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Proposed Strategic Housing Development at the Former Chivers Factory Site, Coolock, Dublin 17

Traffic and Transportation Assessment

Platinum Land Limited

Project number: PR-385358

Quality information

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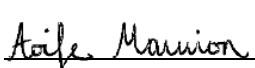		
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Revision History

Revision	Revision date	Details	Authorised	Name	Position
0	8th April 2019	Planning Issue to ABP	CO'B	Cormac O'Brien	Director

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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 of 495 no. Build to Rent residential apartment units, residential amenities, open space and a service building including a crèche, café and gym at the site formerly occupied by Chivers Factory, on Coolock Drive, Dublin 17.

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 network and to minimise any potential traffic impacts.

The TTA demonstrates that the proposed development can be readily accessed by existing and future sustainable modes of transport within the immediate vicinity of the site and that the surrounding road network has the capacity to accommodate the vehicular traffic generated as a result of the proposed development. There are excellent non-car based alternative modes available to residents and visitors at the subject site.

The percentage impact of additional vehicular traffic generated by the proposed development is less than 10%. In consideration of the Traffic Impact Analysis, the junction modelling results indicate that the development will have a negligible impact upon the base scenario.

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.

Pre Application Consultation (PAC)

A significant amount of Pre Application Consultation (PAC) discussions with various stakeholders of the project, outlined in chronological order as follows:

- **DCC Transportation Planning Division (TPD):** Initial consultation discussions were held in December 2017 and January 2018 between the Applicant and the TPD.
- **S247 Dublin City Council:** Formal pre application consultation was undertaken on the 10th April 2018, 9th May 2018 and the 20th September 2018 which the Applicant attended with the DCC TPD.
- **An Bord Pleanala:** A PAC tripartite meeting with ABP and DCC was held on Friday 16th November 2018.
- **Further DCC PAC:** AECOM attended a meeting with DCC Transport Planning Division on Wednesday 9th January 2019 and the DCC Transport Modelling team on the Thursday 17th January 2019 to further discuss the emerging development.

The outcomes of the above correspondence have been incorporated within the proposed application and addressed within this TTA. Section 1.3 of this report presents the key items discussed between the Applicant / AECOM and the various consultees.

Proposed Development

The proposed development comprises 495 no. Build to Rent residential apartments, which include 61 no. studio apartments, 150 no. 1-bed, 178 no. 2-beds and 106 no. 3-bedroom apartments. The proposed apartments will be split across 4 no. proposed blocks (Blocks A1, A2, B and C), as illustrated within the Architect's site layout plan. In addition the scheme includes for a service building including a crèche (300 sq. m), café (34 sq. m) and gym (412 sq. m) at the northwest corner of the site.

Proposed Car Parking

It is proposed to provide a total of 396 car parking spaces on site, 391 no. spaces dedicated to the 495 no. residential units and 5 no. spaces dedicated to the service building for the proposed crèche. Dedicated car parking provision is proposed for disabled parking (5% of the total spaces, i.e. 23 no. spaces), electric vehicle spaces (6% of the total spaces, i.e. 24 spaces) and motorcycle parking (4% of the total spaces, i.e. 16 no. spaces) as per the Dublin City Council (DCC) Development Plan requirements. It is also proposed to provide 10 no. car club spaces and 14 no. visitor spaces for the proposed residential development.

Car Parking Policy

The proposed car parking provision is below the DCC Development Plan (Maximum) car 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 (March 2018). The guidelines recommends that for Intermediate Urban Locations *"planning authorities should consider a reduced overall car parking standard and apply an appropriate maximum car parking standard".*

Section 5 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. Following the assessment outlined in Section 5, it is determined that the proposed quantum of 0.79 of a car parking space per residential dwelling is sufficient to cater for the anticipated demand of perspective residents of the site. This ratio has been agreed in principle, subject to a car parking management strategy which is included within this TTA.

Proposed Cycle Parking

The DCC Development Plan Standards (2016 – 2022) and the Sustainable Urban Housing Design of New Apartments guidelines (March 2018) have been adhered to when determining a suitable amount of cycle parking for the proposed development. A total of 650 cycle parking spaces are proposed for the overall development. The cycle parking will comprise of secure cycle spaces within the basement (634 no. spaces) and standard 'Sheffield style' cycle parking racks (16 no. spaces) at the surface level, adjacent to the service building for both residents and visitors.

Proposed Internal Roads Layout and Site Access

The proposed internal roads layout has been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS) guidelines to cater for the anticipated vehicle, cyclist and pedestrian demand of the development.

