-hr/hr) | Weighted cost of delay (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 8.33 | 43.71 | 0.24 | 3.45 |
| | 2 | 1 | 5.27 | 41.86 | 0.23 | 3.30 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 8.40 | 42.78 | 0.24 | 3.37 |
| | | 2 | 8.40 | 42.78 | 0.24 | 3.37 |
| | 4 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Queues and blocking

| Time Segment | Crossing | Side | Mean max queue (Ped) | Max queue storage (Ped) | Utilised storage (%) | Excess queue penalty (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.52 | 10.00 | 5.17 | 0.00 |
| | 2 | 1 | 0.51 | 10.00 | 5.06 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.51 | 10.00 | 5.11 | 0.00 |
| | | 2 | 0.51 | 10.00 | 5.11 | 0.00 |
| | 4 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Advanced

| Time Segment | Crossing | Side | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Mean Max Queue EoTS (Ped) | Ped Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.52 | 1.00 | 0.00 | 3.45 |
| | 2 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.30 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | | 2 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | 4 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |

## Network Results

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 13/12/2018 08:58:37 | 13/12/2018 08:58:38 | 07:30 | 100 | 220.97 | 14.55 | 82.53 | A/1 | 0 | 0 | A/1 | Cx/1 | A/ |

### Network Results: Vehicle summary

| Time Segment | Degree of saturation (%) | Practical reserve capacity (%) | Calculated flow entering (PCU/hr) | Actual green (s (per cycle)) | Mean Delay per Veh (s) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 83 | 0 | 2372 | 580 | 20.64 | 193.12 | 14.34 | 207.47 |

### Network Results: Pedestrian summary

| Time Segment | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 3 | 80 | 62 | 42.78 | 13.50 | 13.50 |

### Network Results: Flows and signals

| Time Segment | Calculated flow entering (PCU/hr) | Calculated flow out (PCU/hr) | Flow discrepancy (PCU/hr) | Adjusted flow warning | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity (%) | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 2452 | 2452 | 0 | | 83 | | 9 | 642 |

### Network Results: Stops and delays

| Time Segment | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 34.26 | 21.36 | 14.55 | 206.62 | 47.15 | 1156.02 | 14.34 |

### Network Results: Queues and blocking

| Time Segment | Utilised storage (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) |
|---|---|---|---|
| 07:30-08:30 | 46.14 | 0.00 | 216.00 |

### Network Results: Advanced

| Time Segment | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | PCU Factor | Cost of traffic penalties (£ per hr) | Controller stream penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 0.00 | 0.00 | ✓ | 0.00 | 1.00 | 0.00 | 0.00 | 220.97 |

## Point to Point Journey Time

### Average Journey Time (s) for Local Matrix: 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0.0 | 111.0 | 111.0 | 114.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2 | 106.8 | 0.0 | 106.8 | 106.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 3 | 94.8 | 128.3 | 0.0 | 94.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4 | 130.2 | 130.2 | 130.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.1 | 0.0 | 52.0 |
| | 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 |
| | 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 | 0.0 |
| | 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Path Journey Time

| Path | From Location | To Location | Normal Calculated Flow (PCU/hr) | Pedestrian calculated flow (Ped/hr) | Normal journey time (s) | Pedestrian journey time (s) | Calculated Total Flow (PCU/hr) | Avg journey time (s) |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 3 | 42 | | 106.78 | | 42 | 106.78 |
| 12 | 2 | 4 | 3 | | 106.78 | | 3 | 106.78 |
| 16 | 6 | 7 | | 20 | | 51.18 | 20 | 51.18 |
| 17 | 7 | 6 | | 20 | | 51.18 | 20 | 51.18 |
| 18 | 7 | 8 | | 0 | | 0.00 | 0 | 0.00 |
| 19 | 8 | 7 | | 0 | | 0.00 | 0 | 0.00 |
| 20 | 5 | 8 | | 20 | | 52.04 | 20 | 52.04 |
| 21 | 8 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 22 | 5 | 6 | | 20 | | 47.13 | 20 | 47.13 |
| 23 | 6 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 26 | 1 | 3 | 558 | | 111.03 | | 558 | 111.03 |
| 28 | 1 | 2 | 6 | | 111.03 | | 6 | 111.03 |
| 29 | 3 | 4 | 22 | | 94.76 | | 22 | 94.76 |
| 32 | 3 | 2 | 16 | | 128.35 | | 16 | 128.35 |
| 33 | 1 | 4 | 16 | | 114.78 | | 16 | 114.78 |
| 34 | 4 | 3 | 285 | | 130.23 | | 285 | 130.23 |
| 35 | 4 | 2 | 5 | | 130.23 | | 5 | 130.23 |
| 36 | 2 | 1 | 3 | | 106.78 | | 3 | 106.78 |
| 37 | 4 | 1 | 17 | | 130.23 | | 17 | 130.23 |
| 38 | 3 | 1 | 197 | | 94.76 | | 197 | 94.76 |



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## Final Prediction Table

### Traffic Stream Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | | PER PCU | | | QUEUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arm | Traffic Stream | Name | Traffic node | Controller stream | Phase | Calculated flow entering (PCU/hr) | Calculated sat flow (PCU/hr) | Actual green (s (per cycle)) | Wasted time total (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity (%) | JourneyTime (s) | Mean Delay per Veh (s) | Mean stops per Veh (%) | Mean max queue (PCU) |
| A | 1 | (untitled) | J | 1 | C | 580 | 1802 | 38 | 0.00 | 83 | 9 | 75.03 | 39.03 | 98.64 | 16.21 |
| B | 1 | (untitled) | J | 1 | D | 48 | 1547 | 7 | 5.00 | 39 | 132 | 70.78 | 52.78 | 101.71 | 1.37 |
| C | 1 | (untitled) | J | 1 | A | 235 | 1781 | 38 | 0.00 | 34 | 166 | 58.76 | 22.76 | 69.81 | 4.66 |
| D | 1 | (untitled) | J | 1 | B | 307 | 1692 | 21 | 0.00 | 82 | 9 | 94.23 | 58.23 | 113.36 | 9.90 |
| Ar | 1 | (untitled) | J | 1 | C | 16 | 960 | 38 | 23.00 | 4 | 2005 | 3.76 | 2.76 | 41.02 | 0.21 |
| Ax | 1 | (untitled) | J | | | 217 | Unrestricted | 100 | 31.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Bx | 1 | (untitled) | | | | 27 | Unrestricted | 100 | 91.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Cr | 1 | (untitled) | J | 1 | A | 16 | 147 | 38 | 1.00 | 28 | 222 | 33.59 | 32.59 | 102.84 | 0.46 |
| Cx | 1 | (untitled) | | | | 885 | Unrestricted | 100 | 0.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Dx | 1 | (untitled) | | | | 41 | Unrestricted | 100 | 65.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossing Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | PER PED | | QUEUES | WEIGHTS | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian | Side | Name | Traffic node | Controller stream | Phase | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity | JourneyTime (s) | Mean Delay per Ped (s) | Mean max queue (Ped) | Delay weighting (%) | |
| 1 | 1 | (untitled) | | 1 | G | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | G | 20 | 11000 | 7 | 3 | 3365 | 52.04 | 43.71 | 0.52 | 100 | |
| 2 | 1 | (untitled) | | 1 | H | 20 | 11000 | 9 | 2 | 4355 | 47.13 | 41.86 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | H | 0 | 11000 | 9 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| 3 | 1 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| 4 | 1 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |

### Network Results

| | Distance travelled (PCU-km/hr) | Time spent (PCU-hr/hr) | Mean journey speed (kph) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Excess queue penalty (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| Normal traffic | 694.98 | 36.77 | 18.90 | 13.60 | 193.12 | 14.34 | 0.00 | 207.47 |
| Bus | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pedestrians | 0.87 | 1.12 | 0.78 | 0.95 | 13.50 | 0.00 | 0.00 | 13.50 |
| TOTAL | 695.86 | 37.89 | 18.37 | 14.55 | 206.62 | 14.34 | 0.00 | 220.97 |

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

# A4 - PM 2025 DS
# D4 - PM 2025 DS*

## Summary

### Data Errors and Warnings

*No errors or warnings*

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 13/12/2018 08:58:38 | 13/12/2018 08:58:39 | 17:00 | 100 | 107.81 | 6.97 | 67.59 | C/1 | 0 | 0 | C/1 | Cx/1 | C/ |

### Analysis Set Details

| Name | Description | Demand set | Include in report | Locked |
|---|---|---|---|---|
| PM 2025 DS | | D4 | ✓ | |

### Demand Set Details

| Name | Description | Composite | Demand sets | Start time (HH:mm) | Locked |
|---|---|---|---|---|---|
| PM 2025 DS | | | | 17:00 | |

## Network Options

### Network timings

| Network cycle time (s) | Restrict to SCOOT cycle times | Time segment length (min) | Number of time segments | Modelled time period (min) |
|---|---|---|---|---|
| 100 | | 60 | 1 | 60 |

### Signals options

| Start displacement (s) | End displacement (s) |
|---|---|
| 2 | 3 |

### Advanced

| Phase minimum broken penalty (£) | Phase maximum broken penalty (£) | Intergreen broken penalty (£) | Starting Red-with-Amber (s) |
|---|---|---|---|
| 10000.00 | 10000.00 | 10000.00 | 2 |

### Traffic options

| Traffic model | Vehicle flow scaling factor (%) | Pedestrian flow scaling factor (%) | Cruise times or speeds |
|---|---|---|---|
| Platoon Dispersion (PDM) | 100 | 100 | Cruise Speeds |

### Advanced

| Resolution | DOS Threshold (%) | Cruise scaling factor (%) | Use link stop weightings | Use link delay weightings | Exclude pedestrians from results calculation | Random delay mode | Type of Vehicle-in-Service | Type of random parameter | PCU Length (m) | Calculate results for Path Segments | Generate PDM Profile Data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 100 | ✓ | ✓ | | Complex | Uniform (TRANSYT) | Uniform (TRANSYT) | 5.75 | | ✓ |



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### Normal Traffic parameters

| Dispersion type | Dispersion coefficient |
|---|---|
| Default | 35 |

### Normal Traffic Types

| Name | PCU Factor |
|---|---|
| Normal | 1.00 |

### Bus parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Bus | 1.00 | 70 | 15 | 0.94 | 30 | 85 |

### Tram parameters

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Tram | 1.00 | 0 | 0 | 0.94 | 100 | 100 |

### Pedestrian parameters

| Dispersion type |
|---|
| Default |

### Optimisation options

| Enable optimisation | Auto redistribute | Optimisation level | Enable OUT Profile accuracy |
|---|---|---|---|
| ✓ | ✓ | Offsets And Green Splits | ✓ |

### Advanced

| Optimisation type | Hill climb increments | OUTProfile accuracy | Use enhanced optimisation | Auto optimisation order | Optimisation order | Master controller | Offsets relative to master controller | Master controller offset after each run |
|---|---|---|---|---|---|---|---|---|
| Hill Climb (Fast) | 15, 40, -1, 15, 40, 1, -1, 1 | 50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05 | | ✓ | 1 | | | Do nothing |

### Economics

| Vehicle Monetary Value Of Delay (£ per PCU-hr) | Vehicle Monetary Value Of Stops (£ per 100 stops) | Pedestrian monetary value of delay (£ per Ped-hr) |
|---|---|---|
| 14.20 | 2.60 | 14.20 |

## Traffic Nodes

### Traffic Nodes

| Traffic node | Name | Description |
|---|---|---|
| J | (untitled) | |

# Arms and Traffic Streams

## Arms

| Arm | Name | Description | Traffic node |
|---|---|---|---|
| A | (untitled) | | J |
| B | (untitled) | | J |
| C | (untitled) | | J |
| D | (untitled) | | J |
| Ar | (untitled) | | J |
| Ax | (untitled) | | J |
| Bx | (untitled) | | |
| Cr | (untitled) | | J |
| Cx | (untitled) | | |
| Dx | (untitled) | | |

## Traffic Streams

| Arm | Traffic Stream | Name | Description | Auto length | Length (m) | Has Saturation Flow | Saturation flow source | Saturation flow (PCU/hr) | Is signal controlled | Is give way | Traffic type | Allow Nearside Turn On Red |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1802 | ✓ | | Normal | |
| B | 1 | (untitled) | | | 150.00 | ✓ | Sum of lanes | 1547 | ✓ | | Normal | |
| C | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1781 | ✓ | | Normal | |
| D | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1678 | ✓ | | Normal | |
| Ar | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 1604 | ✓ | ✓ | Normal | |
| Ax | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Bx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Cr | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 1704 | ✓ | ✓ | Normal | |
| Cx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Dx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |

## Lanes

| Arm | Traffic Stream | Lane | Name | Description | Use RR67 | Surface condition | Site quality factor | Gradient (%) | Width (m) | Use connector turning radius | Proportion that turn (%) | Turning radius (m) | Nearside lane | Saturation flow (PCU/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 25 | 6.00 | ✓ | 1802 |
| B | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 95 | 6.00 | ✓ | 1547 |
| C | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 30 | 6.00 | ✓ | 1781 |
| D | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 100 | 10.60 | ✓ | 1678 |
| Ar | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 100 | 6.00 | | 1604 |
| Ax | 1 | 1 | (untitled) | | | | | | | | | | | |
| Bx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Cr | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 100 | 8.50 | | 1704 |
| Cx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Dx | 1 | 1 | (untitled) | | | | | | | | | | | |





## Modelling

| Arm | Traffic Stream | Traffic model | Stop weighting multiplier (%) | Delay weighting multiplier (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (PCU) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|---|---|
| A | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| B | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| C | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| D | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Ar | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Ax | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Bx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Cr | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Cx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Dx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |

## Modelling - Advanced

| Arm | Traffic Stream | Initial queue (PCU) | Type of Vehicle-in-Service | Vehicle-in-Service | Type of random parameter | Random parameter | Auto cycle time | Cycle time |
|---|---|---|---|---|---|---|---|---|
| (ALL) | 1 | 0.00 | NetworkDefault | Not-Included | NetworkDefault | 0.50 | ✓ | 100 |

## Normal - Modelling

| Arm | Traffic Stream | Stop weighting (%) | Delay weighting (%) |
|---|---|---|---|
| (ALL) | 1 | 100 | 100 |

## Flows

| Arm | Traffic Stream | Total Flow (PCU/hr) | Normal Flow (PCU/hr) |
|---|---|---|---|
| A | 1 | 237 | 237 |
| B | 1 | 30 | 30 |
| C | 1 | 638 | 638 |
| D | 1 | 59 | 59 |
| Ar | 1 | 19 | 19 |
| Ax | 1 | 480 | 480 |
| Bx | 1 | 52 | 52 |
| Cr | 1 | 20 | 20 |
| Cx | 1 | 243 | 243 |
| Dx | 1 | 189 | 189 |

