Strategic Housing Development at Swords Road, Whitehall, Dublin 9

Traffic and Transport Assessment
Stage 3 Submission

Eastwise Construction Swords Limited

Project reference: 379360
Project number: 6061744

March 2022

Delivering a better world

Executive Summary

This Traffic and Transport Assessment (TTA) has been prepared by AECOM to accompany a planning application for a proposed Strategic Housing Development (SHD) comprising 472 apartment units and a total of 337 parking spaces on a site located off Swords Road, Whitehall, Dublin 9 (ABP Ref: PL29N.308050, DCC Ref: ABPSHDPAC0027/20, SHDPAC0039/20, SHDPAC0091/19 and SHDPAC0071/19). Access to the site will be via a fourth arm to the existing Swords Road / Iveragh Road junction and the subsequent signalisation of this junction. A secondary emergency only access will be formed with Swords Road to the south of Iveragh Road.

Based upon the information and analysis presented within this TTA, the assessment demonstrates how the proposed scheme has been designed, from a traffic and transport perspective, to integrate within the existing and proposed transport network and to minimise any potential impacts.

The TTA has considered the traffic and transportation implications of the proposed development. It demonstrates that the development can be readily accessed by existing and future sustainable modes of transport within the immediate vicinity of the site.

This assessment also demonstrates that the surrounding road network has the capacity to accommodate the vehicular traffic generated as a result of the proposed development. The trip resulting generation volumes are relatively low and there are excellent non-car based alternative modes available to residents and visitors at the subject site.

The percentage impact of additional traffic generated by the proposed development is less than 5% at the Collins Avenue / Swords Road signalised junction. The percentage impact of additional traffic generated by the proposed development is 5.9% during the weekday morning peak and 4.6% during the afternoon peak at the Swords Road / Iveragh Road / Site Access junction. In consideration of the Traffic Impact Analysis, the development generates a low level impact on the road network in comparison to the baseline traffic along Swords Road. The introduction of a signalised junction at this location will formalise the road network and provide a net benefit to pedestrians, cyclists and motorists by providing dedicated crossing facilitates on all arms of the Swords Road / Iveragh Road / Site Access junction ensuring that permeability is provided while also ensuring that the scheme does not comprise the BusConnects proposals at this location.

This TTA considers comments from An Bord Pleanala (ABP) and Dublin City Council (DCC) on the pre-SHD submission and includes commentary on : DMURS, Parking Management, Site Servicing and Outline Construction Traffic Management Plan (CTMP).In addition there are standalone reports embellishing work in the TTA and these included reports on Parking Strategy, Site Servicing and Operational Plan, and Mobility Management Plan (MMP) has been prepared by AECOM to also support this SHD application. Additionally, a Stage 1 Road Safety Audit and Quality Audit will also support the application.

Accordingly, it is concluded that the proposals will not result in a material deterioration of existing road conditions and as a result there are no significant traffic or transportation related reasons that should prevent the granting of planning permission for the proposed development.

Planning History

Permitted 358 Units (ABP Reg Ref: PL 29N.238685, DCC Reg Ref: 3269/10): In December 2011, planning permission was granted on the subject site for a residential development comprising of 358 no. apartments across 7 no. blocks (Block A – G). In summary, the permitted scheme comprises of the following:

- 358 residential units;
- Creche (465sqm);
- Retail Units (344sqm);
- 495 no. car parking spaces, with 413 no. spaces in an underground basement and 82 spaces at surface level;
- 358 no. cycle parking stands; and
- A signalised junction at the proposed site access at the Swords Road / Iveragh Road junction.

A site layout has been issued for compliance. The site layout is akin to the permitted scheme expect for a minor reduction in the number of parking spaces from 495 to 488 total spaces, with 7 no. spaces removed from surface level. In relation to cycle parking provision it is proposed to provide a total of 398 spaces, which incorporates 358 spaces within the basement for residents and 40 spaces at surface level for visitors.

Block F Planning Submission (DCC Reg Ref: 3405/19): In June 2019, planning permission was granted for an amendment application to the permitted residential scheme on the respective site. The proposed amendment application is to the permitted Block F, to increase the number of units in the respective block from 60 no. to 76 no. In summary the block will now comprise of:

- 76 apartment units;
- 78 no. car parking spaces; and
- 106 no. cycle parking.

This increases the number of permitted units on the respective site from 358 to 374 no. units. This application was subject to 11 no. conditions of which 1 no. was traffic and transport related which was as follows:

> **Condition 6**
>
> The following transport planning requirements shall be complied with:
>
> *i. Cycle parking, shall be secure, sheltered and well lit with key/fob access. Cycle parking shall be in situ prior to the occupation of the proposed development.*
>
> *ii. All costs incurred by Dublin City Council, including any repairs to the public road and services necessary as a result of the development, shall be at the expense of the developer.*

Proposed Development

Eastwise Construction Swords Limited intend to apply to An Bord Pleanála for permission for a Strategic Housing Development on a site at Swords Road, Whitehall, Dublin 9 (to be known as Hartfield Place).

The site is bounded to the west by Swords Road, to the south by Highfield Hospital, to the north by vacant lands and GAA pitches and to the east by Beechlawn Nursing Home with residential development beyond.

To facilitate the proposed development infrastructure works are proposed to the adjacent road network including the introduction of a signalised fourth arm to the existing Swords Road / Iveragh Road junction with pedestrian crossings provided to all arms of the junction, to facilitate this one car parking space will be required to be removed along the western side of Swords Road and a new pedestrian refuge island will be provided on the southern arm of the junction. A right turn pocket is to be provided into the subject site on the northbound approach of Swords Road with a left turn filter lane provided on the southbound approach, shared with the bus lane. The proposed development also includes the relocation of the existing footpath (along Swords Road) eastwards and the provision of a grass verge at the location of the existing path and a cycle path along the western boundary of the subject site.

The development comprises an apartment development of 472 no. units within 7 no. blocks ranging in height up to 8 storeys in height (over single level basement) and comprising 32 no. studio apartments, 198 no.1-bed apartments, 233 no. 2-bed apartments and 9 no. 3-bed apartments. Provision of a creche (c.445.8 sq.m), café (c.99 sq.m) and internal communal amenity space (c.511 sq.m) (including a reception area, meeting rooms, screening room, lounge, residents gym, yoga room and ancillary areas. Provision of 337 no. car parking spaces, 968 no. residential bicycle parking spaces (plus14 no. cargo bike spaces) and 14 no. motorcycle spaces at basement/surface levels. Provision of a public open space, and communal open spaces at ground and roof levels. Provision of accesses to the development from Swords Road with associated upgrades to the existing public road and footpaths. Provision of hard and soft landscaping; bin storage; plant areas, ESB substations and switch rooms and all associated site development works and services provision."

The proposed development principally replicates the layout and footprint of the scheme permitted under DCC Reg. Ref. 3269/10 / ABP Ref. PL29N.238685 (as extended under DCC Reg. Ref. 3269/10/X1 and DCC Reg. Ref. 3405/19) but proposes the slight relocation of the creche building to the west and additional height of up to one storey on some of the blocks and the rationalisation of the permitted floorplans, resulting in an increase in the overall quantum of residential units from 374 No. apartments to 472 No. apartments.

Proposed Site Access

The site access arrangements comprise of a proposed 4-arm signalised junction with Swords Road and Iveragh Road. The proposed access location is as per the permitted access arrangements (PL 29N.238685). A secondary emergency only access is proposed 150m south of Iveragh Road. The signalised site access has been future proofed to accommodate potential longer term plans to accommodate BusConnects (to be delivered by others).

A visibility splay assessment and swept path analysis has been undertaken, to demonstrate that the proposed development can cater for traffic to safely access and egress the site.

Proposed Car Parking

A total of 337 no. car parking spaces for residents are proposed at basement level and at surface level. A proportion of parking at basement level will be allocated to Electric Vehicle (EV), Café and Creche staff parking with 5 no. car club spaces being provided . Inclusive of the total number of car parking spaces outlined above, the development provides the following:

Mobility Impaired Spaces: In total, 22 no. mobility impaired parking spaces are proposed in compliance with the DCC Development Plan requirements, which recommends at least 5% of the total number.

EV Spaces: Electric Vehicle spaces are proposed in compliance with the DCC Development Plan requirements, which recommends at least 20% of the total spaces should be designated for EV charging points.

14 no. motorcycle spaces are proposed in compliance with the DCC Development Plan requirements, which recommends a min 4% of spaces should be designated for motorcycles.

Parking Management

The proposed car parking provision is below the DCC Development Plan (Maximum) Parking Standards, which recommends 1 space per unit. However, it should be noted that the proposed parking provision is consistent with the Sustainable Urban Housing Design of New Apartments guidelines, which recommends substantially reducing parking in or adjoining city cores or at a confluence of public transport cities. Section 4 of this report sets out the various policy and research documents used to establish the projected car parking demand and the approach pursued in catering for future residential amenity at the site with Section 5 of this report detailing the car parking strategy for the development.

Cycle Parking Provision

Bicycle Spaces: A total of 968 cycle parking spaces are proposed within the development (and an additional 14 no. cargo bike spaces in the basement bringing the total to 982) to cater for the 472 residential units, creche and café,. The cycle parking spaces will comprise of secure cycle spaces within the basement and at grade with standard ‘Sheffield style’ cycle parking racks at the surface level within secure facilities for both residents and visitors. The location and allocation of the cycle parking spaces are outlined within Section 3.5.

Traffic Impact

The overall development will generate a resultant vehicle generation of 142 and 109 two-way movements during the weekday morning and evening peak hours respectively. These figures were obtained using the Trip Rate Information Computer System (TRICS).

The percentage impact of additional traffic generated by the proposed development on the Swords Road / Collins Avenue West signalized junction is less than 4% during the morning and evening peak hours. This is less than the Transport Infrastructure Ireland (TII) percentage impact standards to warrant detailed assessment of the proposed access junctions (over 5%, where traffic congestion exists).

The percentage impact of additional traffic on the proposed site access / Swords Road / Iveragh Road signalised junction is 5.9% during the morning peak hour and 4.6% during the evening peak hour. AECOM has undertaken a detailed junction modelling analysis of the proposed site access using LinSig. The assumed Opening Year (2023) and Future Year scenarios (2028 and 2038) were calculated using Central Growth Rates from TII’s Travel Demand Projections (Unit 5.3) to take into account the level of committed developments in the immediate vicinity of the development. The results of the analysis indicate that this junction will experience some peak period congestion however this is attributed to the introduction of a signalised junction as opposed to the volume of generated traffic. A signalised junction at this location has already been permitted and provides a net benefit over the existing situation which is uncontrolled for traffic and all pedestrian movements.

Quality information

Prepared by	Checked by	Verified by	Approved by
Zachary Cave Senior Consultant	Zachary Cave Senior Consultant	Tim Robinson Regional Director	Tim Robinson Regional Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	Stage 2 Issue	12.08.2020	CO'B	Cormac O Brien	Director
1	Draft Issue	26.01.2021	CR	Carolyn Rollo	Associate Director
2	Stage 2 Submission	14.10.2021	TR	Tim Robinson	Regional Director
3.0	Stage 3 Draft Taking on board DCC/ABP comments	08.03.2022	TR	Tim Robinson	Regional Director
3.1	Stage 3 Final Taking on board DCC/ABP comments	11.03.2022	TR	Tim Robinson	Regional Director
4	Final with SK comments 22.03.22	24.03.22	TR	Tim Robinson	Regional Director

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1. Introduction

1.1 Background

AECOM has been commissioned by Eastwise Construction Swords Limited to undertake a Traffic and Transport Assessment (TTA) for a planning application to An Bord Pleanala (ABP) for a proposed Strategic Housing Development (SHD) on a site located off Swords Road, Whitehall, Dublin 9.

The proposed development comprises 472 no. residential apartments, comprising of the following breakdown:

- 32 no. studio apartments;
- 198 no. 1-bedroom apartments;
- 233 no. 2-bedroom apartments; and
- 9 no. 3-bedroom apartments.

In addition, the scheme includes for a crèche (445.8 sqm) and café (99.0 sqm). As part of the scheme, it is proposed to provide a total of 337 car parking spaces (249 resident at basement level and 37 resident at grade) a total of 313 no. resident parking spaces. 982 cycle parking spaces (732 long stay and 236 short stay spaces) and 14 cargo bike spaces. In respect of the proposed site access arrangements, AECOM have engaged with Dublin City Council (DCC) and the National Transport Authority (NTA) to agree a junction layout arrangement which would not impede the delivery of the future BusConnects scheme along the Swords Road, Core Bus Corridor 2. Swords to City Centre. The proposed SHD is located approximately 3.9km from Dublin City Centre and approximately 3.4km from the M50 Junction 3. A site location map is presented in Figure 1.1 with Figure 1.2 illustrating the proposed site layout.

Figure 1.1 Site Location (Source: Google Maps)

Figure 1.2 – Proposed Site Layout (Courtesy: C+W O'Brien Architects)

1.2 Proposed Development

Eastwise Construction Swords Limited intend to apply to An Bord Pleanála for permission for a strategic housing development at a c. 2.73 ha (27,340 sq m) site at Swords Road, Whitehall, Dublin 9. The site is bounded to the west by Swords Road, to the south by Highfield Hospital, to the north by vacant lands and GAA pitches and to the east by Beechlawn Nursing Home with residential development beyond.

The proposed development includes works to the adjacent road network including the introduction of a signalised fourth arm to the existing Swords Road / Iveragh Road junction with pedestrian crossings provided to all arms of the junction, to facilitate this one car parking space will be required to be removed along the western side of Swords Road and a new pedestrian refuge island will be provided on the southern arm of the junction. A right turn pocket is to be provided into the subject site on the northbound approach of Swords Road with a left turn filter lane provided on the southbound approach, shared with the bus lane. The proposed development also includes the relocation of the existing footpath (along Swords Road) eastwards and the provision of a grass verge at the location of the existing path and a cycle path along the western boundary of the subject site.

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The proposed development principally replicates the layout and footprint of the scheme permitted under DCC Reg. Ref. 3269/10 / ABP Ref. PL29N.238685 (as extended under DCC Reg. Ref. 3269/10/X1 and DCC Reg. Ref. 3405/19) but proposes the slight relocation of the creche building to the west and additional height of up to one storey on some of the blocks and the rationalisation of the permitted floorplans, resulting in an increase in the overall quantum of residential units from 374 No. apartments to 472 No. apartments.

1.3 Planning History

1.3.1 Permitted 358 Units, ABP Reg Ref: PL 29N.238685

In December 2011, planning permission was granted on the subject site for a residential development comprising of 358 no. apartments across 7 no. blocks (Block A – G). In summary, the permitted scheme comprises of the following:

- 358 residential units;
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A site layout has been issued for compliance. The site layout is akin to the permitted scheme expect for a minor reduction in the number of parking spaces from 495 to 488 total spaces, with 7 no. spaces removed from surface level. In relation to cycle parking provision it is proposed to provide a total of 398 spaces, which incorporates 358 spaces within the basement for residents and 40 spaces at surface level for visitors.

1.3.2 Permitted Block F Planning Submission, DCC Reg Ref: 3405/19

In June 2019, planning permission was granted for an amendment application to the permitted residential scheme on the respective site. The proposed amendment application is to the permitted Block F, to increase the number of units in the respective block from 60 no. to 76 no. In summary the block will now comprise of:

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> The following transport planning requirements shall be complied with:
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>
> *ii. All costs incurred by Dublin City Council, including any repairs to the public road and services necessary as a result of the development, shall be at the expense of the developer.*

1.4 Objective

The main objective of this report is to examine the traffic impact of the proposed development and its access arrangements on the local area road network. The net change in traffic on the network due to additional traffic has been calculated and its influence on the local road network has been investigated. In order to complete this report, AECOM has made reference to the following documents:

- Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities, December 2020 (Department of Housing, Local Government and Heritage);
- DMURS (Design Manual for Urban Roads and Streets), May 2019 (Dept of Transport, Tourism and Sport/Dept. of Environment, Community & Local Govt);
- DCC Development Plan 2016 – 2022;
- The Traffic Management Guidelines 2019 (jointly published by the DOELG, DTO, DOT);
- TII Traffic and Transport Assessment Guidelines May 2014;
- The NTA Greater Dublin Area Cycle Plan (December 2013); and
- Design Recommendations for Multi-storey and underground car parks (4th Edition) March 2011.

1.5 Structure of Report

The remainder of the report is divided into the following sections:

- Section 2 considers the location of the site and existing traffic flows;
- Section 3 discusses the proposed development, and gives a brief outline of the proposed internal road network and site layout;
- Section 4 sets out the various policy and research documents used to establish the projected car parking demand and the approach pursued in catering for perspective residents and visitors of the site;
- Section 5 presents a Parking Management Plan for the proposed scheme;
- Section 6 outlines a DMURS Statement of Compliance for the proposed development in response to ABP;
- Section 7 considers the traffic generation and potential impacts of the development;
- Section 8 contains an analysis of the capacity of key junctions;
- Section 9 presents the Site Servicing and Operational Plan;
- Section 10 presents the outline Construction Traffic Management Plan (CTMP); and
- Section 11 provides a summary and conclusion.

A separate Mobility Management Plan (MMP) and Road Safety Audit (RSA) have been provided to support this application.

2. Existing Conditions

2.1 General

This section of the TTA reviews the existing transport conditions in the vicinity of the proposed development. More specifically, the chapter will provide a description of the existing site operation and location, a review of the existing walking, cycling and public transport facilities in the vicinity of the proposed development and a description of the existing highway network.

This section has been informed by on-site assessments of the local environment which were carried out on Tuesday 2nd April 2019. This section also takes into account a traffic survey within the site's vicinity, online data and a desktop review of the key national, regional and local policy documents of relevance to the proposed development site.

2.2 Location

The subject site is situated on a greenfield site located along the Swords Road in Whitehall, Dublin 9. The site is currently vacant.

The site is bounded by undeveloped land along its northern boundary with residential developments to the east, the Highfield Hospital to the south and the Swords Road to the West.

Figure 2.1 below shows the developments location in relation to Dublin City and Figure 2.2 showing the surrounding environs of the proposed development.

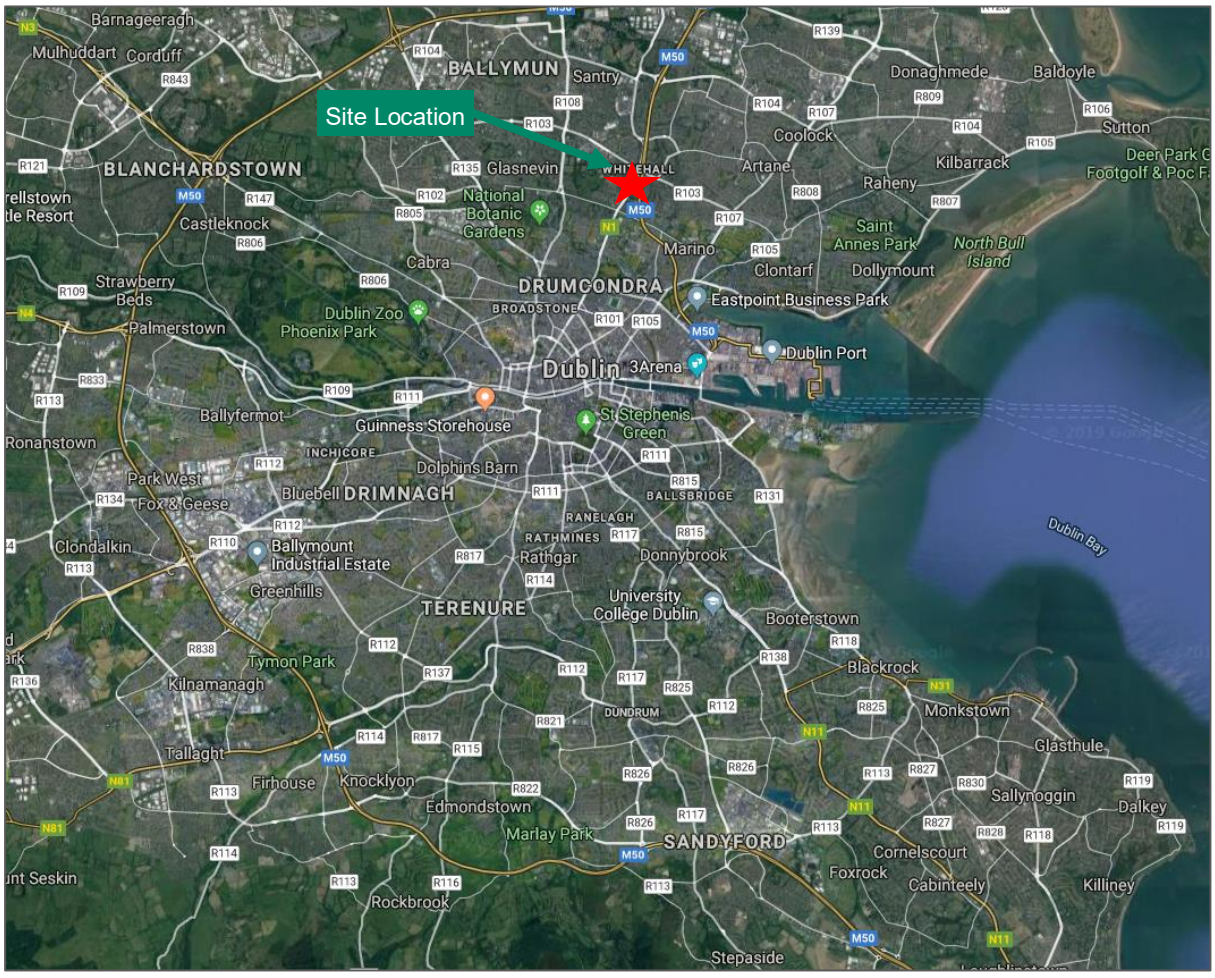


Figure 2.1 – Development Location in Relation to Dublin City (Source: Google Maps)

Figure 2.2 – Site Location (Source: Google Maps)

2.2.1 Land Use Zoning

The subject lands are zoned '*Z12*' within the Dublin City Development Plan (2016 – 2022) as illustrated within Figure 2.3. The zoning objective of lands zoned '*Z12*' is as follows "*To ensure the existing environmental amenities are protected in the predominantly residential future use of these lands*".

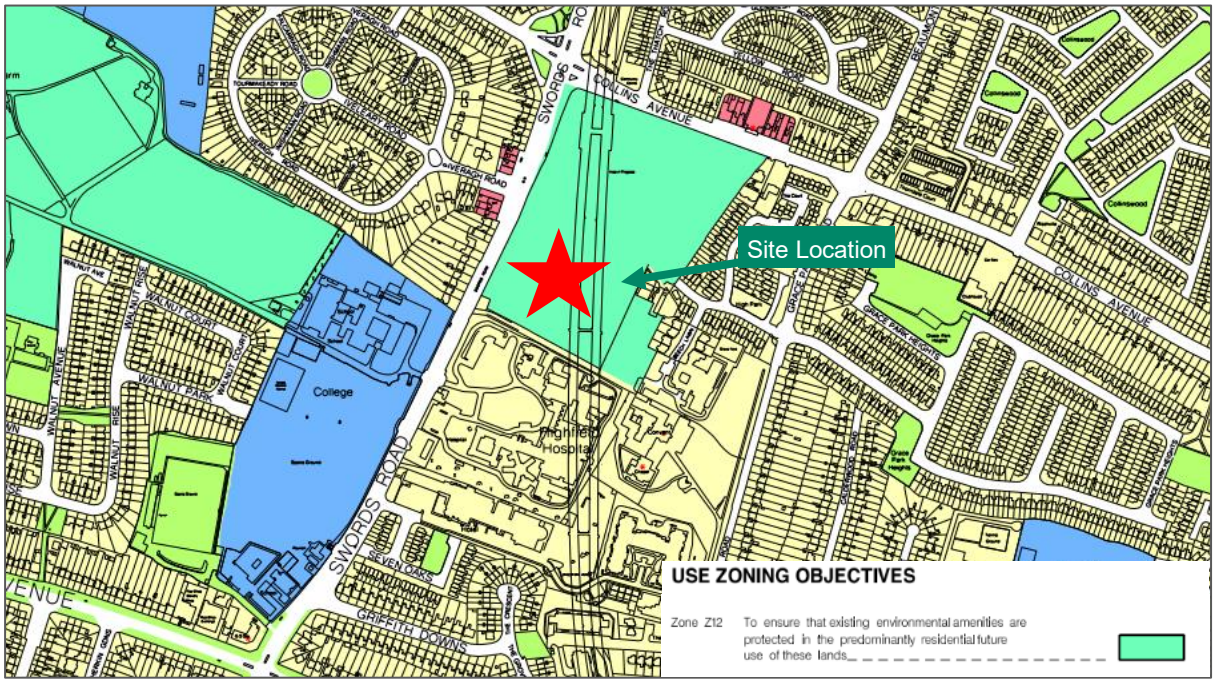


Figure 2.3 – Site Zoning (Source: Dublin City Development Plan, 2016 – 2022, Map B)

2.3 Existing Transportation Infrastructure

2.3.1 Background

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

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.

2.3.2 Existing Pedestrian Cyclist Environment

2.3.2.1 Swords Road

Swords Road (R132) is a regional two-way carriageway with 2 lanes running both north and southbound, with one lane dedicated for buses in each direction. The speed limit along the carriageway is 50 km/hr in the vicinity of the development. Footpaths are situated on both sides of the carriageway. An off-road cycle lane is provided on the western side of the carriageway, which transitions into an on road cycle lane along the approach of Iveragh Road. To the north, Swords Road intersects with Collins Avenue West (R103), as part of an orbital route connecting Killester / Donnycarney with Whitehall, Ballymun, Glasnevin and Finglas. The existing junction at the Swords Road / Iveragh Road / Site Access junction consists of a signalised pedestrian crossing on the northern arm of the junction which is operated by pedestrians pressing the push button. A yellow box junction is provided to prohibit vehicles blocking vehicles exiting / entering the Iveragh Road.

Figure 2.4 – Swords Rd facing North, at Iveragh Road Approach

Figure 2.5 – Swords Road facing Northbound

2.3.3 Iveragh Road

Iveragh Road is a local road accessed off the Swords Road to the east and the R103 to the north, which leads to a residential housing development in Whitehall. Footpaths are provided along both sides of Iveragh Road with street lighting provided on both sides of the street, no dedicated cycling facilties are provided. The road is a one-way vehicle carriageway with a speed limit of 30 km/hr. There is a 3.5 tonne vehicular restriction at Iveragh Road as illustrated in Figure 2.7 below.

Figure 2.6 – Swords Rd facing Southbound

Figure 2.7 – Swords Road / Iveragh Road Priority Junction

The site is situated in close proximity to a number of existing services and amenities which are as follows:

- Conway's Pharmacy – 100m
- Iveragh Road Bus Stop – 100m
- Clonturk Community College – 250m
- Post Office – 350m

- Holy Child Boys and Girls National School – 600m
- Dublin City University (DCU)– 1km

2.4 Sustainable Transport – Bus

As graphically illustrated in Figure 2.8 below, the site is situated to benefit from bus transport connections allowing all site users to travel by this sustainable mode.

The closest bus stops to the site are located along the Swords Road, which are within a 200m walking catchment of the site. These bus stops are operated by Dublin Bus. Figure 2.8 illustrates the location of the bus stops in relation to the development with Table 2.1 detailing the number of services per day and the routes.

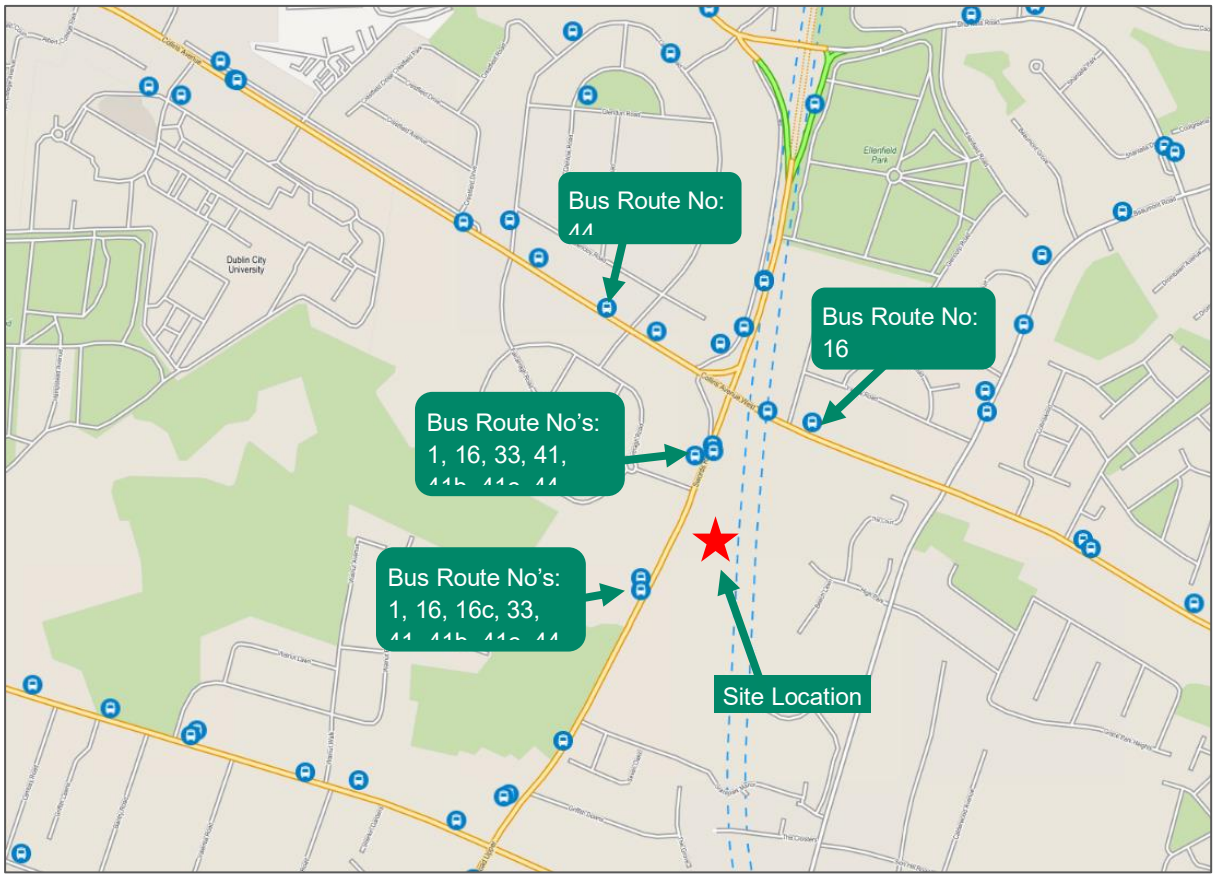


Figure 2.8 – Bus Stops in the Vicinity of the Site (Source: www.journeyplanner.transportforireland.ie)

Table 2.1 – Bus Timetables (Source: www.journeyplanner.transportforireland.ie)

Route No.	Operator	Route	No. of Services		
			Monday to Friday	Saturday	Sunday
1	Dublin Bus	Santry – Whitehall – Dublin City – Sandymount	Every 15 mins	Every 20 mins	
16	Dublin Bus	Dublin Airport – Whitehall – Drumcondra – Dublin City - Ballinteer	Every 10 to 15 mins	Every 15 mins	
16c	Dublin Bus	Dublin Airport – Santry – Whitehall – Ballybough – Dublin City	3 services per day (From 23:00 – 23:30)		
33	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Lusk – Balbriggan	1 service every hour		
41	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Knocksedan	Every 20 mins	Every 30 mins	Every 20 mins
41b	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Rowlestown	5 services per day	3 services per day	4 services per day
41c	Dublin Bus	Dublin City – Drumcondra – Whitehall – Dublin Airport – Swords – Knocksedan	Every 20 mins	Every 30 mins	Every 20 mins
44	Dublin Bus	Whitehall – Drumcondra – Dublin City – Dundrum – Stepaside – Enniskerry	1 service every hour		

2.5 Sustainable Transport – Heavy Rail

The closet railway station to the site is the Drumcondra Train Station located 2.2 km (26 min walk) south of the subject site. The Drumcondra Station is part of the Western Commuter service which provides rail services eastward to Dublin Connolly and westwards towards Sligo. Figure 2.9 illustrates the site location in relation to Drumcondra Train Station.