It is proposed to retain the existing access location into the former Chivers factory site. The main vehicular access / egress to serve the development will be a staggered priority junction with Coolock Drive / Adare Road.

Internal 1.8m wide pedestrian footpaths are proposed, and internal uncontrolled pedestrian crossings are provided in the form of dropped kerbs and tactile paving.

A visibility splay assessment and swept path analysis have been undertaken to demonstrate that the proposed development can cater for traffic to safely access and egress the site and manoeuvre within the development. A servicing strategy has also been outlined in Section 8, to set out the servicing strategy for the waste and delivery management of the proposed development. Please see AECOM drawing numbers PR385358-ACM-00-00-DR-CE-10-0101 and PR385358-ACM-00-00-DR-CE-10-0102 for reference.

Proposed External Infrastructure Improvements

Through pre-planning consultation with DCC, it is agreed to include as part of the application a number of upgrades to the existing pedestrian crossing infrastructure along the local public road network. The proposed infrastructure improvements are summarised as follows:

- Upgrading of the site and signals at the junction of Coolock Drive and Oscar Traynor Road;
- Provision of a signalised pedestrian crossing to the south of the site entrance on Coolock Drive; and
- Provision of a signalised pedestrian crossing at the proposed pedestrian entrance to the park off Greencastle Road.

Accessibility

The proposed development is situated within an ideal location to benefit from existing sustainable travel facilities. High frequency bus services are available from Malahide Road, which is within 500m proximity from the north eastern boundary of the site and connects the site to numerous local destinations including Dublin City Centre. There are also bus services available off Greencastle Road, Coolock Drive and Oscar Traynor Road, all within 400m.

In addition, rail services are located approximately 1.9km from the site, further enhancing the accessibility of the site. The DART extends along the coastline of the South Dublin area, extending from the City Centre to Ballsbridge, Sandymount, Merrion, Booterstown, Blackrock, Monkstown, Dun Laoghaire, Dalkey, Ballybrack, Shankhill, Bray and Greystones, and along the coastline of the north Dublin area extending from the City Centre to Clontarf, Sutton, Howth and Malahide.

Furthermore, the NTA propose several additional Bus Connects stops along Malahide Road, approximately 500m walking distance from the proposed development. The NTA envisages that the benefits will include improved bus service frequency and reliability. The scheme will comprise of a strategy to develop continuous bus lanes along a series of bus corridors.

Traffic Impact

The overall development will generate a resultant trip generation of 176 and 172 two way movements during the AM and PM peak hours respectively. These figures were obtained using the Trip Rate Information Computer System (TRICS 7.6.1).

The percentage impact of additional traffic generated by the proposed development is less than 10% on both junctions assessed during the AM and PM peak hours. This is less than the TII percentage impact standards to warrant detailed assessment of the proposed access junctions (over 10%, of the existing two-way flows on the adjoining highway).

For robustness, AECOM has undertaken a detailed junction modelling analysis using LinSig and Junctions 9 on the Oscar Traynor Road / Coolock Drive signalised junction. The assumed Opening Year (2022) and Future Year scenarios (2027 and 2037) 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 result of the junction analysis undertaken demonstrates that traffic from the proposed development can be accommodated on the surrounding road network without any material or adverse impact on the road infrastructure.

Table of Contents

1. Introduction

1.1 Background

AECOM has been commissioned by Platinum Land Limited to prepare a Traffic and Transport Assessment (TTA) to accompany a Strategic Housing Development (SHD) application to An Bord Pleanala (ABP) at the former Chivers Factory (herein described as 'the site') on Coolock Drive, Coolock, Dublin 17.

The site currently comprises of a derelict brownfield site accessed via an existing staggered junction off Coolock Drive / Adare Road.

The proposed development comprises 495 no. Build to Rent residential apartments and a service building comprising of a crèche, café and gym. The proposed schedule of accommodation is as follows:

- 61 no. studio apartments;
- 150 no. 1 Bedroom apartments;
- 178 no. 2 Bedroom apartments;
- 106 no. 3 Bedroom apartments;
- Crèche (300 sq. m GFA);
- Gym (412 sq. m GFA); and
- Café (34 sq. m).

As part of the application, it is also proposed to introduce a number of upgrades to the existing pedestrian crossing infrastructure along the local public road network. The proposed pedestrian improvements are summarised as follows:

- Upgrading of the site and signals at the junction of Coolock Drive and Oscar Traynor Road;
- Provision of a signalised pedestrian crossing to the south of the site entrance on Coolock Drive; and
- Provision of a signalised pedestrian crossing at the proposed pedestrian entrance to the park off Greencastle Road.