## Signals

| Arm | Traffic Stream | Controller stream | Phase | Second phase enabled |
|---|---|---|---|---|
| A | 1 | 1 | C | |
| B | 1 | 1 | D | |
| C | 1 | 1 | A | |
| D | 1 | 1 | B | |
| Ar | 1 | 1 | C | |
| Cr | 1 | 1 | A | |

## Entry Sources

| Arm | Traffic Stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) |
|---|---|---|---|
| A | 1 | 36.00 | 30.00 |
| B | 1 | 18.00 | 30.00 |
| C | 1 | 36.00 | 30.00 |
| D | 1 | 36.00 | 30.00 |

### Sources

| Arm | Traffic Stream | Source | Source traffic stream | Destination traffic stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) | Auto turning radius | Traffic turn style | Turning radius (m) |
|---|---|---|---|---|---|---|---|---|---|
| Ar | 1 | 1 | A/1 | Ar/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 1 | C/1 | Ax/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Bx | 1 | 1 | D/1 | Bx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cr | 1 | 1 | C/1 | Cr/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cx | 1 | 1 | A/1 | Cx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Dx | 1 | 1 | B/1 | Dx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 2 | B/1 | Ax/1 | 36.00 | 30.00 | ✓ | Offside | 57.17 |
| Bx | 1 | 2 | A/1 | Bx/1 | 36.00 | 30.00 | ✓ | Nearside | 67.46 |
| Cx | 1 | 2 | B/1 | Cx/1 | 36.00 | 30.00 | ✓ | Nearside | 87.33 |
| Dx | 1 | 2 | C/1 | Dx/1 | 36.00 | 30.00 | ✓ | Nearside | 50.78 |
| Ax | 1 | 3 | D/1 | Ax/1 | 36.00 | 30.00 | ✓ | Nearside | 56.71 |
| Bx | 1 | 3 | Cr/1 | Bx/1 | 36.00 | 30.00 | ✓ | Offside | 52.48 |
| Cx | 1 | 3 | D/1 | Cx/1 | 36.00 | 30.00 | ✓ | Offside | 92.66 |
| Dx | 1 | 3 | Ar/1 | Dx/1 | 36.00 | 30.00 | ✓ | Offside | 97.63 |

### Give Way Data

| Arm | Traffic Stream | Opposed traffic | Use Step-wise Opposed Turn Model | Number of storage spaces | Use connector turning radius | Radius of turn (m) | Visibility restricted |
|---|---|---|---|---|---|---|---|
| Ar | 1 | AllTraffic | ✓ | 1 | | 10.00 | |
| Cr | 1 | AllTraffic | ✓ | 1 | | 8.00 | |

### Give Way Data - All Movements - Conflicts

| Traffic Stream | Description | Controlling type | Controlling from traffic stream | Controlling to traffic stream | Percentage opposing (%) | Upstream signals visible | Conflict shift | Conflict duration |
|---|---|---|---|---|---|---|---|---|
| 1 | | TrafficStreamMovement | C/1 | Dx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | C/1 | Ax/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Cx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Bx/1 | 100 | | 2 | 6 |

## Pedestrian Crossings

### Pedestrian Crossings

| Crossing | Name | Description | Traffic node | Allow walk on red | Crossing type | Length (m) | Cruise time (seconds) | Cruise speed (kph) |
|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | | | | Farside | 11.00 | 7.33 | 5.40 |
| 2 | (untitled) | | | | Farside | 6.40 | 4.27 | 5.40 |
| 3 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |
| 4 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |

### Pedestrian Crossings - Signals

| Crossing | Controller stream | Phase | Second phase enabled |
|---|---|---|---|
| 1 | 1 | G | |
| 2 | 1 | H | |
| 3 | 1 | E | |
| 4 | 1 | F | |

### Pedestrian Crossings - Sides

| Crossing | Side | Saturation flow (Ped/hr) |
|---|---|---|
| (ALL) | (ALL) | 11000 |



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### Pedestrian Crossings - Modelling

| Crossing | Side | Delay weighting (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (Ped) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|
| (ALL) | (ALL) | 100 | 100 | | 0.00 | | |

## Local OD Matrix - Local Matrix: 1

### Local Matrix Options

| OD Matrix | Name | Use for point to point table | Auto calculate | Allocation mode | Allow paths past exit locations | Allow looped paths on arms | Allow looped paths on traffic nodes | Copy flows | Matrix to copy flows from | Limit paths by length | Path length limit multiplier | Limit paths by number | Path number limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | ✓ | ✓ | Path Equalisation | | | ✓ | | | ✓ | 1.25 | | |

### Normal Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 32 | 186 | 19 | 0 | 0 | 0 | 0 |
| | 2 | 10 | 0 | 18 | 2 | 0 | 0 | 0 | 0 |
| | 3 | 450 | 20 | 0 | 168 | 0 | 0 | 0 | 0 |
| | 4 | 20 | 0 | 39 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

### Pedestrian Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Locations

| OD Matrix | Location | Name | Entries | Exits | Colour |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | A/1 | Ax/1 | #0000FF |
| | 2 | (untitled) | B/1 | Bx/1 | #00FF00 |
| | 3 | (untitled) | C/1 | Cx/1 | #FFFF00 |
| | 4 | (untitled) | D/1 | Dx/1 | #FFFF00 |
| | 5 | (untitled) | 1:2E, 2:1E | 1:2X, 2:1X | #00FFFF |
| | 6 | (untitled) | 2:2E, 3:2E | 2:2X, 3:2X | #FF00FF |
| | 7 | (untitled) | 3:1E, 4:2E | 3:1X, 4:2X | #008000 |
| | 8 | (untitled) | 4:1E, 1:1E | 4:1X, 1:1X | #FFA500 |

### Normal Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Normal Calculated Flow (PCU/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 4 | | 2 | 3 | B/1, Cx/1 | Normal | 18 |
| | 12 | | 2 | 4 | B/1, Dx/1 | Normal | 2 |
| | 26 | | 1 | 3 | A/1, Cx/1 | Normal | 186 |
| | 28 | | 1 | 2 | A/1, Bx/1 | Normal | 32 |
| | 29 | | 3 | 4 | C/1, Dx/1 | Normal | 168 |
| | 32 | | 3 | 2 | C/1, Cr/1, Bx/1 | Normal | 20 |
| | 33 | | 1 | 4 | A/1, Ar/1, Dx/1 | Normal | 19 |
| | 34 | | 4 | 3 | D/1, Cx/1 | Normal | 39 |
| | 35 | | 4 | 2 | D/1, Bx/1 | Normal | 0 |
| | 36 | | 2 | 1 | B/1, Ax/1 | Normal | 10 |
| | 37 | | 4 | 1 | D/1, Ax/1 | Normal | 20 |
| | 38 | | 3 | 1 | C/1, Ax/1 | Normal | 450 |

### Pedestrian Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Pedestrian calculated flow (Ped/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | | 6 | 7 | 3:2E, 3:1X | Normal | 20 |
| | 17 | | 7 | 6 | 3:1E, 3:2X | Normal | 20 |
| | 18 | | 7 | 8 | 4:2E, 4:1X | Normal | 0 |
| | 19 | | 8 | 7 | 4:1E, 4:2X | Normal | 0 |
| | 20 | | 5 | 8 | 1:2E, 1:1X | Normal | 20 |
| | 21 | | 8 | 5 | 1:1E, 1:2X | Normal | 0 |
| | 22 | | 5 | 6 | 2:1E, 2:2X | Normal | 20 |
| | 23 | | 6 | 5 | 2:2E, 2:1X | Normal | 0 |

## Signal Timings

**Network Default: 100s cycle time; 100 steps**

### Controller Stream 1

| Controller Stream | Name | Description | Use sequence | Cycle time source | Cycle time (s) |
|---|---|---|---|---|---|
| 1 | (untitled) | | 1 | NetworkDefault | 100 |

### Controller Stream 1 - Properties

| Controller Stream | Manufacturer name | Type | Model number | (Telephone) Line Number | Site number | Grid reference | Gaining delay type |
|---|---|---|---|---|---|---|---|
| 1 | Unspecified | | | | | | Absolute |

### Controller Stream 1 - Optimisation

| Controller Stream | Allow offset optimisation | Allow green split optimisation | Optimisation level | Auto redistribute | Enable stage constraint |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | Offsets And Green Splits | ✓ | |

### Phases

| Controller Stream | Phase | Name | Minimum green (s) | Maximum green (s) | Relative start displacement (s) | Relative end displacement (s) | Type | Blackout Time (s) |
|---|---|---|---|---|---|---|---|---|
| 1 | A | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | B | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | C | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | D | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | E | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | F | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | G | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | H | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |



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### Library Stages

| Controller Stream | Library Stage | Phases in stage | User stage minimum (s) |
|---|---|---|---|
| 1 | 1 | A, C | 1 |
| | 2 | B | 1 |
| | 3 | D | 1 |
| | 4 | E, F, G, H | 1 |

### Stage Sequences

| Controller Stream | Sequence | Name | Multiple cycling | Stage IDs | Stage ends |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | Single | 1, 2, 3, 4 | 48, 61, 73, 87 |
| | 2 | (untitled) | Single | 1, 4, 2, 3 | 0, 31, 63, 91 |
| | 3 | (untitled) | Single | 1, 3, 4, 2 | 0, 29, 59, 91 |
| | 4 | (untitled) | Single | 1, 2, 4, 3 | 0, 29, 59, 91 |
| | 5 | (untitled) | Single | 1, 4, 3, 2 | 0, 31, 63, 91 |
| | 6 | (untitled) | Single | 1, 3, 2, 4 | 0, 29, 57, 87 |

### Intergreen Matrix for Controller Stream 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| From | A | | 6 | | 5 | 5 | 6 | 7 | 7 |
| | B | 5 | | 5 | 5 | 7 | 5 | 6 | 6 |
| | C | | 5 | | 6 | 6 | 7 | 5 | 5 |
| | D | 5 | 5 | 5 | | 6 | 7 | 7 | 5 |
| | E | 9 | 9 | 9 | 9 | | | | |
| | F | 9 | 9 | 9 | 9 | | | | |
| | G | 9 | 9 | 9 | 9 | | | | |
| | H | 5 | 5 | 5 | 6 | | | | |

### Banned Stage transitions for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

### Interstage Matrix for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | 0 | 6 | 6 | 7 |
| | 2 | 5 | 0 | 5 | 7 |
| | 3 | 5 | 5 | 0 | 7 |
| | 4 | 9 | 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 | 96 | 48 | 52 | 1 | 7 |
| | 2 | ✓ | 2 | B | 54 | 61 | 7 | 1 | 7 |
| | 3 | ✓ | 3 | D | 66 | 73 | 7 | 1 | 7 |
| | 4 | ✓ | 4 | E,F,G,H | 80 | 87 | 7 | 1 | 7 |

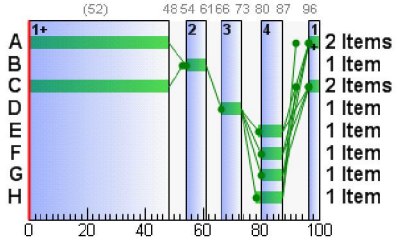
### Resultant Phase Green Periods

| Controller Stream | Phase | Green period | Is base green period | Start time (s) | End time (s) | Duration (s) |
|---|---|---|---|---|---|---|
| 1 | A | 1 | ✓ | 96 | 48 | 52 |
| | B | 1 | ✓ | 54 | 61 | 7 |
| | C | 1 | ✓ | 96 | 48 | 52 |
| | D | 1 | ✓ | 66 | 73 | 7 |
| | E | 1 | ✓ | 79 | 87 | 8 |
| | F | 1 | ✓ | 80 | 87 | 7 |
| | G | 1 | ✓ | 80 | 87 | 7 |
| | H | 1 | ✓ | 78 | 87 | 9 |

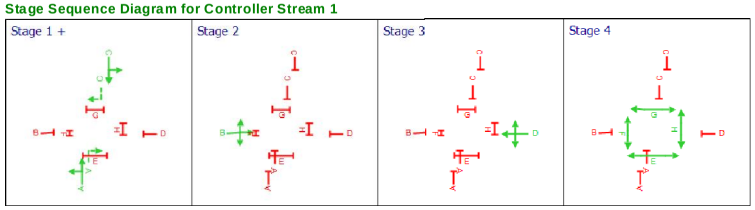
### Traffic Stream Green Times

| Arm | Traffic Stream | Traffic Node | Controller Stream | Phase | Green Period 1 | | |
|---|---|---|---|---|---|---|---|
| | | | | | Start | End | Duration |
| A | 1 | J | 1 | C | 96 | 48 | 52 |
| B | 1 | J | 1 | D | 66 | 73 | 7 |
| C | 1 | J | 1 | A | 96 | 48 | 52 |
| D | 1 | J | 1 | B | 54 | 61 | 7 |
| Ar | 1 | J | 1 | C | 96 | 48 | 52 |
| Cr | 1 | J | 1 | A | 96 | 48 | 52 |

### Phase Timings Diagram for Controller Stream 1




### Stage Sequence Diagram for Controller Stream 1




### Resultant penalties

| Time Segment | Controller stream | Phase min max penalty (£ per hr) | Intergreen broken penalty (£ per hr) | Stage constraint broken penalty (£ per hr) | Cost of controller stream penalties (£ per hr) |
|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 0.00 | 0.00 | 0.00 | 0.00 |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

## 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 | 25 | 263 | 237 | 1802 | 52 | 13.34 | 3.60 | 6.89 | 12.47 | 1.57 | 14.04 |
| | B | 1 | 24 | 271 | 30 | 1547 | 7 | 47.82 | 0.81 | 3.12 | 5.66 | 0.36 | 6.02 |
| | C | 1 | 68 | 33 | 638 | 1781 | 52 | 21.15 | 13.64 | 26.14 | 53.23 | 5.96 | 59.19 |
| | D | 1 | 44 | 105 | 59 | 1678 | 7 | 54.24 | 1.73 | 3.31 | 12.62 | 0.77 | 13.39 |
| | Ar | 1 | 14 | 555 | 19 | 261 | 52 | 18.29 | 0.41 | 41.09 | 1.37 | 0.09 | 1.46 |
| | Ax | 1 | 0 | Unrestricted | 480 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 0 | Unrestricted | 52 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 4 | 2284 | 20 | 999 | 52 | 2.03 | 0.20 | 20.14 | 0.16 | 0.04 | 0.20 |
| | Cx | 1 | 0 | Unrestricted | 243 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 0 | Unrestricted | 189 | Unrestricted | 100 | 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)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 237 | 237 | 0 | | 1802 | 955 | 25 | | 263 | 0.00 | 52 |
| | B | 1 | 30 | 30 | 0 | | 1547 | 124 | 24 | | 271 | 0.00 | 7 |
| | C | 1 | 638 | 638 | 0 | | 1781 | 944 | 68 | | 33 | 0.00 | 52 |
| | D | 1 | 59 | 59 | 0 | | 1678 | 134 | 44 | | 105 | 0.00 | 7 |
| | Ar | 1 | 19 | 19 | 0 | | 261 | 138 | 14 | | 555 | 0.93 | 52 |
| | Ax | 1 | 480 | 480 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.64 | 100 |
| | Bx | 1 | 52 | 52 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.74 | 100 |
| | Cr | 1 | 20 | 20 | 0 | | 999 | 530 | 4 | | 2284 | 0.93 | 52 |
| | Cx | 1 | 243 | 243 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.45 | 100 |
| | Dx | 1 | 189 | 189 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.72 | 100 |