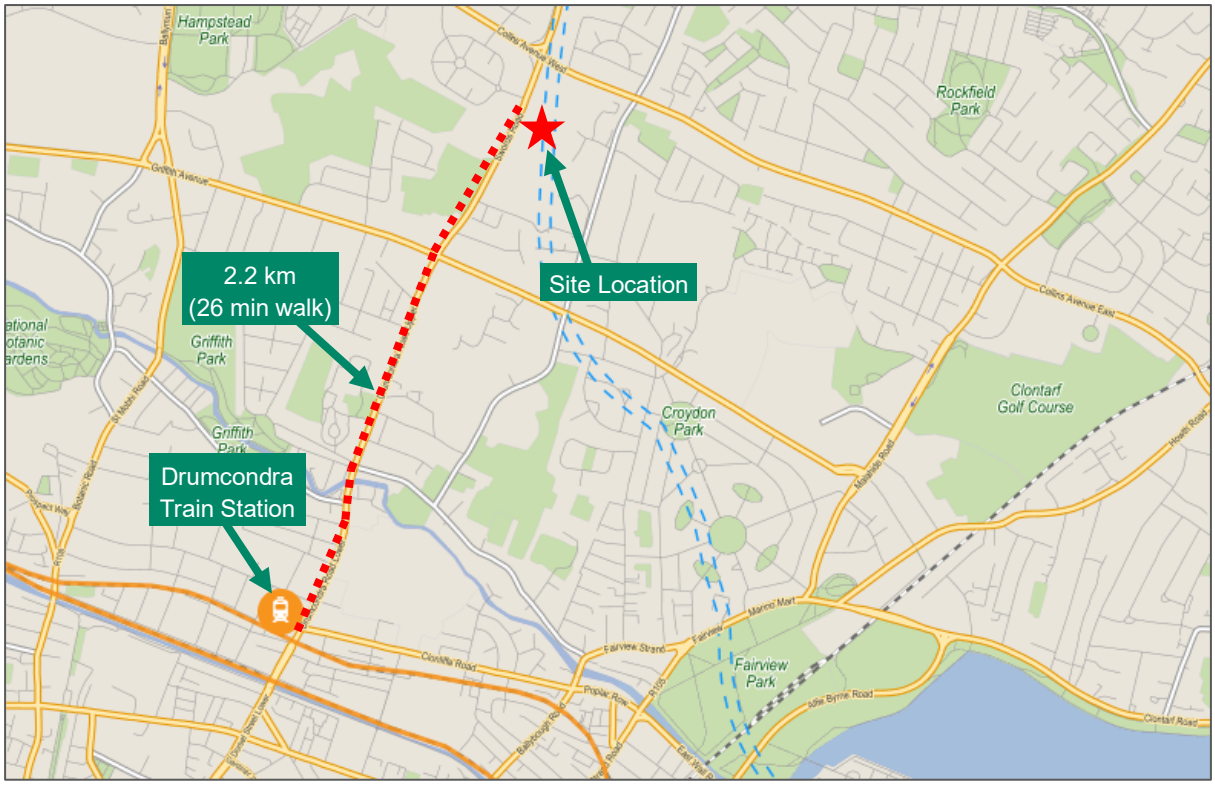


Figure 2.9 – Site Proximity to Train Station (Source: www.journeyplanner.transportforireland.ie)

2.6 Sustainable Transport – Light Rail

The closet railway station which offers DART services is the Killester Train Station located 3.3 km (39 min walk) east of the subject site. The Killester Station is part of the Northern Commuter service which provides light rail services north to Malahide and further to Dundalk and Belfast by heavy rail and south towards Connolly and Bray which continues further to the Rosslare Europort by heavy rail. Figure 2.10 illustrates the site location in relation to the Killester Train Station.

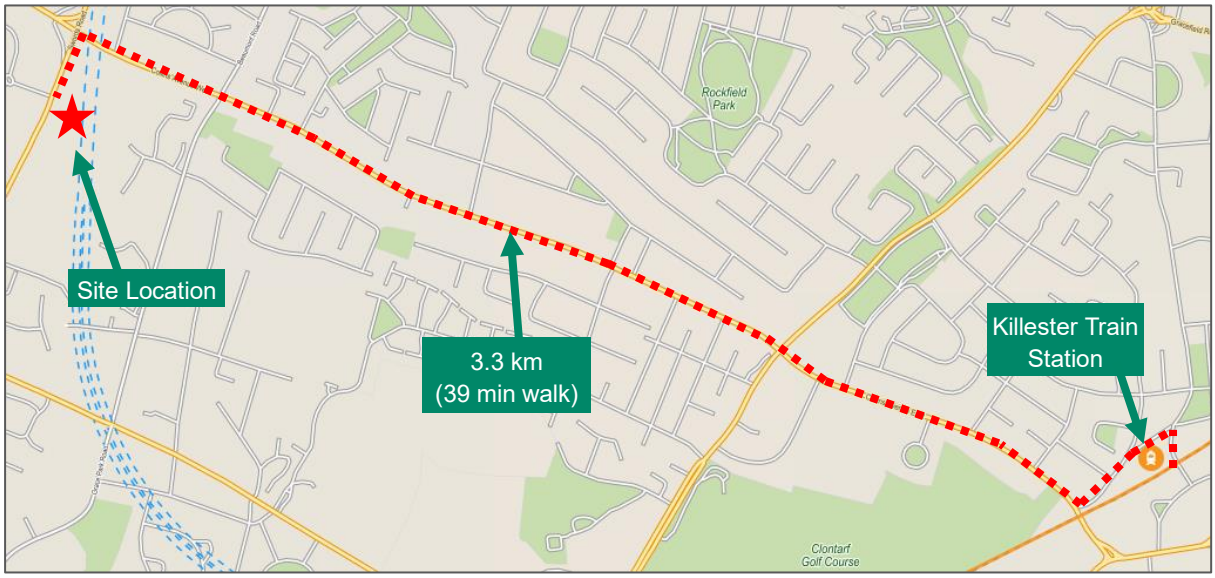


Figure 2.10 – Site Proximity to Nearest DART Station (Source: www.journeyplanner.transportforireland.ie)

2.7 Sustainable Transport – Car Sharing

There are 13 GoCar hire stations located within a 1.5km walking catchment of the subject site. GoCar members can book cars online or via the app for durations of as little as an hour. They then unlock the car with their phone or a GoCard; the keys are in the car, with fuel, insurance and city parking all included. The benefits of such car sharing services include:

- The reduction of cars on the road and therefore traffic congestion, noise and air pollution;
- Frees up land traditionally used for private parking spaces;
- Encourages and potentially increases use of public transport, walking and cycling as the need for car ownership is reduced;
- Car sharing allows those who cannot afford a car the opportunity to drive, encouraging social inclusivity; and
- Car share replaces approximately 20 private car parking spaces.

The locations of the GoCar bases are illustrated in Figure 2.11 with Table 2.2 providing additional details in relation to walking distance from the site and the type of GoCar vehicle available.

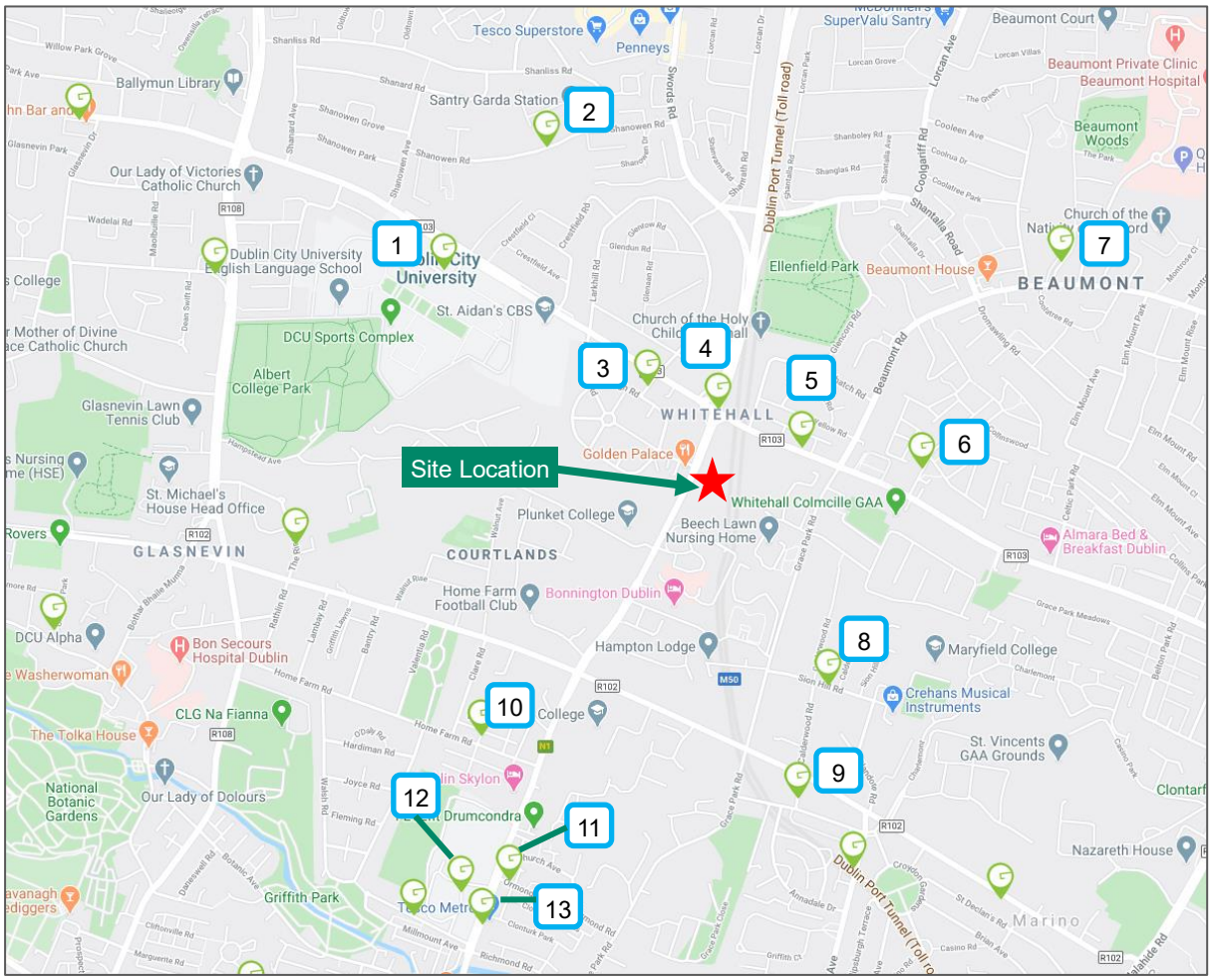


Figure 2.11 – GoBase Locations (Source: www.GoCar.ie)

Table 2.2 – GoBase Details

Ref No.	Go Base Location	Vehicle Class	Approximate Distance from the development
1	Dublin City University, Collins Avenue	GoCity	1.00 km
2	Shanowen Road	GoCity	1.50 km
3	Iveragh Road	GoCity	0.35 km
4	Whitehall Car Park	GoCargo	0.20 km
5	Collins Avenue West – Whitehall	GoCity	0.40 km
6	Collinswood	GoTripper	0.85 km
7	The Park – Beaumont	GoTripper	1.50 km
8	Sion Hill Road	GoCity	1.20 km
9	Griffith Walk	GoCity	1.40 km
10	Achill Road	GoCity	1.20 km
11	Ormond Road, Drumcondra	GoCity	1.40 km
12	Dublin City University, St. Pat's	Go City	1.40 km
13	Clonturk Park	GoCargo, GoTripper	1.50 km

2.8 Emerging Transportation infrastructure

2.8.1 Cycle Network Proposals

In the vicinity of the subject site, it is planned to upgrade the cycle facilities along the Swords Road, Collins Avenue and Griffith Avenue. It is understood that the cycle facilities to be provided along the Swords Road will be part of the BusConnects redesign. Figure 2.12 illustrates the existing cycle facilities in the vicinity of the subject site with Figure 2.13 illustrating the proposed cycle network upgrades as part of the Cycle Network Plan for the Greater Dublin Area.

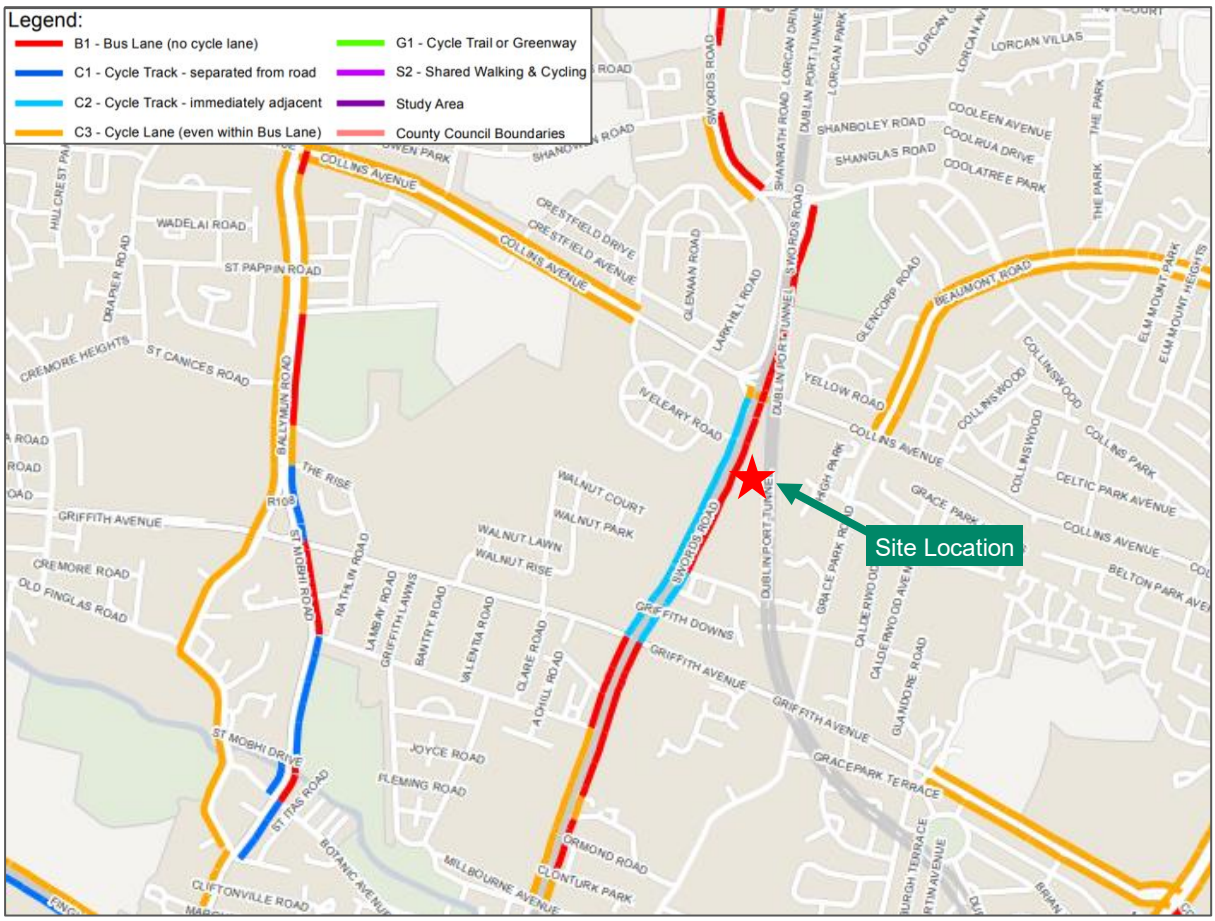


Figure 2.12 – Existing Cycle Facilities (Source: GDA Cycle Network Plan, National Transport Authority)

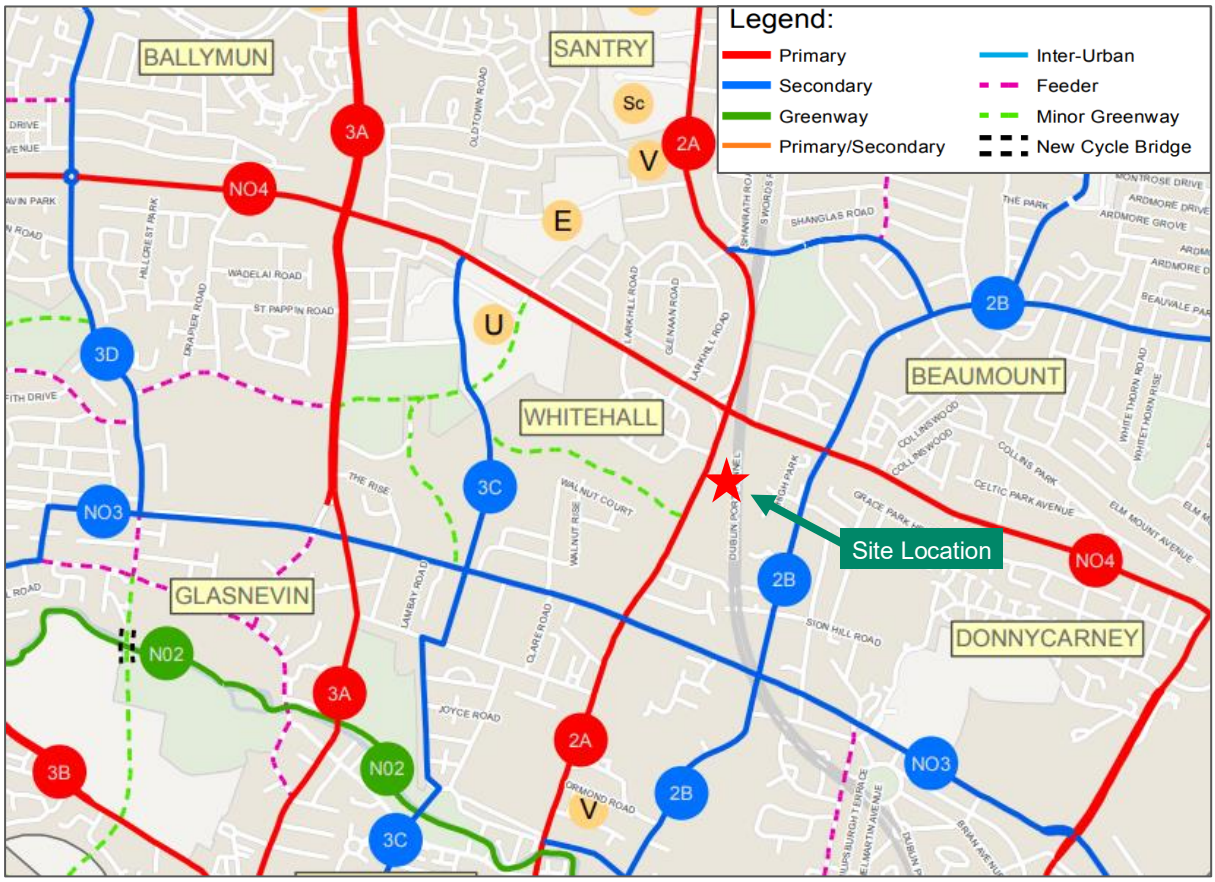


Figure 2.13 – Proposed Cycling Facilities (Source: GDA Cycle Network Plan, National Transport Authority)

2.8.2 Bus Network Proposals

The National Transport Authority (NTA) has put forward proposals to upgrade a number of core bus corridors from the Dublin environs to the City Centre under the title 'BusConnects'. The aim of the project is to:

- *'Make bus journeys faster, predictable and reliable;*
- *New bus stops and better facilities;*
- *More efficient network, connecting more places and carrying more passengers;*
- *Updated ticketing systems and implementing a cashless payment system with a simpler fare structure; and*
- *Improving the cycling network and making it safer.'*

As part of the BusConnects scheme the current bus network is to be revised and more frequent and efficient services are to be provided across the Dublin environs. Table 2.3 details the proposed routes in the vicinity of the subject site with Figure 2.14 illustrating the proposed routing.

Table 2.3 – Revised Bus Network Routes

Service Number	Route Type	Route	Frequency
A1	Spine / Branch Routes	Beaumont – City Centre – Terenure – Templeogue – Ballycullen	Every 10 – 15 mins
A2	Spine / Branch Routes	Airport – City Centre – Terenure – Ballinteer – Dundrum	Every 10 – 15 mins
A3	Spine / Branch Routes	Shanowen Rd – City Centre – Rathmines – Terenure – Tallaght	Every 10 – 15 mins
A4	Spine / Branch Routes	Swords – City Centre – Rathmines – Terenure – Nutgrove	Every 10 – 15 mins
N2	Orbital Route	Clontarf Rd Station – Marino – Glasnevin – Broombridge – Stoneybatter – Heuston Station	Every 20 mins
N4	Orbital Route	Blanchardstown Centre – Finglas – DCU – Whitehall – Killester – Spencer Dock	Every 10 – 15 mins
82	Other City Bound Route	Glen Ellan Rd – Swords Rd – Drumcondra – City Centre – Merrion Sq	Every 10 – 15 mins
94	Other City Bound Route	Ballymun – Wadelai – Glasnevin – Drumcondra – City Centre – Parnell Sq	Every 10 – 15 mins
280	Local Routes	Swords Business Park – Drynam Rd – Clongriffin Station – Beaumont – Whitehall – DCU	Every 40 mins

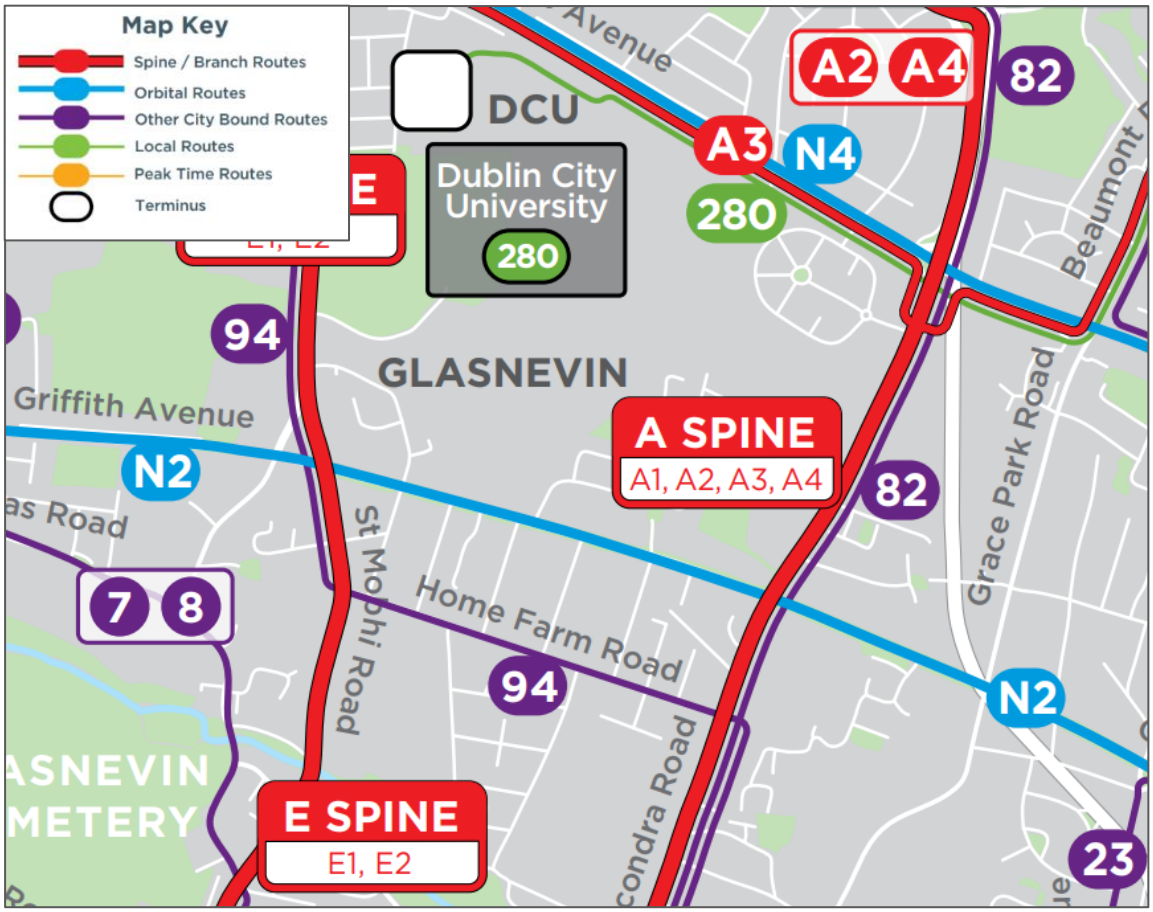


Figure 2.14 – Proposed Public Transport Services (Source: www.busconnects.ie)

The proposed access arrangements to the site have been designed to not impede the delivery (by others) of cycle and bus improvements along Swords Road.

2.8.3 Metro Link

MetroLink is a proposed large-scale infrastructure project which will provide a metro line within the Dublin Area. The proposed scheme will start in Swords and terminate in Charlemont to tie in with the Luas Green Line. As part of the scheme, it is proposed to provide 16 no. stations which will include locations such as the Dublin Airport,

Glasnevin and O' Connell Street. While the project is currently in its public consultation phase, a preferred route has been published along with the locations of proposed metro stations. It is anticipated that the completed Metrolinks project may be delivered in 2027. The subject site is located approximately 1.8km from the proposed Collins Avenue Station which has been illustrated in Figure 2.15.

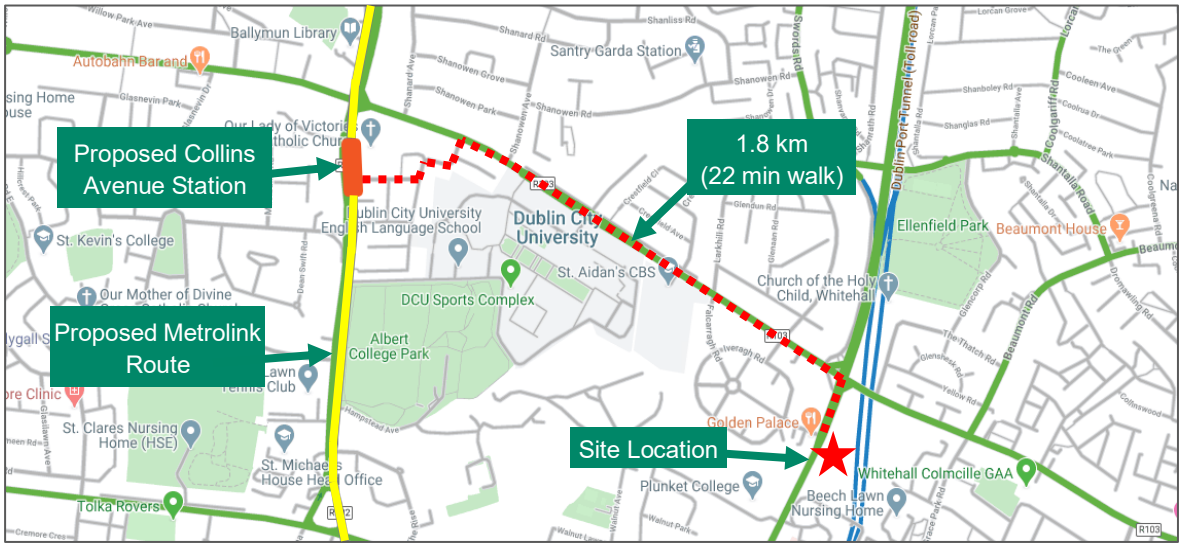


Figure 2.15 – Metrolink Emerging Preferred Route (Source: www.metrolink.ie)

2.8.4 Local Road Proposals

The Dublin City Development Plan 2016 – 2022, has outlined both short (6 years) and long-term road network proposals for the Dublin City environs.

Upon review of the Development Plan, no roads objectives have been identified within the vicinity of the subject site.

2.9 Existing Site Access

There is an existing vehicular access at the north-western and south-western corners of the site. The northern access is located at the existing 3-arm junction with Iveragh Road. The junction currently operates as a priority controlled minor arm with signal heads controlling the major arm.

The permitted scheme comprised of a single vehicular access to the site off Swords Road. The permitted access comprised of a new 4th arm connecting onto the existing Swords Road / Iveragh Road signalised junction. A new left turn and a right turn lane off Swords Road northern and southern arms respectively were granted.

Intervening changes now mean that a slightly different access arrangement is proposed from Swords Road as discussed in Section 3.3. An emergency only access is now also proposed at the south-western corner of the site, approximately 150m from the Swords Road / Iveragh Road / Site Access junction.

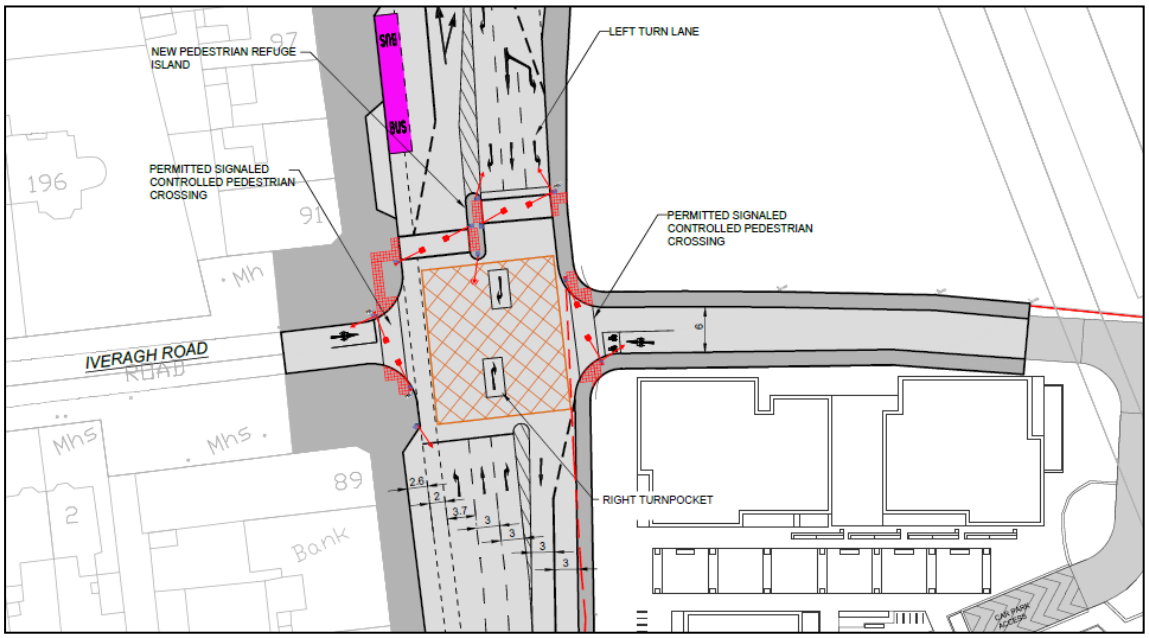


Figure 2.16 – Permitted Access Arrangements

2.10 Road Collision Statistics

A review of the Road Safety Authority (RSA) traffic collision database has been undertaken for the road network in the vicinity of the proposed site to identify any collision trends. This review will assist to identify any potential safety concerns in relation to the existing road network.

Traffic collision data was obtained for the period 2005 – 2016, which is the most recent data available from the RSA website. It should be noted that information relating to reported incidents for the years 2017, 2018, 2019 and 2020 is not yet available on the Road Safety Authority (RSA) website. The RSA records detail only those occasions where the incident was officially recorded such as the Garda being present to formally record details of the incident.

The incidents are categorised into class of severity, which includes minor serious and fatal collisions. The collision locations are shown in Figure 2.17 below.

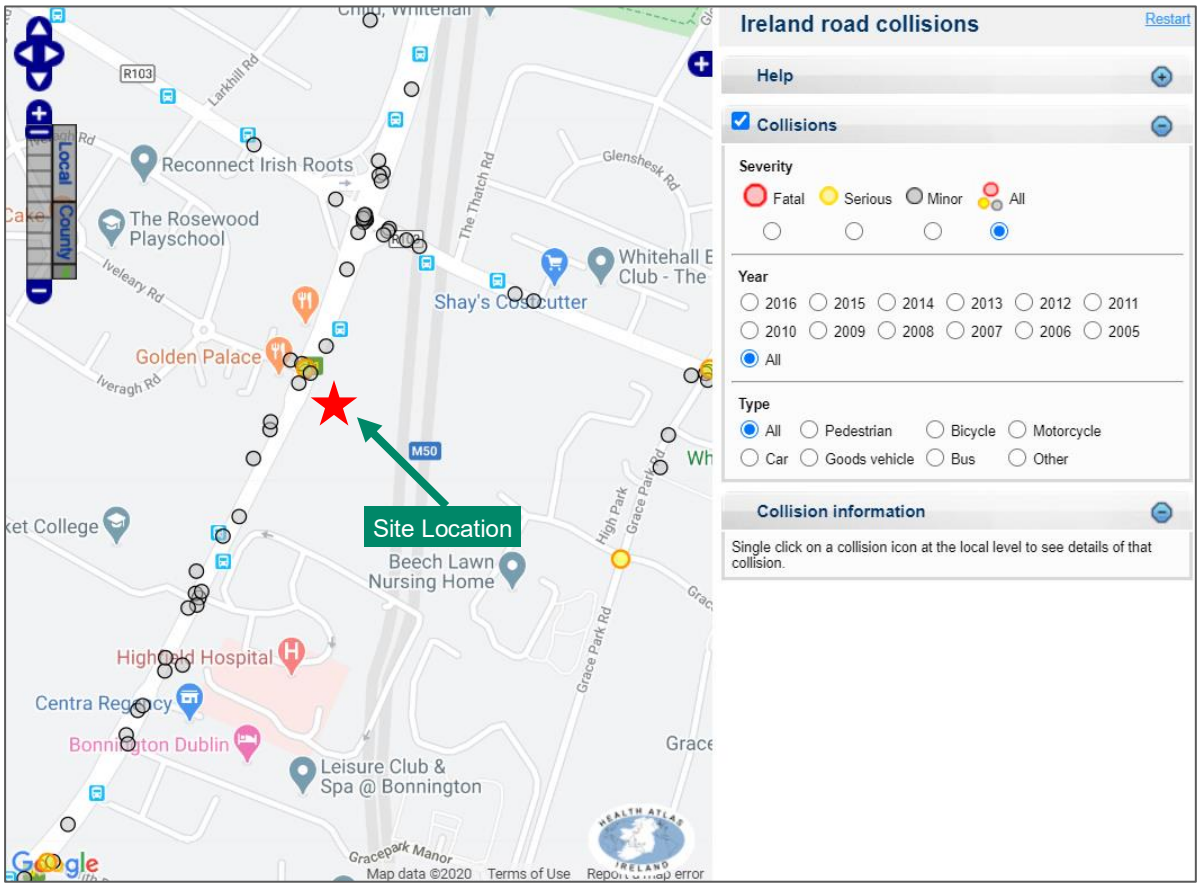


Figure 2.17 – Collision Record within the vicinity of the subject site (source: www.rsa.ie)

Upon inspection there has been 5 no. collisions recorded along the Swords Road in the vicinity of the subject site. Of the five collisions, one collision was recorded as a serious collision which involved a cyclist in 2016 and the remaining incidents were all minor in nature. It should be noted that the four minor incidents all occurred before 2011. The collisions do not indicate any reoccurring collision hotspots or traffic concerns with the existing road network and it is anticipated that the formalisation of this junction to full signal control provides a safety benefit for existing users.