A site location map is presented in Figure 1.1 below, which shows the site and local improvement upgrades immediately adjacent to it and remotely at the Oscar Traynor Road / Coolock Drive junction.

Figure 1.1 Indicative Site Location

1.2 Objectives

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;
- DMURS (Design Manual for Urban Roads and Streets), March 2013 (Dept of Transport, Tourism and Sport/Dept. of Environment, Community & Local Govt);
- Dublin City Council Development Plan 2016 – 2022;
- The Traffic Management Guidelines 2003 (jointly published by the DOELG, DTO, DOT);
- The National Planning Framework (Project Ireland 2040);
- Traffic Signs Manual Chapter 8 Temporary Traffic Measures and Sign Roadworks (2008);
- Addendum Transport Chapter 8, Temporary Traffic Measures and Sign Roadworks (2008);
- TII (Transport Infrastructure Ireland) Traffic and Transport Assessment Guidelines (May 2014);
- Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2016);
- The NTA (National Transport Authority) Greater Dublin Area Cycle Plan (December 2013); and
- Design Recommendations for Multi-storey and underground car parks (4th Edition) March 2011.

1.3 Pre Application Consultation (PAC)

1.3.1 Dublin City Council

The Applicant corresponded with the DCC Transportation Planning Division (TPD) in December 2017, January 2018. Formal pre application consultation was undertaken on the 10th April 2018, 9th May 2018 and 20th September 2018 which the Applicant attended with the DCC TPD. The correspondence provided an opportunity to present the emerging proposals from a traffic and transport perspective.

DCC recommended that in order to provide a case for the reduced car parking rate of the proposed development, the following transportation items should be included within the Traffic and Transport Assessment:

- **Car ownership data:** The existing car parking ownership from the latest census data has been discussed in Section 5.3.2 of this report.
- **Modal split:** The projected modal split of the future residents, staff and visitors of the proposed development has been discussed in Section 11 of this report.
- **Overspill Parking:** Mitigation measures for the potential overspill of car parking onto the local road network has been discussed in Section 5 of this report.
- **Mobility Management Plan:** The provision of a proactive mobility management strategy for the site during use including the appointment of a Mobility Manager on site to coordinate use of facilities such as car club vehicles has been outlined in Section 11.

1.3.2 An Bord Pleanala, November 2018

A PAC tripartite meeting with ABP and DCC was held on Friday 16th November 2018. Prior to the meeting, DCC provided an opinion. AECOM's response to DCC's opinion is presented in Appendix A of this report. At the PAC meeting, ABP queried the existing accessibility of the site and requested for a mobility strategy to be undertaken to demonstrate the public transport within the local road network. This has been presented by AECOM in Section 11 of this report.

Following the meeting, ABP issued an opinion to the application, which includes 4 no. items. AECOM's response to number 4 (car parking) of opinion is presented in Appendix A of this report.

1.3.3 Further DCC PAC

AECOM attended a meeting with DCC Transport Planning Division on Wednesday 9th January 2019. Discussions were based around AECOM's response to DCC's opinion and associated planning drawings, which were agreed in principle with the Council. Please refer to Appendix A for further reference.

AECOM had another follow up meeting with DCC Transport Modelling team on Thursday 16th January 2019 to discuss the requirements of the upgrade at the Oscar Traynor Road. It was acknowledged that the Oscar Traynor Road would require road widening, double lane approaches and pedestrian crossing facilities on the northern and

western arms to improve the pedestrian facilities for the proposed development. AECOM has included DCC's infrastructure requirements as part of this application. Please refer to Section 6 for further details of the Oscar Traynor Road upgrade.

1.4 Structure of Report

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

- Section 2 presents the findings of a site assessment and review of the surrounding road network in terms of location and existing / permitted uses;
- Section 3 presents an overview of the baseline accessibility of the site: existing pedestrian / cyclist provision, public transport, on-street car parking;
- Section 4 discusses the proposed development, and gives a brief outline of the proposed internal road network and site layout;
- Section 5 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 6 discusses the proposed improvements to the local road network;
- Section 8 outlines the waste servicing strategy of the proposed development during the operational stage;
- Section 7 outlines a statement of compliance for the proposed development in response to An Bord Pleanala;
- Section 9 considers the traffic generation and potential impacts of the development;
- Section 10 contains an analysis of the capacity of key junctions;
- Section 11 presents the mobility management plan;
- Section 12 presents the outline construction management requirements;
- Section 13 provides a summary and conclusion.