### Traffic Stream Results: Stops and delays

| Time Segment | Arm | Traffic Stream | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 36.00 | 13.34 | 0.88 | 12.47 | 52.85 | 125.25 | 1.57 |
| | B | 1 | 18.00 | 47.82 | 0.40 | 5.66 | 96.39 | 28.92 | 0.36 |
| | C | 1 | 36.00 | 21.15 | 3.75 | 53.23 | 74.51 | 475.35 | 5.96 |
| | D | 1 | 36.00 | 54.24 | 0.89 | 12.62 | 103.90 | 61.30 | 0.77 |
| | Ar | 1 | 1.00 | 18.29 | 0.10 | 1.37 | 77.53 | 14.73 | 0.09 |
| | Ax | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 1.00 | 2.03 | 0.01 | 0.16 | 32.01 | 6.40 | 0.04 |
| | Cx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 36.00 | 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 (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) | Estimated blocking |
|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 0.00 | 3.60 | 52.17 | 6.89 | 0.00 | 0.00 | |
| | B | 1 | 0.00 | 0.81 | 26.09 | 3.12 | 0.00 | 6.00 | |
| | C | 1 | 0.00 | 13.64 | 52.17 | 26.14 | 0.00 | 0.00 | |
| | D | 1 | 0.00 | 1.73 | 52.17 | 3.31 | 0.00 | 4.00 | |
| | Ar | 1 | 0.00 | 0.41 | 1.00 | 41.09 | 0.00 | 17.00 | |
| | Ax | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 14.00 | |
| | Bx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 56.00 | |
| | Cr | 1 | 0.00 | 0.20 | 1.00 | 20.14 | 0.00 | 39.00 | |
| | Cx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 11.00 | |
| | Dx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 34.00 | |

### Traffic Stream Results: Advanced

| Time Segment | Arm | Traffic Stream | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | Mean Max Queue EoTS (PCU) | Max End of Green Queue EoTS (PCU) | Max End of Red Queue EoTS (PCU) | PCU Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 0.00 | 0.00 | ✓ | 0.00 | 3.60 | 0.04 | 3.14 | 1.00 | 0.00 | 14.04 |
| | B | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.81 | 0.04 | 0.81 | 1.00 | 0.00 | 6.02 |
| | C | 1 | 0.00 | 0.00 | ✓ | 0.00 | 13.64 | 0.70 | 9.03 | 1.00 | 0.00 | 59.19 |
| | D | 1 | 0.00 | 0.00 | ✓ | 0.00 | 1.73 | 0.17 | 1.68 | 1.00 | 0.00 | 13.39 |
| | Ar | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.41 | 0.01 | 0.02 | 1.00 | 0.00 | 1.46 |
| | Ax | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Bx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Cr | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.20 | 0.00 | 0.01 | 1.00 | 0.00 | 0.20 |
| | Cx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Dx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

### Pedestrian Crossings: Pedestrian summary

| Time Segment | Crossing | Side | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Mean max queue (Ped) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3 | 20 | 11000 | 7 | 43.71 | 0.52 | 3.45 | 3.45 |
| | 2 | 1 | 2 | 20 | 11000 | 9 | 41.86 | 0.51 | 3.30 | 3.30 |
| | | 2 | 0 | 0 | 11000 | 9 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | | 2 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | 4 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Flows and signals

| Time Segment | Crossing | Side | Calculated flow entering (Ped/hr) | Calculated flow out (Ped/hr) | Flow discrepancy (Ped/hr) | Adjusted flow warning | Calculated sat flow (Ped/hr) | Calculated capacity (Ped/hr) | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity | Mean modulus of error | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 20 | 20 | 0 | | 11000 | 770 | 3 | | 3365 | 0.00 | 7 |
| | 2 | 1 | 20 | 20 | 0 | | 11000 | 990 | 2 | | 4355 | 0.00 | 9 |
| | | 2 | 0 | 0 | 0 | | 11000 | 990 | 0 | | Unrestricted | 0.00 | 9 |
| | 3 | 1 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | | 2 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | 4 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

### Pedestrian Crossings: Stops and delays

| Time Segment | Crossing | Side | Mean Cruise Time per Ped (s) | Mean Delay per Ped (s) | Total delay (Ped-hr/hr) | Weighted cost of delay (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 8.33 | 43.71 | 0.24 | 3.45 |
| | 2 | 1 | 5.27 | 41.86 | 0.23 | 3.30 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 8.40 | 42.78 | 0.24 | 3.37 |
| | | 2 | 8.40 | 42.78 | 0.24 | 3.37 |
| | 4 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Queues and blocking

| Time Segment | Crossing | Side | Mean max queue (Ped) | Max queue storage (Ped) | Utilised storage (%) | Excess queue penalty (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.52 | 10.00 | 5.17 | 0.00 |
| | 2 | 1 | 0.51 | 10.00 | 5.06 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.51 | 10.00 | 5.11 | 0.00 |
| | | 2 | 0.51 | 10.00 | 5.11 | 0.00 |
| | 4 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Advanced

| Time Segment | Crossing | Side | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Mean Max Queue EoTS (Ped) | Ped Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.52 | 1.00 | 0.00 | 3.45 |
| | 2 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.30 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | | 2 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | 4 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |

## Network Results

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 13/12/2018 08:58:38 | 13/12/2018 08:58:39 | 17:00 | 100 | 107.81 | 6.97 | 67.59 | C/1 | 0 | 0 | C/1 | Cx/1 | C/ |

### Network Results: Vehicle summary

| Time Segment | Degree of saturation (%) | Practical reserve capacity (%) | Calculated flow entering (PCU/hr) | Actual green (s (per cycle)) | Mean Delay per Veh (s) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 68 | 0 | 1967 | 622 | 11.02 | 85.52 | 8.79 | 94.31 |

### Network Results: Pedestrian summary

| Time Segment | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 3 | 80 | 62 | 42.78 | 13.50 | 13.50 |

### Network Results: Flows and signals

| Time Segment | Calculated flow entering (PCU/hr) | Calculated flow out (PCU/hr) | Flow discrepancy (PCU/hr) | Adjusted flow warning | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity (%) | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 2047 | 2047 | 0 | | 68 | | 33 | 684 |

### Network Results: Stops and delays

| Time Segment | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 33.96 | 12.26 | 6.97 | 99.02 | 34.78 | 711.96 | 8.79 |

### Network Results: Queues and blocking

| Time Segment | Utilised storage (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) |
|---|---|---|---|
| 17:00-18:00 | 41.09 | 0.00 | 181.00 |

### Network Results: Advanced

| Time Segment | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | PCU Factor | Cost of traffic penalties (£ per hr) | Controller stream penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 0.00 | 0.00 | ✓ | 0.00 | 1.00 | 0.00 | 0.00 | 107.81 |

## Point to Point Journey Time

### Average Journey Time (s) for Local Matrix: 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0.0 | 85.3 | 85.3 | 104.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2 | 101.8 | 0.0 | 101.8 | 101.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 3 | 93.2 | 96.2 | 0.0 | 93.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4 | 126.2 | 0.0 | 126.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.1 | 0.0 | 52.0 |
| | 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 |
| | 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 | 0.0 |
| | 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Path Journey Time

| Path | From Location | To Location | Normal Calculated Flow (PCU/hr) | Pedestrian calculated flow (Ped/hr) | Normal journey time (s) | Pedestrian journey time (s) | Calculated Total Flow (PCU/hr) | Avg journey time (s) |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 3 | 18 | | 101.82 | | 18 | 101.82 |
| 12 | 2 | 4 | 2 | | 101.82 | | 2 | 101.82 |
| 16 | 6 | 7 | | 20 | | 51.18 | 20 | 51.18 |
| 17 | 7 | 6 | | 20 | | 51.18 | 20 | 51.18 |
| 18 | 7 | 8 | | 0 | | 0.00 | 0 | 0.00 |
| 19 | 8 | 7 | | 0 | | 0.00 | 0 | 0.00 |
| 20 | 5 | 8 | | 20 | | 52.04 | 20 | 52.04 |
| 21 | 8 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 22 | 5 | 6 | | 20 | | 47.13 | 20 | 47.13 |
| 23 | 6 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 26 | 1 | 3 | 186 | | 85.34 | | 186 | 85.34 |
| 28 | 1 | 2 | 32 | | 85.34 | | 32 | 85.34 |
| 29 | 3 | 4 | 168 | | 93.15 | | 168 | 93.15 |
| 32 | 3 | 2 | 20 | | 96.19 | | 20 | 96.19 |
| 33 | 1 | 4 | 19 | | 104.63 | | 19 | 104.63 |
| 34 | 4 | 3 | 39 | | 126.24 | | 39 | 126.24 |
| 35 | 4 | 2 | 0 | | 0.00 | | 0 | 0.00 |
| 36 | 2 | 1 | 10 | | 101.82 | | 10 | 101.82 |
| 37 | 4 | 1 | 20 | | 126.24 | | 20 | 126.24 |
| 38 | 3 | 1 | 450 | | 93.15 | | 450 | 93.15 |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

## Final Prediction Table

### Traffic Stream Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | | PER PCU | | | QUEUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arm | Traffic Stream | Name | Traffic node | Controller stream | Phase | Calculated flow entering (PCU/hr) | Calculated sat flow (PCU/hr) | Actual green (s (per cycle)) | Wasted time total (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity (%) | JourneyTime (s) | Mean Delay per Veh (s) | Mean stops per Veh (%) | Mean max queue (PCU) |
| A | 1 | (untitled) | J | 1 | C | 237 | 1802 | 52 | 0.00 | 25 | 263 | 49.34 | 13.34 | 52.85 | 3.60 |
| B | 1 | (untitled) | J | 1 | D | 30 | 1547 | 7 | 6.00 | 24 | 271 | 65.82 | 47.82 | 96.39 | 0.81 |
| C | 1 | (untitled) | J | 1 | A | 638 | 1781 | 52 | 0.00 | 68 | 33 | 57.15 | 21.15 | 74.51 | 13.64 |
| D | 1 | (untitled) | J | 1 | B | 59 | 1678 | 7 | 4.00 | 44 | 105 | 90.24 | 54.24 | 103.90 | 1.73 |
| Ar | 1 | (untitled) | J | 1 | C | 19 | 261 | 52 | 17.00 | 14 | 555 | 19.29 | 18.29 | 77.53 | 0.41 |
| Ax | 1 | (untitled) | J | | | 480 | Unrestricted | 100 | 14.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Bx | 1 | (untitled) | | | | 52 | Unrestricted | 100 | 56.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Cr | 1 | (untitled) | J | 1 | A | 20 | 999 | 52 | 39.00 | 4 | 2284 | 3.03 | 2.03 | 32.01 | 0.20 |
| Cx | 1 | (untitled) | | | | 243 | Unrestricted | 100 | 11.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Dx | 1 | (untitled) | | | | 189 | Unrestricted | 100 | 34.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossing Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | PER PED | | QUEUES | WEIGHTS | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian | Side | Name | Traffic node | Controller stream | Phase | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity | JourneyTime (s) | Mean Delay per Ped (s) | Mean max queue (Ped) | Delay weighting (%) | |
| 1 | 1 | (untitled) | | 1 | G | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | G | 20 | 11000 | 7 | 3 | 3365 | 52.04 | 43.71 | 0.52 | 100 | |
| 2 | 1 | (untitled) | | 1 | H | 20 | 11000 | 9 | 2 | 4355 | 47.13 | 41.86 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | H | 0 | 11000 | 9 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| 3 | 1 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| 4 | 1 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |

### Network Results

| | Distance travelled (PCU-km/hr) | Time spent (PCU-hr/hr) | Mean journey speed (kph) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Excess queue penalty (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| Normal traffic | 574.12 | 25.16 | 22.82 | 6.02 | 85.52 | 8.79 | 0.00 | 94.31 |
| Bus | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pedestrians | 0.87 | 1.12 | 0.78 | 0.95 | 13.50 | 0.00 | 0.00 | 13.50 |
| TOTAL | 575.00 | 26.28 | 21.88 | 6.97 | 99.02 | 8.79 | 0.00 | 107.81 |

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

## Data Errors and Warnings

*No errors or warnings*

## Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 13/12/2018 08:58:39 | 13/12/2018 08:58:39 | 07:30 | 100 | 266.66 | 17.63 | 88.12 | D/1 | 0 | 0 | D/1 | Cx/1 | D/ |

## Analysis Set Details

| Name | Description | Demand set | Include in report | Locked |
|---|---|---|---|---|
| AM 2035 DS | | D5 | ✓ | |

## Demand Set Details

| Name | Description | Composite | Demand sets | Start time (HH:mm) | Locked |
|---|---|---|---|---|---|
| AM 2035 DS | | | | 07:30 | |

## Network timings

| Network cycle time (s) | Restrict to SCOOT cycle times | Time segment length (min) | Number of time segments | Modelled time period (min) |
|---|---|---|---|---|
| 100 | | 60 | 1 | 60 |

## Signals options

| Start displacement (s) | End displacement (s) |
|---|---|
| 2 | 3 |

## Advanced

| Phase minimum broken penalty (£) | Phase maximum broken penalty (£) | Intergreen broken penalty (£) | Starting Red-with-Amber (s) |
|---|---|---|---|
| 10000.00 | 10000.00 | 10000.00 | 2 |

## Traffic options

| Traffic model | Vehicle flow scaling factor (%) | Pedestrian flow scaling factor (%) | Cruise times or speeds |
|---|---|---|---|
| Platoon Dispersion (PDM) | 100 | 100 | Cruise Speeds |

## Advanced

| Resolution | DOS Threshold (%) | Cruise scaling factor (%) | Use link stop weightings | Use link delay weightings | Exclude pedestrians from results calculation | Random delay mode | Type of Vehicle-in-Service | Type of random parameter | PCU Length (m) | Calculate results for Path Segments | Generate PDM Profile Data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 100 | ✓ | ✓ | | Complex | Uniform (TRANSYT) | Uniform (TRANSYT) | 5.75 | | ✓ |





| Dispersion type | Dispersion coefficient |
|---|---|
| Default | 35 |

| Name | PCU Factor |
|---|---|
| Normal | 1.00 |

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Bus | 1.00 | 70 | 15 | 0.94 | 30 | 85 |