2.11 Existing Conditions Summary

The subject site is ideally positioned within the urban environment to maximise access to / from the site utilising sustainable forms of travel including walking, cycling and public transport.

The site is in proximity to bus stops, (within a 200m walking catchment) which provide bus services every 15 minutes which further enhances the sustainability characteristics of the site. These services travel towards Dublin City and will allow residents / staff / customers to avail of the wider bus network or train services.

The site can also avail of a number of car sharing facilities, as outlined previously, with 13 GoCar GoBase locations within a 1.5km walking catchment of the site. These services will allow residents to take day trips without the requirement for owning a private vehicle. This will aid in reducing the car parking demand by perspective residents.

Consideration of proposed longer term changes to Swords Road have been included for as part of the proposed development access arrangement, namely BusConnects.

3. Proposed Development

3.1 Introduction

This chapter details the proposed development with regard to the transportation elements which includes the internal roads layout, proposed pedestrian / cycling infrastructure and parking provisions within the development area.

3.2 Development Proposals

The proposed development entails 472 no. residential apartments with a Creche and a café unit consisting of the following breakdown:

Table 3.1 – Proposed Schedule of Accommodation

Land Use	Type	Quantum	Total
Residential	Studio Apartment	32 units	472 units
	1 Bedroom Apartment	198 units	
	2 Bedroom Apartment	233 units	
	3 Bedroom Apartment	9 units	
Retail	Café	99.0 sq.m (GFA)	99.0 sq.m
Education	Creche	445.8 sq.m (GFA)	445.8 sq.m
Car Parking (Basement)	Residential	249 spaces	277 spaces
	Creche Staff	5 spaces	
	Accessible (residential)	18 spaces	
	Car Club	5 Spaces	
Car Parking (At-grade)	Residential	37 spaces	60 spaces
	Accessible (residential)	4 spaces	
	Visitor Spaces	19 Spaces	
Cycle Parking	Long Stay	732 Spaces	982 Spaces
	Short Stay	236 spaces	
	Cargo Bike	14 spaces	
Motorcycle Parking	Basement	14 spaces	14 spaces

3.3 Vehicular Access

The permitted scheme comprised of a single vehicular access to the site off Swords Road. The permitted access comprised of a new 4th arm connecting onto the existing Swords Road / Iveragh Road signalised junction. A new left turn and a right turn lane off Swords Road Northern and Southern arms respectively were granted as shown in Section 2.

The proposed development now includes a slightly different access arrangement to the permitted scheme, this is due to land ownership constraints. The indicative layout of the revised access arrangement has been submitted to DCC and their comments on the layout have been addressed, as have comments as part of the RSA. The proposed access arrangement is shown in Figure 3.1.

Figure 3.1 – Proposed Access Arrangements (AECOM Drawing: PR379360-ACM-01-00-SKE-CE-20-0006)

Should BusConnects (delivered by others) come forward along Swords Road, the latest NTA layout at this location has been replicated in Figure 3.2, confirming that the provision of the proposed access arrangement does not preclude the delivery of BusConnects subject to detailed design.

Figure 3.2 – Scheme Proposals with BusConnects in Place (AECOM Drawing: PR379360-ACM-01-00-SKE-CE-20-0007)

3.4 Visibility Splay

In accordance with The Geometric Layout of Signal-Controlled Junctions (DN-GEO-03044), an inter-visibility zone of 2.5m is required for the 4-arm signalised site access junction along Swords Road. This visibility splay requirement is achieved and is shown in Figure 3.3 and illustrated in AECOM Drawing: PR379360-ACM-XX-XX-DR-CE-10-0101.

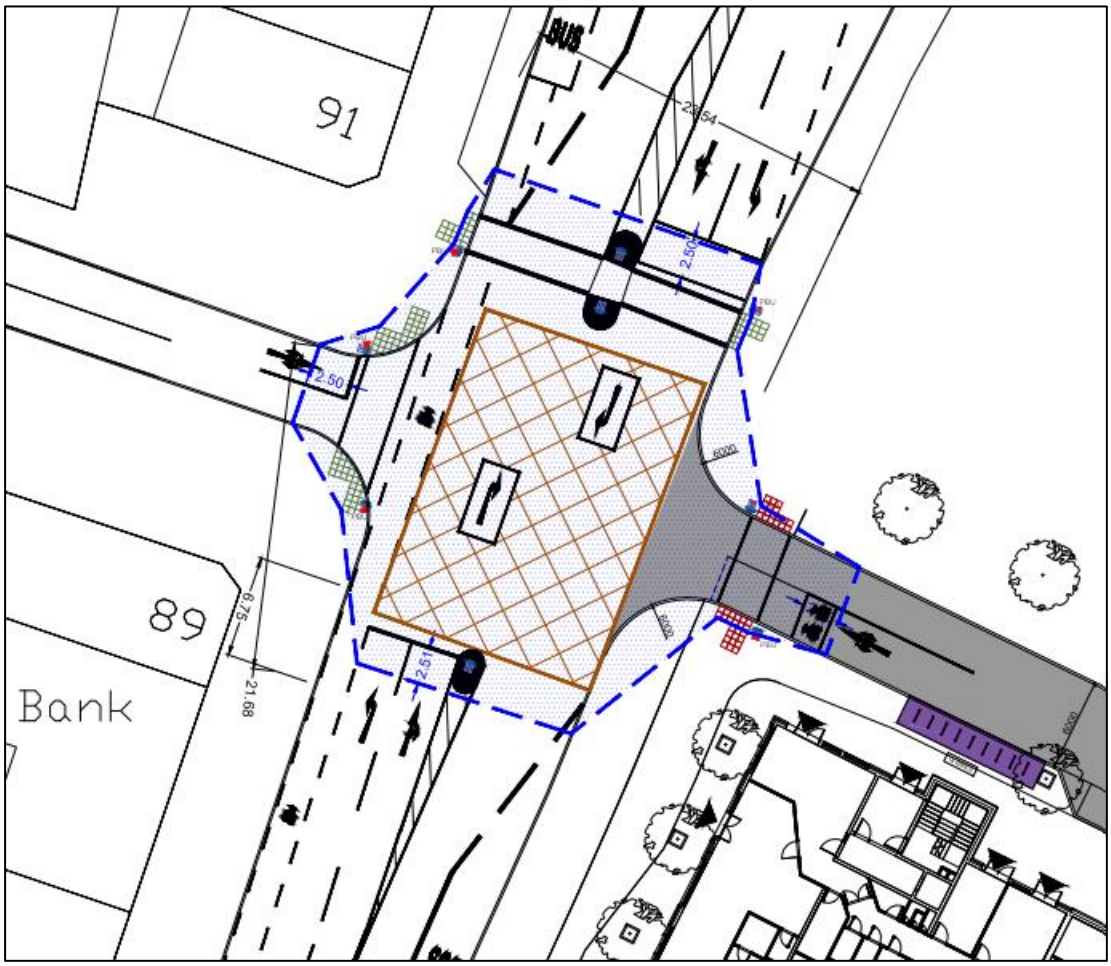


Figure 3.3 – Intervisibility Zone at the Proposed Site Access (AECOM Drawing: PR379360-ACM-01-00-SKE-CE-20-0006)

3.5 Servicing

An AutoTrack analysis has been undertaken to demonstrate the capability of the development to cater for a 10.2m bin lorry. The results of the analysis show that the site access junction can accommodate a 10.2m bin lorry accessing, exiting and travelling through the site. This is illustrated in AECOM Drawing: PR379360-ACM-XX-XX-DR-CE-10-0102. The site Servicing and Operation Plan is included in Section 8 of this report.

3.6 Pedestrian and Cyclist Permeability

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

3.7 Car Parking Provision

It is proposed to provide a total of 337 car parking spaces on site. This includes 313 no. spaces dedicated to the 472 no. residential units (272 at basement level and 41 at grade), 19 visitor parking spaces at grade including set down spaces adjacent to the Creche. Additional are 5 no. spaces within the basement for creche staff. The resident parking spaces in the basement include 5 no. car club spaces.

Given the above provision is below the DCC Development Plan (Maximum) car parking standards, which recommends 1 spaces per unit, AECOM has assessed the projected car parking demand for perspective residents of the development, which is outlined in Section 4 of this report. The strategy for the management of parking is included in Section 5.

3.8 Cycle Parking Provision

The proposed cycle parking provision has been designed to encourage cycling as a key mode of travel to and from the development. The cycle parking spaces will comprise of secure cycle spaces for residents of the apartment units within the basement and secure cycle lockers at surface level with standard 'Sheffield style' cycle parking stands for visitors on the ground floor.

The DCC Development Plan Standards (2016 – 2022) and the Sustainable Urban Housing Design of New Apartments guidelines (December 2020) have been adhered to when determining a suitable amount of cycle parking for the proposed development.

Table 3.2 illustrates the proposed cycle parking provision against DCC's and the Sustainable Urban Housing parking standards.

Table 3.2 – Cycle Parking Requirements

National Standards	Cycle Parking Requirements	Minimum Cycle Parking Standard	Number of Cycle Parking Spaces Required	Total Number of Cycle Parking Spaces Required
DCC Development Plan standards (2016 – 2022)	Apartment Units (472)	1 cycle space per unit	472	472
	Visitor Spaces	TBD on case by case	NA	
The Sustainable Urban Housing Design of New Apartments guidelines (December 2020)	Bedrooms (723)	1 cycle space per bedroom	723	959
	Visitor Spaces	1 cycle space per 2 units	236	

A total of 982 no. cycle parking spaces are proposed within the site to cater for the proposed development. Inclusive in this is an additional 14 no. cargo bike spaces provided in the basement for residents.

Table 3.2 above demonstrates that the residential cycle parking provision of 982 no. spaces is compliant with the DCC Development Plan standards (472 no. spaces + visitors) and the Design Standards for New Apartments guidelines, which recommends provision of 1 cycle space per bedroom along with 1 visitor space per 2 units.

AECOM considers the proposed cycle parking provision to be appropriate when cognisance is given to the accessibility of the site to existing walking and public transport infrastructure in the surrounding area.

It is proposed within the MMP (standalone report) to monitor the usage of the cycle stands following the opening of the proposed development. Should demand meet the proposed level of cycle parking, the management company will allocate additional cycle parking for the development i.e. increasing the number of cycle stands. There is ample space at surface level to add more cycle stands following a review of the demand.

The proposed cycle parking spaces will comprise of the following:

- 732 no. spaces in secure bike storage within the basement and at grade for residents; and
- 236 no. spaces in the form of Sheffield stands at-grade for visitors.
- 14 no. cargo bike spaces, providing secure parking within the basement.

Access to the basement level cycle parking will be permitted via the use of a key or fob, providing a sense of security for cyclists.

It is therefore anticipated that the proposed cycle parking provision is sufficient to accommodate predicted demand, whilst also complying with DCC's minimum cycle parking standards.

4. Car Parking Review

4.1 General

This section sets out the various policy documents used to establish that the proposed car parking quantum of 0.71 spaces per unit will cater for the projected car parking demand and the amenity at the site.

A review was undertaken of the requirements identified within the DCC Development Plan Parking Standards, and the Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities. Guidance has also been provided by Go Car in relation to usage by residents in apartments. The findings from the various policy documents are shown below.

4.2 DCC Development Plan Standards

The DCC Development Plan (Section 16.38.9) identifies the car parking requirements for new residential developments, which are as follows:

- "*Car parking standards are maximum in nature and may be reduced in specific, mainly inner city locations where it is demonstrated that other modes of transport are sufficient for the needs of residents;*
- *In other locations it is considered desirable that one car parking space be provided off street within the curtilage of the development;*
- *Each parking space shall be permanently assigned to and sold with each apartment and shall not be sublet or leased to non-residential owners;*
- *Where sites are constrained or provision of onsite car storage is not possible, alternative solutions will be considered such as residential car clubs or off-site curtilage;*
- *Apartment parking spaces are mainly to provide for car storage to support family friendly living policies in the city and make apartments more attractive for residents."*

4.3 Design Standards for New Apartments

The design team has taken into consideration the Dept. of Housing, Local Government and Heritage 'Design Standards for New Apartments', which provides the Government's latest national policy guidelines to local planning authorities in relation to car parking provision for new apartments. The key car parking note for Central and/or accessible urban locations within the policy (Section 4.19 and 4.20) is documented as follows:

- *"In larger scale and higher density developments, comprising wholly of apartments in more central locations that are well served by public transport, the default policy is for car parking provision to be minimised, substantially reduced or wholly eliminated in certain circumstances. The policies above would be particularly applicable in highly accessible areas such as in or adjoining city cores or at a confluence of public transport systems such rail and bus stations located in close proximity*.
- "*These locations are most likely to be in cities, especially in or adjacent to (i.e. within 15 minutes walking distance of) city centres or centrally located employment locations. This includes 10 minutes walking distance of DART, commuter rail or Luas stops or within 5 minutes walking distance of high frequency (min 10 minute peak hour frequency) bus services."*

It is considered that the subject site is located within an Accessible Urban Location as set out in the Apartment Guidelines due to its proximity to significant employment locations such as Beaumont Hospital which is approximately 1km to the north east of the subject site and Dublin City University which is approximately 1km to the north west. The subject site is also in proximity to a number of high frequency bus services which travel along the Swords Road Quality Bus Corridor, which forms the western boundary of the subject site.

The design team have taken into consideration of DCC's maximum parking requirements, whilst appreciating the need to cater for future residential amenity at the site and balancing the guidelines at a National Level as identified within the new apartment guidelines.

4.4 Go Car / Car Club

Research has been undertaken by Go Car in relation to the benefits of car clubs across Europe in terms of the potential to reduce the reliance on private vehicular travel. The benefits of Go Car are to reduce car ownership,

car dependency, congestion, noise and air pollution. The Go Car guidance identifies that each Go Car has the potential to replace approximately 10 – 20 private cars subject to location.

The findings from the Go Car research have been included within the design of the car parking provision, and it is proposed to provide a total of 5 No. dedicated Car Cub parking spaces, in the basement, as part of the scheme.. On the basis of the Go Car research, the provision of 5 no car club spaces has the potential to replace up to 100 – car parking spaces on the site. A car share company has been engaged with and they are in-principle supportive of the scheme.

Appendix A of this report contains a letter of intent from GoCar to support the development by providing 5 no. car share parking spaces

4.5 Census 2016 Data

AECOM have undertaken an analysis of the Census 2016 data available from the Central Statistics Office (CSO) to determine the existing commuting patterns and car ownership within the surrounding area of the development site. The areas that have been included within this analysis are illustrated in Figure 4.1.

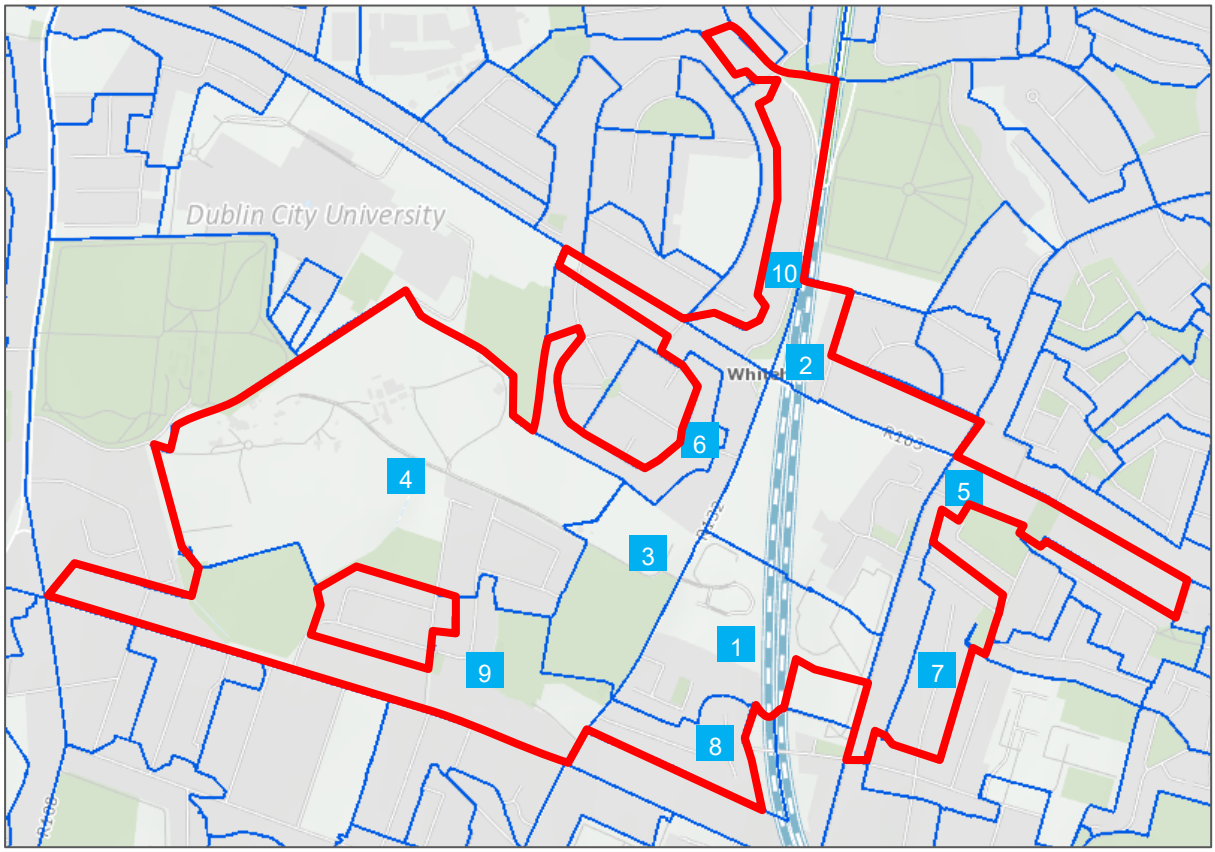


Figure 4.1 – Extent of Small Areas within the vicinity of the Subject Site (Source: Central Statistics Office – 2016 SAP Maps)

4.5.1 Existing Commuter Patterns

Census 2016 figures obtained from the Central Statistics Office (CSO) detail the means of travel to work, school or college (i.e. on foot, bicycle, car driver etc.) for people aged 5 years and over for the electoral division of Whitehall and Grace Park, in which the development site falls. These figures are shown below together with mode shares of each of the means of travel and demonstrate that while 31.0% of individuals surveyed drive to their place of work / education, approximately 23.0% take the bus. Also note that 19.0% of commuters walk to their place of work or education while 11.0% cycle. This would further indicate that the proposed development is well situated to take advantage of the existing sustainable travel infrastructure in the area.

In 2016 working from home accounted for a small proportion of existing journey behaviours, however post Covid-19 pandemic there is potential for a higher proportion of working from home which may reduce car ownership in urban location and thus the traffic impact of developments such as the proposed scheme.

Table 4.1 – Existing Journey Patterns

Means of Travel	Work	School or College	Total	Mode Share (%)
On foot	96	189	285	19.0%
Bicycle	101	64	165	11.0%
Bus, minibus or coach	202	143	345	23.0%
Train, DART or LUAS	16	4	20	1.3%
Motorcycle or scooter	3	0	3	0.2%
Car driver	449	16	465	31.0%
Car passenger	26	118	144	9.6%
Van	30	1	31	2.1%
Other (incl. lorry)	0	0	0	0.0%
Work mainly at or from home	44	0	44	2.9%
Total	**967**	**535**	**1502**	**100.0%**

4.5.2 Existing Car Ownership

Census 2016 figures obtained from the Central Statistics Office (CSO) detail the car ownership per household and car ownership rate for the electoral division of Whitehall and Grace Park, in which the development site falls. Figure 4.2 illustrates the of number of cars per household and the overall car ownership rate for the electoral division. Figure 4.2 indicates that 47.2% of houses in the electoral division own one car followed by 29.3% with two cars, 17.3% with no car, 4.9% with three cars and 1.4% with four or more cars. The overall car ownership for the electoral division is 82.7% of houses own a car with 17.3% having no car.

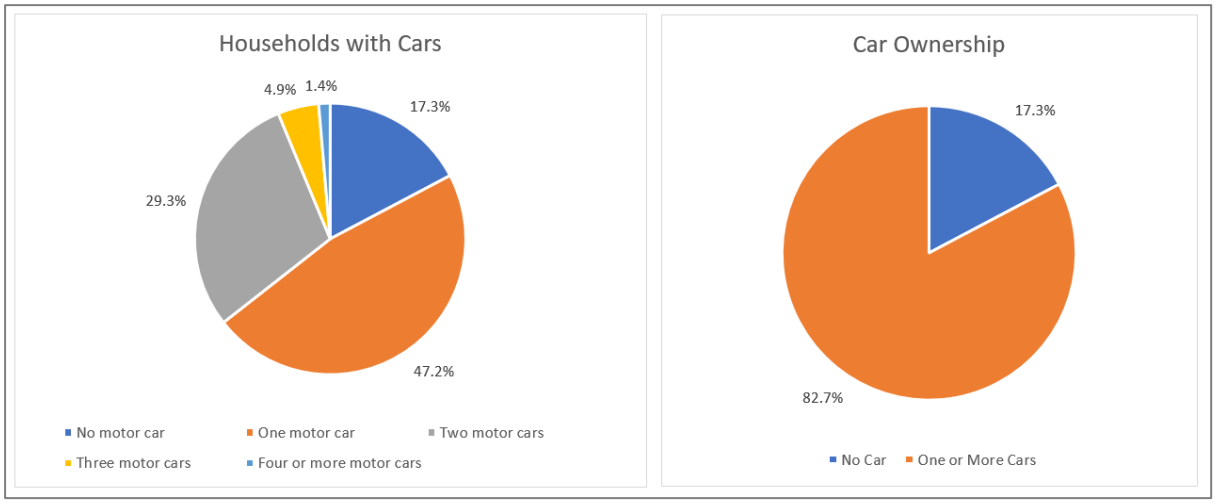


Figure 4.2 – Households With Cars (L) and Car Ownership % (R) from CSO Census 2016 Figures

4.6 Parking Review Summary

Upon review of the census 2016 data with regard to the modal split and car ownership rates it is clear that although a number of households own a vehicle (82.7%), the majority of residents in the area rely on active and sustainable forms of transport, accounting for 69.0% of commuting habits in the area. With respect to these findings it is proposed to provide a lower car parking ratio for the development with a parking management plan being presented in the section 5 of this report to justify this reduction in car parking.

5. Parking Management Plan

5.1 Introduction

In determining a suitable car parking management and allocation, AECOM have referred to the '*Dublin City Development Plan 2016-2022*' and also the parking strategy presented within the DBFL Traffic and Transport Assessment which accompanied the original planning application in 2011 (ABP Ref: PL 29N.238685).

The DCC Development Plan parking standards for a development within Zone 3, which the site resides, are presented below. The car parking standards are identified as follows:

- Residential, **maximum** provision of 1 space per unit;
- Retail, **maximum** provision of 1 per 75 sqm; and
- Creche, no specific standard is provided within the DCC Development Plan - The creche has 5 no. play rooms, so 5 no. spaces are provided in the basement for staff on basis 1 space per 'classroom'.

In addition to the above, we note the following additional requirements as per the DCC Development Plan and relevant best practice which are shown in Table 5.1 with the development requirement shown in Table 5.2:

- Disabled Parking, at least 5% of the total spaces should be allocated for mobility impaired persons as per the DCC Development Plan;
- Motorcycle Parking, 4% of the total number of parking spaces provided;
- EV Charging Infrastructure, whilst no specific requirement is identified within the DCC Development Plan, an advisory 20% of spaces should cater for EV;
- Visitor Parking, an advisory additional 10% of parking spaces - note there is no minimum or maximum requirement in DCC Development Plan; and
- Car Club, whilst there is no specific requirement in DCC Development Plan, it is proposed to provide 5 no. spaces to be dedicated for Car Club.

Table 5.1 – Dublin City Council Car Parking Standards Summary

Land Use	DCC Parking Requirement (Maximum, Zone 3)
Residential	1 per dwelling
Retail	1 per 75 sqm Gross Floor Area (GFA)
Creche	No specific requirement but used 1 staff space per 'classrom'
Disabled Parking	5% of total spaces
Motorcycle Parking	4% of total car spaces
EV Parking	No specific but advised as part of DCC consultation minimum of 20% should cater for EV
Visitor Parking	No specific requirement, advisory additional 6%
Car Share (Club)	No specific requirement

Table 5.2 – Car Parking Requirement

Size	No. of Units	Parking Ratio	Parking Requirements
1 bed (incl. 32 studios)	230	1 per unit	230
2 bed	233	1 per unit	233
3 bed	9	1 per unit	9
Retail (Café)			1
Creche			6
Overcall Car Parking Requirement			**479**

As the DCC development plan car parking standards are regarded as the **maximum,** the applicant is proposing to provide 337 no. total car parking spaces, with 313 spaces to serve the 472 residential units. A total of 277 no. car parking spaces at basement level and a further 60 no car parking spaces at surface level. The applicant is providing the required quantum of car parking spaces to meet with the DCC maximum requirements.

The proposed development provides a total of 337 car parking spaces plus 14 motorcycle spaces. 5 No spaces will be allocated to the creche staff (in the basement). There are 19 visitor spaces with spaces being provided adjacent to the creche for pick-ups and drop-offs. EV, disabled and Car Club spaces are also provided. The EV spaces (20 % of total will be provided in the basement, the disabled spaces are dispersed across the site including in the basement and at grade with the car club spaces being provided in the basement. The Car Club spaces are however intended to support residents of the proposed development and would be marketed as such through the Mobility Management Plan (MMP). Thus the Car Club spaces (5 no.) fall within the quantum of parking for residents.

The proposed development provides 313 car parking spaces for the residential apartments which results in a car parking ratio of 0.66 This complies with the DCC Development Plan maximum standards, a justification for this reduced quantum of residential car parking is provided in the section 5.3. Note the proposed parking quantum for the creche and retail units is considered appropriate to the DCC standards. Please refer to the architects drawings for the proposed car park arrangement and accessibility for pedestrians and cyclists.

A standalone Parking Strategy is to be submitted in addition to this TTA within the application process. This will further detail the parking strategy proposed for the proposed for the development

5.2 Bicycle Parking Strategy

The bicycle allocation is based on the requirements as set out in the *'Dublin City Development Plan 2016-2022'* which states that one space must be provided per unit. The parking allocation is shown in Table 5.3.

Table 5.3 – Dublin City Council Cycle Parking Standards Summary

Land Use	Minimum Cycle Parking Standard	Required No. of Cycle Parking	Proposed Cycle Parking Spaces
Residential (Long Stay)	1 cycle space per unit	472	732 (Basement Level and Surface Level)
Residential (Short Stay)	TBD on case by case	TBD	236 (Surface Level)

A total of 968 (or 982 if the 14 no. cargo bike spaces are included) residential cycle parking spaces are proposed within the site to cater for the proposed development, which is compliant with the respective DCC Development Plan. It is therefore considered that the cycle parking provision provides a high level of amenity for those wishing to cycle. Further to this, the pedestrian and cycle routes along with the location of the cycle parking spaces for the basement and at-grade are shown on the architects drawings.

5.3 Reduced Car Parking Rationale

The vast majority of the units (all 2 and 3 bedroom units) will be 'assigned' a parking space thus the ratio for parking is 1 space to 1 unit.

The 1 bedroom units are proposed to have a lower parking ratio (0.22 spaces per unit) given the likely characteristics of the residents of these units. As already shown the site is accessible by a variety of sustainable travel modes, cycle parking spaces (1+ space to 1 unit) will be provided and a MMP introduced. Moreover 5 No. Car Club spaces are available for residents, Car Clubs provide an alternative to private car ownership and research has shown that Car Clubs can replace between 10-20 private vehicles. Thus it is therefore considered that the Car Club spaces are more than capable of accommodating the demand of residents of the 1 bedroom flats as well as providing opportunities for other residents to benefit from such as scheme. Moreover this lower car parking provision and favour of Car Clubs (which are more likely to be electric) is in keeping with global and national initiatives to reduce carbon dioxide emissions.[1]

It is therefore considered that the reduced parking quantum is justified.

5.4 Car Parking Management

A management company will be appointed to oversee the operations of the scheme in ensuring that the car parking is managed and enforced. It is proposed that each of the 2 and 3 bedroom apartment will be allocated with one car parking space (in the basement), these spaces would be assigned by the management company to a particular unit. A barrier system will be provided for access to the basement. For the 1 bedroom apartments prospective

[1] https://www.sustrans.org.uk/our-blog/get-active/2019/everyday-walking-and-cycling/car-clubs-and-car-sharing/

residents of these units will be made aware that parking is not automatically available with these units, however they may be able to rent a car parking space through agreement..

A management company will be appointed to enforce the car parking arrangements on the site which perspective residents will be made aware of prior to moving in. The management company will be responsible for the following:

- Manage and control barrier entry system to the basement.
- Regular checks of the car park to ensure appropriate parking.
- Internal warning signs to be erected to warn visitors of parking restriction.
- Letters to be sent to all residents informing them of the agreed parking strategy.

5.5 Bicycle Parking Management

The residents cycle parking provision is proposed within the basement, within dedicated cycle parking compounds, which will be accessed via key or fob, which will offer a level of security to residents. At surface level, cycle parking is proposed within the immediate vicinity of main entrances to the buildings, which will allow for passive surveillance to offer a sense of security for visitors. Figure 5.1 shows an example of the type of Sheffield stands that are to be provided to accommodate visitors to the development.

Plans showing the assignment and segregation of the different parking types across the site are appended to this note and summarised as follows:

- 982 cycle parking spaces which includes:
    - 732 no. spaces in secure bike storage within the basement for residents; and
    - 236 no. spaces in the form of Sheffield stands at-grade for visitors.
    - 14 no. cargo bike spaces within the basement for residents cargo bike parking.

Figure 5.1 – Example of Sheffield Stand

In addition to above section there a stand alone Parking Strategy which supplements this section and has been requested by DCC as part of the consultation response.

6. DMURS Statement of Compliance

6.1 General

This chapter comprises of a Statement of Compliance, prepared as per the Strategic Housing Development (SHD) Section 5 Pre Application Consultation Request, Section 19, which stipulates the following:

AECOM's response to this request is as follows:

6.2 Compliance with DMURS

The following measures are examples of where compliance with the DMURS guidelines has been demonstrated:

6.3 Internal Road Network

The internal layout design has been informed by the DMURS guidelines. The following measures are examples of where compliance with the DMURS guidelines has been demonstrated:

- Internal footpaths have been provided at a minimum width of 1.8m, which is the space required to allow two wheelchairs to pass each other;
- The internal carriageway width is typically 5.5m to allow for manoeuvrability of vehicles accessing the perpendicular parking spaces;
- Pedestrian crossings are proposed which comprise of tactile paving and dropped kerbs to facilitate pedestrian movements;
- The corner radii of the proposed junctions are 4 – 6m, as per Section 4.3.3 of DMURS.

6.4 Landscaping

Section 4.2.7 of DMURS recommends to provide softer landscaping areas in order to provide a sense of "place function" within the development. The site therefore provides a significant amount of landscaping, including trees located along the surface level roads to provide a sense of enclosure. There's also public open space within the central portion of the development which also comprises of pedestrian and cycle way facilities. We refer the Board to the Landscape Report prepared by Reddy Architecture.

6.5 Materials and Finishes

DMURS also gives guidance on the types of materials and finishes to be used in order to provide a sense of calm for traffic and improve legibility for vulnerable road users. The proposed shared surface carriageway and pedestrian / cycle / emergency entrance will be of visually contrasting colour. The road markings will be flush so as to permit fire tenders manoeuvring within the development infrequently.

6.6 Signing and Lining

As per Section 4.2.4 of DMURS, signing and lining has been provided appropriately at the required locations throughout the development. However, the proposed development has been designed to have a self-regulating approach to increase the road safety as opposed to relying on mandatory and warning signs.

7. Trip Generation and Distribution

7.1 General

The purpose of this section is to determine the overall number of trips that will be generated by the proposed development in terms of vehicular traffic. To understand the potential vehicular trip generation associated with the site, AECOM has undertaken a review of the committed traffic upon the adjoining road network against the proposed trip generation, outlined in the subsequent sections.

7.2 Existing / Baseline Traffic Flows

In order to establish the existing local road networks traffic characteristics and subsequently enable the identification of the potential impact of the proposed residential development, traffic surveys were commissioned in September 2019.

The traffic surveys (weekday classified junction turning counts) were conducted by an independent survey company, IDASO over a 12-hr survey period from 07:00 – 19:00 on Thursday the 3rd of October 2019. The survey was undertaken at the following locations (Figure 7.1):

1. Swords Road / Collins Avenue Signalised Junction; and
2. Swords Road / Iveragh Road.

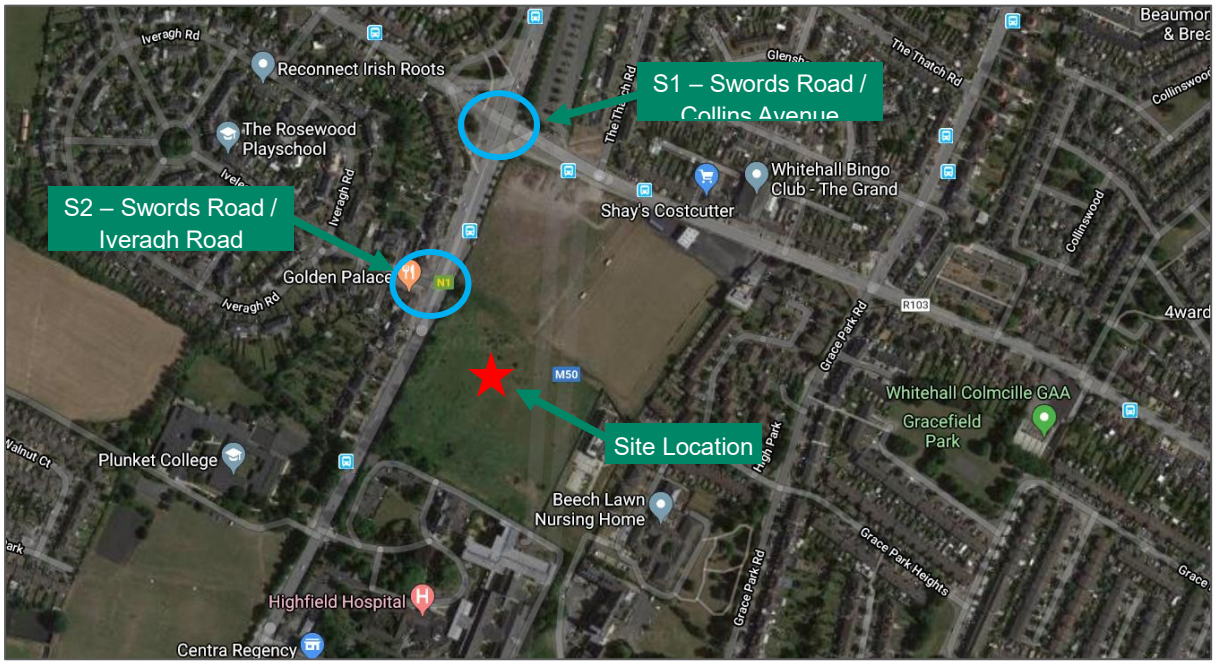


Figure 7.1 – Junction Locations

The site is currently a greenfield site and has no associated trip generation associated with it. The existing traffic flows at the site access road from Swords Road are shown below for the weekday morning and evening peak periods, denoted by green and yellow, respectively, in Figure 7.2. The full baseline traffic flows for the surrounding road network are shown in Appendix B of this report.

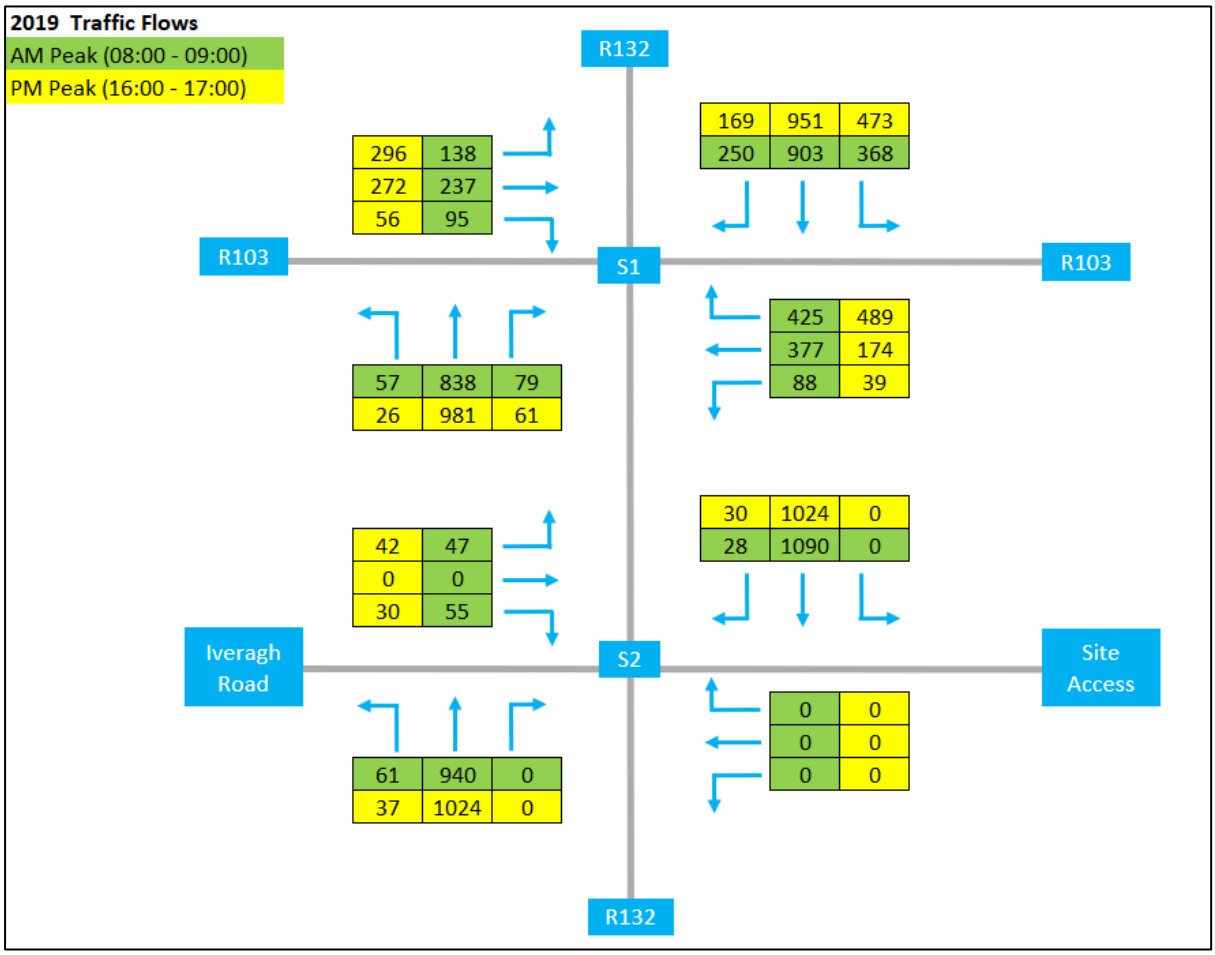


Figure 7.2 – 2019 Baseline Traffic Flows

7.3 Traffic Growth

The TTA adopts an Opening Design Year of 2023. In accordance with TII Guidance, Future Design years (+5 and +15 years) of 2028 and 2038 will therefore be adopted.
The Transport Infrastructure Ireland (TII) 'Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (May 2019)' sets out growth rates for forecasting future year traffic for use in scheme modelling and appraisal. It is noted that in respect of Swords Road, which is in the 'Dublin Metropolitan Area', the growth during the period 2016 – 2030 is set at 1.62% per annum for Low Growth, reducing to 0.51% per annum from 2030 – 2040 (LV rates used). These traffic growth values do not consider the potential short, medium and long term impact of the Covid-19 pandemic on traffic patterns.

This chapter assesses the anticipated opening year of the development (2023) and the two horizon year assessments (2028 and 2038), as per the TII Traffic Assessment Guidelines. The assessment years used for this assessment are as follows:

- 2019 to 2023 – 1.0664 (or 6.64%);
- 2019 to 2028 – 1.1556 (or 15.56%); and
- 2019 to 2038 – 1.2296 (or 22.96%).

7.4 Trip Distribution

To understand the potential distribution of the trips arriving and departing the site, the base traffic survey results have been interrogated. The base traffic surveys indicate the direction that motorists currently travel to / from when arriving onto the immediate road network adjacent to the site during the typical peak periods. Figure 7.3 illustrates the proposed trip distribution patterns during the morning and evening peak hours, respectively. For traffic travelling to / from the subject development it has been assumed that they will arrive and depart the site in the same manner to how the existing travel arrives / departs the site.

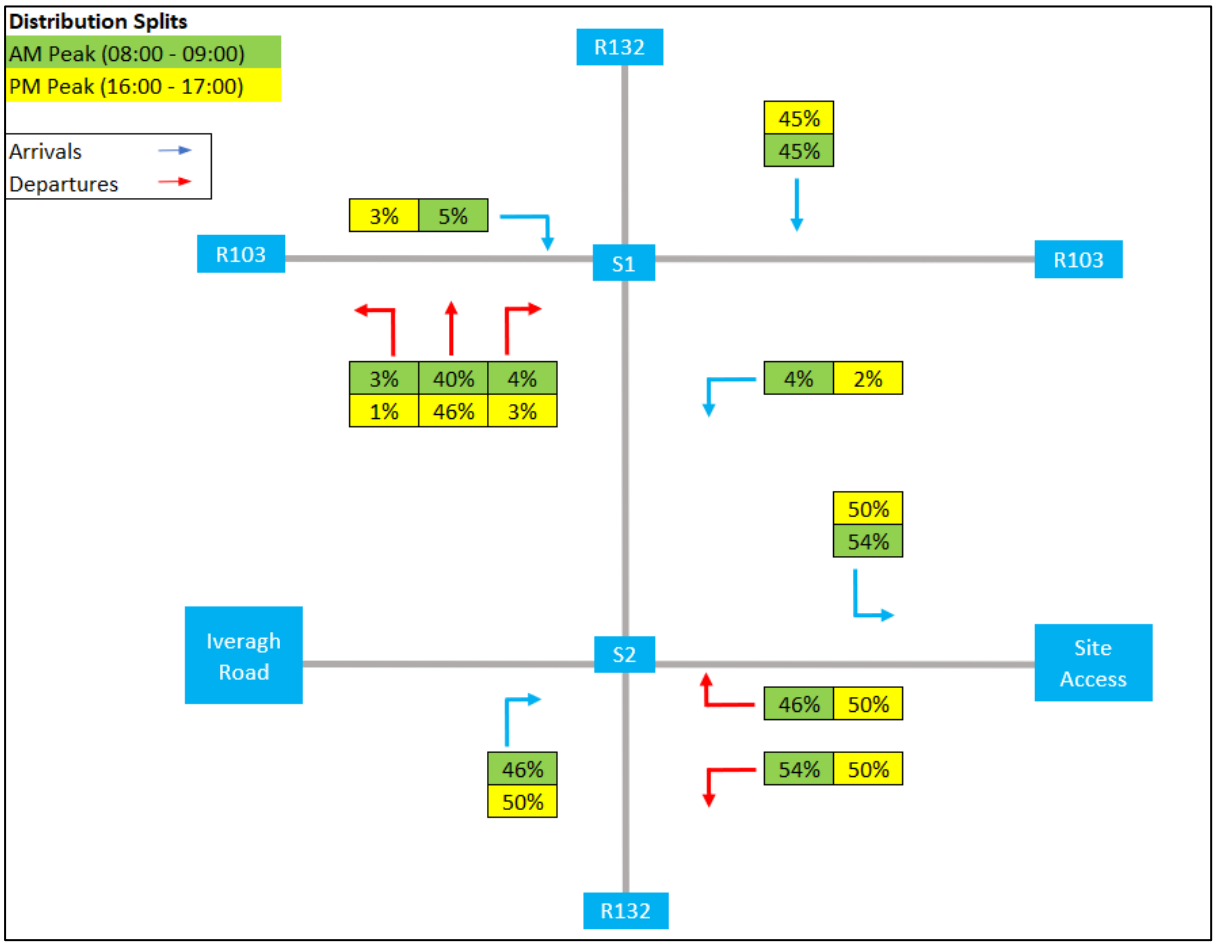


Figure 7.3 – Proposed Trip Distribution from Subject Site

7.5 Vehicular Trip Generation

To understand the potential vehicular trip generation associated with the site, AECOM has undertaken a review of the existing and committed traffic upon the adjoining road network, outlined in the subsequent sections.

7.5.1 Permitted Trip Generation

A TTA was prepared by DBFL in July 2010 to accompany the permitted planning application on the proposed site (DCC Ref: 3269/10). The approved scheme comprises of 358 no. residential units, creche and 3 no. retail units. The approved car parking proposed at basement level and surface level, totalled 495 no. car parking spaces.

The TTA outlined the quantum of vehicle trips likely to be generated by a development of the scale and type proposed. A dynamic trip factor was established from surveying traffic flows of existing residential units along highly serviced Quality Bus Corridors in Dublin. The trip generation for the morning and evening peak hours which were used by DBFL can be found in Table 7.1 below.

Table 7.1 – Permitted Trip Rates

Development	Quantum	AM Peak Hour		PM Peak Hour	
		Arrivals	Departures	Arrivals	Departures
Dynamic Trip Rate Factor	Per Unit	0.14	0.33	0.33	0.14
Approved Development	358 no. units	**51**	**119**	**118**	**51**

Table 7.1 demonstrates that the anticipated trip generations associated with the development is 170 and 169 two-way vehicular trips respectively during the morning and evening peak hour periods.

7.5.2 Proposed Trip Generation

The latest version of the Trip Rate Information Computer System (TRICS) has been interrogated to calculate the quantum of vehicle trips likely to be generated by a development of the scale and type proposed. Trip generation

data was calculated for the morning and evening peak hours (08:00 – 09:00 and 16:00 – 17:00 respectively), so as to determine the maximum impact of the proposed development on the surrounding road network.

The TRICS outputs are shown in Appendix C, whilst the proposed trip rates for the morning and evening peaks can be found in Table 7.2.

Table 7.2 – Proposed Trip Rates

Land Use	AM (08:00 – 09:00)		PM (16:00 – 17:00)	
	Arrivals	Departures	Arrivals	Departures
Flats (Private)	0.053	0.189	0.118	0.077
Café	0	0	1.265	0.897
Nursery/ creche	3.531	2.627	1.488	1.664

When the above trip rates are used in conjunction with the schedule of accommodation of the proposed development, the resulting trip generations are shown in Table 7.3.

Table 7.3 – Proposed Trip Generation

Land Use	Quantum	AM (08:00 – 09:00)		PM (16:00 – 17:00)	
		Arrivals	Departures	Arrivals	Departures
Flats (Private)	472 Units	25	89	56	36
Café	99.0 sqm	0	0	1	1
Nursery/creche	445.8 sqm	16	12	7	8
Total One-Way Traffic		41	101	64	45
Total Two-Way Traffic		**142**		**109**	

Table 7.3 outlines that the estimated total movements by the proposed development during the morning and evening peak hours is **142** and **109** two-way vehicular flows, respectively.

It is AECOM's opinion that the proposed updated trip rates indicated above are appropriate when considering a realistic quantum of trips for the proposed development, given the following reasons:

- The proposed trip rate calculation has been derived using the latest version of TRICS, and hence contains more up to date and relevant arrivals and departures figures;
- The proposed trip rates are akin to recently permitted residential schemes of similar scale in the vicinity of the subject site;
- The trips associated with the proposed development include rates associated with the creche and retail. These trip rates were omitted from the approved planning application because realistically, traffic associated with the creche / retail units will predominately be generated by the perspective residents of the development. The proposed trip rates are therefore more robust;
- The approved scheme comprised of a car parking quantum of approx. 1.4 spaces per unit, whilst the subject application comprises 0.65 spaces per unit. The reduced quantum of car parking spaces provided per residential unit will ultimately result in a lower level of arrivals and departures to / from the site;
- The proposed development is situated within an ideal location to benefit from existing sustainable travel facilities. High frequency bus services are available directly off Swords Road and Collins Avenue, which connect the site to numerous local destinations including Dublin City Centre; and
- The Metrolinks project was detailed in 2019 which when constructed will provide a dedicated Metro service connecting a number of locations across Co. Dublin. The Collins Avenue stop is located approximately 1.7km north west of the proposed development site. This will further enhance the accessibility of the site for sustainable travel, thus reducing the potential vehicular trip rate.

7.6 Percentage Impact Assessment

7.6.1 Transport Infrastructure Ireland Guidelines

The TII Guidelines for Transport Assessments state that the thresholds for junction analysis in Transport Assessments are as follows:

- *'Traffic to and from the development exceeds 10% of the existing two-way traffic flow on the adjoining highway.'*

- *'Traffic to and from the development exceeds 5% of the existing two-way flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations.'*

In accordance with the above guidelines, an assessment has been undertaken of the net development impact upon the surrounding road network, which is discussed in further detail in the subsequent sections.

7.6.2 Impact Assessment Methodology

A comparison was made between the existing baseline traffic flows and the overall development flows, to identify the percentage impact of the development. The projected percentage impact of operational traffic on the surrounding road junctions in the year of opening (2023) is set out in Table 7.4.

It should be noted that the opening year of the development has been assessed only. Any future year base flows would be greater than the flows presented in Table 7.4, hence a smaller percentage impact in comparison to the development flows would be recorded.

Table 7.4 – Percentage Impact Assessment

Junction		Opening Year – 2023	
		AM Peak	PM Peak
Site 1 - Swords Road / Collins Avenue West	Base Flows at Junction	4111	4252
	Development	68	54
	% Impact	1.7%	1.3%
Site 2 - Swords Road / Iveragh Road / Site Access	Base Flows at Junction	2368	2332
	Development	142	109
	% Impact	5.9%	4.6%

The percentage impact of the proposed development at Site 1 is within the 5% threshold and therefore analysis has not been undertaken on this signal-controlled junction.

The percentage impact of the proposed development at Site 2 marginally exceeds 5% during the morning peak hour by 0.9%. In the evening peak the impact is less than 5%. As a new junction type is proposed at this Site further junction modelling analysis is required to be undertaken as per TII Guidelines for Transport Assessments and to confirm the suitability of the access arrangement at Site 2. An assessment has therefore been undertaken utilising the TII approved modelling package, LinSig, on this signal-controlled junction, the results of which are provided in the following chapter.

8. Junction Modelling Analysis

8.1 Introduction

Figure 8.1 shows the subject junction that has been analysed as part of this assessment.

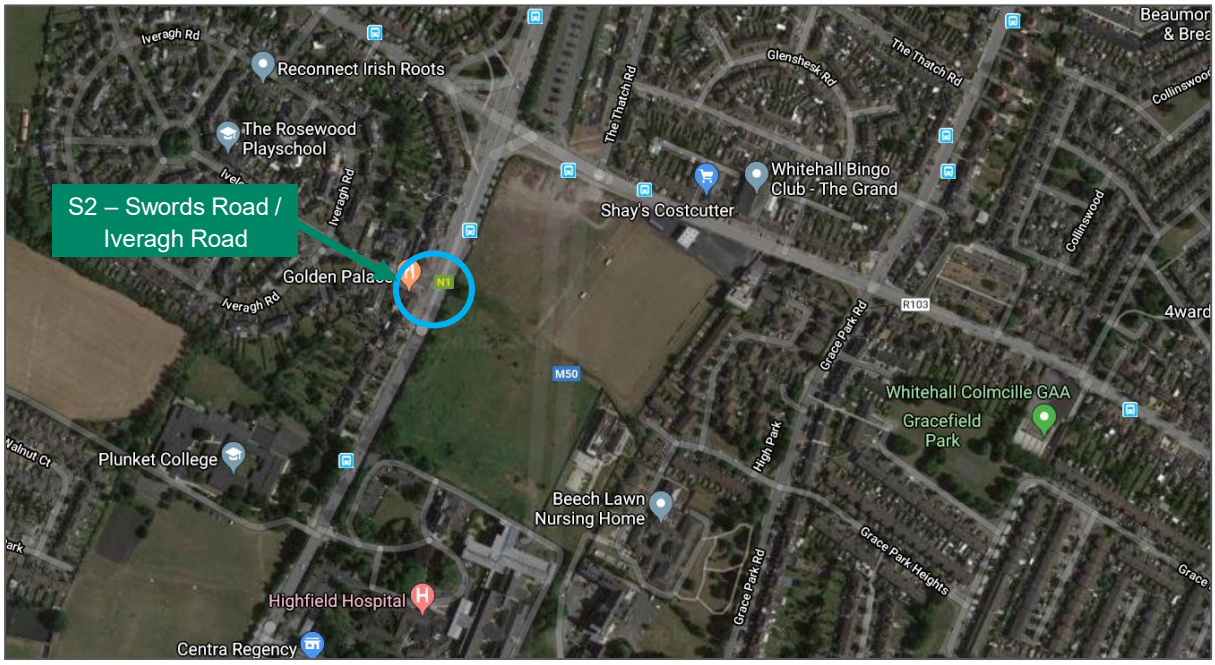


Figure 8.1 – Junction Analysed

8.2 Junction Analysis

The operational assessment of the local road network has been undertaken using LinSig for signal controlled junctions. When considering signal controlled junctions, a Degree of Saturation (DoS) of 90% (0.90) would indicate a junction to be approaching capacity

8.2.1 Junction 1 – Signal Controlled 4-Arm Site Access

LinSig is an industry standard software used to model the capacity and queuing of signalised junctions. The meaning of the acronyms used within the capacity assessment results are discussed below.

- DoS DoS (for signal controlled junctions)
- Q Queue length (PCU's)
- PRC Practical Reserve Capacity (for signal controlled junctions)

It is generally accepted that DoS values of 90% and less are indicators that a junction is operating within capacity. Although a junction would be said to be operating at capacity at values of 100%, the use of 90% allows for a margin of error and fluctuations in traffic flows. Junctions are therefore only identified as operating over capacity if these values are exceeded.

PRC is a term used to denote the maximum desirable flow through a signalised junction and 0% PRC is reached when one or more of the approaches to the junction are operating at 90% of their capacity. Therefore it should be recognised that the actual maximum limit for a signalised junction is -10% PRC and a junction would therefore be considered to be operating within its maximum capacity with a PRC value of -9.99%.

With regard to the above, it is noted that DMURS acknowledges that the above thresholds cannot always be achieved in urban areas and that "In areas …such as in Neighbourhoods and Centres…junctions may have to operate at saturation levels for short periods…"

The Swords Road southbound and the Iveragh Road lanes both experience high levels of demand at peak times. This junction at present is not fully signalised as described in section 2 of this report. The current junction operates akin to a priority controlled junction with a signalised pedestrian crossing being provided on the northern arm which

is operated by push button unit. As illustrated in Figure 7.2, there is currently over 2,000 vehicles travelling northbound and southbound along the Swords Road during the peak periods.

Analysis was completed for Opening Year of 2023, Opening Year +5 of 2028 and Opening Year + 15 of 2038. The results are synopsised in Table 8.1, Table 8.2 and Table 8.3, respectively. Full results are contained within Appendix D.

Table 8.1 – 2023 With Development LinSig Analysis

Arm	2023 AM With Dev	
	DoS %	MMQ
Swords Road Southbound Left Ahead Right	96.6%	59.0
Site Access Left Ahead Right	80.9%	5.7
Swords Road Northbound Right Left Ahead	83.2%	32.5
Iveragh Road Ahead Right Left	96.1%	8.4
Arm	**2023 PM With Dev**	
R132 Swords Road North Left Ahead Right	91.6%	47.3
Site Access Right Left Ahead	35.1%	1.7
R132 Swords Road South Ahead Right Left	87.9%	39.4
Iveragh Road Left Ahead Right	70.9%	3.7

Table 8.2 – 2028 With Development LinSig Analysis

Arm	2028 AM With Dev	
	DoS %	MMQ
Swords Road Southbound Left Ahead Right	104.5%	114.8
Site Access Left Ahead Right	80.9%	6.5
Swords Road Northbound Right Left Ahead	90.1%	42.1
Iveragh Road Ahead Right Left	104.1%	12.7
Arm	**2028 PM With Dev**	
R132 Swords Road North Left Ahead Right	99.1%	69.8
Site Access Right Left Ahead	35.1%	2
R132 Swords Road South Ahead Right Left	95.1%	53.7
Iveragh Road Left Ahead Right	77.3%	4.9

Table 8.3 – 2038 With Development LinSig Analysis

Arm	2038 AM With Dev	
	DoS %	MMQ
Swords Road Southbound Left Ahead Right	111.1%	163.4
Site Access Left Ahead Right	80.9%	5.9
Swords Road Northbound Right Left Ahead	95.8%	55.1
Iveragh Road Ahead Right Left	111.0%	16.3
Arm	**2038 PM With Dev**	
R132 Swords Road North Left Ahead Right	100.7%	94.6
Site Access Right Left Ahead	39.7%	2.4
R132 Swords Road South Ahead Right Left	97.1%	68.3
Iveragh Road Left Ahead Right	92.5%	7.5

The LinSig analysis indicates that the proposed signalised junction will operate within capacity for the opening year (2023) and is at capacity during the Opening Year + 5 (2028) morning Peak and Opening Year + 15 (2038) with the

development in place. The development generates a low level impact on the road network in comparison to the baseline traffic along Swords Road. The introduction of a signalised junction at this location will formalise the road network and provide a net benefit to pedestrians, cyclists and motorists by providing dedicated crossing facilitates on all arms of the Swords Road / Iveragh Road / Site Access junction ensuring that permeability is provided while also ensuring that the scheme does not comprise the BusConnects proposals at this location.

It is acknowledged that this junction will experience queuing and delays at peak times but this is due to the large volumes of traffic already travelling along the Swords Road during the morning and evening peak periods.

9. Site Servicing and Operational Plan

9.1 Objective

The main objective of this chapter is to present an outline servicing strategy and operation plan, including waste and delivery management, for the proposed development. In order to prepare this chapter, AECOM has made reference to the following documents:

- Dublin City Council Development Plan 2016 – 2022;
- Eastern Midlands Region Waste Management Plan 2015 – 2021; and
- Design Recommendations for Multi-storey and underground car parks (4th Edition) March 2011.

9.2 Site Servicing

Waste will be generated by the occupants of the 472 apartments, creche and by the management staff. The types of bins which will be provided within the development are 1100 litre bins. An example of these bins is shown in Figure 9.1.

Figure 9.1 – Example of 1100 litre bin provided within the basement for residential units

The majority of the bin storage area is proposed to be located within the basement car parking area, which is accessed via a vehicular ramp. The internal basement car park has not been designed to cater for a refuse lorry to access the basement. Consequently the bins will be transported by manual or other means to the surface level. For example there are electric bin movers that provide bin towing solutions and it is anticipated that this work will be undertaken by the management company of the residential complex.

There is further coverage on these matters in the separate AWN document entitled Operational Waste Management Plan.

At surface level, a designated area for a refuse lorry is illustrated on the architects layouts. It is proposed that the bin lorry will be able to turn at the hammerhead located at the southern boundary of the site, as illustrated on AECOM drawing PR379360-ACM-XX-XX-DR-CE-10-0102 (Viewport E).

Figure 9.2 – Example of Electric Bin Mover

9.3 Operational Plan

9.3.1 Vehicular Access

The main vehicular access point into the development is via the Swords Road / Iveragh Road / Site Access signalised junction. The proposed site access has been designed to facilitate the access of service and delivery vehicles. The site access point will feature buff coloured tactile paving and push button units to facilitate safe crossings for pedestrians travelling north or south along Swords Road.

There is a secondary access onto the Swords Road, situated 150m south (approximately) from the main access but this is for use in emergency only, as shown in AECOM Drawing PR379360-ACM-XX-XX-DR-CE-10-0103.

9.3.2 Pedestrian / Cyclist Access

There are a number of access points along the western boundary of the site onto the Swords Road which facilitate safe access and permeability to / from the site with Figure 9.3 indicating the location of these access points. Once residents enter the site there are paved footways which will allow residents to easily access their apartment block, please refer to the architects site layouts.

In addition to above section there a stand alone Site Servicing Plan which supplements this section and has been requested by DCC as part of the consultation response.

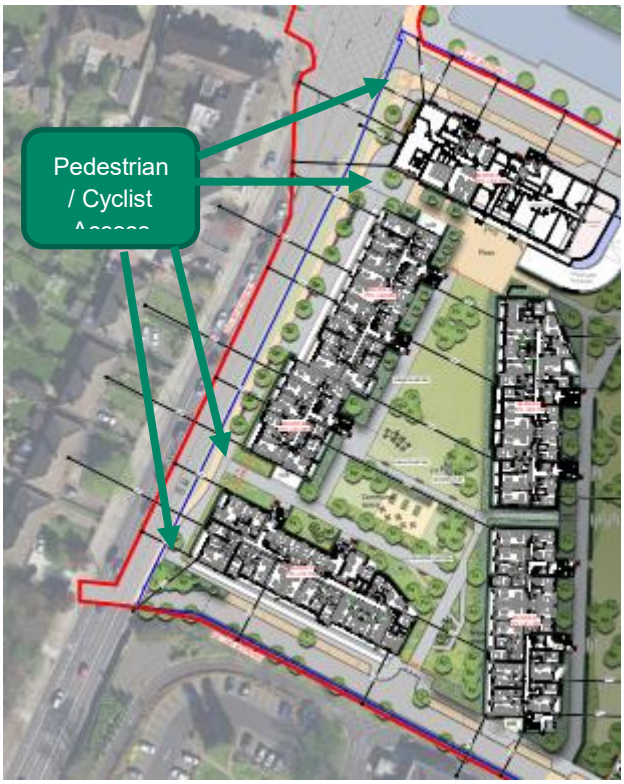


Figure 9.3 – Pedestrian / Cyclist Access Points (Courtesy: C+W O'Brien Architects)

9.3.3 Creche

The 4 No visitor spaces beside the creche could be used to allow parents to drop-off / pick-up their children, although most drop offs are likely be internal for the site so walking would be the most likely option

10. Outline Construction Traffic Management Plan

10.1 General

This Outline CTMP deals directly with the impacts of construction of the subject development. As with any construction project, the appointed contractor will be required to prepare a comprehensive CTMP for the construction phase. The purpose of such a plan is to outline measures to manage the expected construction traffic activity during the construction period. A standalone CTMP report will accompany this application separately and encompasses the construction traffic management plan in further detail

This Outline CTMP will provide an overview of the likely routing of construction vehicles, based on a most likely scenario of construction. It should be noted that the impacts of the construction will be temporary and it will be the appointed contractor's responsibility to prepare a CTMP for the approval of DCC and key other stakeholders such as bus operators in advance of any works.

10.2 Policy Guidance

Guidance for the temporary control of traffic at road works to facilitate the safety of the public during the works is provided below:

- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign for Roadworks (2019);
- Traffic Management Guidelines, Department of Transport (2003); and
- Requirements of DCC and other stakeholders.

10.3 Likely Construction Programme & Phasing

The construction programme is expected to require 36 months to complete. The anticipated construction may commence in 2022 subject to planning approval.

10.4 Construction Route

To minimise construction impacts upon the surrounding road network, it is recommended that all construction traffic access and exits the site from the M50 Junction 2 joining Swords Road at the Santry Roundabout. From exiting the M50, this route is approximately 1.9km to / from the site. This routing has been illustrated in Figure 10.1 below.

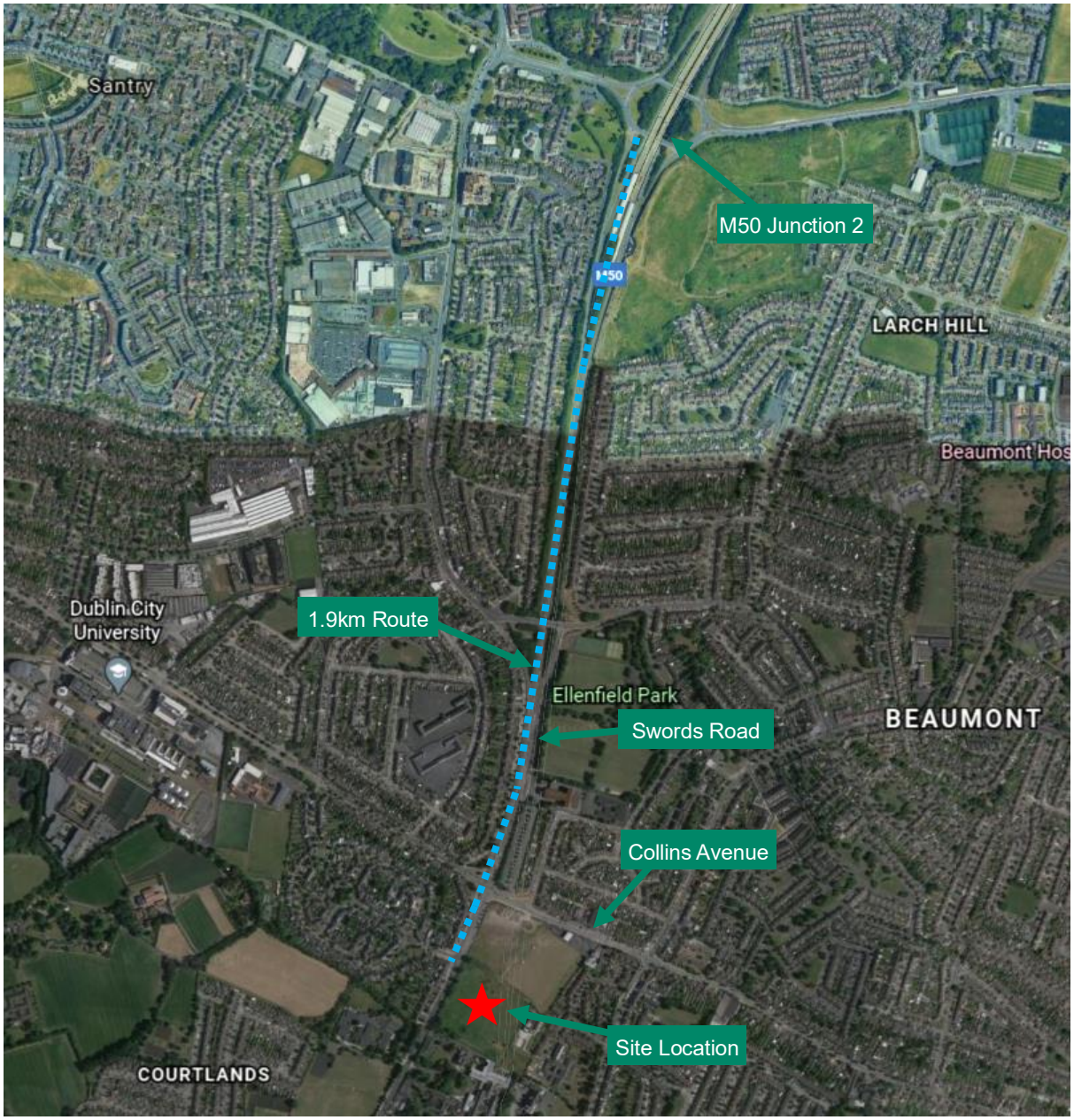


Figure 10.1 Proposed Construction Route (Source: Google Earth)

10.5 Parking

All contractor vehicles will park within the development site area, it is recommended that as part of the construction management plan the contactor designates an area within the confines of the site dedicated to operative car parking. There will be no parking permitted on the surrounding road network or estate roads by the contractor or site operatives.