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Tram | 1.00 | 0 | 0 | 0.94 | 100 | 100 |

| Dispersion type |
|---|
| Default |

| Enable optimisation | Auto redistribute | Optimisation level | Enable OUT Profile accuracy |
|---|---|---|---|
| ✓ | ✓ | Offsets And Green Splits | ✓ |

| Optimisation type | Hill climb increments | OUTProfile accuracy | Use enhanced optimisation | Auto optimisation order | Optimisation order | Master controller | Offsets relative to master controller | Master controller offset after each run |
|---|---|---|---|---|---|---|---|---|
| Hill Climb (Fast) | 15, 40, -1, 15, 40, 1, -1, 1 | 50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05 | | ✓ | 1 | | | Do nothing |

| Vehicle Monetary Value Of Delay (£ per PCU-hr) | Vehicle Monetary Value Of Stops (£ per 100 stops) | Pedestrian monetary value of delay (£ per Ped-hr) |
|---|---|---|
| 14.20 | 2.60 | 14.20 |

## Traffic Nodes

| Traffic node | Name | Description |
|---|---|---|
| J | (untitled) | |

# Arms and Traffic Streams

## Arms

| Arm | Name | Description | Traffic node |
|---|---|---|---|
| A | (untitled) | | J |
| B | (untitled) | | J |
| C | (untitled) | | J |
| D | (untitled) | | J |
| Ar | (untitled) | | J |
| Ax | (untitled) | | J |
| Bx | (untitled) | | |
| Cr | (untitled) | | J |
| Cx | (untitled) | | |
| Dx | (untitled) | | |

## Traffic Streams

| Arm | Traffic Stream | Name | Description | Auto length | Length (m) | Has Saturation Flow | Saturation flow source | Saturation flow (PCU/hr) | Is signal controlled | Is give way | Traffic type | Allow Nearside Turn On Red |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1802 | ✓ | | Normal | |
| B | 1 | (untitled) | | | 150.00 | ✓ | Sum of lanes | 1547 | ✓ | | Normal | |
| C | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1781 | ✓ | | Normal | |
| D | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1692 | ✓ | | Normal | |
| Ar | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Ax | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Bx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Cr | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 2005 | ✓ | ✓ | Normal | |
| Cx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Dx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |

## Lanes

| Arm | Traffic Stream | Lane | Name | Description | Use RR67 | Surface condition | Site quality factor | Gradient (%) | Width (m) | Use connector turning radius | Proportion that turn (%) | Turning radius (m) | Nearside lane | Saturation flow (PCU/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 25 | 6.00 | ✓ | 1802 |
| B | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 95 | 6.00 | ✓ | 1547 |
| C | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 30 | 6.00 | ✓ | 1781 |
| D | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 93 | 10.60 | ✓ | 1692 |
| Ar | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 6.00 | | 2005 |
| Ax | 1 | 1 | (untitled) | | | | | | | | | | | |
| Bx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Cr | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 0 | 8.50 | | 2005 |
| Cx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Dx | 1 | 1 | (untitled) | | | | | | | | | | | |



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## Modelling

| Arm | Traffic Stream | Traffic model | Stop weighting multiplier (%) | Delay weighting multiplier (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (PCU) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|---|---|
| A | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| B | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| C | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| D | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Ar | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Ax | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Bx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Cr | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Cx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Dx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |

## Modelling - Advanced

| Arm | Traffic Stream | Initial queue (PCU) | Type of Vehicle-in-Service | Vehicle-in-Service | Type of random parameter | Random parameter | Auto cycle time | Cycle time |
|---|---|---|---|---|---|---|---|---|
| (ALL) | 1 | 0.00 | NetworkDefault | Not-Included | NetworkDefault | 0.50 | ✓ | 100 |

## Normal - Modelling

| Arm | Traffic Stream | Stop weighting (%) | Delay weighting (%) |
|---|---|---|---|
| (ALL) | 1 | 100 | 100 |

## Flows

| Arm | Traffic Stream | Total Flow (PCU/hr) | Normal Flow (PCU/hr) |
|---|---|---|---|
| A | 1 | 616 | 616 |
| B | 1 | 48 | 48 |
| C | 1 | 251 | 251 |
| D | 1 | 328 | 328 |
| Ar | 1 | 17 | 17 |
| Ax | 1 | 233 | 233 |
| Bx | 1 | 27 | 27 |
| Cr | 1 | 16 | 16 |
| Cx | 1 | 940 | 940 |
| Dx | 1 | 43 | 43 |

## Signals

| Arm | Traffic Stream | Controller stream | Phase | Second phase enabled |
|---|---|---|---|---|
| A | 1 | 1 | C | |
| B | 1 | 1 | D | |
| C | 1 | 1 | A | |
| D | 1 | 1 | B | |
| Ar | 1 | 1 | C | |
| Cr | 1 | 1 | A | |

## Entry Sources

| Arm | Traffic Stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) |
|---|---|---|---|
| A | 1 | 36.00 | 30.00 |
| B | 1 | 18.00 | 30.00 |
| C | 1 | 36.00 | 30.00 |
| D | 1 | 36.00 | 30.00 |

### Sources

| Arm | Traffic Stream | Source | Source traffic stream | Destination traffic stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) | Auto turning radius | Traffic turn style | Turning radius (m) |
|---|---|---|---|---|---|---|---|---|---|
| Ar | 1 | 1 | A/1 | Ar/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 1 | C/1 | Ax/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Bx | 1 | 1 | D/1 | Bx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cr | 1 | 1 | C/1 | Cr/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cx | 1 | 1 | A/1 | Cx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Dx | 1 | 1 | B/1 | Dx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 2 | B/1 | Ax/1 | 36.00 | 30.00 | ✓ | Offside | 57.17 |
| Bx | 1 | 2 | A/1 | Bx/1 | 36.00 | 30.00 | ✓ | Nearside | 67.46 |
| Cx | 1 | 2 | B/1 | Cx/1 | 36.00 | 30.00 | ✓ | Nearside | 87.33 |
| Dx | 1 | 2 | C/1 | Dx/1 | 36.00 | 30.00 | ✓ | Nearside | 50.78 |
| Ax | 1 | 3 | D/1 | Ax/1 | 36.00 | 30.00 | ✓ | Nearside | 56.71 |
| Bx | 1 | 3 | Cr/1 | Bx/1 | 36.00 | 30.00 | ✓ | Offside | 52.48 |
| Cx | 1 | 3 | D/1 | Cx/1 | 36.00 | 30.00 | ✓ | Offside | 92.66 |
| Dx | 1 | 3 | Ar/1 | Dx/1 | 36.00 | 30.00 | ✓ | Offside | 97.63 |

### Give Way Data

| Arm | Traffic Stream | Opposed traffic | Use Step-wise Opposed Turn Model | Number of storage spaces | Use connector turning radius | Radius of turn (m) | Visibility restricted |
|---|---|---|---|---|---|---|---|
| Ar | 1 | AllTraffic | ✓ | 1 | | 10.00 | |
| Cr | 1 | AllTraffic | ✓ | 1 | | 8.00 | |

### Give Way Data - All Movements - Conflicts

| Traffic Stream | Description | Controlling type | Controlling from traffic stream | Controlling to traffic stream | Percentage opposing (%) | Upstream signals visible | Conflict shift | Conflict duration |
|---|---|---|---|---|---|---|---|---|
| 1 | | TrafficStreamMovement | C/1 | Dx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | C/1 | Ax/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Cx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Bx/1 | 100 | | 2 | 6 |

## Pedestrian Crossings

### Pedestrian Crossings

| Crossing | Name | Description | Traffic node | Allow walk on red | Crossing type | Length (m) | Cruise time (seconds) | Cruise speed (kph) |
|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | | | | Farside | 11.00 | 7.33 | 5.40 |
| 2 | (untitled) | | | | Farside | 6.40 | 4.27 | 5.40 |
| 3 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |
| 4 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |

### Pedestrian Crossings - Signals

| Crossing | Controller stream | Phase | Second phase enabled |
|---|---|---|---|
| 1 | 1 | G | |
| 2 | 1 | H | |
| 3 | 1 | E | |
| 4 | 1 | F | |

### Pedestrian Crossings - Sides

| Crossing | Side | Saturation flow (Ped/hr) |
|---|---|---|
| (ALL) | (ALL) | 11000 |



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### Pedestrian Crossings - Modelling

| Crossing | Side | Delay weighting (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (Ped) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|
| (ALL) | (ALL) | 100 | 100 | | 0.00 | | |

## Local OD Matrix - Local Matrix: 1

### Local Matrix Options

| OD Matrix | Name | Use for point to point table | Auto calculate | Allocation mode | Allow paths past exit locations | Allow looped paths on arms | Allow looped paths on traffic nodes | Copy flows | Matrix to copy flows from | Limit paths by length | Path length limit multiplier | Limit paths by number | Path number limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | ✓ | ✓ | Path Equalisation | | | ✓ | | | ✓ | 1.25 | | |

### Normal Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 6 | 593 | 17 | 0 | 0 | 0 | 0 |
| | 2 | 3 | 0 | 42 | 3 | 0 | 0 | 0 | 0 |
| | 3 | 212 | 16 | 0 | 23 | 0 | 0 | 0 | 0 |
| | 4 | 18 | 5 | 305 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

### Pedestrian Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Locations

| OD Matrix | Location | Name | Entries | Exits | Colour |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | A/1 | Ax/1 | #0000FF |
| | 2 | (untitled) | B/1 | Bx/1 | #00FF00 |
| | 3 | (untitled) | C/1 | Cx/1 | #FFFF00 |
| | 4 | (untitled) | D/1 | Dx/1 | #FFFF00 |
| | 5 | (untitled) | 1:2E, 2:1E | 1:2X, 2:1X | #00FFFF |
| | 6 | (untitled) | 2:2E, 3:2E | 2:2X, 3:2X | #FF00FF |
| | 7 | (untitled) | 3:1E, 4:2E | 3:1X, 4:2X | #008000 |
| | 8 | (untitled) | 4:1E, 1:1E | 4:1X, 1:1X | #FFA500 |

### Normal Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Normal Calculated Flow (PCU/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 4 | | 2 | 3 | B/1, Cx/1 | Normal | 42 |
| | 12 | | 2 | 4 | B/1, Dx/1 | Normal | 3 |
| | 26 | | 1 | 3 | A/1, Cx/1 | Normal | 593 |
| | 28 | | 1 | 2 | A/1, Bx/1 | Normal | 6 |
| | 29 | | 3 | 4 | C/1, Dx/1 | Normal | 23 |
| | 32 | | 3 | 2 | C/1, Cr/1, Bx/1 | Normal | 16 |
| | 33 | | 1 | 4 | A/1, Ar/1, Dx/1 | Normal | 17 |
| | 34 | | 4 | 3 | D/1, Cx/1 | Normal | 305 |
| | 35 | | 4 | 2 | D/1, Bx/1 | Normal | 5 |
| | 36 | | 2 | 1 | B/1, Ax/1 | Normal | 3 |
| | 37 | | 4 | 1 | D/1, Ax/1 | Normal | 18 |
| | 38 | | 3 | 1 | C/1, Ax/1 | Normal | 212 |

### Pedestrian Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Pedestrian calculated flow (Ped/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | | 6 | 7 | 3:2E, 3:1X | Normal | 20 |
| | 17 | | 7 | 6 | 3:1E, 3:2X | Normal | 20 |
| | 18 | | 7 | 8 | 4:2E, 4:1X | Normal | 0 |
| | 19 | | 8 | 7 | 4:1E, 4:2X | Normal | 0 |
| | 20 | | 5 | 8 | 1:2E, 1:1X | Normal | 20 |
| | 21 | | 8 | 5 | 1:1E, 1:2X | Normal | 0 |
| | 22 | | 5 | 6 | 2:1E, 2:2X | Normal | 20 |
| | 23 | | 6 | 5 | 2:2E, 2:1X | Normal | 0 |

## Signal Timings

**Network Default: 100s cycle time; 100 steps**

### Controller Stream 1

| Controller Stream | Name | Description | Use sequence | Cycle time source | Cycle time (s) |
|---|---|---|---|---|---|
| 1 | (untitled) | | 1 | NetworkDefault | 100 |

### Controller Stream 1 - Properties

| Controller Stream | Manufacturer name | Type | Model number | (Telephone) Line Number | Site number | Grid reference | Gaining delay type |
|---|---|---|---|---|---|---|---|
| 1 | Unspecified | | | | | | Absolute |

### Controller Stream 1 - Optimisation

| Controller Stream | Allow offset optimisation | Allow green split optimisation | Optimisation level | Auto redistribute | Enable stage constraint |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | Offsets And Green Splits | ✓ | |

### Phases

| Controller Stream | Phase | Name | Minimum green (s) | Maximum green (s) | Relative start displacement (s) | Relative end displacement (s) | Type | Blackout Time (s) |
|---|---|---|---|---|---|---|---|---|
| 1 | A | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | B | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | C | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | D | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | E | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | F | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | G | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | H | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |





### Library Stages

| Controller Stream | Library Stage | Phases in stage | User stage minimum (s) |
|---|---|---|---|
| 1 | 1 | A, C | 1 |
| | 2 | B | 1 |
| | 3 | D | 1 |
| | 4 | E, F, G, H | 1 |

### Stage Sequences

| Controller Stream | Sequence | Name | Multiple cycling | Stage IDs | Stage ends |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | Single | 1, 2, 3, 4 | 35, 62, 74, 88 |
| | 2 | (untitled) | Single | 1, 4, 2, 3 | 0, 31, 63, 91 |
| | 3 | (untitled) | Single | 1, 3, 4, 2 | 0, 29, 59, 91 |
| | 4 | (untitled) | Single | 1, 2, 4, 3 | 0, 29, 59, 91 |
| | 5 | (untitled) | Single | 1, 4, 3, 2 | 0, 31, 63, 91 |
| | 6 | (untitled) | Single | 1, 3, 2, 4 | 0, 29, 57, 87 |

### Intergreen Matrix for Controller Stream 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| From | A | | 6 | | 5 | 5 | 6 | 7 | 7 |
| | B | 5 | | 5 | 5 | 7 | 5 | 6 | 6 |
| | C | | 5 | | 6 | 6 | 7 | 5 | 5 |
| | D | 5 | 5 | 5 | | 6 | 7 | 7 | 5 |
| | E | 9 | 9 | 9 | 9 | | | | |
| | F | 9 | 9 | 9 | 9 | | | | |
| | G | 9 | 9 | 9 | 9 | | | | |
| | H | 5 | 5 | 5 | 6 | | | | |

### Banned Stage transitions for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

### Interstage Matrix for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | 0 | 6 | 6 | 7 |
| | 2 | 5 | 0 | 5 | 7 |
| | 3 | 5 | 5 | 0 | 7 |
| | 4 | 9 | 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 | 97 | 35 | 38 | 1 | 7 |
| | 2 | ✓ | 2 | B | 41 | 62 | 21 | 1 | 7 |
| | 3 | ✓ | 3 | D | 67 | 74 | 7 | 1 | 7 |
| | 4 | ✓ | 4 | E,F,G,H | 81 | 88 | 7 | 1 | 7 |

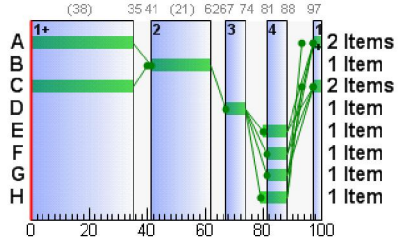
### Resultant Phase Green Periods

| Controller Stream | Phase | Green period | Is base green period | Start time (s) | End time (s) | Duration (s) |
|---|---|---|---|---|---|---|
| 1 | A | 1 | ✓ | 97 | 35 | 38 |
| | B | 1 | ✓ | 41 | 62 | 21 |
| | C | 1 | ✓ | 97 | 35 | 38 |
| | D | 1 | ✓ | 67 | 74 | 7 |
| | E | 1 | ✓ | 80 | 88 | 8 |
| | F | 1 | ✓ | 81 | 88 | 7 |
| | G | 1 | ✓ | 81 | 88 | 7 |
| | H | 1 | ✓ | 79 | 88 | 9 |

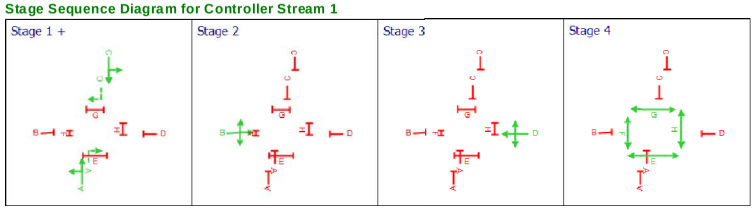
### Traffic Stream Green Times

| Arm | Traffic Stream | Traffic Node | Controller Stream | Phase | Green Period 1 | | |
|---|---|---|---|---|---|---|---|
| | | | | | Start | End | Duration |
| A | 1 | J | 1 | C | 97 | 35 | 38 |
| B | 1 | J | 1 | D | 67 | 74 | 7 |
| C | 1 | J | 1 | A | 97 | 35 | 38 |
| D | 1 | J | 1 | B | 41 | 62 | 21 |
| Ar | 1 | J | 1 | C | 97 | 35 | 38 |
| Cr | 1 | J | 1 | A | 97 | 35 | 38 |

### Phase Timings Diagram for Controller Stream 1




### Stage Sequence Diagram for Controller Stream 1




### Resultant penalties

| Time Segment | Controller stream | Phase min max penalty (£ per hr) | Intergreen broken penalty (£ per hr) | Stage constraint broken penalty (£ per hr) | Cost of controller stream penalties (£ per hr) |
|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 0.00 | 0.00 | 0.00 | 0.00 |



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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 | 88 | 3 | 616 | 1802 | 38 | 45.01 | 18.61 | 35.66 | 109.36 | 8.20 | 117.57 |
| | B | 1 | 39 | 132 | 48 | 1547 | 7 | 52.78 | 1.37 | 5.27 | 9.99 | 0.61 | 10.60 |
| | C | 1 | 36 | 149 | 251 | 1781 | 38 | 23.12 | 4.98 | 9.55 | 22.89 | 2.21 | 25.10 |
| | D | 1 | 88 | 2 | 328 | 1692 | 21 | 68.48 | 11.55 | 22.13 | 88.60 | 5.06 | 93.67 |
| | Ar | 1 | 5 | 1804 | 17 | 922 | 38 | 3.05 | 0.22 | 22.14 | 0.20 | 0.04 | 0.25 |
| | Ax | 1 | 0 | Unrestricted | 233 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 0 | Unrestricted | 27 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 40 | 125 | 16 | 103 | 38 | 92.80 | 0.54 | 54.17 | 5.86 | 0.11 | 5.97 |
| | Cx | 1 | 0 | Unrestricted | 940 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 0 | Unrestricted | 43 | Unrestricted | 100 | 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)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 616 | 616 | 0 | | 1802 | 703 | 88 | | 3 | 0.00 | 38 |
| | B | 1 | 48 | 48 | 0 | | 1547 | 124 | 39 | | 132 | 0.00 | 7 |
| | C | 1 | 251 | 251 | 0 | | 1781 | 695 | 36 | | 149 | 0.00 | 38 |
| | D | 1 | 328 | 328 | 0 | | 1692 | 372 | 88 | | 2 | 0.00 | 21 |
| | Ar | 1 | 17 | 17 | 0 | | 922 | 360 | 5 | | 1804 | 1.21 | 38 |
| | Ax | 1 | 233 | 233 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.83 | 100 |
| | Bx | 1 | 27 | 27 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.68 | 100 |
| | Cr | 1 | 16 | 16 | 0 | | 103 | 40 | 40 | | 125 | 1.21 | 38 |
| | Cx | 1 | 940 | 940 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.44 | 100 |
| | Dx | 1 | 43 | 43 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.82 | 100 |

### Traffic Stream Results: Stops and delays

| Time Segment | Arm | Traffic Stream | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 36.00 | 45.01 | 7.70 | 109.36 | 106.22 | 654.31 | 8.20 |
| | B | 1 | 18.00 | 52.78 | 0.70 | 9.99 | 101.71 | 48.82 | 0.61 |
| | C | 1 | 36.00 | 23.12 | 1.61 | 22.89 | 70.26 | 176.36 | 2.21 |
| | D | 1 | 36.00 | 68.48 | 6.24 | 88.60 | 123.12 | 403.84 | 5.06 |
| | Ar | 1 | 1.00 | 3.05 | 0.01 | 0.20 | 42.29 | 7.19 | 0.04 |
| | Ax | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 1.00 | 92.80 | 0.41 | 5.86 | 120.06 | 19.21 | 0.11 |
| | Cx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 36.00 | 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 (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) | Estimated blocking |
|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 0.00 | 18.61 | 52.17 | 35.66 | 0.00 | 0.00 | |
| | B | 1 | 0.00 | 1.37 | 26.09 | 5.27 | 0.00 | 5.00 | |
| | C | 1 | 0.00 | 4.98 | 52.17 | 9.55 | 0.00 | 0.00 | |
| | D | 1 | 0.00 | 11.55 | 52.17 | 22.13 | 0.00 | 0.00 | |
| | Ar | 1 | 0.00 | 0.22 | 1.00 | 22.14 | 0.00 | 22.00 | |
| | Ax | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 29.00 | |
| | Bx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 89.00 | |
| | Cr | 1 | 0.00 | 0.54 | 1.00 | 54.17 | 0.00 | 0.00 | |
| | Cx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 0.00 | |
| | Dx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 64.00 | |

### Traffic Stream Results: Advanced

| Time Segment | Arm | Traffic Stream | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | Mean Max Queue EoTS (PCU) | Max End of Green Queue EoTS (PCU) | Max End of Red Queue EoTS (PCU) | PCU Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | A | 1 | 0.00 | 0.00 | ✓ | 0.00 | 18.72 | 2.98 | 13.42 | 1.00 | 0.00 | 117.57 |
| | B | 1 | 0.00 | 0.00 | ✓ | 0.00 | 1.38 | 0.12 | 1.35 | 1.00 | 0.00 | 10.60 |
| | C | 1 | 0.00 | 0.00 | ✓ | 0.00 | 4.98 | 0.10 | 4.36 | 1.00 | 0.00 | 25.10 |
| | D | 1 | 0.00 | 0.00 | ✓ | 0.00 | 11.75 | 3.00 | 10.11 | 1.00 | 0.00 | 93.67 |
| | Ar | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.22 | 0.00 | 0.01 | 1.00 | 0.00 | 0.25 |
| | Ax | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Bx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Cr | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.54 | 0.44 | 0.44 | 1.00 | 0.00 | 5.97 |
| | Cx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Dx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

### Pedestrian Crossings: Pedestrian summary

| Time Segment | Crossing | Side | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Mean max queue (Ped) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3 | 20 | 11000 | 7 | 43.71 | 0.52 | 3.45 | 3.45 |
| | 2 | 1 | 2 | 20 | 11000 | 9 | 41.86 | 0.51 | 3.30 | 3.30 |
| | | 2 | 0 | 0 | 11000 | 9 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | | 2 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | 4 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Flows and signals

| Time Segment | Crossing | Side | Calculated flow entering (Ped/hr) | Calculated flow out (Ped/hr) | Flow discrepancy (Ped/hr) | Adjusted flow warning | Calculated sat flow (Ped/hr) | Calculated capacity (Ped/hr) | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity | Mean modulus of error | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 20 | 20 | 0 | | 11000 | 770 | 3 | | 3365 | 0.00 | 7 |
| | 2 | 1 | 20 | 20 | 0 | | 11000 | 990 | 2 | | 4355 | 0.00 | 9 |
| | | 2 | 0 | 0 | 0 | | 11000 | 990 | 0 | | Unrestricted | 0.00 | 9 |
| | 3 | 1 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | | 2 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | 4 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

### Pedestrian Crossings: Stops and delays

| Time Segment | Crossing | Side | Mean Cruise Time per Ped (s) | Mean Delay per Ped (s) | Total delay (Ped-hr/hr) | Weighted cost of delay (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 8.33 | 43.71 | 0.24 | 3.45 |
| | 2 | 1 | 5.27 | 41.86 | 0.23 | 3.30 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 8.40 | 42.78 | 0.24 | 3.37 |
| | | 2 | 8.40 | 42.78 | 0.24 | 3.37 |
| | 4 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Queues and blocking

| Time Segment | Crossing | Side | Mean max queue (Ped) | Max queue storage (Ped) | Utilised storage (%) | Excess queue penalty (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.52 | 10.00 | 5.17 | 0.00 |
| | 2 | 1 | 0.51 | 10.00 | 5.06 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.51 | 10.00 | 5.11 | 0.00 |
| | | 2 | 0.51 | 10.00 | 5.11 | 0.00 |
| | 4 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Advanced

| Time Segment | Crossing | Side | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Mean Max Queue EoTS (Ped) | Ped Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 1 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.52 | 1.00 | 0.00 | 3.45 |
| | 2 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.30 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | | 2 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | 4 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |

## Network Results

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 13/12/2018 08:58:39 | 13/12/2018 08:58:39 | 07:30 | 100 | 266.66 | 17.63 | 88.12 | D/1 | 0 | 0 | D/1 | Cx/1 | D/ |

### Network Results: Vehicle summary

| Time Segment | Degree of saturation (%) | Practical reserve capacity (%) | Calculated flow entering (PCU/hr) | Actual green (s (per cycle)) | Mean Delay per Veh (s) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 88 | 0 | 2519 | 580 | 23.84 | 236.91 | 16.25 | 253.16 |

### Network Results: Pedestrian summary

| Time Segment | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|
| 07:30-08:30 | 3 | 80 | 62 | 42.78 | 13.50 | 13.50 |

### Network Results: Flows and signals

| Time Segment | Calculated flow entering (PCU/hr) | Calculated flow out (PCU/hr) | Flow discrepancy (PCU/hr) | Adjusted flow warning | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity (%) | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 2599 | 2599 | 0 | | 88 | | 2 | 642 |

### Network Results: Stops and delays

| Time Segment | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 34.35 | 24.43 | 17.63 | 250.41 | 50.39 | 1309.74 | 16.25 |

### Network Results: Queues and blocking

| Time Segment | Utilised storage (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) |
|---|---|---|---|
| 07:30-08:30 | 54.17 | 0.00 | 209.00 |

### Network Results: Advanced

| Time Segment | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | PCU Factor | Cost of traffic penalties (£ per hr) | Controller stream penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 07:30-08:30 | 0.00 | 0.00 | ✓ | 0.00 | 1.00 | 0.00 | 0.00 | 266.66 |

## Point to Point Journey Time

### Average Journey Time (s) for Local Matrix: 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0.0 | 117.0 | 117.0 | 121.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2 | 106.8 | 0.0 | 106.8 | 106.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 3 | 95.1 | 188.9 | 0.0 | 95.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4 | 140.5 | 140.5 | 140.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.1 | 0.0 | 52.0 |
| | 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 |
| | 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 | 0.0 |
| | 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

### Path Journey Time

| Path | From Location | To Location | Normal Calculated Flow (PCU/hr) | Pedestrian calculated flow (Ped/hr) | Normal journey time (s) | Pedestrian journey time (s) | Calculated Total Flow (PCU/hr) | Avg journey time (s) |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 3 | 42 | | 106.78 | | 42 | 106.78 |
| 12 | 2 | 4 | 3 | | 106.78 | | 3 | 106.78 |
| 16 | 6 | 7 | | 20 | | 51.18 | 20 | 51.18 |
| 17 | 7 | 6 | | 20 | | 51.18 | 20 | 51.18 |
| 18 | 7 | 8 | | 0 | | 0.00 | 0 | 0.00 |
| 19 | 8 | 7 | | 0 | | 0.00 | 0 | 0.00 |
| 20 | 5 | 8 | | 20 | | 52.04 | 20 | 52.04 |
| 21 | 8 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 22 | 5 | 6 | | 20 | | 47.13 | 20 | 47.13 |
| 23 | 6 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 26 | 1 | 3 | 593 | | 117.01 | | 593 | 117.01 |
| 28 | 1 | 2 | 6 | | 117.01 | | 6 | 117.01 |
| 29 | 3 | 4 | 23 | | 95.12 | | 23 | 95.12 |
| 32 | 3 | 2 | 16 | | 188.92 | | 16 | 188.92 |
| 33 | 1 | 4 | 17 | | 121.06 | | 17 | 121.06 |
| 34 | 4 | 3 | 305 | | 140.48 | | 305 | 140.48 |
| 35 | 4 | 2 | 5 | | 140.48 | | 5 | 140.48 |
| 36 | 2 | 1 | 3 | | 106.78 | | 3 | 106.78 |
| 37 | 4 | 1 | 18 | | 140.48 | | 18 | 140.48 |
| 38 | 3 | 1 | 212 | | 95.12 | | 212 | 95.12 |



TRL THE FUTURE OF TRANSPORT
Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