10.6 Mitigation Measures

A CTMP will be developed by the contractor prior to the commencement of work on site and will be prepared in consultation with DCC.

Construction debris particularly site clearance, spoil removal and dirty water run off can have a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will require to be fully addressed in the contractors CTMP.

10.7 Hours of Operation

Site development and building works shall be carried out between the hours of operation recommended by DCC to safeguard the residential amenities of properties in the vicinity. The typical hours of operation are as follows:

- Monday to Friday, 8am – 7pm, Saturdays 8am – 2pm and no works on Sundays or Public holidays.

10.8 Traffic Management Measures

Below is a list of the proposed traffic management measures to be adopted during the construction works. Please note that this is not an exhaustive list, and that it will be the appointed contractor's responsibility to prepare a detailed CTMP.

- Warning signs / Advanced warning signs will be installed at appropriate locations in advance of the construction access locations;
- Construction and delivery vehicles will be instructed to use only the approved and agreed means of access; and movement of construction vehicles will be restricted to these designated routes;
- Consideration will be given to reduce the volume of construction traffic accessing the site through reduce – reuse and recycle methods. Delivery control will also be adopted to reduce potential heavy vehicle convoys.
- Appropriate vehicles will be used to minimise environmental impacts from transporting construction material, for example the use of dust covers on trucks carrying dust producing material;
- Speed limits of construction vehicles to be managed by appropriate signage, to promote low vehicular speeds within the site;
- Parking of site vehicles will be managed and will not be permitted on the public road, unless proposed within a designated area that is subject to traffic management measures and agreed with DCC;
- A road sweeper will be employed to clean the public roads adjacent to the site of any residual debris that may be deposited on the public roads leading away from the construction works;
- On site wheel washing will be undertaken for construction trucks and vehicles to remove any debris prior to leaving the site, to remove any potential debris on the local roads;
- All vehicles will be suitably serviced and maintained to avoid any leaks or spillage of oil, petrol or diesel. Spill kits will be available on site. All scheduled maintenance carried out off-site will not be carried out on the public highway; and
- Safe and secure pedestrian facilities are to be provided where construction works obscure any existing pedestrian footways. Alternative pedestrian facilities will be provided in these instances, supported by physical barriers to segregate traffic and pedestrian movements, and to be identified by appropriate signage. Pedestrian facilities will cater for vulnerable users including mobility impaired persons.

The mitigation measures will therefore ensure that the presence of construction traffic will not lead to any significant environmental degradation or safety concerns in the vicinity of the proposed works. Furthermore, it is in the interests of the construction programme that deliveries, particularly concrete deliveries are not unduly hampered by traffic congestion, and as a result continuous review of haulage routes, delivery timings and access arrangements will be undertaken as construction progresses to ensure smooth operation.

11. Conclusion

11.1 Overview

AECOM has been commissioned by Eastwise Construction Swords Limited to prepare a Traffic and Transport Assessment (TTA) in support of a planning application to An Bord Pleanála (ABP) for a proposed Strategic Housing Development (SHD) at a greenfield site located along the Swords Road in Whitehall, Dublin 9.

The proposed development comprises 472 no. residential apartments, 337 no. car parking spaces and 968 cycle parking spaces, 14 cargo bike spaces and 14 no. motorcycle spaces. The scheme comprises 32 no studio, 198 no. one bedroom, 233 two bedroom and 9 no. three-bedroom apartments. It is also proposed to provide a creche (445.8 sqm) and café (99.0 sqm).

The permitted scheme on the site consists of 358 no. residential apartments, 495 no. car parking spaces and 398 cycle parking spaces with a creche (465 sq.m) and retail unit (344.0 sq.m) which included converting the Swords Road / Iveragh Road / Site Access junction into a fully signalised junction. An amendment application was granted permission by Dublin City Council (DCC) which increased the number of units in Block F from 60 to 76 units which resulted in an overall increase from 358 to 374 no. units.

The purpose of this TTA is to demonstrate how the proposed development will integrate with the existing transport network and to set out the impacts of the scheme and measures to manage any impacts. A standalone Mobility Management Plan (MMP) has been prepared by AECOM to support the proposed development and a Stage 1 Road Safety Audit (RSA) has also been undertaken.

11.2 Conclusion

Based upon the information and analysis presented within this TTA the following subsections demonstrate how the scheme has been designed from a traffic and transport perspective to integrate within the existing network and to minimise potential impacts.

11.2.1 Vehicular Access

It is proposed that the vehicular access into the site will be via a 4-arm signalised junction on the western side of the site, via the Swords Road / Iveragh Road junction. AECOM drawing no. PR379360-ACM-XX-XX-DR-CE-10-0001 illustrates the proposed access arrangements. This access arrangement is different to the permitted scheme but AECOM have prepared a drawing showing that the scheme can accommodate the BusConnects proposal when the Swords to City Centre (Route 2) infrastructure is in place (to be delivered by others).

A secondary vehicular access will also be available for emergency vehicles at the south-western corner of the site. Provision has also been included within the design for future connectivity to the lands to the north and east.

11.2.2 Accessibility

The site benefits from being accessible for walking, cycling and public transport. Excellent pedestrian infrastructure facilities and street lighting connect the site to an array of existing services and amenities in Whitehall including shops, restaurants and schools.

11.2.3 Car Parking

It is proposed to provide a total of 337 no. car parking spaces to serve the proposed development. Of this total provision, 277 parking spaces are proposed within the basement and 60 no. spaces are proposed at surface level, with 249 no. car parking spaces at basement to serve residents and 37 no. car parking spaces at surface for residential use. As part of this car parking provision the following are to be provided; 22 No. mobility impaired spaces across the site, 5 no. spaces within the basement for creche staff with Electric Vehicle (EV) spaces in basement and 19 visitor spaces.

11.2.4 Cycle Parking

It is proposed to provide a total of 982 cycle parking spaces to serve the respective development. In total 236 cycle spaces will be provided for visitors and 732 secure cycle parking spaces for residents, with 14 spaces available within the basement for cargo bikes.

11.2.5 Parking Management

A parking management plan has been prepared to demonstrate how the car parking will be assigned for perspective residents of the development along with a justification for the reduced car parking ratio for the development. This section also details the bicycle parking management measures for the proposed development.

11.2.6 Servicing

Refuse vehicles will be required to access the proposed land uses. A swept path assessment demonstrates that a refuse vehicle will be able to safely manoeuvre within the internal site road network and via the reconfigured site access junction. AECOM have prepared a site servicing and operational plan from a traffic perspective.

11.2.7 Trip Generation

The overall development will generate 142 and 109 two-way vehicle movements during the weekday morning and evening peak hours respectively. These figures were obtained using the Trip Rate Information Computer System (TRICS).

The percentage impact of additional traffic generated by the proposed development on the Swords Road / Collins Avenue West signalized junction is less than 3% during the morning and evening peak hours. This is less than the TII percentage impact standards to warrant detailed assessment (over 5%, where traffic congestion exists).

The percentage impact of additional traffic on the proposed Site Access / Swords Road / Iveragh Road signalised junction is 5.9% during the morning peak hour and 4.6% during the evening peak hour. AECOM has undertaken a detailed junction modelling analysis of the proposed site access using LinSig. The assumed Opening Year (2023) and Future Year scenarios (2028 and 2038) were calculated using Central Growth Rates from TII's Travel Demand Projections (Unit 5.3) to take into account the level of committed developments in the immediate vicinity of the development. The development generates a low level impact on the road network in comparison to the baseline traffic along Swords Road. The introduction of a signalised junction at this location will formalise the road network and provide a net benefit to pedestrians, cyclists and motorists by providing dedicated crossing facilitates on all arms of the Swords Road / Iveragh Road / Site Access junction ensuring that permeability is provided while also ensuring that the scheme does not comprise the BusConnects proposals at this location.

11.2.8 Outline Construction Traffic Management Plan

An Outline Construction Management Plan has been submitted within this TTA in order to provide a range of key measures to be undertaken by the appointed contractor in order to manage the expected construction traffic activity during the construction period. This Plan addresses such items as construction vehicle parking, mitigation measures and hours of operation in order to mitigate degradation to the surrounding environment and disruption to the surrounding road network, local residents of the existing developments in the local area.

It should be noted that the impacts of the construction will be the contractor's responsibility and they will be required to prepare a Traffic Management Plan for the approval of DCC in advance of any works.

11.3 Overall Conclusions

The TTA has considered the transport implications of the proposed development. It demonstrates that the location of the development benefits from existing public transport infrastructure within the vicinity of the site.

The proposed roads layout and access arrangements have been designed and outlined within this report to comply with DMURS, TII and DCC requirements.

The proposed parking provision has been reviewed and has taken cognisance of the Sustainable Urban Housing Design of New Apartments Guidelines (December 2020).

Based upon the information and analysis presented within this TTA, the assessment demonstrates how the scheme has been designed from a traffic and transportation perspective, to integrate within the existing and proposed transport network and to minimise any potential traffic impacts.

Appendix A - Go Car Letter of Intent

Eastwise Construction Limited
Station Mews
Lindsay Grove
Glasnevin
D09 W8W8
09/02/2022

To Whom It May Concern,

This is a letter to confirm that GoCar intends to provide a service of 5 (no) shared GoCar vehicles for the proposed Hartfield Place strategic housing development at Swords Road, Whitehall, Dublin 9. GoCar representatives have discussed the project with representatives of Aecom, who are the engineering company for this development, and are excited to provide a car sharing service at this location.

It is understood that the vehicles at this development will be positioned in a resident's car park to allow for ease of access for all residents. While it is the intention for most of these vehicles to be used exclusively by the residents of the development, GoCar may agree with the eventual managers of the site to allow some vehicles to be open for access to other GoCar members nearby. This will depend on usership levels and will be reviewed at various periods to ensure adequate supply for the residents of the development.

GoCar is Ireland's leading car sharing service with over 60,000 members and over 800 cars and vans on fleet. 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."

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 sharing vehicles in a development such as this, the residents therein 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.

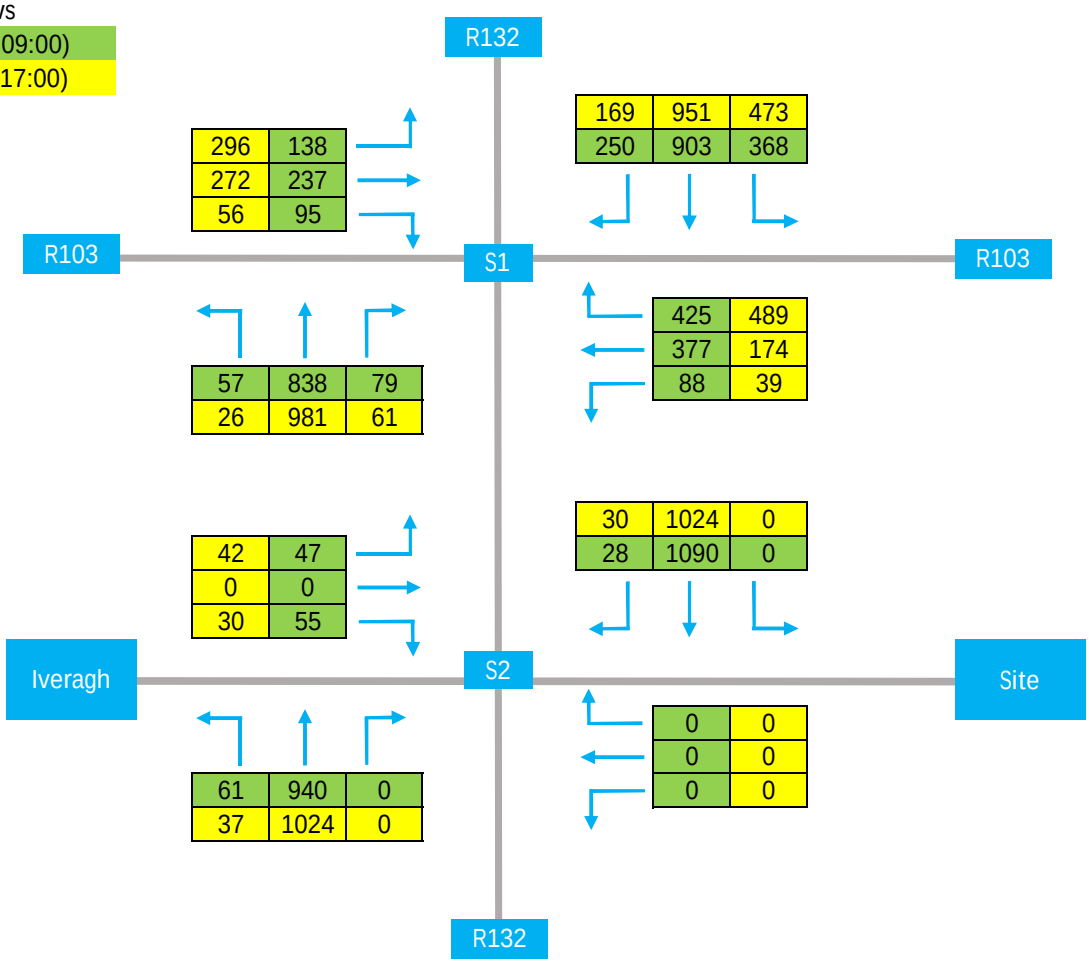
Rob Montgomery
Revenue and Growth Manager
GoCar Carsharing Ltd
Mobile: 086 609 7096
E: robert.montgomery@gocar.ie

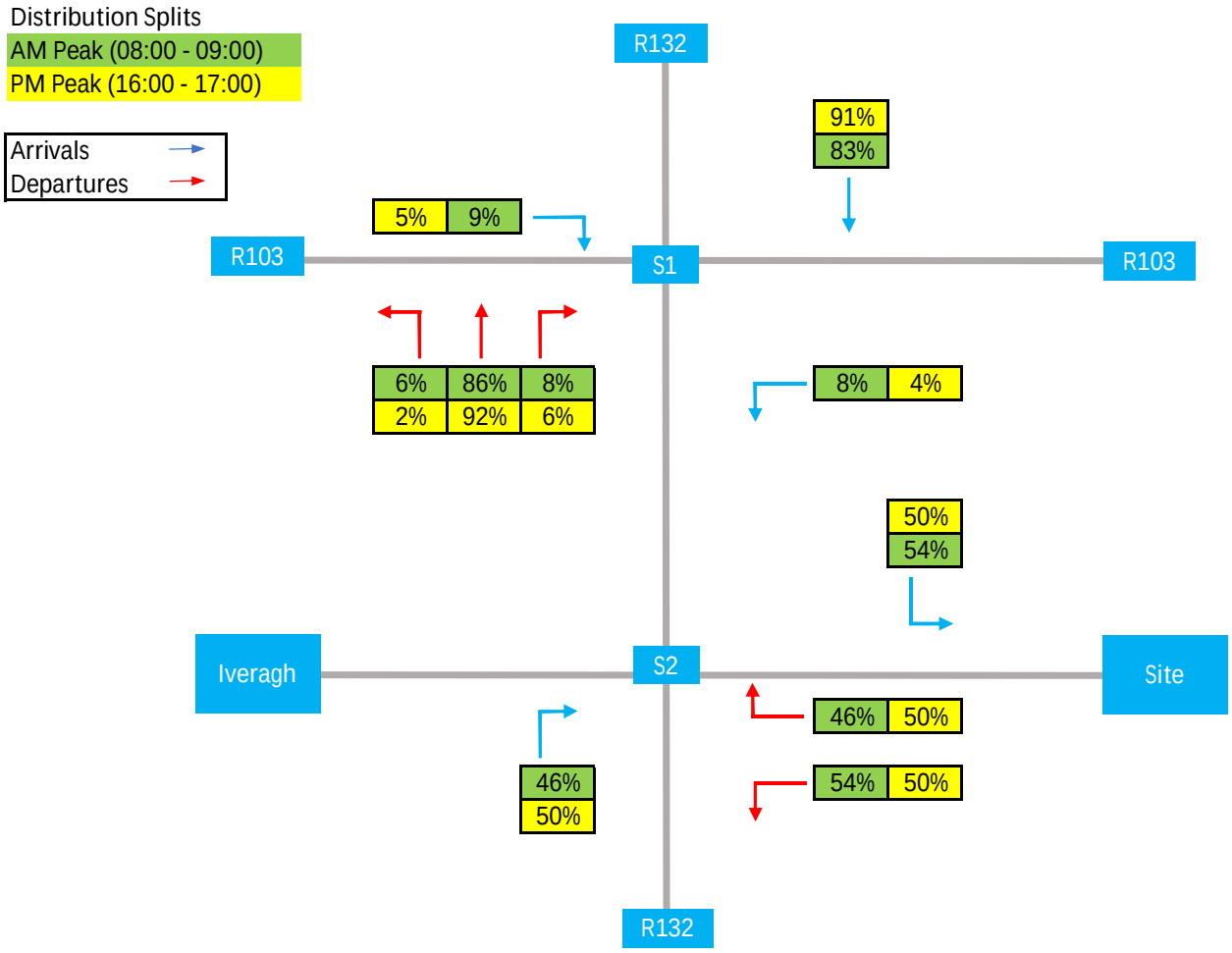
Appendix B – Network Flow Diagrams

2019 Traffic Flows

AM Peak (08:00 - 09:00)

PM Peak (16:00 - 17:00)




Distribution Splits
AM Peak (08:00 - 09:00)
PM Peak (16:00 - 17:00)
Arrivals
Departures
R132
91%
83%
5%
9%
R103
S1
R103
6%
86%
8%
2%
92%
6%
8%
4%
50%
54%
Iveragh
S2
Site
46%
50%
46%
50%
54%
50%
R132

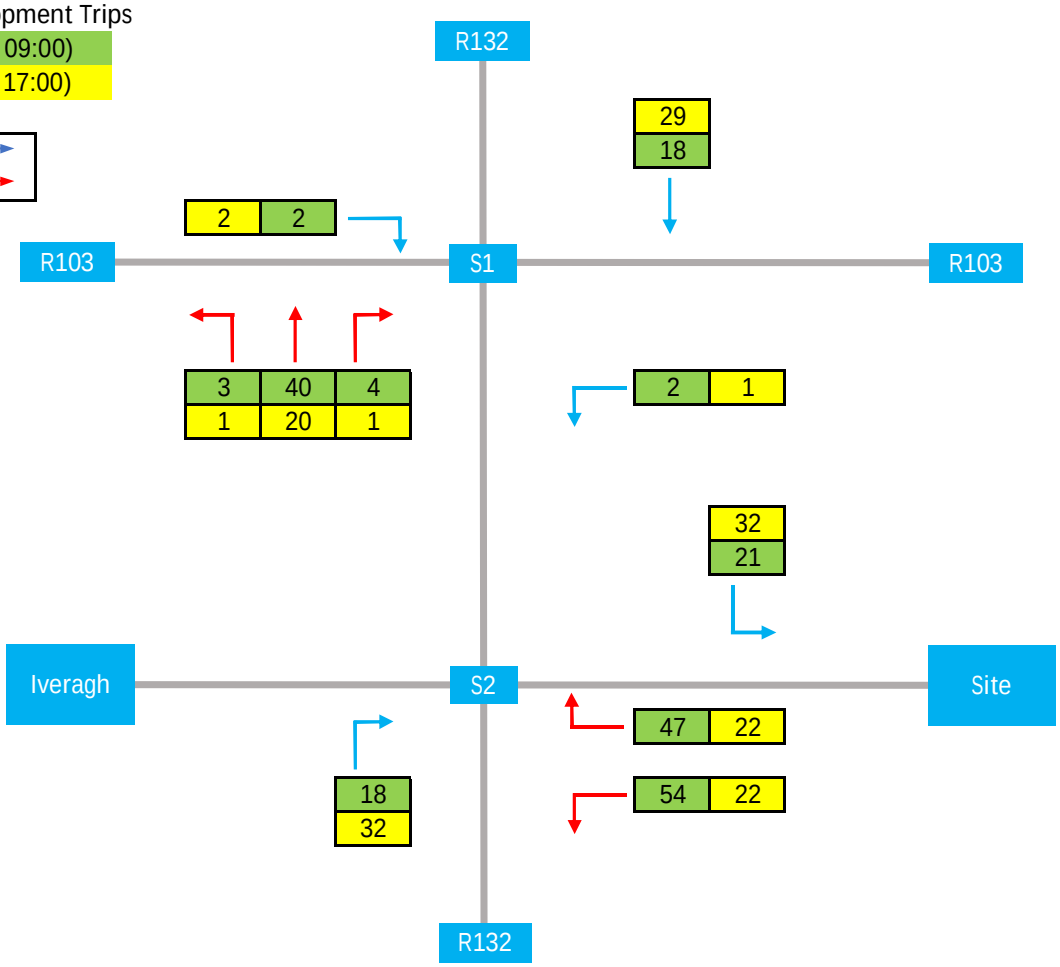
Proposed Development Trips

AM Peak (08:00 - 09:00)

PM Peak (16:00 - 17:00)

Arrivals

Departures



Appendix C TRICS

Calculation Reference: AUDIT-204602-200807-0815

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	BD	BEDFORDSHIRE	3 days
	ES	EAST SUSSEX	1 days
	EX	ESSEX	2 days
	HC	HAMPSHIRE	1 days
	HF	HERTFORDSHIRE	1 days
03	SOUTH WEST		
	DC	DORSET	1 days
	DV	DEVON	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	NT	NOTTINGHAMSHIRE	2 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	RI	EAST RIDING OF YORKSHIRE	1 days
08	NORTH WEST		
	MS	MERSEYSIDE	2 days
09	NORTH		
	CB	CUMBRIA	2 days
10	WALES		
	CO	CONWY	1 days
11	SCOTLAND		
	EB	CITY OF EDINBURGH	1 days
	SA	SOUTH AYRSHIRE	1 days
	SR	STIRLING	2 days
12	CONNAUGHT		
	GA	GALWAY	1 days
13	MUNSTER		
	WA	WATERFORD	1 days
14	LEINSTER		
	LU	LOUTH	3 days
15	GREATER DUBLIN		
	DL	DUBLIN	4 days
16	ULSTER (REPUBLIC OF IRELAND)		
	MG	MONAGHAN	1 days
17	ULSTER (NORTHERN IRELAND)		
	AN	ANTRIM	1 days

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

Primary Filtering selection:

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

Parameter: No of Dwellings
Actual Range: 6 to 184 (units:)
Range Selected by User: 6 to 372 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 18/11/19

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

Selected survey days:

Monday	7 days
Tuesday	17 days
Wednesday	7 days
Thursday	5 days
Friday	4 days

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

Selected survey types:

Manual count	40 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	19
Suburban Area (PPS6 Out of Centre)	18
Edge of Town	3

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

Selected Location Sub Categories:

Development Zone	2
Residential Zone	25
Built-Up Zone	5
No Sub Category	8

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

Secondary Filtering selection:

Use Class:

C3	40 days

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

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	3 days
5,001 to 10,000	3 days
10,001 to 15,000	8 days
15,001 to 20,000	4 days
20,001 to 25,000	6 days
25,001 to 50,000	15 days
50,001 to 100,000	1 days

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

Population within 5 miles:

5,001 to 25,000	2 days
25,001 to 50,000	4 days
50,001 to 75,000	11 days
75,001 to 100,000	2 days
125,001 to 250,000	7 days
250,001 to 500,000	9 days
500,001 or More	5 days

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

Car ownership within 5 miles:

0.6 to 1.0	14 days
1.1 to 1.5	26 days

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

Travel Plan:

Yes	2 days
No	38 days

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

PTAL Rating:

No PTAL Present	40 days

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

LIST OF SITES relevant to selection parameters

1 AN-03-C-02 BLOCK OF FLATS ANTRIM
SUMMERHILL AVENUE
BELFAST
KNOCK
Edge of Town
Residential Zone
Total No of Dwellings: 22
Survey date: FRIDAY *28/11/14* *Survey Type: MANUAL*

2 BD-03-C-01 BLOCKS OF FLATS BEDFORDSHIRE
WING ROAD
LEIGHTON BUZZARD
LINSLADE
Edge of Town Centre
Residential Zone
Total No of Dwellings: 175
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

3 BD-03-C-02 BLOCKS OF FLATS BEDFORDSHIRE
STANBRIDGE ROAD
LEIGHTON BUZZARD

Edge of Town Centre
Residential Zone
Total No of Dwellings: 62
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

4 BD-03-C-03 BLOCKS OF FLATS BEDFORDSHIRE
COURT DRIVE
DUNSTABLE

Edge of Town Centre
No Sub Category
Total No of Dwellings: 146
Survey date: TUESDAY *15/05/18* *Survey Type: MANUAL*

5 CA-03-C-03 BLOCKS OF FLATS CAMBRIDGESHIRE
CROMWELL ROAD
CAMBRIDGE

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 82
Survey date: MONDAY *18/09/17* *Survey Type: MANUAL*

6 CB-03-C-02 BLOCK OF FLATS CUMBRIA
BRIDGE LANE
PENRITH

Edge of Town
No Sub Category
Total No of Dwellings: 35
Survey date: WEDNESDAY *11/06/14* *Survey Type: MANUAL*

7 CB-03-C-03 FLATS & BUNGALOWS CUMBRIA
LOUND STREET
KENDAL

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 33
Survey date: MONDAY *09/06/14* *Survey Type: MANUAL*

8 CO-03-C-01 BLOCKS OF FLATS CONWY
MOSTYN BROADWAY
LLANDUDNO

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 37
Survey date: MONDAY *26/03/18* *Survey Type: MANUAL*

9 DC-03-C-02 FLATS IN BLOCKS DORSET
PALM COURT
WEYMOUTH
SPA ROAD
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 14
Survey date: FRIDAY *28/03/14* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

10 DL-03-C-12 BLOCK OF FLATS DUBLIN
BOOTERSTOWN AVENUE
DUBLIN

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 47
Survey date: TUESDAY *10/09/13* *Survey Type: MANUAL*

11 DL-03-C-14 BLOCKS OF FLATS DUBLIN
BALLINTEER ROAD
DUBLIN
DUNDRUM
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 140
Survey date: TUESDAY *10/09/13* *Survey Type: MANUAL*

12 DL-03-C-15 BLOCKS OF FLATS DUBLIN
MONKSTOWN ROAD
DUBLIN
MONKSTOWN
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 20
Survey date: WEDNESDAY *01/10/14* *Survey Type: MANUAL*

13 DL-03-C-16 BLOCKS OF FLATS DUBLIN
BOTANIC AVENUE
DUBLIN
DRUMCONDRA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 31
Survey date: TUESDAY *22/11/16* *Survey Type: MANUAL*

14 DS-03-C-03 BLOCKS OF FLATS DERBYSHIRE
CAESAR STREET
DERBY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 30
Survey date: WEDNESDAY *25/09/19* *Survey Type: MANUAL*

15 DV-03-C-01 BLOCK OF FLATS DEVON
BONHAY ROAD
EXETER

Edge of Town Centre
Residential Zone
Total No of Dwellings: 27
Survey date: MONDAY *10/07/17* *Survey Type: MANUAL*

16 EB-03-C-01 BLOCKS OF FLATS CITY OF EDINBURGH
MYRESIDE ROAD
EDINBURGH
CRAIGLOCKHART
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 32
Survey date: TUESDAY *26/05/15* *Survey Type: MANUAL*

17 ES-03-C-01 BLOCK OF FLATS EAST SUSSEX
OLD SHOREHAM RD
BRIGHTON
HOVE
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 71
Survey date: TUESDAY *26/09/17* *Survey Type: MANUAL*

18 EX-03-C-01 FLATS ESSEX
WESTCLIFF PARADE
SOUTHEND-ON-SEA
WESTCLIFF
Edge of Town Centre
Residential Zone
Total No of Dwellings: 6
Survey date: TUESDAY *22/10/13* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

19 EX-03-C-02 BLOCK OF FLATS ESSEX
WESTCLIFF PARADE
SOUTHEND-ON-SEA
WESTCLIFF
Edge of Town Centre
Residential Zone
Total No of Dwellings: 94
Survey date: TUESDAY *22/10/13* *Survey Type: MANUAL*

20 GA-03-C-01 FLATS GALWAY
BALLYLOUGHANE ROAD
GALWAY

Suburban Area (PPS6 Out of Centre)
No Sub Category
Total No of Dwellings: 34
Survey date: THURSDAY *31/10/13* *Survey Type: MANUAL*

21 HC-03-C-01 BLOCKS OF FLATS HAMPSHIRE
CROSS STREET
PORTSMOUTH

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

22 HF-03-C-03 BLOCK OF FLATS HERTFORDSHIRE
SHENLEY ROAD
BOREHAMWOOD

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

23 LU-03-C-01 BLOCKS OF FLATS LOUTH
DONORE ROAD
DROGHEDA

Edge of Town Centre
Residential Zone
Total No of Dwellings: 52
Survey date: THURSDAY *12/09/13* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 33
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 20
Survey date: MONDAY *16/09/13* *Survey Type: MANUAL*

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

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

LIST OF SITES relevant to selection parameters (Cont.)

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

28 MS-03-C-03 BLOCK OF FLATS MERSEYSIDE
MARINERS WHARF
LIVERPOOL
QUEENS DOCK
Suburban Area (PPS6 Out of Centre)
Development Zone
Total No of Dwellings: 9
Survey date: TUESDAY *13/11/18* *Survey Type: MANUAL*

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

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

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

31 NT-03-C-01 HOUSES (SPLIT INTO FLATS) NOTTINGHAMSHIRE
LAWRENCE WAY
NOTTINGHAM

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

32 NT-03-C-02 HOUSES (SPLIT INTO FLATS) NOTTINGHAMSHIRE
CASTLE MARINA ROAD
NOTTINGHAM

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

33 RI-03-C-01 FLATS EAST RIDING OF YORKSHIRE
465 PRIORY ROAD
HULL

Edge of Town
Residential Zone
Total No of Dwellings: 20
Survey date: TUESDAY *13/05/14* *Survey Type: MANUAL*

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

Edge of Town Centre
Residential Zone
Total No of Dwellings: 51
Survey date: TUESDAY *16/09/14* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

35 SF-03-C-01 BLOCKS OF FLATS SUFFOLK
STATION HILL
BURY ST EDMUNDS

Edge of Town Centre
Built-Up Zone
Total No of Dwellings: 85
Survey date: THURSDAY *18/12/14* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 30
Survey date: WEDNESDAY *03/12/14* *Survey Type: MANUAL*

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

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

38 SR-03-C-02 FLATS STIRLING
ROSEBERRY TERRACE
STIRLING

Edge of Town Centre
Residential Zone
Total No of Dwellings: 48
Survey date: WEDNESDAY *18/06/14* *Survey Type: MANUAL*

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

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 51
Survey date: TUESDAY *12/05/15* *Survey Type: MANUAL*

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

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

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	40	60	0.041	40	60	0.147	40	60	0.188
08:00 - 09:00	40	60	0.053	40	60	0.189	40	60	0.242
09:00 - 10:00	40	60	0.071	40	60	0.100	40	60	0.171
10:00 - 11:00	40	60	0.062	40	60	0.080	40	60	0.142
11:00 - 12:00	40	60	0.069	40	60	0.084	40	60	0.153
12:00 - 13:00	40	60	0.095	40	60	0.090	40	60	0.185
13:00 - 14:00	40	60	0.073	40	60	0.086	40	60	0.159
14:00 - 15:00	40	60	0.082	40	60	0.078	40	60	0.160
15:00 - 16:00	40	60	0.102	40	60	0.065	40	60	0.167
16:00 - 17:00	40	60	0.118	40	60	0.077	40	60	0.195
17:00 - 18:00	40	60	0.175	40	60	0.086	40	60	0.261
18:00 - 19:00	40	60	0.167	40	60	0.095	40	60	0.262
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.108			1.177			2.285

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

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

Parameter summary

Trip rate parameter range selected:	6 - 184 (units:)
Survey date date range:	01/01/12 - 18/11/19
Number of weekdays (Monday-Friday):	40
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

Calculation Reference: AUDIT-204602-200807-0819

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 06 - HOTEL, FOOD & DRINK
Category : B - RESTAURANTS
VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	HC	HAMPSHIRE	1 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
06	WEST MIDLANDS		
	ST	STAFFORDSHIRE	1 days
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	1 days
14	LEINSTER		
	LU	LOUTH	1 days
17	ULSTER (NORTHERN IRELAND)		
	AN	ANTRIM	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 259 to 2200 (units: sqm)
Range Selected by User: 75 to 2400 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 25/09/19

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

Selected survey days:

Monday	2 days
Tuesday	2 days
Thursday	2 days
Friday	2 days

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

Selected survey types:

Manual count	8 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	4
Suburban Area (PPS6 Out of Centre)	1
Edge of Town	3

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

Selected Location Sub Categories:

Development Zone	2
Retail Zone	2
Built-Up Zone	3
No Sub Category	1

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

Secondary Filtering selection:

Use Class:

A3	8 days

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

Population within 1 mile:

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

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

Population within 5 miles:

25,001 to 50,000	2 days
75,001 to 100,000	1 days
100,001 to 125,000	1 days
125,001 to 250,000	1 days
250,001 to 500,000	2 days
500,001 or More	1 days

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

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	3 days
1.1 to 1.5	4 days

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

Travel Plan:

No	8 days

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

PTAL Rating:

No PTAL Present	8 days

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

LIST OF SITES relevant to selection parameters

1 AN-06-B-02 FRANKIE & BENNY'S ANTRIM
HILSBOROUGH ROAD
LISBURN

Edge of Town
Retail Zone
Total Gross floor area: 275 sqm
Survey date: FRIDAY *19/06/15* *Survey Type: MANUAL*

2 CH-06-B-01 BBQ RESTAURANT CHESHIRE
SOUTERS LANE
CHESTER

Edge of Town Centre
Built-Up Zone
Total Gross floor area: 500 sqm
Survey date: TUESDAY *11/11/14* *Survey Type: MANUAL*

3 HC-06-B-01 PIZZA HUT HAMPSHIRE
BINNACLE WAY
PORTSMOUTH
COSHAM
Suburban Area (PPS6 Out of Centre)
Development Zone
Total Gross floor area: 325 sqm
Survey date: MONDAY *23/11/15* *Survey Type: MANUAL*

4 LN-06-B-01 PREZZO LINCOLNSHIRE
BRAYFORD WHARF NORTH
LINCOLN
BRAYFORD WHARF
Edge of Town Centre
Development Zone
Total Gross floor area: 1136 sqm
Survey date: TUESDAY *10/10/17* *Survey Type: MANUAL*

5 LU-06-B-02 RESTAURANT LOUTH
DONORE ROAD
DROGHEDA
LAGAVOOREN
Edge of Town
No Sub Category
Total Gross floor area: 2200 sqm
Survey date: FRIDAY *19/06/15* *Survey Type: MANUAL*

6 ST-06-B-01 RESTAURANT STAFFORDSHIRE
STONE ROAD
STOKE-ON-TRENT
TRENTHAM
Edge of Town
Retail Zone
Total Gross floor area: 259 sqm
Survey date: THURSDAY *24/10/13* *Survey Type: MANUAL*

7 WM-06-B-05 AKBARS WEST MIDLANDS
THE BUTTS
COVENTRY

Edge of Town Centre
Built-Up Zone
Total Gross floor area: 600 sqm
Survey date: THURSDAY *17/11/16* *Survey Type: MANUAL*

8 WY-06-B-01 CHINESE RESTAURANT WEST YORKSHIRE
BINGLEY STREET
LEEDS

Edge of Town Centre
Built-Up Zone
Total Gross floor area: 950 sqm
Survey date: MONDAY *19/10/15* *Survey Type: MANUAL*

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

TRIP RATE for Land Use 06 - HOTEL, FOOD & DRINK/B - RESTAURANTS
VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	1	950	0.211	1	950	0.211	1	950	0.422
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00									
08:00 - 09:00									
09:00 - 10:00									
10:00 - 11:00	5	712	0.899	5	712	0.562	5	712	1.461
11:00 - 12:00	7	806	1.329	7	806	0.833	7	806	2.162
12:00 - 13:00	7	806	2.781	7	806	1.240	7	806	4.021
13:00 - 14:00	7	806	2.356	7	806	2.445	7	806	4.801
14:00 - 15:00	7	806	1.346	7	806	2.073	7	806	3.419
15:00 - 16:00	7	806	0.779	7	806	1.240	7	806	2.019
16:00 - 17:00	8	781	1.265	8	781	0.897	8	781	2.162
17:00 - 18:00	8	781	1.938	8	781	0.833	8	781	2.771
18:00 - 19:00	8	781	2.626	8	781	2.194	8	781	4.820
19:00 - 20:00	8	781	2.658	8	781	2.482	8	781	5.140
20:00 - 21:00	8	781	1.425	8	781	2.626	8	781	4.051
21:00 - 22:00	8	781	0.961	8	781	1.537	8	781	2.498
22:00 - 23:00	8	781	0.673	8	781	1.377	8	781	2.050
23:00 - 24:00	8	781	0.288	8	781	0.865	8	781	1.153
Total Rates:			21.535			21.415			42.950

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

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

Parameter summary

Trip rate parameter range selected:	259 - 2200 (units: sqm)
Survey date date range:	01/01/12 - 25/09/19
Number of weekdays (Monday-Friday):	8
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

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

Calculation Reference: AUDIT-204602-200807-0848

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

03	SOUTH WEST		
	WL	WILTSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	LE	LEICESTERSHIRE	1 days
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
	WK	WARWICKSHIRE	1 days
09	NORTH		
	TV	TEES VALLEY	1 days
	TW	TYNE & WEAR	2 days
11	SCOTLAND		
	DU	DUNDEE CITY	1 days
12	CONNAUGHT		
	RO	ROSCOMMON	2 days
15	GREATER DUBLIN		
	DL	DUBLIN	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 150 to 750 (units: sqm)
Range Selected by User: 120 to 2350 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/12 to 27/09/19

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

Selected survey days:

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

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

Selected survey types:

Manual count	16 days
Directional ATC Count	0 days

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

Selected Locations:

Edge of Town Centre	3
Suburban Area (PPS6 Out of Centre)	8
Edge of Town	5

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

Selected Location Sub Categories:

Residential Zone	16

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

Secondary Filtering selection:

Use Class:

D1	16 days

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

Population within 1 mile:

1,001 to 5,000	2 days
5,001 to 10,000	2 days
15,001 to 20,000	4 days
20,001 to 25,000	2 days
25,001 to 50,000	5 days
100,001 or More	1 days

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

Population within 5 miles:

5,001 to 25,000	2 days
50,001 to 75,000	1 days
75,001 to 100,000	4 days
125,001 to 250,000	4 days
250,001 to 500,000	4 days
500,001 or More	1 days

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

Car ownership within 5 miles:

0.5 or Less	1 days
0.6 to 1.0	5 days
1.1 to 1.5	9 days
2.1 to 2.5	1 days

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

Travel Plan:

No	16 days

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

PTAL Rating:

No PTAL Present	16 days

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

LIST OF SITES relevant to selection parameters

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

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

2 DL-04-D-01 NURSERY DUBLIN
78 THE PARK
DUBLIN
BEAUMONT WOODS
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 256 sqm
Survey date: WEDNESDAY *26/09/12* *Survey Type: MANUAL*

3 DS-04-D-02 NURSERY DERBYSHIRE
MAXWELL AVENUE
DERBY
DARLEY ABBEY
Edge of Town
Residential Zone
Total Gross floor area: 415 sqm
Survey date: THURSDAY *12/07/18* *Survey Type: MANUAL*

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

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

5 LE-04-D-01 NURSERY LEICESTERSHIRE
WIGSTON ROAD
LEICESTER
OADBY
Edge of Town
Residential Zone
Total Gross floor area: 375 sqm
Survey date: THURSDAY *30/10/14* *Survey Type: MANUAL*

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

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

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

8 RO-04-D-01 NURSERY ROSCOMMON
PARK VIEW
ROSCOMMON
CRUBY HILL
Edge of Town
Residential Zone
Total Gross floor area: 500 sqm
Survey date: FRIDAY *26/09/14* *Survey Type: MANUAL*

9 RO-04-D-02 NURSERY ROSCOMMON
CIRCULAR ROAD
ROSCOMMON
BALLYPHEASAN
Edge of Town Centre
Residential Zone
Total Gross floor area: 509 sqm
Survey date: FRIDAY *27/04/18* *Survey Type: MANUAL*

LIST OF SITES relevant to selection parameters (Cont.)

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

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

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

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

12 TV-04-D-01 NURSERY TEES VALLEY
COTSWOLD DRIVE
REDCAR

Edge of Town
Residential Zone
Total Gross floor area: 150 sqm
Survey date: FRIDAY *19/05/17* *Survey Type: MANUAL*

13 TW-04-D-02 NURSERY TYNE & WEAR
ETTRICK GROVE
SUNDERLAND
HIGH BARNES
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 500 sqm
Survey date: WEDNESDAY *28/11/12* *Survey Type: MANUAL*

14 TW-04-D-03 NURSERY TYNE & WEAR
JUBILEE ROAD
NEWCASTLE UPON TYNE
GOSFORTH
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 725 sqm
Survey date: TUESDAY *21/05/19* *Survey Type: MANUAL*

15 WK-04-D-01 NURSERY WARWICKSHIRE
THE RIDGEWAY
STRATFORD UPON AVON

Edge of Town
Residential Zone
Total Gross floor area: 340 sqm
Survey date: FRIDAY *29/06/18* *Survey Type: MANUAL*

16 WL-04-D-01 NURSERY WILTSHIRE
SHREWSBURY ROAD
SWINDON
WALCOT
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total Gross floor area: 500 sqm
Survey date: THURSDAY *22/09/16* *Survey Type: MANUAL*

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

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

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00	2	328	0.152	2	328	0.000	2	328	0.152
07:00 - 08:00	16	428	1.605	16	428	0.861	16	428	2.466
08:00 - 09:00	16	428	3.531	16	428	2.627	16	428	6.158
09:00 - 10:00	16	428	2.087	16	428	1.985	16	428	4.072
10:00 - 11:00	16	428	0.511	16	428	0.394	16	428	0.905
11:00 - 12:00	16	428	0.759	16	428	0.482	16	428	1.241
12:00 - 13:00	16	428	1.255	16	428	1.693	16	428	2.948
13:00 - 14:00	16	428	0.963	16	428	1.226	16	428	2.189
14:00 - 15:00	16	428	0.861	16	428	0.759	16	428	1.620
15:00 - 16:00	16	428	0.978	16	428	1.211	16	428	2.189
16:00 - 17:00	16	428	1.488	16	428	1.664	16	428	3.152
17:00 - 18:00	16	428	2.437	16	428	2.962	16	428	5.399
18:00 - 19:00	15	447	0.224	15	447	0.776	15	447	1.000
19:00 - 20:00	1	400	0.000	1	400	0.000	1	400	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			16.851			16.640			33.491

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

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

Parameter summary

Trip rate parameter range selected:	150 - 750 (units: sqm)
Survey date date range:	01/01/12 - 27/09/19
Number of weekdays (Monday-Friday):	16
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

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

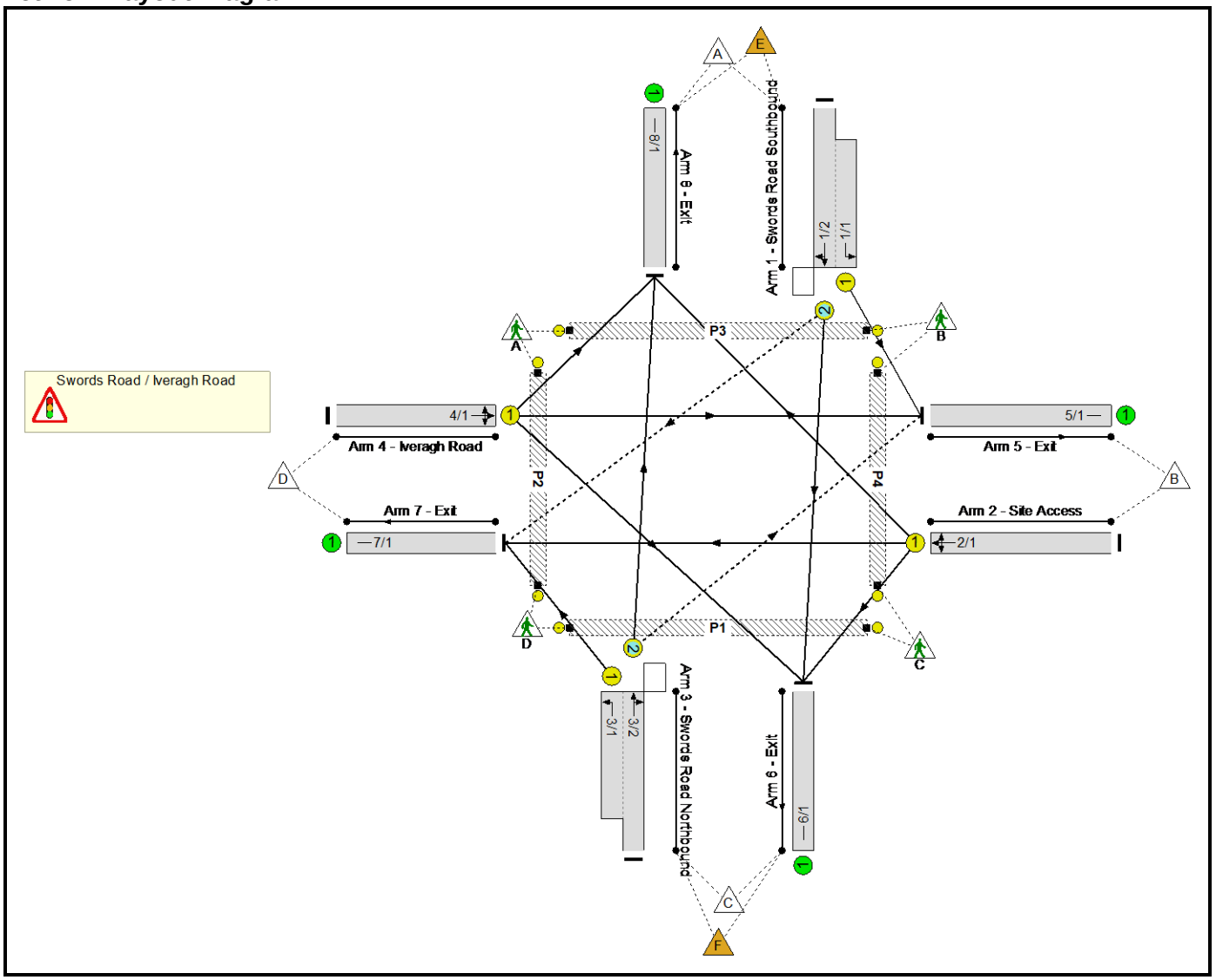
Appendix D – Linsig Results

Full Input Data And Results

User and Project Details

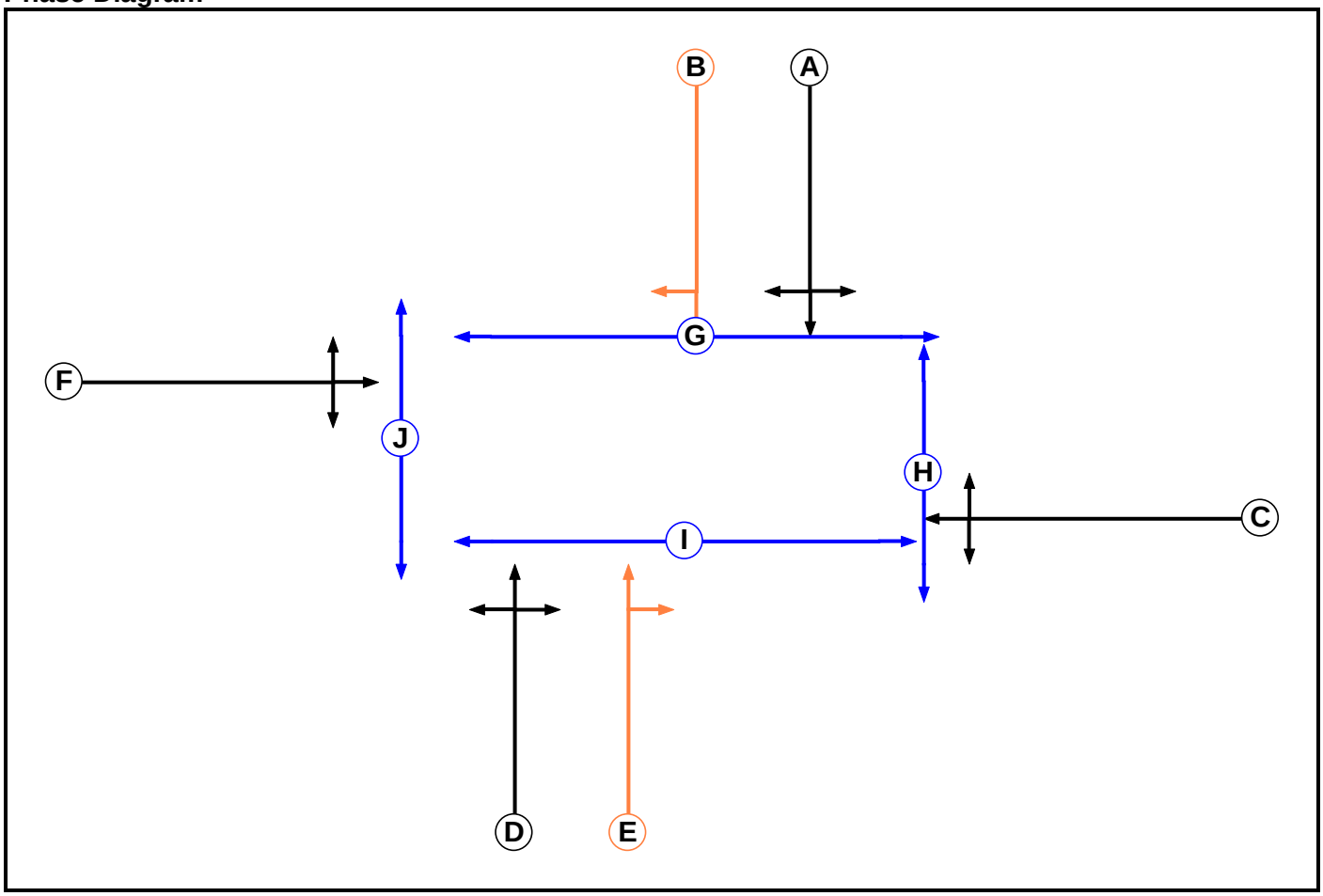
Project:	**Swords Road**
Title:	**Strategic Housing Development at Swords Road, Whitehall, Dublin 9**
Location:	Swords Road / Iveragh Road
Client:	Eastwise Construction Swords limited
Date Started:	09/02/2021
Date Completed:	10/02/2021
Model Purpose:	Site Access Junction Design
Additional detail:	
File name:	Proposed Junction.lsg3x
Author:	Zachary Cave
Company:	AECOM
Address:	4th Floor, Adelphi Plaza, Georges Street Uppe, Dun Laoghaire, Co. Dublin

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Filter with Closing Amber (Not UK)		4	4
C	Traffic		7	7
D	Traffic		7	7
E	Filter with Closing Amber (Not UK)		4	4
F	Traffic		7	7
G	Pedestrian		7	7
H	Pedestrian		7	7
I	Pedestrian		7	7
J	Pedestrian		7	7

Full Input Data And Results

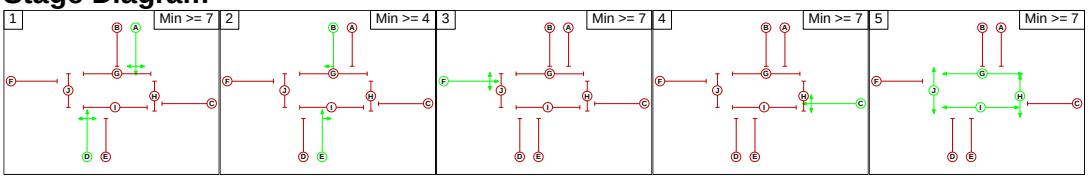
Phase Intergreens Matrix

		Starting Phase									
		A	B	C	D	E	F	G	H	I	J
Terminating Phase	A		-	-	-	5	5	-	7	-	-
	B	-		6	5	-	6	-	-	8	8
	C	-	5		5	5	5	7	-	6	7
	D	-	5	5		-	-	-	-	-	7
	E	6	-	6	-		6	8	7	-	-
	F	6	5	6	-	5		6	8	7	-
	G	-	-	5	-	5	5		-	-	-
	H	5	-	-	-	5	5	-		-	-
	I	-	5	5	-	-	5	-	-		-
	J	-	5	5	5	-	-	-	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A D
2	B E
3	F
4	C
5	G H I J

Stage Diagram



Full Input Data And Results

Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
1	2	A	Losing	5	5
1	3	D	Losing	5	5
1	4	A	Losing	5	5
1	5	A	Losing	7	7
2	1	B	Losing	6	6
2	5	B	Losing	8	8
3	1	F	Losing	2	2
4	1	C	Losing	2	2
5	1	G	Losing	5	5
5	1	I	Losing	5	5
5	2	G	Losing	5	5
5	2	H	Losing	5	5
5	3	J	Losing	5	5
5	4	H	Losing	5	5

Prohibited Stage Change

		To Stage				
		1	2	3	4	5
From Stage	1		10	5	5	14
	2	11		6	6	16
	3	8	5		6	8
	4	7	5	5		7
	5	5	10	5	5	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Swords Road / Iveragh Road

Lane	Movement	Max Flow when Giving Way (PCU/Hr)	Min Flow when Giving Way (PCU/Hr)	Opposing Lane	Opp. Lane Coeff.	Opp. Mvmnts.	Right Turn Storage (PCU)	Non-Blocking Storage (PCU)	RTF	Right Turn Move up (s)	Max Turns in Intergreen (PCU)
1/2 (Swords Road Southbound)	7/1 (Right)	1439	0	3/1	1.09	All	2.00	2.00	0.50	2	2.00
				3/2	1.09	To 8/1 (Ahead)					
3/2 (Swords Road Northbound)	5/1 (Right)	1439	0	1/1	1.09	All	2.00	2.00	0.50	2	2.00
				1/2	1.09	To 6/1 (Ahead)					

Full Input Data And Results

Lane Input Data

Junction: Swords Road / Iveragh Road

Lane	Lane Type	Phases	Start Disp.	End Disp.	Physical Length (PCU)	Sat Flow Type	Def User Saturation Flow (PCU/Hr)	Lane Width (m)	Gradient	Nearside Lane	Turns	Turning Radius (m)
1/1 (Swords Road Southbound)	U	A	2	3	11.0	Geom	-	3.70	0.00	Y	Arm 5 Left	6.00
1/2 (Swords Road Southbound)	O	A B	2	3	23.5	Geom	-	3.00	0.00	Y	Arm 6 Ahead	Inf
											Arm 7 Right	15.20
2/1 (Site Access)	U	C	2	3	60.0	Geom	-	3.10	0.00	Y	Arm 6 Left	6.80
											Arm 7 Ahead	Inf
											Arm 8 Right	17.80
3/1 (Swords Road Northbound)	U	D	2	3	11.0	Geom	-	3.30	0.00	Y	Arm 7 Left	7.30
3/2 (Swords Road Northbound)	O	D E	2	3	40.0	Geom	-	3.00	0.00	Y	Arm 5 Right	14.60
											Arm 8 Ahead	Inf
4/1 (Iveragh Road)	U	F	2	3	15.5	Geom	-	2.70	0.00	Y	Arm 5 Ahead	Inf
											Arm 6 Right	6.00
											Arm 8 Left	16.50
5/1 (Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1 (Exit)	U		2	3	60.0	Inf	-	-	-	-	-	-
7/1 (Exit)	U		2	3	15.5	Inf	-	-	-	-	-	-
8/1 (Exit)	U		2	3	23.5	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2019 Baseline'	08:00	09:00	01:00	
2: '2019 Baseline'	16:00	17:00	01:00	
5: '2026 With Dev AM'	08:00	09:00	01:00	(F1*1.1191)+F3
6: '2026 With Dev PM'	16:00	17:00	01:00	(F2*1.1191)+F4
7: '2031 With Dev AM'	08:00	09:00	01:00	(F1*1.2127)+F3
8: '2031 With Dev PM'	16:00	17:00	01:00	(F2*1.2127)+F4
9: '2041 With Dev AM'	08:00	09:00	01:00	(F1*1.2455)+F3
10: '2041 With Dev PM'	16:00	17:00	01:00	(F2*1.2455)+F4

Scenario 1: '2026 With Dev AM' (FG5: '2026 With Dev AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	21	1220	31	0	0	1272
	B	47	0	54	0	0	0	101
	C	1052	18	0	68	0	0	1138
	D	53	0	62	0	0	0	115
	E	0	0	0	0	0	96	96
	F	0	0	0	0	83	0	83
	Tot.	1152	39	1336	99	83	96	2805

Traffic Lane Flows

Lane	Scenario 1: 2026 With Dev AM
Junction: Swords Road / Iveragh Road	
1/1 (short)	21
1/2 (with short)	1368(In) 1347(Out)
2/1	101
3/1 (short)	68
3/2 (with short)	1221(In) 1153(Out)
4/1	115
5/1	39
6/1	1432
7/1	99
8/1	1235

Full Input Data And Results

Lane Saturation Flows

Junction: Swords Road / Iveragh Road

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Swords Road Southbound)	3.70	0.00	Y	Arm 5 Left	6.00	100.0 %	1588	1588
1/2 (Swords Road Southbound)	3.00	0.00	Y	Arm 6 Ahead	Inf	97.7 %	1911	1911
				Arm 7 Right	15.20	2.3 %		
2/1 (Site Access)	3.10	0.00	Y	Arm 6 Left	6.80	53.5 %	1664	1664
				Arm 7 Ahead	Inf	0.0 %		
				Arm 8 Right	17.80	46.5 %		
3/1 (Swords Road Northbound)	3.30	0.00	Y	Arm 7 Left	7.30	100.0 %	1613	1613
3/2 (Swords Road Northbound)	3.00	0.00	Y	Arm 5 Right	14.60	1.6 %	1912	1912
				Arm 8 Ahead	Inf	98.4 %		
4/1 (Iveragh Road)	2.70	0.00	Y	Arm 5 Ahead	Inf	0.0 %	1602	1602
				Arm 6 Right	6.00	53.9 %		
				Arm 8 Left	16.50	46.1 %		
5/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2026 With Dev PM' (FG6: '2026 With Dev PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin \ Destination	A	B	C	D	E	F	Tot.
A	0	32	1146	34	0	0	1212
B	22	0	22	0	0	0	44
C	1146	32	0	41	0	0	1219
D	47	0	34	0	0	0	81
E	0	0	0	0	0	94	94
F	0	0	0	0	72	0	72
Tot.	1215	64	1202	75	72	94	2722

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2026 With Dev PM
Junction: Swords Road / Iveragh Road	
1/1 (short)	32
1/2 (with short)	1306(In) 1274(Out)
2/1	44
3/1 (short)	41
3/2 (with short)	1291(In) 1250(Out)
4/1	81
5/1	64
6/1	1296
7/1	75
8/1	1287

Lane Saturation Flows

Junction: Swords Road / Iveragh Road

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Swords Road Southbound)	3.70	0.00	Y	Arm 5 Left	6.00	100.0 %	1588	1588
1/2 (Swords Road Southbound)	3.00	0.00	Y	Arm 6 Ahead	Inf	97.3 %	1910	1910
				Arm 7 Right	15.20	2.7 %		
2/1 (Site Access)	3.10	0.00	Y	Arm 6 Left	6.80	50.0 %	1670	1670
				Arm 7 Ahead	Inf	0.0 %		
				Arm 8 Right	17.80	50.0 %		
3/1 (Swords Road Northbound)	3.30	0.00	Y	Arm 7 Left	7.30	100.0 %	1613	1613
3/2 (Swords Road Northbound)	3.00	0.00	Y	Arm 5 Right	14.60	2.6 %	1910	1910
				Arm 8 Ahead	Inf	97.4 %		
4/1 (Iveragh Road)	2.70	0.00	Y	Arm 5 Ahead	Inf	0.0 %	1628	1628
				Arm 6 Right	6.00	42.0 %		
				Arm 8 Left	16.50	58.0 %		
5/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 3: '2031 With Dev AM' (FG7: '2031 With Dev AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin	Destination							
		A	B	C	D	E	F	Tot.
	A	0	21	1322	34	0	0	1377
	B	47	0	54	0	0	0	101
	C	1140	18	0	74	0	0	1232
	D	57	0	67	0	0	0	124
	E	0	0	0	0	0	104	104
	F	0	0	0	0	90	0	90
	Tot.	1244	39	1443	108	90	104	3028

Traffic Lane Flows

Lane	Scenario 3: 2031 With Dev AM
Junction: Swords Road / Iveragh Road	
1/1 (short)	21
1/2 (with short)	1481(In) 1460(Out)
2/1	101
3/1 (short)	74
3/2 (with short)	1322(In) 1248(Out)
4/1	124
5/1	39
6/1	1547
7/1	108
8/1	1334

Full Input Data And Results

Lane Saturation Flows

Junction: Swords Road / Iveragh Road

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Swords Road Southbound)	3.70	0.00	Y	Arm 5 Left	6.00	100.0 %	1588	1588
1/2 (Swords Road Southbound)	3.00	0.00	Y	Arm 6 Ahead	Inf	97.7 %	1911	1911
				Arm 7 Right	15.20	2.3 %		
2/1 (Site Access)	3.10	0.00	Y	Arm 6 Left	6.80	53.5 %	1664	1664
				Arm 7 Ahead	Inf	0.0 %		
				Arm 8 Right	17.80	46.5 %		
3/1 (Swords Road Northbound)	3.30	0.00	Y	Arm 7 Left	7.30	100.0 %	1613	1613
3/2 (Swords Road Northbound)	3.00	0.00	Y	Arm 5 Right	14.60	1.4 %	1912	1912
				Arm 8 Ahead	Inf	98.6 %		
4/1 (Iveragh Road)	2.70	0.00	Y	Arm 5 Ahead	Inf	0.0 %	1602	1602
				Arm 6 Right	6.00	54.0 %		
				Arm 8 Left	16.50	46.0 %		
5/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 4: '2031 With Dev PM' (FG8: '2031 With Dev PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination						
		A	B	C	D	E	F	Tot.
Origin	A	0	32	1242	36	0	0	1310
	B	22	0	22	0	0	0	44
	C	1242	32	0	45	0	0	1319
	D	51	0	36	0	0	0	87
	E	0	0	0	0	0	102	102
	F	0	0	0	0	78	0	78
	Tot.	1315	64	1300	81	78	102	2940

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 2031 With Dev PM
Junction: Swords Road / Iveragh Road	
1/1 (short)	32
1/2 (with short)	1412(In) 1380(Out)
2/1	44
3/1 (short)	45
3/2 (with short)	1397(In) 1352(Out)
4/1	87
5/1	64
6/1	1402
7/1	81
8/1	1393

Lane Saturation Flows

Junction: Swords Road / Iveragh Road

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Swords Road Southbound)	3.70	0.00	Y	Arm 5 Left	6.00	100.0 %	1588	1588
1/2 (Swords Road Southbound)	3.00	0.00	Y	Arm 6 Ahead	Inf	97.4 %	1910	1910
				Arm 7 Right	15.20	2.6 %		
2/1 (Site Access)	3.10	0.00	Y	Arm 6 Left	6.80	50.0 %	1670	1670
				Arm 7 Ahead	Inf	0.0 %		
				Arm 8 Right	17.80	50.0 %		
3/1 (Swords Road Northbound)	3.30	0.00	Y	Arm 7 Left	7.30	100.0 %	1613	1613
3/2 (Swords Road Northbound)	3.00	0.00	Y	Arm 5 Right	14.60	2.4 %	1910	1910
				Arm 8 Ahead	Inf	97.6 %		
4/1 (Iveragh Road)	2.70	0.00	Y	Arm 5 Ahead	Inf	0.0 %	1630	1630
				Arm 6 Right	6.00	41.4 %		
				Arm 8 Left	16.50	58.6 %		
5/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 5: '2041 With Dev AM' (FG9: '2041 With Dev AM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin	Destination							
		A	B	C	D	E	F	Tot.
	A	0	21	1358	35	0	0	1414
	B	47	0	54	0	0	0	101
	C	1171	18	0	76	0	0	1265
	D	59	0	69	0	0	0	128
	E	0	0	0	0	0	107	107
	F	0	0	0	0	92	0	92
	Tot.	1277	39	1481	111	92	107	3107

Traffic Lane Flows

Lane	Scenario 5: 2041 With Dev AM
Junction: Swords Road / Iveragh Road	
1/1 (short)	21
1/2 (with short)	1521(In) 1500(Out)
2/1	101
3/1 (short)	76
3/2 (with short)	1357(In) 1281(Out)
4/1	128
5/1	39
6/1	1588
7/1	111
8/1	1369

Full Input Data And Results

Lane Saturation Flows

Junction: Swords Road / Iveragh Road

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Swords Road Southbound)	3.70	0.00	Y	Arm 5 Left	6.00	100.0 %	1588	1588
1/2 (Swords Road Southbound)	3.00	0.00	Y	Arm 6 Ahead	Inf	97.7 %	1911	1911
				Arm 7 Right	15.20	2.3 %		
2/1 (Site Access)	3.10	0.00	Y	Arm 6 Left	6.80	53.5 %	1664	1664
				Arm 7 Ahead	Inf	0.0 %		
				Arm 8 Right	17.80	46.5 %		
3/1 (Swords Road Northbound)	3.30	0.00	Y	Arm 7 Left	7.30	100.0 %	1613	1613
3/2 (Swords Road Northbound)	3.00	0.00	Y	Arm 5 Right	14.60	1.4 %	1912	1912
				Arm 8 Ahead	Inf	98.6 %		
4/1 (Iveragh Road)	2.70	0.00	Y	Arm 5 Ahead	Inf	0.0 %	1602	1602
				Arm 6 Right	6.00	53.9 %		
				Arm 8 Left	16.50	46.1 %		
5/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Scenario 6: '2041 With Dev PM' (FG10: '2041 With Dev PM', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