## Final Prediction Table

### Traffic Stream Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | | PER PCU | | | QUEUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arm | Traffic Stream | Name | Traffic node | Controller stream | Phase | Calculated flow entering (PCU/hr) | Calculated sat flow (PCU/hr) | Actual green (s (per cycle)) | Wasted time total (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity (%) | JourneyTime (s) | Mean Delay per Veh (s) | Mean stops per Veh (%) | Mean max queue (PCU) |
| A | 1 | (untitled) | J | 1 | C | 616 | 1802 | 38 | 0.00 | 88 | 3 | 81.01 | 45.01 | 106.22 | 18.61 |
| B | 1 | (untitled) | J | 1 | D | 48 | 1547 | 7 | 5.00 | 39 | 132 | 70.78 | 52.78 | 101.71 | 1.37 |
| C | 1 | (untitled) | J | 1 | A | 251 | 1781 | 38 | 0.00 | 36 | 149 | 59.12 | 23.12 | 70.26 | 4.98 |
| D | 1 | (untitled) | J | 1 | B | 328 | 1692 | 21 | 0.00 | 88 | 2 | 104.48 | 68.48 | 123.12 | 11.55 |
| Ar | 1 | (untitled) | J | 1 | C | 17 | 922 | 38 | 22.00 | 5 | 1804 | 4.05 | 3.05 | 42.29 | 0.22 |
| Ax | 1 | (untitled) | J | | | 233 | Unrestricted | 100 | 29.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Bx | 1 | (untitled) | | | | 27 | Unrestricted | 100 | 89.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Cr | 1 | (untitled) | J | 1 | A | 16 | 103 | 38 | 0.00 | 40 | 125 | 93.80 | 92.80 | 120.06 | 0.54 |
| Cx | 1 | (untitled) | | | | 940 | Unrestricted | 100 | 0.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Dx | 1 | (untitled) | | | | 43 | Unrestricted | 100 | 64.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossing Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | PER PED | | QUEUES | WEIGHTS | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian | Side | Name | Traffic node | Controller stream | Phase | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity | JourneyTime (s) | Mean Delay per Ped (s) | Mean max queue (Ped) | Delay weighting (%) | |
| 1 | 1 | (untitled) | | 1 | G | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | G | 20 | 11000 | 7 | 3 | 3365 | 52.04 | 43.71 | 0.52 | 100 | |
| 2 | 1 | (untitled) | | 1 | H | 20 | 11000 | 9 | 2 | 4355 | 47.13 | 41.86 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | H | 0 | 11000 | 9 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| 3 | 1 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| 4 | 1 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |

### Network Results

| | Distance travelled (PCU-km/hr) | Time spent (PCU-hr/hr) | Mean journey speed (kph) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Excess queue penalty (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| Normal traffic | 738.79 | 41.31 | 17.88 | 16.68 | 236.91 | 16.25 | 0.00 | 253.16 |
| Bus | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pedestrians | 0.87 | 1.12 | 0.78 | 0.95 | 13.50 | 0.00 | 0.00 | 13.50 |
| TOTAL | 739.66 | 42.43 | 17.43 | 17.63 | 250.41 | 16.25 | 0.00 | 266.66 |

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

## Data Errors and Warnings

*No errors or warnings*

## Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 13/12/2018 08:58:40 | 13/12/2018 08:58:41 | 17:00 | 100 | 119.08 | 7.70 | 72.04 | C/1 | 0 | 0 | C/1 | Cx/1 | C/ |

## Analysis Set Details

| Name | Description | Demand set | Include in report | Locked |
|---|---|---|---|---|
| PM 2035 DS | | D6 | ✓ | |

## Demand Set Details

| Name | Description | Composite | Demand sets | Start time (HH:mm) | Locked |
|---|---|---|---|---|---|
| PM 2035 DS | | | | 17:00 | |

## Network timings

| Network cycle time (s) | Restrict to SCOOT cycle times | Time segment length (min) | Number of time segments | Modelled time period (min) |
|---|---|---|---|---|
| 100 | | 60 | 1 | 60 |

## Signals options

| Start displacement (s) | End displacement (s) |
|---|---|

| Phase minimum broken penalty (£) | Phase maximum broken penalty (£) | Intergreen broken penalty (£) | Starting Red-with-Amber (s) |
|---|---|---|---|
| 10000.00 | 10000.00 | 10000.00 | 2 |

| Traffic model | Vehicle flow scaling factor (%) | Pedestrian flow scaling factor (%) | Cruise times or speeds |
|---|---|---|---|
| Platoon Dispersion (PDM) | 100 | 100 | Cruise Speeds |

| Resolution | DOS Threshold (%) | Cruise scaling factor (%) | Use link stop weightings | Use link delay weightings | Exclude pedestrians from results calculation | Random delay mode | Type of Vehicle-in-Service | Type of random parameter | PCU Length (m) | Calculate results for Path Segments | Generate PDM Profile Data |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 90 | 100 | ✓ | ✓ | | Complex | Uniform (TRANSYT) | Uniform (TRANSYT) | 5.75 | | ✓ |





| Dispersion type | Dispersion coefficient |
|---|---|
| Default | 35 |

| Name | PCU Factor |
|---|---|
| Normal | 1.00 |

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Bus | 1.00 | 70 | 15 | 0.94 | 30 | 85 |

| Name | PCU Factor | Dispersion coefficient1 | Dispersion coefficient2 | Acceleration (ms^[-2]) | Travel time coefficient1 | Travel time coefficient2 |
|---|---|---|---|---|---|---|
| Tram | 1.00 | 0 | 0 | 0.94 | 100 | 100 |

| Dispersion type |
|---|
| Default |

| Enable optimisation | Auto redistribute | Optimisation level | Enable OUT Profile accuracy |
|---|---|---|---|
| ✓ | ✓ | Offsets And Green Splits | ✓ |

| Optimisation type | Hill climb increments | OUTProfile accuracy | Use enhanced optimisation | Auto optimisation order | Optimisation order | Master controller | Offsets relative to master controller | Master controller offset after each run |
|---|---|---|---|---|---|---|---|---|
| Hill Climb (Fast) | 15, 40, -1, 15, 40, 1, -1, 1 | 50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05 | | ✓ | 1 | | | Do nothing |

| Vehicle Monetary Value Of Delay (£ per PCU-hr) | Vehicle Monetary Value Of Stops (£ per 100 stops) | Pedestrian monetary value of delay (£ per Ped-hr) |
|---|---|---|
| 14.20 | 2.60 | 14.20 |

## Traffic Nodes

| Traffic node | Name | Description |
|---|---|---|
| J | (untitled) | |

# Arms and Traffic Streams

## Arms

| Arm | Name | Description | Traffic node |
|---|---|---|---|
| A | (untitled) | | J |
| B | (untitled) | | J |
| C | (untitled) | | J |
| D | (untitled) | | J |
| Ar | (untitled) | | J |
| Ax | (untitled) | | J |
| Bx | (untitled) | | |
| Cr | (untitled) | | J |
| Cx | (untitled) | | |
| Dx | (untitled) | | |

## Traffic Streams

| Arm | Traffic Stream | Name | Description | Auto length | Length (m) | Has Saturation Flow | Saturation flow source | Saturation flow (PCU/hr) | Is signal controlled | Is give way | Traffic type | Allow Nearside Turn On Red |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1802 | ✓ | | Normal | |
| B | 1 | (untitled) | | | 150.00 | ✓ | Sum of lanes | 1547 | ✓ | | Normal | |
| C | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1781 | ✓ | | Normal | |
| D | 1 | (untitled) | | | 300.00 | ✓ | Sum of lanes | 1678 | ✓ | | Normal | |
| Ar | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 1604 | ✓ | ✓ | Normal | |
| Ax | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Bx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Cr | 1 | (untitled) | | | 5.75 | ✓ | Sum of lanes | 1704 | ✓ | ✓ | Normal | |
| Cx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |
| Dx | 1 | (untitled) | | | 300.00 | | | | | | Normal | |

## Lanes

| Arm | Traffic Stream | Lane | Name | Description | Use RR67 | Surface condition | Site quality factor | Gradient (%) | Width (m) | Use connector turning radius | Proportion that turn (%) | Turning radius (m) | Nearside lane | Saturation flow (PCU/hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 25 | 6.00 | ✓ | 1802 |
| B | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 95 | 6.00 | ✓ | 1547 |
| C | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 30 | 6.00 | ✓ | 1781 |
| D | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 3.00 | | 100 | 10.60 | ✓ | 1678 |
| Ar | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 100 | 6.00 | | 1604 |
| Ax | 1 | 1 | (untitled) | | | | | | | | | | | |
| Bx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Cr | 1 | 1 | (untitled) | | ✓ | N/A | N/A | 0 | 2.50 | | 100 | 8.50 | | 1704 |
| Cx | 1 | 1 | (untitled) | | | | | | | | | | | |
| Dx | 1 | 1 | (untitled) | | | | | | | | | | | |



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## Modelling

| Arm | Traffic Stream | Traffic model | Stop weighting multiplier (%) | Delay weighting multiplier (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (PCU) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|---|---|
| A | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| B | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| C | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| D | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Ar | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Ax | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Bx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Cr | 1 | NetworkDefault | 100 | 100 | 100 | | 1.00 | | |
| Cx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |
| Dx | 1 | NetworkDefault | 100 | 100 | 100 | | 0.00 | | |

## Modelling - Advanced

| Arm | Traffic Stream | Initial queue (PCU) | Type of Vehicle-in-Service | Vehicle-in-Service | Type of random parameter | Random parameter | Auto cycle time | Cycle time |
|---|---|---|---|---|---|---|---|---|
| (ALL) | 1 | 0.00 | NetworkDefault | Not-Included | NetworkDefault | 0.50 | ✓ | 100 |

## Normal - Modelling

| Arm | Traffic Stream | Stop weighting (%) | Delay weighting (%) |
|---|---|---|---|
| (ALL) | 1 | 100 | 100 |

## Flows

| Arm | Traffic Stream | Total Flow (PCU/hr) | Normal Flow (PCU/hr) |
|---|---|---|---|
| A | 1 | 250 | 250 |
| B | 1 | 30 | 30 |
| C | 1 | 680 | 680 |
| D | 1 | 64 | 64 |
| Ar | 1 | 20 | 20 |
| Ax | 1 | 512 | 512 |
| Bx | 1 | 52 | 52 |
| Cr | 1 | 20 | 20 |
| Cx | 1 | 258 | 258 |
| Dx | 1 | 202 | 202 |

## Signals

| Arm | Traffic Stream | Controller stream | Phase | Second phase enabled |
|---|---|---|---|---|
| A | 1 | 1 | C | |
| B | 1 | 1 | D | |
| C | 1 | 1 | A | |
| D | 1 | 1 | B | |
| Ar | 1 | 1 | C | |
| Cr | 1 | 1 | A | |

## Entry Sources

| Arm | Traffic Stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) |
|---|---|---|---|
| A | 1 | 36.00 | 30.00 |
| B | 1 | 18.00 | 30.00 |
| C | 1 | 36.00 | 30.00 |
| D | 1 | 36.00 | 30.00 |

### Sources

| Arm | Traffic Stream | Source | Source traffic stream | Destination traffic stream | Cruise time for Normal Traffic (s) | Cruise speed for Normal Traffic (kph) | Auto turning radius | Traffic turn style | Turning radius (m) |
|---|---|---|---|---|---|---|---|---|---|
| Ar | 1 | 1 | A/1 | Ar/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 1 | C/1 | Ax/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Bx | 1 | 1 | D/1 | Bx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cr | 1 | 1 | C/1 | Cr/1 | 1.00 | 30.00 | ✓ | Straight | Straight Movement |
| Cx | 1 | 1 | A/1 | Cx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Dx | 1 | 1 | B/1 | Dx/1 | 36.00 | 30.00 | ✓ | Straight | Straight Movement |
| Ax | 1 | 2 | B/1 | Ax/1 | 36.00 | 30.00 | ✓ | Offside | 57.17 |
| Bx | 1 | 2 | A/1 | Bx/1 | 36.00 | 30.00 | ✓ | Nearside | 67.46 |
| Cx | 1 | 2 | B/1 | Cx/1 | 36.00 | 30.00 | ✓ | Nearside | 87.33 |
| Dx | 1 | 2 | C/1 | Dx/1 | 36.00 | 30.00 | ✓ | Nearside | 50.78 |
| Ax | 1 | 3 | D/1 | Ax/1 | 36.00 | 30.00 | ✓ | Nearside | 56.71 |
| Bx | 1 | 3 | Cr/1 | Bx/1 | 36.00 | 30.00 | ✓ | Offside | 52.48 |
| Cx | 1 | 3 | D/1 | Cx/1 | 36.00 | 30.00 | ✓ | Offside | 92.66 |
| Dx | 1 | 3 | Ar/1 | Dx/1 | 36.00 | 30.00 | ✓ | Offside | 97.63 |

### Give Way Data

| Arm | Traffic Stream | Opposed traffic | Use Step-wise Opposed Turn Model | Number of storage spaces | Use connector turning radius | Radius of turn (m) | Visibility restricted |
|---|---|---|---|---|---|---|---|
| Ar | 1 | AllTraffic | ✓ | 1 | | 10.00 | |
| Cr | 1 | AllTraffic | ✓ | 1 | | 8.00 | |

### Give Way Data - All Movements - Conflicts

| Traffic Stream | Description | Controlling type | Controlling from traffic stream | Controlling to traffic stream | Percentage opposing (%) | Upstream signals visible | Conflict shift | Conflict duration |
|---|---|---|---|---|---|---|---|---|
| 1 | | TrafficStreamMovement | C/1 | Dx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | C/1 | Ax/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Cx/1 | 100 | | 2 | 6 |
| | | TrafficStreamMovement | A/1 | Bx/1 | 100 | | 2 | 6 |

## Pedestrian Crossings

### Pedestrian Crossings

| Crossing | Name | Description | Traffic node | Allow walk on red | Crossing type | Length (m) | Cruise time (seconds) | Cruise speed (kph) |
|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | | | | Farside | 11.00 | 7.33 | 5.40 |
| 2 | (untitled) | | | | Farside | 6.40 | 4.27 | 5.40 |
| 3 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |
| 4 | (untitled) | | | | Farside | 11.10 | 7.40 | 5.40 |

### Pedestrian Crossings - Signals

| Crossing | Controller stream | Phase | Second phase enabled |
|---|---|---|---|
| 1 | 1 | G | |
| 2 | 1 | H | |
| 3 | 1 | E | |
| 4 | 1 | F | |

### Pedestrian Crossings - Sides

| Crossing | Side | Saturation flow (Ped/hr) |
|---|---|---|
| (ALL) | (ALL) | 11000 |



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### Pedestrian Crossings - Modelling

| Crossing | Side | Delay weighting (%) | Assignment Cost Weighting (%) | Exclude from results calculation | Max queue storage (Ped) | Has queue limit | Has degree of saturation limit |
|---|---|---|---|---|---|---|---|
| (ALL) | (ALL) | 100 | 100 | | 0.00 | | |

## Local OD Matrix - Local Matrix: 1

### Local Matrix Options

| OD Matrix | Name | Use for point to point table | Auto calculate | Allocation mode | Allow paths past exit locations | Allow looped paths on arms | Allow looped paths on traffic nodes | Copy flows | Matrix to copy flows from | Limit paths by length | Path length limit multiplier | Limit paths by number | Path number limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (untitled) | ✓ | ✓ | Path Equalisation | | | ✓ | | | ✓ | 1.25 | | |

### Normal Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 32 | 198 | 20 | 0 | 0 | 0 | 0 |
| | 2 | 10 | 0 | 18 | 2 | 0 | 0 | 0 | 0 |
| | 3 | 480 | 20 | 0 | 180 | 0 | 0 | 0 | 0 |
| | 4 | 22 | 0 | 42 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Bus Input Flows not shown as they are blank.

Tram Input Flows not shown as they are blank.

### Pedestrian Input Flows (PCU/hr)

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 |
| | 7 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 |
| | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### Locations

| OD Matrix | Location | Name | Entries | Exits | Colour |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | A/1 | Ax/1 | #0000FF |
| | 2 | (untitled) | B/1 | Bx/1 | #00FF00 |
| | 3 | (untitled) | C/1 | Cx/1 | #FFFF00 |
| | 4 | (untitled) | D/1 | Dx/1 | #FFFF00 |
| | 5 | (untitled) | 1:2E, 2:1E | 1:2X, 2:1X | #00FFFF |
| | 6 | (untitled) | 2:2E, 3:2E | 2:2X, 3:2X | #FF00FF |
| | 7 | (untitled) | 3:1E, 4:2E | 3:1X, 4:2X | #008000 |
| | 8 | (untitled) | 4:1E, 1:1E | 4:1X, 1:1X | #FFA500 |

### Normal Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Normal Calculated Flow (PCU/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 4 | | 2 | 3 | B/1, Cx/1 | Normal | 18 |
| | 12 | | 2 | 4 | B/1, Dx/1 | Normal | 2 |
| | 26 | | 1 | 3 | A/1, Cx/1 | Normal | 198 |
| | 28 | | 1 | 2 | A/1, Bx/1 | Normal | 32 |
| | 29 | | 3 | 4 | C/1, Dx/1 | Normal | 180 |
| | 32 | | 3 | 2 | C/1, Cr/1, Bx/1 | Normal | 20 |
| | 33 | | 1 | 4 | A/1, Ar/1, Dx/1 | Normal | 20 |
| | 34 | | 4 | 3 | D/1, Cx/1 | Normal | 42 |
| | 35 | | 4 | 2 | D/1, Bx/1 | Normal | 0 |
| | 36 | | 2 | 1 | B/1, Ax/1 | Normal | 10 |
| | 37 | | 4 | 1 | D/1, Ax/1 | Normal | 22 |
| | 38 | | 3 | 1 | C/1, Ax/1 | Normal | 480 |

### Pedestrian Paths and Flows

| OD Matrix | Path | Description | From location | To location | Path items | Allocation type | Pedestrian calculated flow (Ped/hr) |
|---|---|---|---|---|---|---|---|
| 1 | 16 | | 6 | 7 | 3:2E, 3:1X | Normal | 20 |
| | 17 | | 7 | 6 | 3:1E, 3:2X | Normal | 20 |
| | 18 | | 7 | 8 | 4:2E, 4:1X | Normal | 0 |
| | 19 | | 8 | 7 | 4:1E, 4:2X | Normal | 0 |
| | 20 | | 5 | 8 | 1:2E, 1:1X | Normal | 20 |
| | 21 | | 8 | 5 | 1:1E, 1:2X | Normal | 0 |
| | 22 | | 5 | 6 | 2:1E, 2:2X | Normal | 20 |
| | 23 | | 6 | 5 | 2:2E, 2:1X | Normal | 0 |

## Signal Timings

**Network Default: 100s cycle time; 100 steps**

### Controller Stream 1

| Controller Stream | Name | Description | Use sequence | Cycle time source | Cycle time (s) |
|---|---|---|---|---|---|
| 1 | (untitled) | | 1 | NetworkDefault | 100 |

### Controller Stream 1 - Properties

| Controller Stream | Manufacturer name | Type | Model number | (Telephone) Line Number | Site number | Grid reference | Gaining delay type |
|---|---|---|---|---|---|---|---|
| 1 | Unspecified | | | | | | Absolute |

### Controller Stream 1 - Optimisation

| Controller Stream | Allow offset optimisation | Allow green split optimisation | Optimisation level | Auto redistribute | Enable stage constraint |
|---|---|---|---|---|---|
| 1 | ✓ | ✓ | Offsets And Green Splits | ✓ | |

### Phases

| Controller Stream | Phase | Name | Minimum green (s) | Maximum green (s) | Relative start displacement (s) | Relative end displacement (s) | Type | Blackout Time (s) |
|---|---|---|---|---|---|---|---|---|
| 1 | A | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | B | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | C | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | D | (untitled) | 7 | 300 | 0 | 0 | Traffic | |
| | E | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | F | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | G | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |
| | H | (untitled) | 7 | 300 | 0 | 0 | Pedestrian | 0 |





### Library Stages

| Controller Stream | Library Stage | Phases in stage | User stage minimum (s) |
|---|---|---|---|
| 1 | 1 | A, C | 1 |
| | 2 | B | 1 |
| | 3 | D | 1 |
| | 4 | E, F, G, H | 1 |

### Stage Sequences

| Controller Stream | Sequence | Name | Multiple cycling | Stage IDs | Stage ends |
|---|---|---|---|---|---|
| 1 | 1 | (untitled) | Single | 1, 2, 3, 4 | 47, 60, 72, 86 |
| | 2 | (untitled) | Single | 1, 4, 2, 3 | 0, 31, 63, 91 |
| | 3 | (untitled) | Single | 1, 3, 4, 2 | 0, 29, 59, 91 |
| | 4 | (untitled) | Single | 1, 2, 4, 3 | 0, 29, 59, 91 |
| | 5 | (untitled) | Single | 1, 4, 3, 2 | 0, 31, 63, 91 |
| | 6 | (untitled) | Single | 1, 3, 2, 4 | 0, 29, 57, 87 |

### Intergreen Matrix for Controller Stream 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| From | A | | 6 | | 5 | 5 | 6 | 7 | 7 |
| | B | 5 | | 5 | 5 | 7 | 5 | 6 | 6 |
| | C | | 5 | | 6 | 6 | 7 | 5 | 5 |
| | D | 5 | 5 | 5 | | 6 | 7 | 7 | 5 |
| | E | 9 | 9 | 9 | 9 | | | | |
| | F | 9 | 9 | 9 | 9 | | | | |
| | G | 9 | 9 | 9 | 9 | | | | |
| | H | 5 | 5 | 5 | 6 | | | | |

### Banned Stage transitions for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | | | | |
| | 2 | | | | |
| | 3 | | | | |
| | 4 | | | | |

### Interstage Matrix for Controller Stream 1

| | | To | | | |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 |
| From | 1 | 0 | 6 | 6 | 7 |
| | 2 | 5 | 0 | 5 | 7 |
| | 3 | 5 | 5 | 0 | 7 |
| | 4 | 9 | 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 | 95 | 47 | 52 | 1 | 7 |
| | 2 | ✓ | 2 | B | 53 | 60 | 7 | 1 | 7 |
| | 3 | ✓ | 3 | D | 65 | 72 | 7 | 1 | 7 |
| | 4 | ✓ | 4 | E,F,G,H | 79 | 86 | 7 | 1 | 7 |

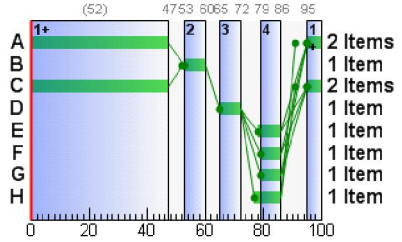
### Resultant Phase Green Periods

| Controller Stream | Phase | Green period | Is base green period | Start time (s) | End time (s) | Duration (s) |
|---|---|---|---|---|---|---|
| 1 | A | 1 | ✓ | 95 | 47 | 52 |
| | B | 1 | ✓ | 53 | 60 | 7 |
| | C | 1 | ✓ | 95 | 47 | 52 |
| | D | 1 | ✓ | 65 | 72 | 7 |
| | E | 1 | ✓ | 78 | 86 | 8 |
| | F | 1 | ✓ | 79 | 86 | 7 |
| | G | 1 | ✓ | 79 | 86 | 7 |
| | H | 1 | ✓ | 77 | 86 | 9 |

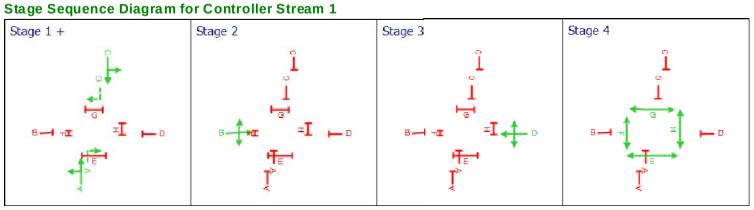
### Traffic Stream Green Times

| Arm | Traffic Stream | Traffic Node | Controller Stream | Phase | Green Period 1 | | |
|---|---|---|---|---|---|---|---|
| | | | | | Start | End | Duration |
| A | 1 | J | 1 | C | 95 | 47 | 52 |
| B | 1 | J | 1 | D | 65 | 72 | 7 |
| C | 1 | J | 1 | A | 95 | 47 | 52 |
| D | 1 | J | 1 | B | 53 | 60 | 7 |
| Ar | 1 | J | 1 | C | 95 | 47 | 52 |
| Cr | 1 | J | 1 | A | 95 | 47 | 52 |

### Phase Timings Diagram for Controller Stream 1




### Stage Sequence Diagram for Controller Stream 1




### Resultant penalties

| Time Segment | Controller stream | Phase min max penalty (£ per hr) | Intergreen broken penalty (£ per hr) | Stage constraint broken penalty (£ per hr) | Cost of controller stream penalties (£ per hr) |
|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 0.00 | 0.00 | 0.00 | 0.00 |



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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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 26 | 244 | 250 | 1802 | 52 | 13.50 | 3.80 | 7.28 | 13.31 | 1.67 | 14.98 |
| | B | 1 | 24 | 271 | 30 | 1547 | 7 | 47.82 | 0.81 | 3.12 | 5.66 | 0.36 | 6.02 |
| | C | 1 | 72 | 25 | 680 | 1781 | 52 | 22.72 | 15.08 | 28.91 | 60.94 | 6.65 | 67.59 |
| | D | 1 | 48 | 89 | 64 | 1678 | 7 | 56.01 | 1.90 | 3.65 | 14.14 | 0.85 | 14.99 |
| | Ar | 1 | 17 | 418 | 20 | 217 | 52 | 21.58 | 0.46 | 45.76 | 1.70 | 0.10 | 1.80 |
| | Ax | 1 | 0 | Unrestricted | 512 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 0 | Unrestricted | 52 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 4 | 2217 | 20 | 971 | 52 | 1.96 | 0.20 | 20.36 | 0.15 | 0.04 | 0.19 |
| | Cx | 1 | 0 | Unrestricted | 258 | Unrestricted | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 0 | Unrestricted | 202 | Unrestricted | 100 | 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)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 250 | 250 | 0 | | 1802 | 955 | 26 | | 244 | 0.00 | 52 |
| | B | 1 | 30 | 30 | 0 | | 1547 | 124 | 24 | | 271 | 0.00 | 7 |
| | C | 1 | 680 | 680 | 0 | | 1781 | 944 | 72 | | 25 | 0.00 | 52 |
| | D | 1 | 64 | 64 | 0 | | 1678 | 134 | 48 | | 89 | 0.00 | 7 |
| | Ar | 1 | 20 | 20 | 0 | | 217 | 115 | 17 | | 418 | 0.93 | 52 |
| | Ax | 1 | 512 | 512 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.64 | 100 |
| | Bx | 1 | 52 | 52 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.73 | 100 |
| | Cr | 1 | 20 | 20 | 0 | | 971 | 515 | 4 | | 2217 | 0.93 | 52 |
| | Cx | 1 | 258 | 258 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.45 | 100 |
| | Dx | 1 | 202 | 202 | 0 | | Unrestricted | Unrestricted | 0 | | Unrestricted | 0.71 | 100 |

### Traffic Stream Results: Stops and delays

| Time Segment | Arm | Traffic Stream | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 36.00 | 13.50 | 0.94 | 13.31 | 53.33 | 133.33 | 1.67 |
| | B | 1 | 18.00 | 47.82 | 0.40 | 5.66 | 96.39 | 28.92 | 0.36 |
| | C | 1 | 36.00 | 22.72 | 4.29 | 60.94 | 78.02 | 530.51 | 6.65 |
| | D | 1 | 36.00 | 56.01 | 1.00 | 14.14 | 105.45 | 67.49 | 0.85 |
| | Ar | 1 | 1.00 | 21.58 | 0.12 | 1.70 | 82.12 | 16.42 | 0.10 |
| | Ax | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Bx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Cr | 1 | 1.00 | 1.96 | 0.01 | 0.15 | 31.91 | 6.38 | 0.04 |
| | Cx | 1 | 36.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Dx | 1 | 36.00 | 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 (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) | Estimated blocking |
|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 0.00 | 3.80 | 52.17 | 7.28 | 0.00 | 0.00 | |
| | B | 1 | 0.00 | 0.81 | 26.09 | 3.12 | 0.00 | 6.00 | |
| | C | 1 | 0.00 | 15.08 | 52.17 | 28.91 | 0.00 | 0.00 | |
| | D | 1 | 0.00 | 1.90 | 52.17 | 3.65 | 0.00 | 0.00 | |
| | Ar | 1 | 0.00 | 0.46 | 1.00 | 45.76 | 0.00 | 14.00 | |
| | Ax | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 14.00 | |
| | Bx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 54.00 | |
| | Cr | 1 | 0.00 | 0.20 | 1.00 | 20.36 | 0.00 | 38.00 | |
| | Cx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 11.00 | |
| | Dx | 1 | 0.00 | 0.00 | 52.17 | 0.00 | 0.00 | 33.00 | |