Origin	Destination							
		A	B	C	D	E	F	Tot.
	A	0	32	1275	37	0	0	1344
	B	22	0	22	0	0	0	44
	C	1275	32	0	46	0	0	1353
	D	52	0	37	0	0	0	89
	E	0	0	0	0	0	105	105
	F	0	0	0	0	80	0	80
	Tot.	1349	64	1334	83	80	105	3015

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 2041 With Dev PM
Junction: Swords Road / Iveragh Road	
1/1 (short)	32
1/2 (with short)	1449(In) 1417(Out)
2/1	44
3/1 (short)	46
3/2 (with short)	1433(In) 1387(Out)
4/1	89
5/1	64
6/1	1439
7/1	83
8/1	1429

Lane Saturation Flows

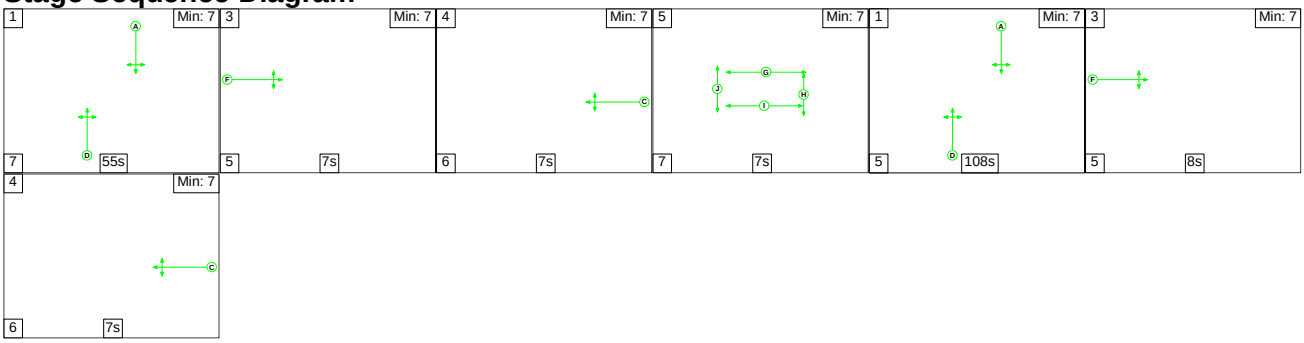
Junction: Swords Road / Iveragh Road

Lane	Lane Width (m)	Gradient	Nearside Lane	Allowed Turns	Turning Radius (m)	Turning Prop.	Sat Flow (PCU/Hr)	Flared Sat Flow (PCU/Hr)
1/1 (Swords Road Southbound)	3.70	0.00	Y	Arm 5 Left	6.00	100.0 %	1588	1588
1/2 (Swords Road Southbound)	3.00	0.00	Y	Arm 6 Ahead	Inf	97.4 %	1910	1910
				Arm 7 Right	15.20	2.6 %		
2/1 (Site Access)	3.10	0.00	Y	Arm 6 Left	6.80	50.0 %	1670	1670
				Arm 7 Ahead	Inf	0.0 %		
				Arm 8 Right	17.80	50.0 %		
3/1 (Swords Road Northbound)	3.30	0.00	Y	Arm 7 Left	7.30	100.0 %	1613	1613
3/2 (Swords Road Northbound)	3.00	0.00	Y	Arm 5 Right	14.60	2.3 %	1910	1910
				Arm 8 Ahead	Inf	97.7 %		
4/1 (Iveragh Road)	2.70	0.00	Y	Arm 5 Ahead	Inf	0.0 %	1629	1629
				Arm 6 Right	6.00	41.6 %		
				Arm 8 Left	16.50	58.4 %		
5/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
6/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
7/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf
8/1 (Exit Lane 1)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 1: '2026 With Dev AM' (FG5: '2026 With Dev AM', Plan 1: 'Network Control Plan 1')

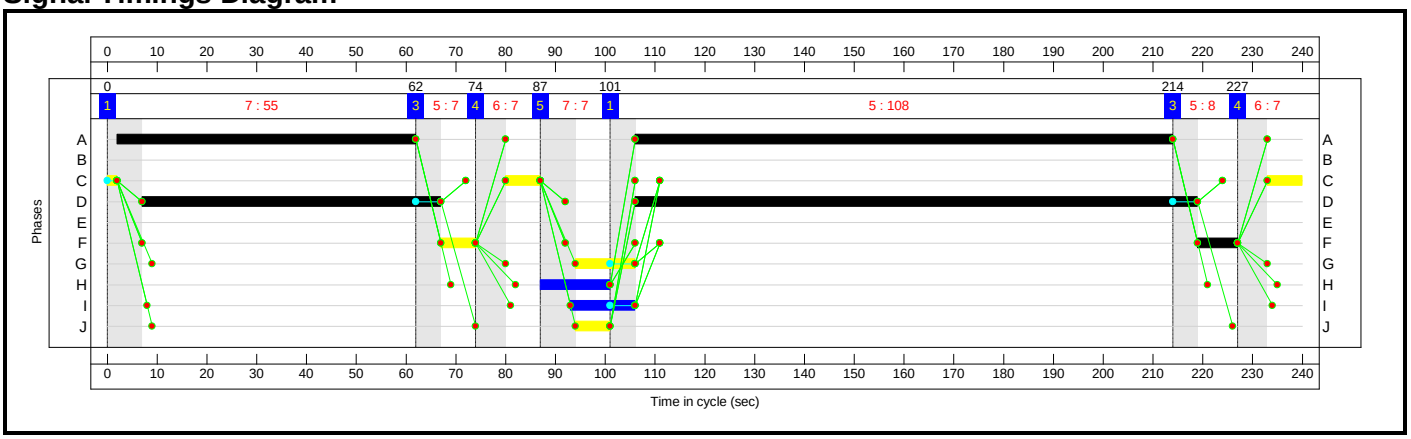
Stage Sequence Diagram



Stage Timings

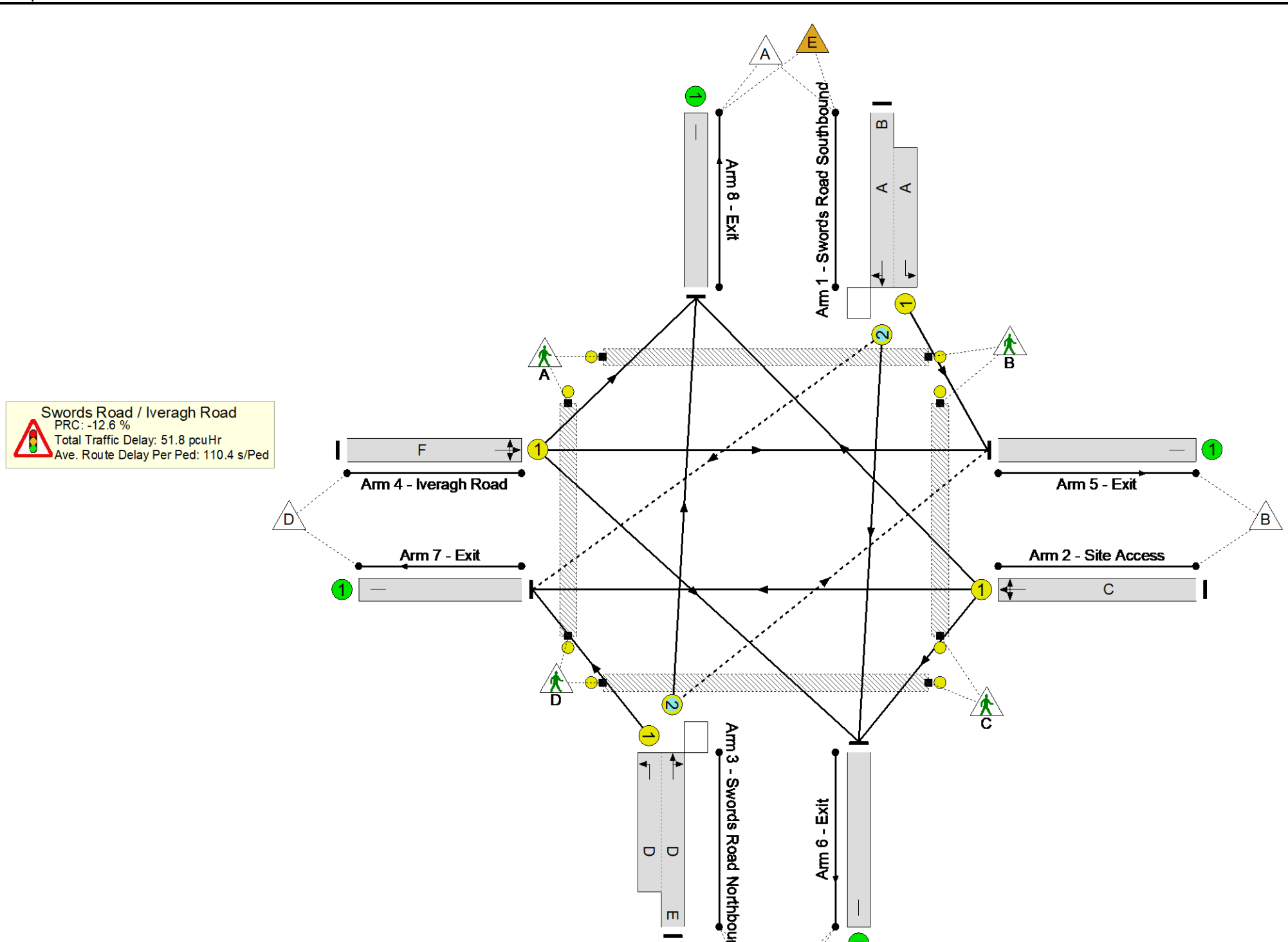
Stage	1	3	4	5	1	3	4
Duration	55	7	7	7	108	8	7
Change Point	0	62	74	87	101	214	227

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Swords Road / Iveragh Road
PRC: -12.6 %
Total Traffic Delay: 51.8 pcuHr
Ave. Route Delay Per Ped: 110.4 s/Ped
Arm 8 - Exit
Arm 1 - Swords Road Southbound
Arm 4 - Iveragh Road
Arm 5 - Exit
Arm 7 - Exit
Arm 2 - Site Access
Arm 3 - Swords Road Northbound
Arm 6 - Exit

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.3%**
Swords Road / Iveragh Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.3%**
1/2+1/1	Swords Road Southbound Left Ahead Right	O+U	N/A	N/A	A	B	2	168	0	1368	1911:1588	1330+21	101.2 : 101.2%
2/1	Site Access Left Ahead Right	U	N/A	N/A	C		2	16	-	101	1664	125	80.9%
3/2+3/1	Swords Road Northbound Right Left Ahead	O+U	N/A	N/A	D	E	2	173	0	1221	1912:1613	1320+78	87.3 : 87.3%
4/1	Iveragh Road Ahead Right Left	U	N/A	N/A	F		2	15	-	115	1602	113	101.3%
5/1	Exit	U	N/A	N/A	-		-	-	-	39	Inf	Inf	0.0%
6/1	Exit	U	N/A	N/A	-		-	-	-	1432	Inf	Inf	0.0%
7/1	Exit	U	N/A	N/A	-		-	-	-	99	Inf	Inf	0.0%
8/1	Exit	U	N/A	N/A	-		-	-	-	1235	Inf	Inf	0.0%
Ped Link: P1	Swords Road (Southern Crossing)	-	N/A	-	I		1	13	-	42	-	3900	1.1%
Ped Link: P2	Iveragh Road Crossing	-	N/A	-	J		1	7	-	42	-	2100	2.0%
Ped Link: P3	Swords Road (Northern Crossing)	-	N/A	-	G		1	12	-	42	-	3600	1.2%
Ped Link: P4	Site Access Crossing	-	N/A	-	H		1	14	-	42	-	4200	1.0%

Full Input Data And Results

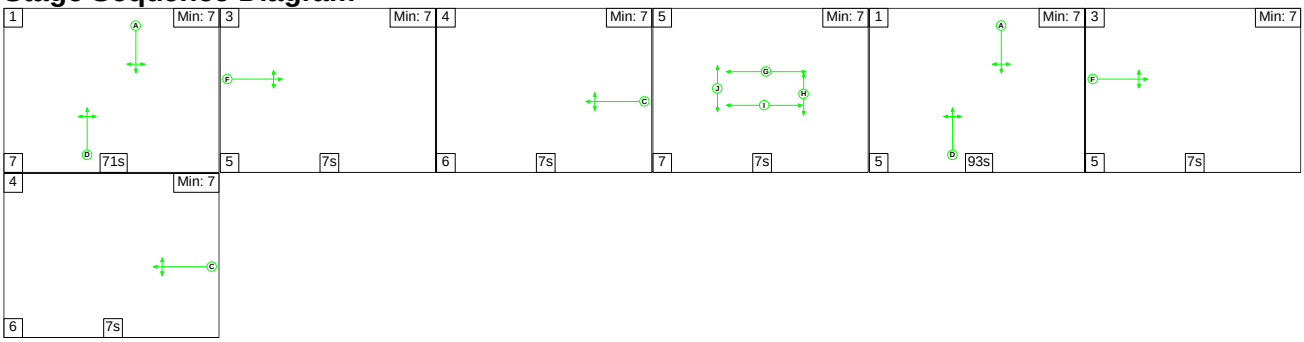
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	**-**	**-**	**27**	**18**	**3**	**17.2**	**34.1**	**0.5**	**51.8**	**-**	**-**	**-**	**-**
Swords Road / Iveragh Road	**-**	**-**	**27**	**18**	**3**	**17.2**	**34.1**	**0.5**	**51.8**	**-**	**-**	**-**	**-**
1/2+1/1	1368	1351	27	1	3	9.1	23.2	0.3	32.5	85.6	63.6	23.2	86.8
2/1	101	101	-	-	-	1.7	1.8	-	3.5	125.3	4.3	1.8	6.2
3/2+3/1	1221	1221	0	18	0	4.0	3.3	0.2	7.6	22.4	34.3	3.3	37.6
4/1	115	113	-	-	-	2.4	5.8	-	8.2	255.9	5.1	5.8	10.8
5/1	39	39	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1415	1415	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	99	99	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1234	1234	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	42	42	-	-	-	-	-	-	1.3	108.8	-	-	2.7
Ped Link: P2	42	42	-	-	-	-	-	-	1.3	115.3	-	-	2.7
Ped Link: P3	42	42	-	-	-	-	-	-	1.3	109.8	-	-	2.7
Ped Link: P4	42	42	-	-	-	-	-	-	1.3	107.7	-	-	2.6

C1 PRC for Signalled Lanes (%): -12.6 PRC Over All Lanes (%): -12.6 Total Delay for Signalled Lanes (pcuHr): 51.82 Total Delay Over All Lanes(pcuHr): 51.82 Cycle Time (s): 240

Full Input Data And Results

Scenario 2: '2026 With Dev PM' (FG6: '2026 With Dev PM', Plan 1: 'Network Control Plan 1')

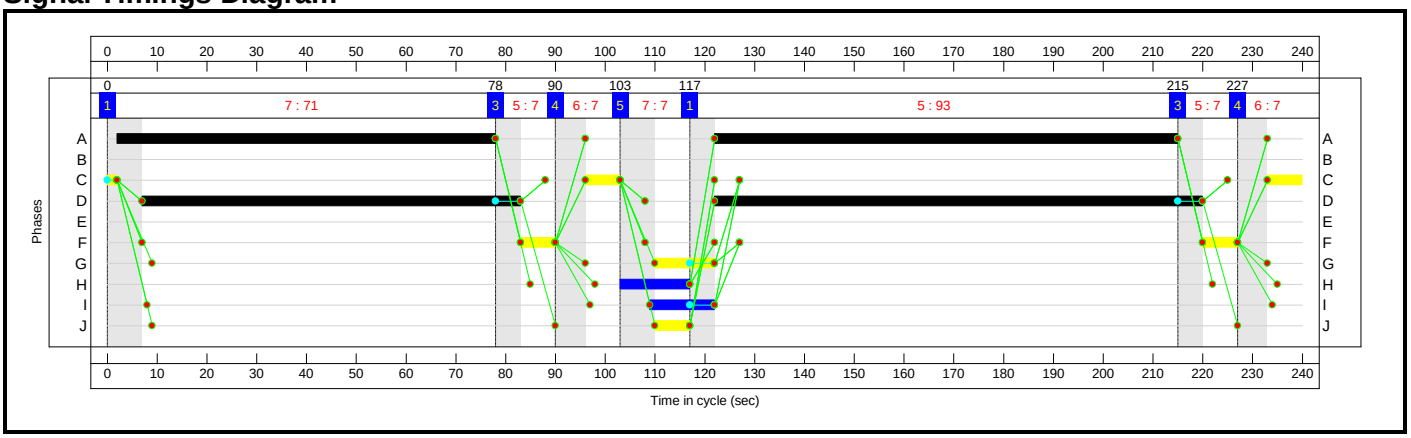
Stage Sequence Diagram



Stage Timings

Stage	1	3	4	5	1	3	4
Duration	71	7	7	7	93	7	7
Change Point	0	78	90	103	117	215	227

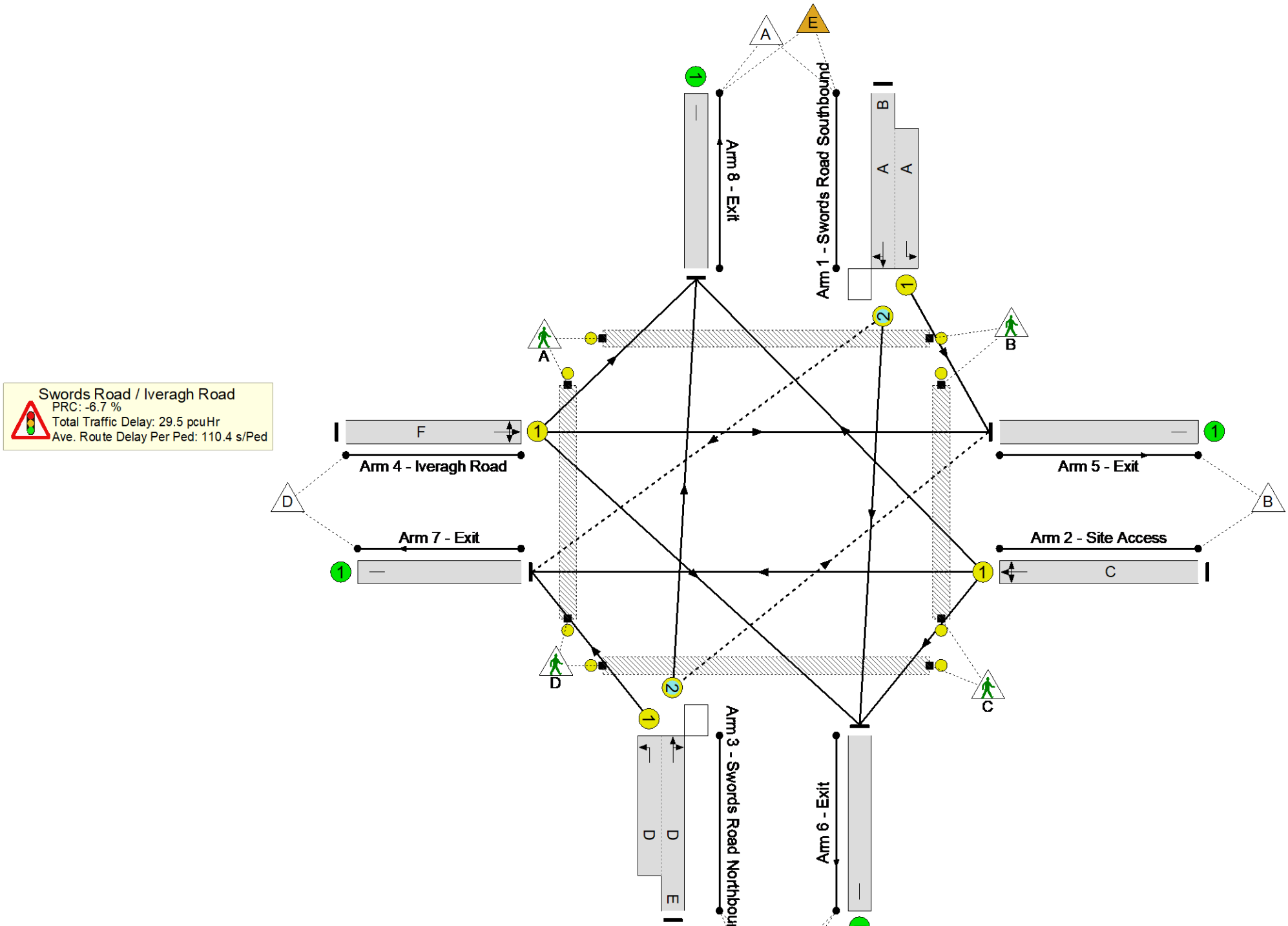
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**96.0%**
Swords Road / Iveragh Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**96.0%**
1/2+1/1	Swords Road Southbound Left Ahead Right	O+U	N/A	N/A	A	B	2	169	0	1306	1910:1588	1327+33	96.0 : 96.0%
2/1	Site Access Left Ahead Right	U	N/A	N/A	C		2	16	-	44	1670	125	35.1%
3/2+3/1	Swords Road Northbound Right Left Ahead	O+U	N/A	N/A	D	E	2	174	0	1291	1910:1613	1357+44	92.1 : 92.1%
4/1	Iveragh Road Ahead Right Left	U	N/A	N/A	F		2	14	-	81	1628	109	74.6%
5/1	Exit	U	N/A	N/A	-		-	-	-	64	Inf	Inf	0.0%
6/1	Exit	U	N/A	N/A	-		-	-	-	1296	Inf	Inf	0.0%
7/1	Exit	U	N/A	N/A	-		-	-	-	75	Inf	Inf	0.0%
8/1	Exit	U	N/A	N/A	-		-	-	-	1287	Inf	Inf	0.0%
Ped Link: P1	Swords Road (Southern Crossing)	-	N/A	-	I		1	13	-	42	-	3900	1.1%
Ped Link: P2	Iveragh Road Crossing	-	N/A	-	J		1	7	-	42	-	2100	2.0%
Ped Link: P3	Swords Road (Northern Crossing)	-	N/A	-	G		1	12	-	42	-	3600	1.2%
Ped Link: P4	Site Access Crossing	-	N/A	-	H		1	14	-	42	-	4200	1.0%

Full Input Data And Results

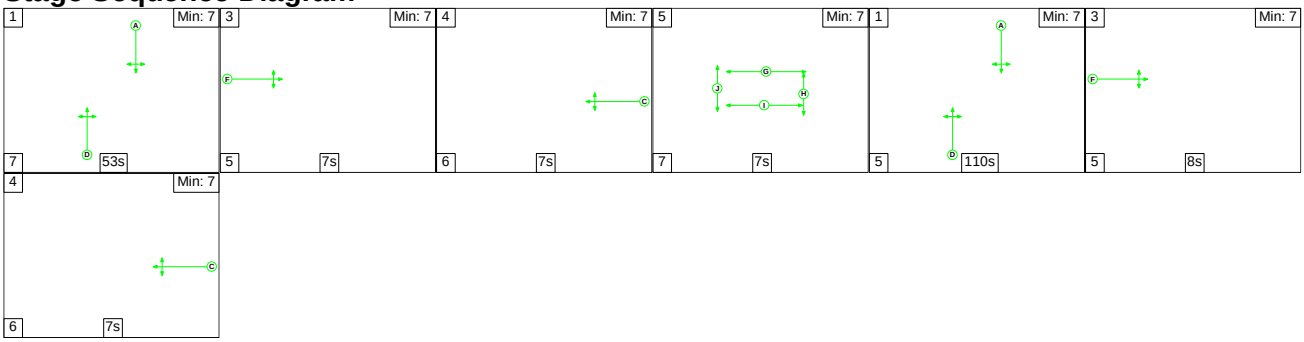
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	**-**	**-**	**16**	**28**	**23**	**12.7**	**16.0**	**0.8**	**29.5**	**-**	**-**	**-**	**-**
Swords Road / Iveragh Road	**-**	**-**	**16**	**28**	**23**	**12.7**	**16.0**	**0.8**	**29.5**	**-**	**-**	**-**	**-**
1/2+1/1	1306	1306	11	1	22	6.0	9.1	0.4	15.5	42.6	49.1	9.1	58.1
2/1	44	44	-	-	-	0.7	0.3	-	0.9	76.2	1.6	0.3	1.9
3/2+3/1	1291	1291	4	27	1	4.8	5.3	0.4	10.5	29.3	41.6	5.3	46.9
4/1	81	81	-	-	-	1.3	1.3	-	2.6	115.9	3.0	1.3	4.4
5/1	64	64	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1296	1296	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	75	75	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1287	1287	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	42	42	-	-	-	-	-	-	1.3	108.8	-	-	2.7
Ped Link: P2	42	42	-	-	-	-	-	-	1.3	115.3	-	-	2.7
Ped Link: P3	42	42	-	-	-	-	-	-	1.3	109.8	-	-	2.7
Ped Link: P4	42	42	-	-	-	-	-	-	1.3	107.7	-	-	2.6

C1 PRC for Signalled Lanes (%): -6.7 PRC Over All Lanes (%): -6.7 Total Delay for Signalled Lanes (pcuHr): 29.50 Total Delay Over All Lanes(pcuHr): 29.50 Cycle Time (s): 240

Full Input Data And Results

Scenario 3: '2031 With Dev AM' (FG7: '2031 With Dev AM', Plan 1: 'Network Control Plan 1')

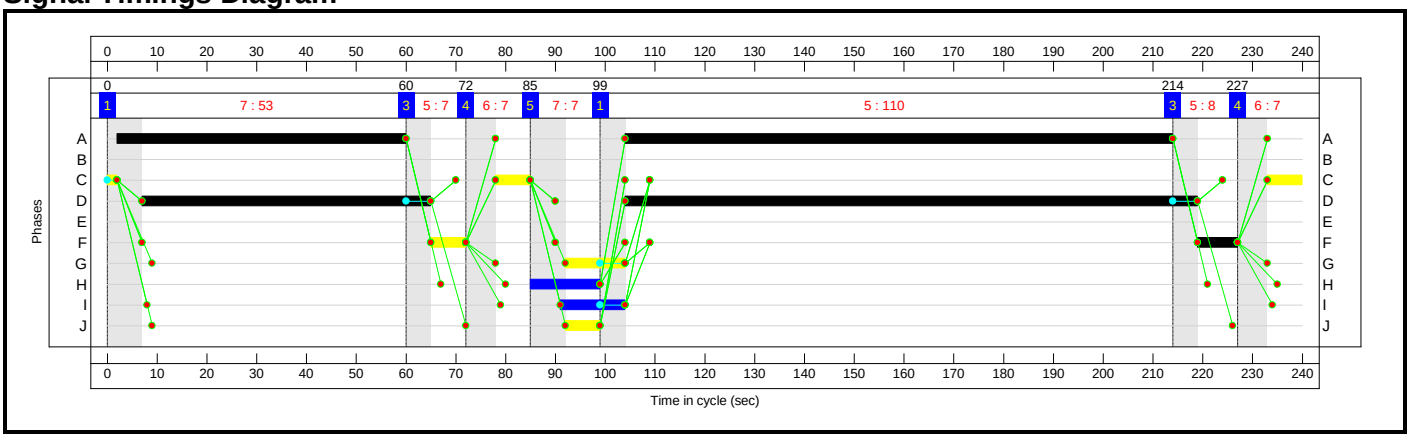
Stage Sequence Diagram



Stage Timings

Stage	1	3	4	5	1	3	4
Duration	53	7	7	7	110	8	7
Change Point	0	60	72	85	99	214	227

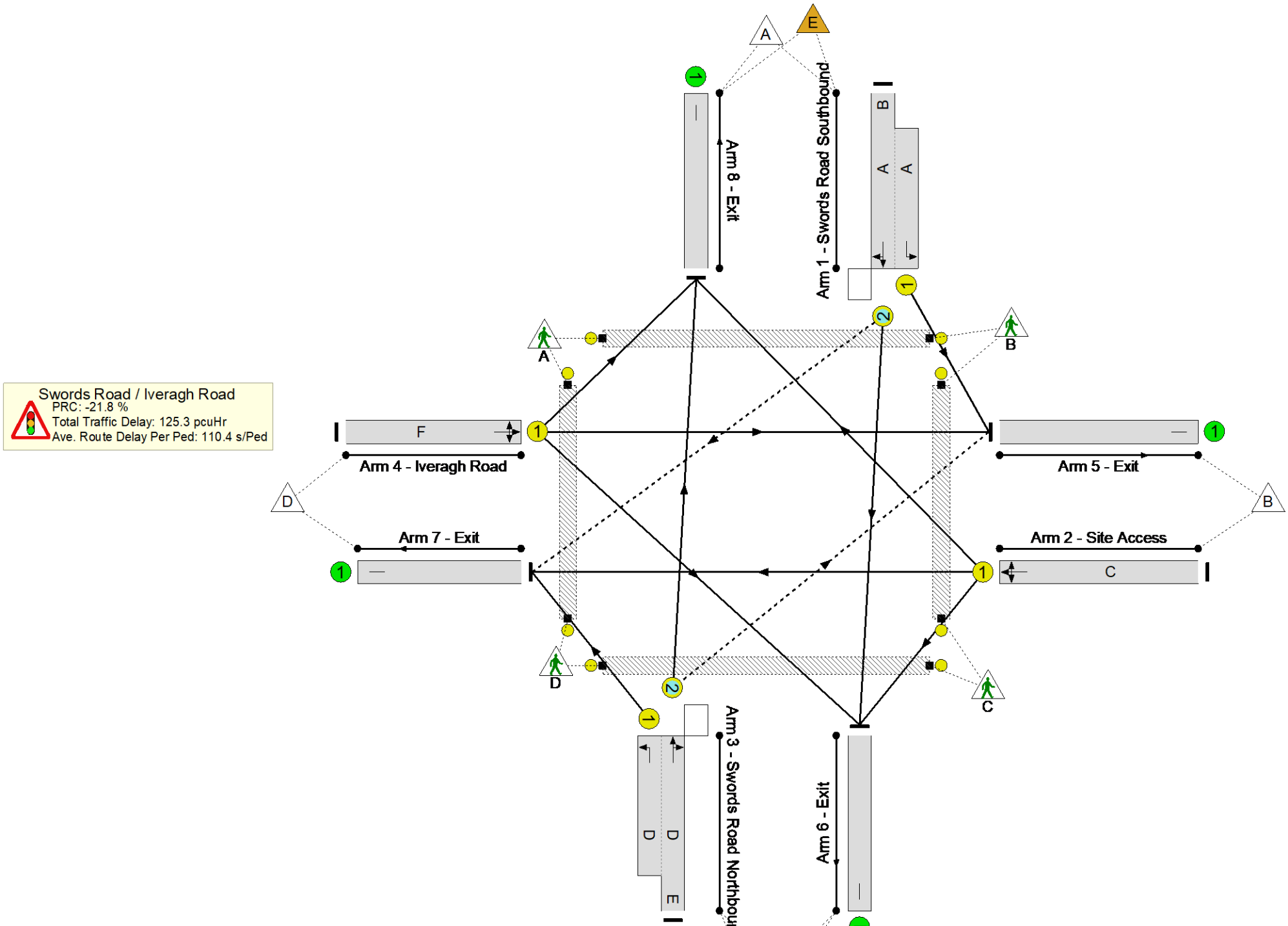
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.6%**
Swords Road / Iveragh Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**109.6%**
1/2+1/1	Swords Road Southbound Left Ahead Right	O+U	N/A	N/A	A	B	2	168	0	1481	1911:1588	1332+19	109.6 : 109.6%
2/1	Site Access Left Ahead Right	U	N/A	N/A	C		2	16	-	101	1664	125	80.9%
3/2+3/1	Swords Road Northbound Right Left Ahead	O+U	N/A	N/A	D	E	2	173	0	1322	1912:1613	1320+78	94.5 : 94.5%
4/1	Iveragh Road Ahead Right Left	U	N/A	N/A	F		2	15	-	124	1602	113	109.3%
5/1	Exit	U	N/A	N/A	-		-	-	-	39	Inf	Inf	0.0%
6/1	Exit	U	N/A	N/A	-		-	-	-	1547	Inf	Inf	0.0%
7/1	Exit	U	N/A	N/A	-		-	-	-	108	Inf	Inf	0.0%
8/1	Exit	U	N/A	N/A	-		-	-	-	1334	Inf	Inf	0.0%
Ped Link: P1	Swords Road (Southern Crossing)	-	N/A	-	I		1	13	-	44	-	3900	1.1%
Ped Link: P2	Iveragh Road Crossing	-	N/A	-	J		1	7	-	44	-	2100	2.1%
Ped Link: P3	Swords Road (Northern Crossing)	-	N/A	-	G		1	12	-	44	-	3600	1.2%
Ped Link: P4	Site Access Crossing	-	N/A	-	H		1	14	-	44	-	4200	1.0%

Full Input Data And Results

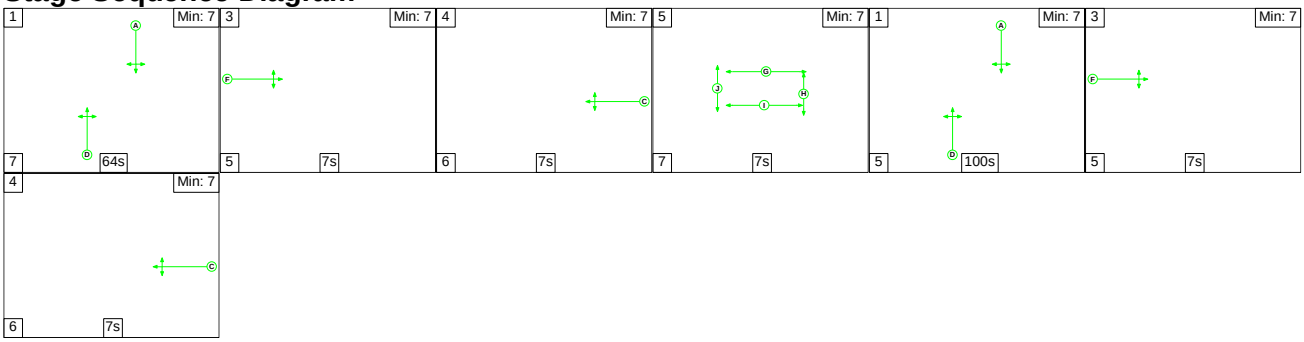
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	**-**	**-**	**2**	**18**	**29**	**36.5**	**88.2**	**0.7**	**125.3**	**-**	**-**	**-**	**-**
Swords Road / Iveragh Road	**-**	**-**	**2**	**18**	**29**	**36.5**	**88.2**	**0.7**	**125.3**	**-**	**-**	**-**	**-**
1/2+1/1	1481	1351	2	1	28	25.9	70.3	0.4	96.6	234.8	84.6	70.3	154.9
2/1	101	101	-	-	-	1.7	1.8	-	3.5	125.9	4.4	1.8	6.2
3/2+3/1	1322	1322	0	18	0	5.1	7.3	0.2	12.6	34.4	44.1	7.3	51.4
4/1	124	113	-	-	-	3.8	8.8	-	12.6	364.5	6.7	8.8	15.5
5/1	37	37	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1416	1416	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	105	105	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1329	1329	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	44	44	-	-	-	-	-	-	1.3	108.8	-	-	2.8
Ped Link: P2	44	44	-	-	-	-	-	-	1.4	115.3	-	-	2.9
Ped Link: P3	44	44	-	-	-	-	-	-	1.3	109.8	-	-	2.8
Ped Link: P4	44	44	-	-	-	-	-	-	1.3	107.7	-	-	2.8

C1 PRC for Signalled Lanes (%): -21.8 PRC Over All Lanes (%): -21.8 Total Delay for Signalled Lanes (pcuHr): 125.33 Total Delay Over All Lanes(pcuHr): 125.33 Cycle Time (s): 240

Full Input Data And Results

Scenario 4: '2031 With Dev PM' (FG8: '2031 With Dev PM', Plan 1: 'Network Control Plan 1')

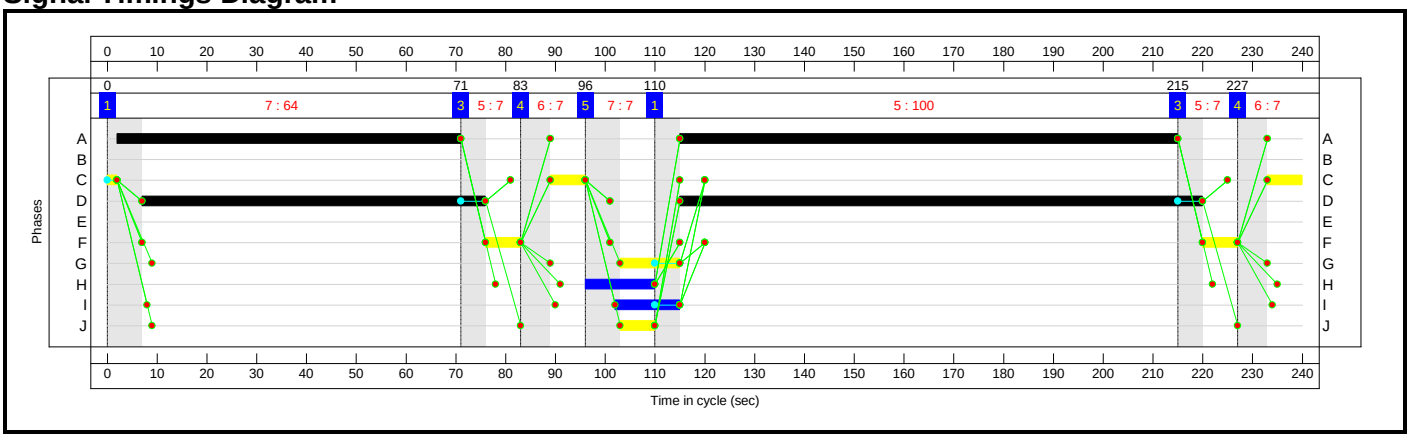
Stage Sequence Diagram



Stage Timings

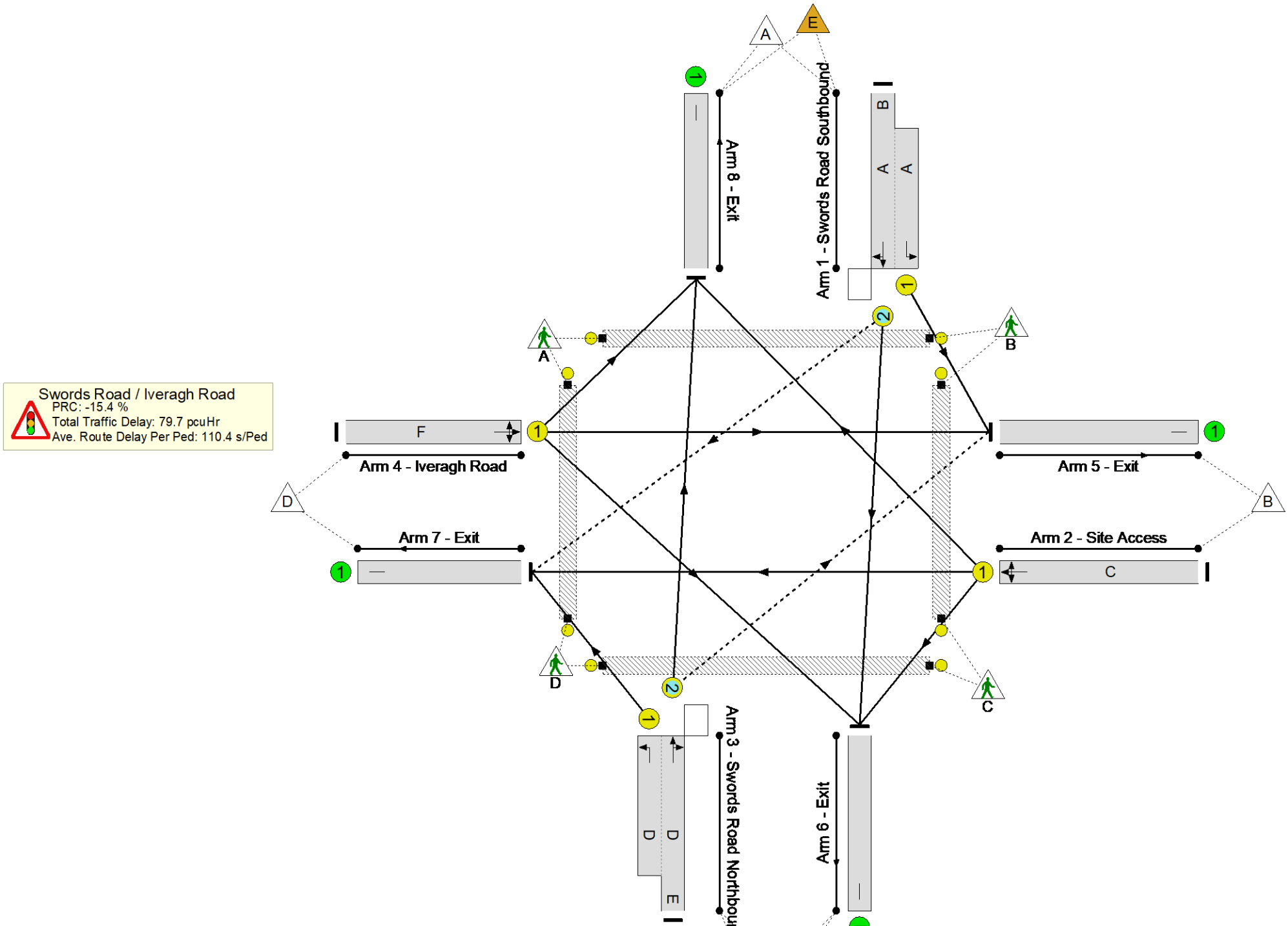
Stage	1	3	4	5	1	3	4
Duration	64	7	7	7	100	7	7
Change Point	0	71	83	96	110	215	227

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Swords Road / Iveragh Road
PRC: -15.4 %
Total Traffic Delay: 79.7 pcuHr
Ave. Route Delay Per Ped: 110.4 s/Ped
Arm 8 - Exit
Arm 1 - Swords Road Southbound
Arm 4 - Iveragh Road
Arm 5 - Exit
Arm 7 - Exit
Arm 2 - Site Access
Arm 3 - Swords Road Northbound
Arm 6 - Exit

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**103.9%**
Swords Road / Iveragh Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**103.9%**
1/2+1/1	Swords Road Southbound Left Ahead Right	O+U	N/A	N/A	A	B	2	169	0	1412	1910:1588	1329+31	103.9 : 103.9%
2/1	Site Access Left Ahead Right	U	N/A	N/A	C		2	16	-	44	1670	125	35.1%
3/2+3/1	Swords Road Northbound Right Left Ahead	O+U	N/A	N/A	D	E	2	174	0	1397	1910:1613	1356+45	99.7 : 99.7%
4/1	Iveragh Road Ahead Right Left	U	N/A	N/A	F		2	14	-	87	1630	109	80.1%
5/1	Exit	U	N/A	N/A	-		-	-	-	64	Inf	Inf	0.0%
6/1	Exit	U	N/A	N/A	-		-	-	-	1402	Inf	Inf	0.0%
7/1	Exit	U	N/A	N/A	-		-	-	-	81	Inf	Inf	0.0%
8/1	Exit	U	N/A	N/A	-		-	-	-	1393	Inf	Inf	0.0%
Ped Link: P1	Swords Road (Southern Crossing)	-	N/A	-	I		1	13	-	44	-	3900	1.1%
Ped Link: P2	Iveragh Road Crossing	-	N/A	-	J		1	7	-	44	-	2100	2.1%
Ped Link: P3	Swords Road (Northern Crossing)	-	N/A	-	G		1	12	-	44	-	3600	1.2%
Ped Link: P4	Site Access Crossing	-	N/A	-	H		1	14	-	44	-	4200	1.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	**-**	**-**	**0**	**32**	**35**	**23.2**	**55.7**	**0.8**	**79.7**	**-**	**-**	**-**	**-**
Swords Road / Iveragh Road	**-**	**-**	**0**	**32**	**35**	**23.2**	**55.7**	**0.8**	**79.7**	**-**	**-**	**-**	**-**
1/2+1/1	1412	1360	0	1	34	14.8	36.0	0.5	51.3	130.8	67.1	36.0	103.1
2/1	44	44	-	-	-	0.7	0.3	-	0.9	77.4	1.7	0.3	2.0
3/2+3/1	1397	1397	0	31	1	6.3	17.7	0.4	24.4	62.8	54.8	17.7	72.5
4/1	87	87	-	-	-	1.4	1.7	-	3.1	129.4	3.5	1.7	5.2
5/1	63	63	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1352	1352	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	80	80	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1393	1393	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	44	44	-	-	-	-	-	-	1.3	108.8	-	-	2.8
Ped Link: P2	44	44	-	-	-	-	-	-	1.4	115.3	-	-	2.9
Ped Link: P3	44	44	-	-	-	-	-	-	1.3	109.8	-	-	2.8
Ped Link: P4	44	44	-	-	-	-	-	-	1.3	107.7	-	-	2.8

C1

PRC for Signalled Lanes (%): -15.4
PRC Over All Lanes (%): -15.4

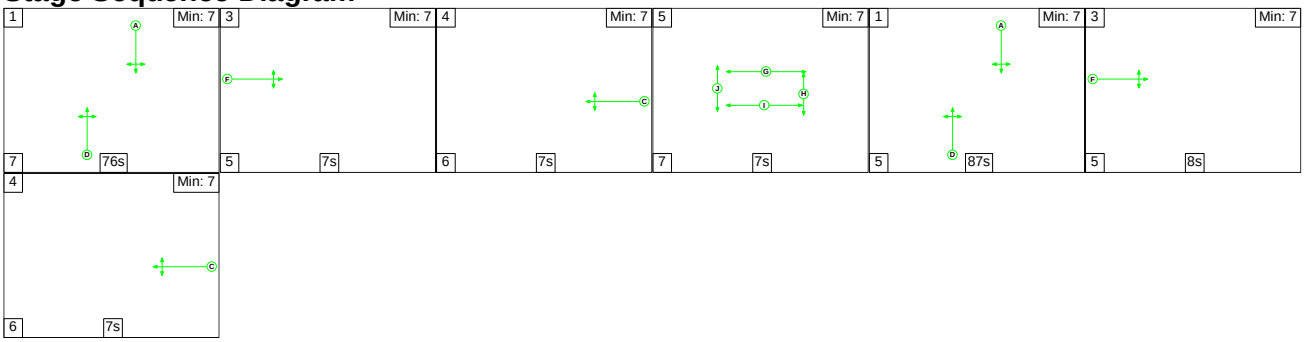
Total Delay for Signalled Lanes (pcuHr): 79.75
Total Delay Over All Lanes(pcuHr): 79.75

Cycle Time (s): 240

Full Input Data And Results

Scenario 5: '2041 With Dev AM' (FG9: '2041 With Dev AM', Plan 1: 'Network Control Plan 1')

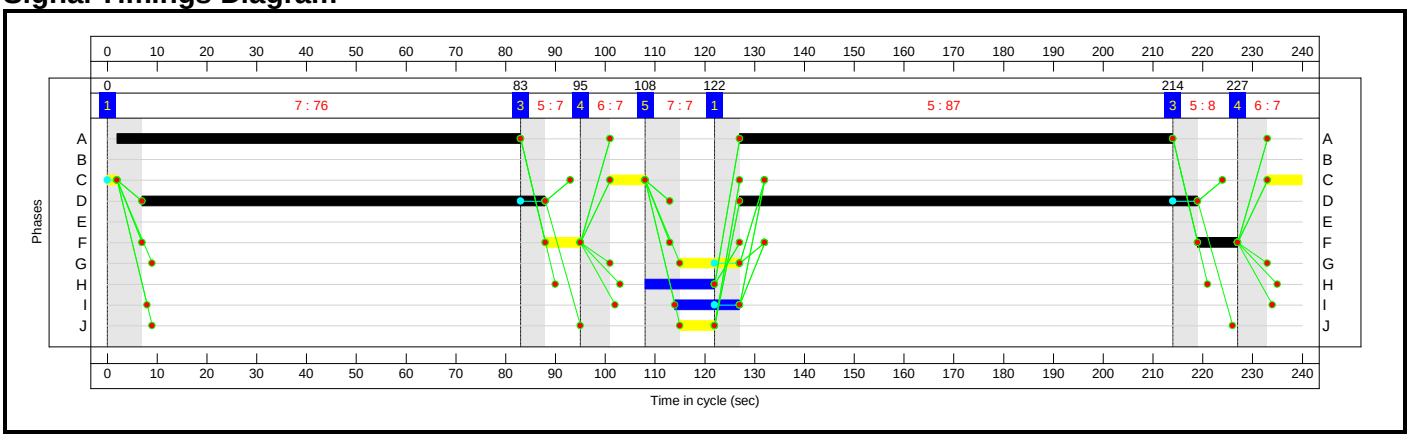
Stage Sequence Diagram



Stage Timings

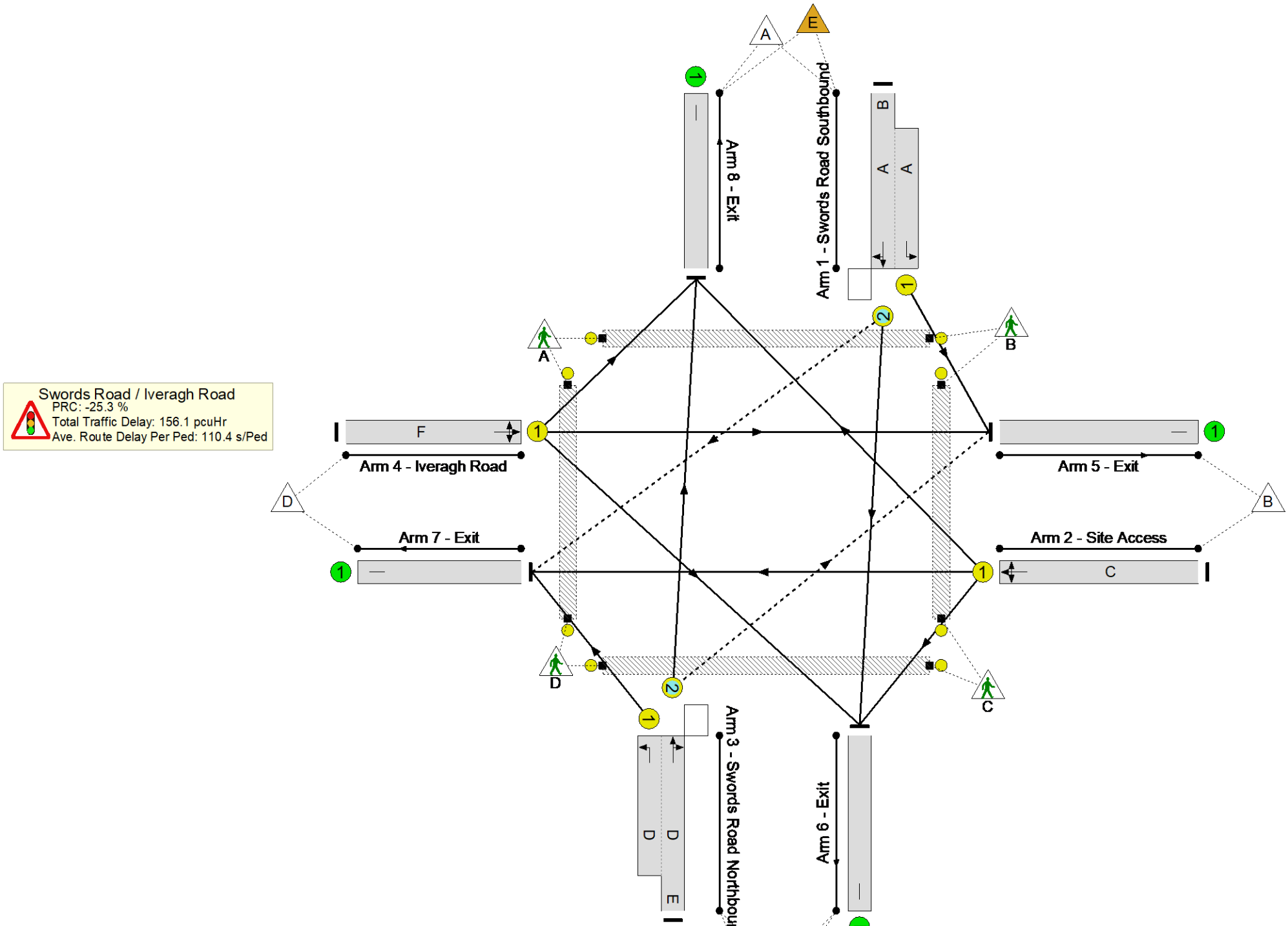
Stage	1	3	4	5	1	3	4
Duration	76	7	7	7	87	8	7
Change Point	0	83	95	108	122	214	227

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram


Swords Road / Iveragh Road
PRC: -25.3 %
Total Traffic Delay: 156.1 pcuHr
Ave. Route Delay Per Ped: 110.4 s/Ped
Arm 8 - Exit
Arm 1 - Swords Road Southbound
Arm 4 - Iveragh Road
Arm 5 - Exit
Arm 7 - Exit
Arm 2 - Site Access
Arm 3 - Swords Road Northbound
Arm 6 - Exit

Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**112.8%**
Swords Road / Iveragh Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**112.8%**
1/2+1/1	Swords Road Southbound Left Ahead Right	O+U	N/A	N/A	A	B	2	168	0	1521	1911:1588	1332+19	112.6 : 112.6%
2/1	Site Access Left Ahead Right	U	N/A	N/A	C		2	16	-	101	1664	125	80.9%
3/2+3/1	Swords Road Northbound Right Left Ahead	O+U	N/A	N/A	D	E	2	173	0	1357	1912:1613	1320+78	97.0 : 97.0%
4/1	Iveragh Road Ahead Right Left	U	N/A	N/A	F		2	15	-	128	1602	113	112.8%
5/1	Exit	U	N/A	N/A	-		-	-	-	39	Inf	Inf	0.0%
6/1	Exit	U	N/A	N/A	-		-	-	-	1588	Inf	Inf	0.0%
7/1	Exit	U	N/A	N/A	-		-	-	-	111	Inf	Inf	0.0%
8/1	Exit	U	N/A	N/A	-		-	-	-	1369	Inf	Inf	0.0%
Ped Link: P1	Swords Road (Southern Crossing)	-	N/A	-	I		1	13	-	44	-	3900	1.1%
Ped Link: P2	Iveragh Road Crossing	-	N/A	-	J		1	7	-	44	-	2100	2.1%
Ped Link: P3	Swords Road (Northern Crossing)	-	N/A	-	G		1	12	-	44	-	3600	1.2%
Ped Link: P4	Site Access Crossing	-	N/A	-	H		1	14	-	44	-	4200	1.0%

Full Input Data And Results

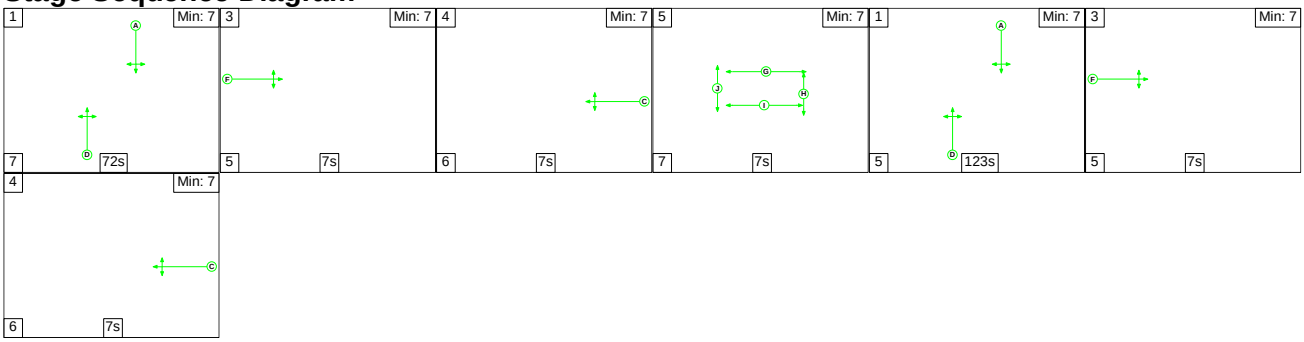
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	**-**	**-**	**0**	**18**	**31**	**43.2**	**112.3**	**0.6**	**156.1**	**-**	**-**	**-**	**-**
Swords Road / Iveragh Road	**-**	**-**	**0**	**18**	**31**	**43.2**	**112.3**	**0.6**	**156.1**	**-**	**-**	**-**	**-**
1/2+1/1	1521	1351	0	1	31	32.2	89.3	0.4	121.8	288.4	82.1	89.3	171.4
2/1	101	101	-	-	-	1.6	1.8	-	3.4	120.9	3.7	1.8	5.5
3/2+3/1	1357	1357	0	18	0	5.6	10.8	0.2	16.6	44.1	48.4	10.8	59.1
4/1	128	113	-	-	-	3.9	10.4	-	14.2	400.1	6.6	10.4	17.0
5/1	37	37	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1416	1416	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	107	107	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1362	1362	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	44	44	-	-	-	-	-	-	1.3	108.8	-	-	2.8
Ped Link: P2	44	44	-	-	-	-	-	-	1.4	115.3	-	-	2.9
Ped Link: P3	44	44	-	-	-	-	-	-	1.3	109.8	-	-	2.8
Ped Link: P4	44	44	-	-	-	-	-	-	1.3	107.7	-	-	2.8

C1 PRC for Signalled Lanes (%): -25.3 Total Delay for Signalled Lanes (pcuHr): 156.07 Cycle Time (s): 240
PRC Over All Lanes (%): -25.3 Total Delay Over All Lanes(pcuHr): 156.07

Full Input Data And Results

Scenario 6: '2041 With Dev PM' (FG10: '2041 With Dev PM', Plan 1: 'Network Control Plan 1')

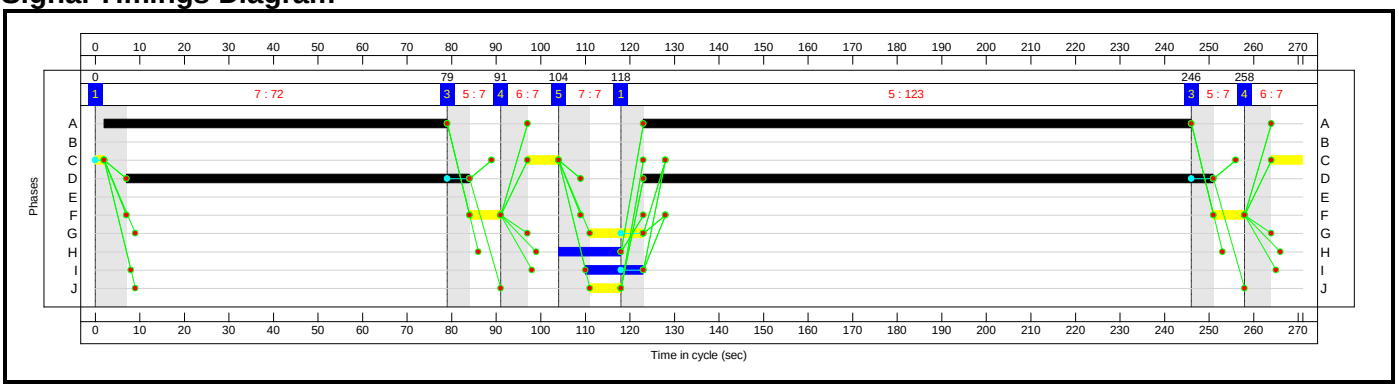
Stage Sequence Diagram



Stage Timings

Stage	1	3	4	5	1	3	4
Duration	72	7	7	7	123	7	7
Change Point	0	79	91	104	118	246	258

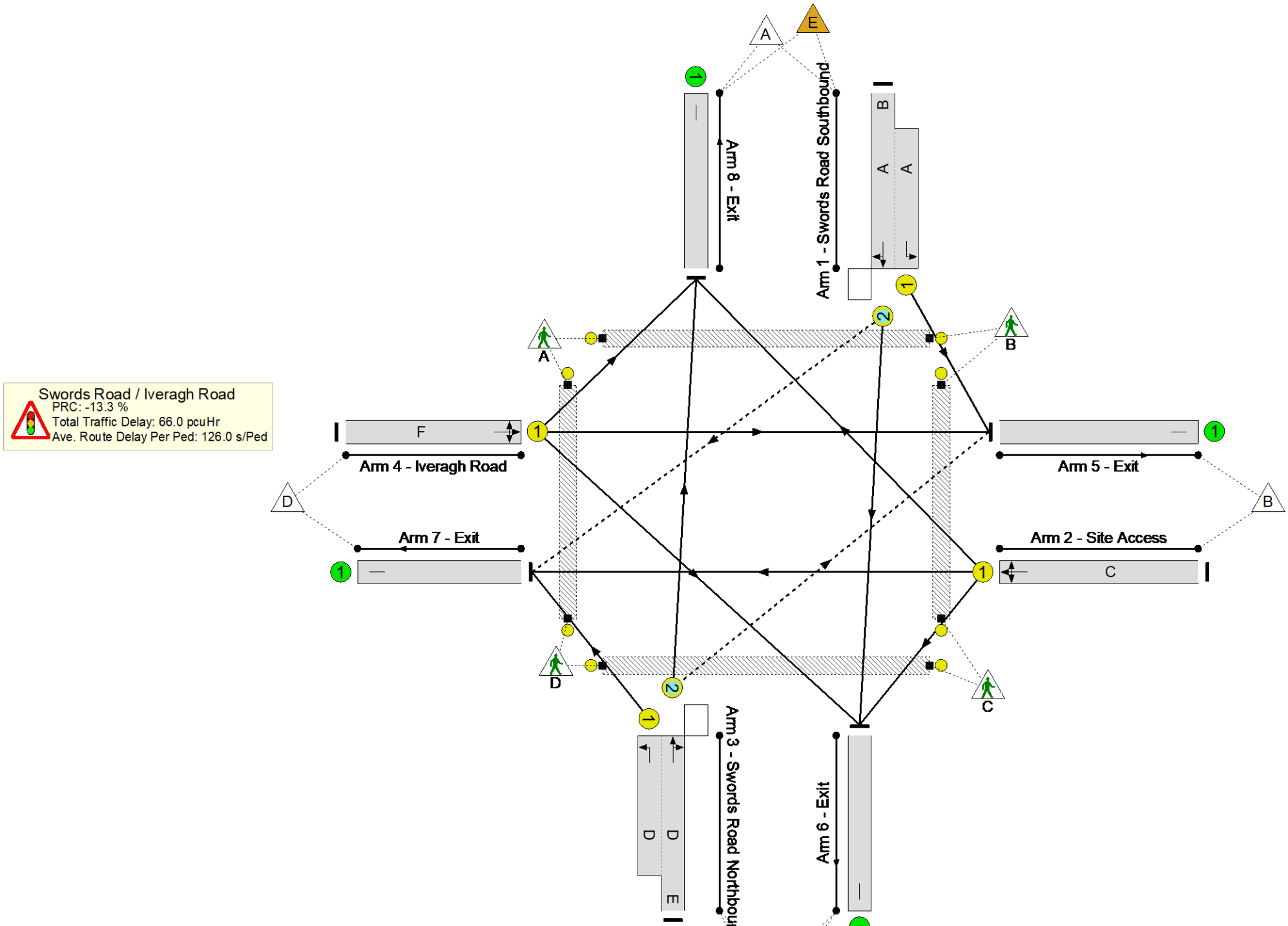
Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram

Full Input Data And Results



Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.9%**
Swords Road / Iveragh Road	-	-	**N/A**	-	-		-	-	-	-	-	-	**101.9%**
1/2+1/1	Swords Road Southbound Left Ahead Right	O+U	N/A	N/A	A	B	2	200	0	1449	1910:1588	1390+31	101.9 : 101.9%
2/1	Site Access Left Ahead Right	U	N/A	N/A	C		2	16	-	44	1670	111	39.7%
3/2+3/1	Swords Road Northbound Right Left Ahead	O+U	N/A	N/A	D	E	2	205	0	1433	1910:1613	1411+47	98.3 : 98.3%
4/1	Iveragh Road Ahead Right Left	U	N/A	N/A	F		2	14	-	89	1629	96	92.5%
5/1	Exit	U	N/A	N/A	-		-	-	-	64	Inf	Inf	0.0%
6/1	Exit	U	N/A	N/A	-		-	-	-	1439	Inf	Inf	0.0%
7/1	Exit	U	N/A	N/A	-		-	-	-	83	Inf	Inf	0.0%
8/1	Exit	U	N/A	N/A	-		-	-	-	1429	Inf	Inf	0.0%
Ped Link: P1	Swords Road (Southern Crossing)	-	N/A	-	I		1	13	-	44	-	3454	1.3%
Ped Link: P2	Iveragh Road Crossing	-	N/A	-	J		1	7	-	44	-	1860	2.4%
Ped Link: P3	Swords Road (Northern Crossing)	-	N/A	-	G		1	12	-	44	-	3188	1.4%
Ped Link: P4	Site Access Crossing	-	N/A	-	H		1	14	-	44	-	3720	1.2%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Strategic Housing Development at Swords Road, Whitehall, Dublin 9	**-**	**-**	**0**	**32**	**36**	**20.6**	**44.4**	**1.1**	**66.0**	**-**	**-**	**-**	**-**
Swords Road / Iveragh Road	**-**	**-**	**0**	**32**	**36**	**20.6**	**44.4**	**1.1**	**66.0**	**-**	**-**	**-**	**-**
1/2+1/1	1449	1421	0	1	36	11.8	27.1	0.6	39.5	98.2	75.1	27.1	102.2
2/1	44	44	-	-	-	0.8	0.3	-	1.1	91.3	2.0	0.3	2.3
3/2+3/1	1433	1433	0	31	1	6.1	13.7	0.5	20.3	50.9	60.1	13.7	73.8
4/1	89	89	-	-	-	1.9	3.3	-	5.1	206.6	4.1	3.3	7.4
5/1	63	63	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	1413	1413	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
7/1	82	82	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
8/1	1429	1429	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	44	44	-	-	-	-	-	-	1.5	124.3	-	-	3.2
Ped Link: P2	44	44	-	-	-	-	-	-	1.6	131.1	-	-	3.3
Ped Link: P3	44	44	-	-	-	-	-	-	1.5	125.4	-	-	3.2
Ped Link: P4	44	44	-	-	-	-	-	-	1.5	123.3	-	-	3.2

C1 PRC for Signalled Lanes (%): -13.3 Total Delay for Signalled Lanes (pcuHr): 66.01 Cycle Time (s): 271
PRC Over All Lanes (%): -13.3 Total Delay Over All Lanes(pcuHr): 66.01

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