### Traffic Stream Results: Advanced

| Time Segment | Arm | Traffic Stream | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | Mean Max Queue EoTS (PCU) | Max End of Green Queue EoTS (PCU) | Max End of Red Queue EoTS (PCU) | PCU Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | A | 1 | 0.00 | 0.00 | ✓ | 0.00 | 3.80 | 0.05 | 3.31 | 1.00 | 0.00 | 14.98 |
| | B | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.81 | 0.04 | 0.81 | 1.00 | 0.00 | 6.02 |
| | C | 1 | 0.00 | 0.00 | ✓ | 0.00 | 15.09 | 0.92 | 9.80 | 1.00 | 0.00 | 67.59 |
| | D | 1 | 0.00 | 0.00 | ✓ | 0.00 | 1.90 | 0.22 | 1.85 | 1.00 | 0.00 | 14.99 |
| | Ar | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.46 | 0.02 | 0.03 | 1.00 | 0.00 | 1.80 |
| | Ax | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Bx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Cr | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.20 | 0.00 | 0.01 | 1.00 | 0.00 | 0.19 |
| | Cx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |
| | Dx | 1 | 0.00 | 0.00 | ✓ | 0.00 | 0.00 | | | 1.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

### Pedestrian Crossings: Pedestrian summary

| Time Segment | Crossing | Side | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Mean max queue (Ped) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 3 | 20 | 11000 | 7 | 43.71 | 0.52 | 3.45 | 3.45 |
| | 2 | 1 | 2 | 20 | 11000 | 9 | 41.86 | 0.51 | 3.30 | 3.30 |
| | | 2 | 0 | 0 | 11000 | 9 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | | 2 | 2 | 20 | 11000 | 8 | 42.78 | 0.51 | 3.37 | 3.37 |
| | 4 | 1 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 0 | 0 | 11000 | 7 | 0.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Flows and signals

| Time Segment | Crossing | Side | Calculated flow entering (Ped/hr) | Calculated flow out (Ped/hr) | Flow discrepancy (Ped/hr) | Adjusted flow warning | Calculated sat flow (Ped/hr) | Calculated capacity (Ped/hr) | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity | Mean modulus of error | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 20 | 20 | 0 | | 11000 | 770 | 3 | | 3365 | 0.00 | 7 |
| | 2 | 1 | 20 | 20 | 0 | | 11000 | 990 | 2 | | 4355 | 0.00 | 9 |
| | | 2 | 0 | 0 | 0 | | 11000 | 990 | 0 | | Unrestricted | 0.00 | 9 |
| | 3 | 1 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | | 2 | 20 | 20 | 0 | | 11000 | 880 | 2 | | 3860 | 0.00 | 8 |
| | 4 | 1 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |
| | | 2 | 0 | 0 | 0 | | 11000 | 770 | 0 | | Unrestricted | 0.00 | 7 |



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### Pedestrian Crossings: Stops and delays

| Time Segment | Crossing | Side | Mean Cruise Time per Ped (s) | Mean Delay per Ped (s) | Total delay (Ped-hr/hr) | Weighted cost of delay (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 8.33 | 43.71 | 0.24 | 3.45 |
| | 2 | 1 | 5.27 | 41.86 | 0.23 | 3.30 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |
| | 3 | 1 | 8.40 | 42.78 | 0.24 | 3.37 |
| | | 2 | 8.40 | 42.78 | 0.24 | 3.37 |
| | 4 | 1 | 1.00 | 0.00 | 0.00 | 0.00 |
| | | 2 | 1.00 | 0.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Queues and blocking

| Time Segment | Crossing | Side | Mean max queue (Ped) | Max queue storage (Ped) | Utilised storage (%) | Excess queue penalty (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.52 | 10.00 | 5.17 | 0.00 |
| | 2 | 1 | 0.51 | 10.00 | 5.06 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.51 | 10.00 | 5.11 | 0.00 |
| | | 2 | 0.51 | 10.00 | 5.11 | 0.00 |
| | 4 | 1 | 0.00 | 10.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 10.00 | 0.00 | 0.00 |

### Pedestrian Crossings: Advanced

| Time Segment | Crossing | Side | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Mean Max Queue EoTS (Ped) | Ped Factor | Cost of traffic penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 1 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.52 | 1.00 | 0.00 | 3.45 |
| | 2 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.30 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | 3 | 1 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | | 2 | 0.00 | 0.00 | 0.51 | 1.00 | 0.00 | 3.37 |
| | 4 | 1 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| | | 2 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |

## Network Results

### Run Summary

| Analysis set used | Run start time | Run finish time | Modelling start time (HH:mm) | Network Cycle Time (s) | Performance Index (£ per hr) | Total network delay (PCU-hr/hr) | Highest DOS (%) | Item with highest DOS | Number of oversaturated items | Percentage of oversaturated items (%) | Item with worst signalised PRC | Item with worst unsignalised PRC | Ite wit wor over PR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 13/12/2018 08:58:40 | 13/12/2018 08:58:41 | 17:00 | 100 | 119.08 | 7.70 | 72.04 | C/1 | 0 | 0 | C/1 | Cx/1 | C/ |

### Network Results: Vehicle summary

| Time Segment | Degree of saturation (%) | Practical reserve capacity (%) | Calculated flow entering (PCU/hr) | Actual green (s (per cycle)) | Mean Delay per Veh (s) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 72 | 0 | 2088 | 622 | 11.64 | 95.91 | 9.67 | 105.57 |

### Network Results: Pedestrian summary

| Time Segment | Degree of saturation (%) | Calculated Flow Entering (Ped/hr) | Actual green (s (per cycle)) | Mean Delay Per Ped (s) | Weighted cost of delay (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|
| 17:00-18:00 | 3 | 80 | 62 | 42.78 | 13.50 | 13.50 |

| Time Segment | Calculated flow entering (PCU/hr) | Calculated flow out (PCU/hr) | Flow discrepancy (PCU/hr) | Adjusted flow warning | Degree of saturation (%) | DOS Threshold exceeded | Practical reserve capacity (%) | Actual green (s (per cycle)) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 2168 | 2168 | 0 | | 72 | | 25 | 684 |

| Time Segment | Mean Cruise Time per Veh (s) | Mean Delay per Veh (s) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Mean stops per Veh (%) | Total stops (Stops per hr) | Weighted cost of stops (£ per hr) |
|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 34.06 | 12.79 | 7.70 | 109.41 | 36.12 | 783.05 | 9.67 |

| Time Segment | Utilised storage (%) | Excess queue penalty (£ per hr) | Wasted time total (s (per cycle)) |
|---|---|---|---|
| 17:00-18:00 | 45.76 | 0.00 | 170.00 |

| Time Segment | Degree of saturation penalty (£ per hr) | Ped gap accepting penalty (£ per hr) | Warmed up | Warmed up error | PCU Factor | Cost of traffic penalties (£ per hr) | Controller stream penalties (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| 17:00-18:00 | 0.00 | 0.00 | ✓ | 0.00 | 1.00 | 0.00 | 0.00 | 119.08 |

## Average Journey Time (s) for Local Matrix: 1

| | | To | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| From | 1 | 0.0 | 85.5 | 85.5 | 108.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 2 | 101.8 | 0.0 | 101.8 | 101.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 3 | 94.7 | 97.7 | 0.0 | 94.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 4 | 128.0 | 0.0 | 128.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | 5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.1 | 0.0 | 52.0 |
| | 6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 |
| | 7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 51.2 | 0.0 | 0.0 |
| | 8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

## Path Journey Time

| Path | From Location | To Location | Normal Calculated Flow (PCU/hr) | Pedestrian calculated flow (Ped/hr) | Normal journey time (s) | Pedestrian journey time (s) | Calculated Total Flow (PCU/hr) | Avg journey time (s) |
|---|---|---|---|---|---|---|---|---|
| 4 | 2 | 3 | 18 | | 101.82 | | 18 | 101.82 |
| 12 | 2 | 4 | 2 | | 101.82 | | 2 | 101.82 |
| 16 | 6 | 7 | | 20 | | 51.18 | 20 | 51.18 |
| 17 | 7 | 6 | | 20 | | 51.18 | 20 | 51.18 |
| 18 | 7 | 8 | | 0 | | 0.00 | 0 | 0.00 |
| 19 | 8 | 7 | | 0 | | 0.00 | 0 | 0.00 |
| 20 | 5 | 8 | | 20 | | 52.04 | 20 | 52.04 |
| 21 | 8 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 22 | 5 | 6 | | 20 | | 47.13 | 20 | 47.13 |
| 23 | 6 | 5 | | 0 | | 0.00 | 0 | 0.00 |
| 26 | 1 | 3 | 198 | | 85.50 | | 198 | 85.50 |
| 28 | 1 | 2 | 32 | | 85.50 | | 32 | 85.50 |
| 29 | 3 | 4 | 180 | | 94.72 | | 180 | 94.72 |
| 32 | 3 | 2 | 20 | | 97.68 | | 20 | 97.68 |
| 33 | 1 | 4 | 20 | | 108.08 | | 20 | 108.08 |
| 34 | 4 | 3 | 42 | | 128.01 | | 42 | 128.01 |
| 35 | 4 | 2 | 0 | | 0.00 | | 0 | 0.00 |
| 36 | 2 | 1 | 10 | | 101.82 | | 10 | 101.82 |
| 37 | 4 | 1 | 22 | | 128.01 | | 22 | 128.01 |
| 38 | 3 | 1 | 480 | | 94.72 | | 480 | 94.72 |



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Generated on 13/12/2018 09:02:28 using TRANSYT 15 (15.5.1.7048)

## Traffic Stream Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | | PER PCU | | | QUEUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arm | Traffic Stream | Name | Traffic node | Controller stream | Phase | Calculated flow entering (PCU/hr) | Calculated sat flow (PCU/hr) | Actual green (s (per cycle)) | Wasted time total (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity (%) | JourneyTime (s) | Mean Delay per Veh (s) | Mean stops per Veh (%) | Mean max queue (PCU) |
| A | 1 | (untitled) | J | 1 | C | 250 | 1802 | 52 | 0.00 | 26 | 244 | 49.50 | 13.50 | 53.33 | 3.80 |
| B | 1 | (untitled) | J | 1 | D | 30 | 1547 | 7 | 6.00 | 24 | 271 | 65.82 | 47.82 | 96.39 | 0.81 |
| C | 1 | (untitled) | J | 1 | A | 680 | 1781 | 52 | 0.00 | 72 | 25 | 58.72 | 22.72 | 78.02 | 15.08 |
| D | 1 | (untitled) | J | 1 | B | 64 | 1678 | 7 | 0.00 | 48 | 89 | 92.01 | 56.01 | 105.45 | 1.90 |
| Ar | 1 | (untitled) | J | 1 | C | 20 | 217 | 52 | 14.00 | 17 | 418 | 22.58 | 21.58 | 82.12 | 0.46 |
| Ax | 1 | (untitled) | J | | | 512 | Unrestricted | 100 | 14.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Bx | 1 | (untitled) | | | | 52 | Unrestricted | 100 | 54.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Cr | 1 | (untitled) | J | 1 | A | 20 | 971 | 52 | 38.00 | 4 | 2217 | 2.96 | 1.96 | 31.91 | 0.20 |
| Cx | 1 | (untitled) | | | | 258 | Unrestricted | 100 | 11.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |
| Dx | 1 | (untitled) | | | | 202 | Unrestricted | 100 | 33.00 | 0 | Unrestricted | 36.00 | 0.00 | 0.00 | 0.00 |

## Pedestrian Crossing Results

| | | | | SIGNALS | | FLOWS | | PERFORMANCE | | | PER PED | | QUEUES | WEIGHTS | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pedestrian | Side | Name | Traffic node | Controller stream | Phase | Calculated Flow Entering (Ped/hr) | Calculated sat flow (Ped/hr) | Actual green (s (per cycle)) | Degree of saturation (%) | Practical reserve capacity | JourneyTime (s) | Mean Delay per Ped (s) | Mean max queue (Ped) | Delay weighting (%) | |
| 1 | 1 | (untitled) | | 1 | G | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | G | 20 | 11000 | 7 | 3 | 3365 | 52.04 | 43.71 | 0.52 | 100 | |
| 2 | 1 | (untitled) | | 1 | H | 20 | 11000 | 9 | 2 | 4355 | 47.13 | 41.86 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | H | 0 | 11000 | 9 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| 3 | 1 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| | 2 | (untitled) | | 1 | E | 20 | 11000 | 8 | 2 | 3860 | 51.18 | 42.78 | 0.51 | 100 | |
| 4 | 1 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |
| | 2 | (untitled) | | 1 | F | 0 | 11000 | 7 | 0 | Unrestricted | 0.00 | 0.00 | 0.00 | 100 | |

## Network Results

| | Distance travelled (PCU-km/hr) | Time spent (PCU-hr/hr) | Mean journey speed (kph) | Total delay (PCU-hr/hr) | Weighted cost of delay (£ per hr) | Weighted cost of stops (£ per hr) | Excess queue penalty (£ per hr) | Performance Index (£ per hr) |
|---|---|---|---|---|---|---|---|---|
| Normal traffic | 610.13 | 27.10 | 22.52 | 6.75 | 95.91 | 9.67 | 0.00 | 105.57 |
| Bus | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tram | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pedestrians | 0.87 | 1.12 | 0.78 | 0.95 | 13.50 | 0.00 | 0.00 | 13.50 |
| TOTAL | 611.00 | 28.21 | 21.66 | 7.70 | 109.41 | 9.67 | 0.00 | 119.08 |

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

# APPENDIX D

## GoCAR Letter of Intent

Glenveagh Living,
15 Merrion Square North,
Dublin 2

To Whom It May Concern,

This is a letter to confirm that GoCar intends to provide three shared car club vehicles in the proposed residential development at the East Road scheme, located in East Wall, Dublin 1, with final terms to be agreed.

GoCar is Ireland's leading car sharing service with 40,000 members and over 600 cars and vans across 18 counties in Ireland. Each GoCar which is placed in a community has the potential to replace the journeys of up to 15 private cars.

The Department of Housing's Design Standards for New Apartments - Guidelines for Planning Authorities 2018 outline: "For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure... provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles."

GoCar members sign up online and can book cars or vans via the website or mobile app. Rates start from €4 for half an hour, with fuel, insurance and maintenance included. As such, it is both convenient and cost effective. It allows individuals to have the benefits of a private car, without having the large costs and hassle associated with car ownership. GoCar is ideal for people or organisations who only need occasional access to a car, for families who need a second car sometimes, and for others who would like occasional access to a vehicle of a different type than they use day-to-day.

Carsharing is a sustainable service. By allowing multiple people to use the same vehicle at different times, car sharing reduces car ownership, car dependency, congestion, noise and air pollution. It frees up land which would otherwise be used for additional parking spaces. Most GoCar users only use a car when necessary, and walk and use public transport more often than car owners.

By having GoCar car club vehicles in a residential development such as this, residents will have access to pay-as-you-go driving, in close proximity to their homes, which will increase usership of the service.

I trust that this information is satisfactory. For any queries, please do not hesitate to contact me.

Regards,

Rob Kearns
Head of Growth
GoCar Carsharing Limited
M: 083 822 3924
E: rob.kearns@gocar.ie