2. Existing Site Information

2.1 General

This section of the TA 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 was carried out on Monday 7th January and Wednesday 16th January 2019. This section also takes into account a traffic survey within the site's vicinity, online data and a review of the key national, regional and local policy documents of relevance to the proposed development site.

2.2 Existing Site Conditions

Previously the site had comprised of the former Chivers Factory, with an existing vehicular access to the site located off Coolock Drive, situated immediately southwest of the Coolock Drive / Greencastle Road priority junction.

AECOM understands that the site has been derelict since approximately 2008. At the time of closure approximately 60 people were employed at the site.

Whilst the site is currently derelict and has no vehicular activity, it should be acknowledged that the site, when operational, had a level of vehicle trips including a significant proportion of larger vehicles / HGVs associated with the factory use.

2.2.1 Land Use Zoning Objectives

The northern portion of the site is formally zoned as '*Z9 – To preserve, provide and improve recreational amenity and open space and green networks'.*

DCC formally varied the zoning of the southern portion of the site under Variation (No. 5) of the DCC Development Plan (2016 – 2022):

- From Zoning Objective Z6 – To provide for the creation and protection of enterprise and facilitate opportunities for employment creation;
- To Zoning Objective Z1 – To protect, provide and improve residential amenities.

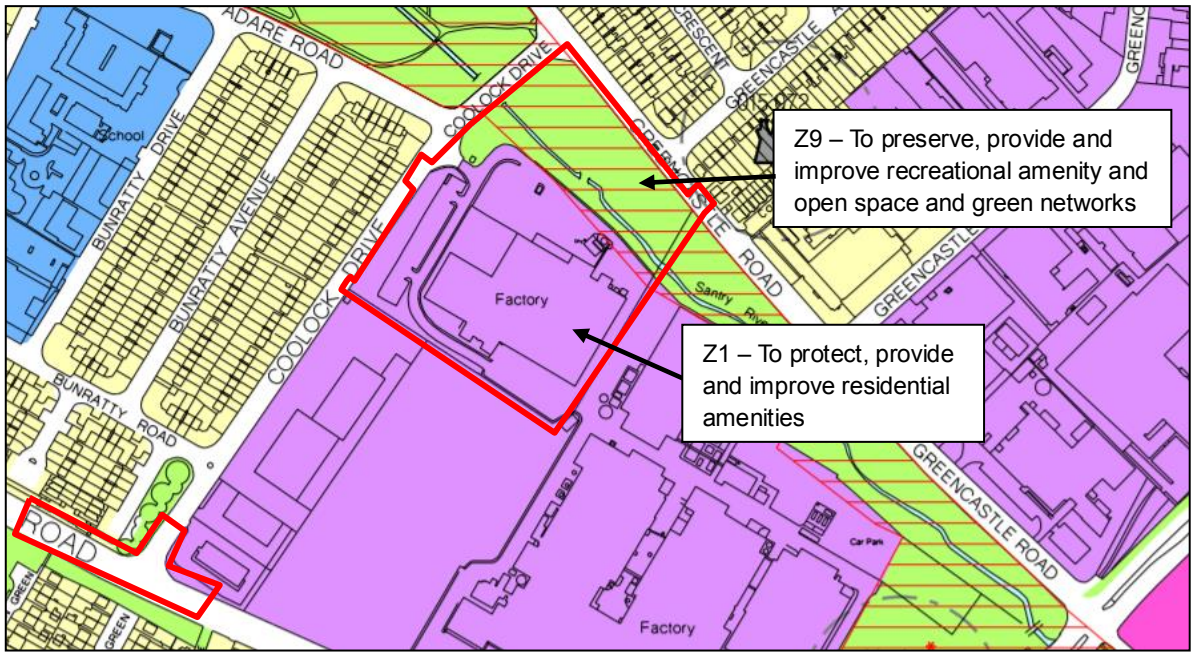


Figure 2.1 DCC Development Plan Land Use Zoning Objectives Map B

2.3 Existing Local Road Network

Coolock Drive is a single carriageway, approx. 10.6m wide kerb-to-kerb, with a single lane in either direction. Coolock Drive will provide the access to the site and connects to Greencastle Road.

In addition, the existing footpaths of 2.0m (minimum) are situated on both sides of the carriageway, which means that the highway / pedestrian area is at least 14.6m wide. The speed limit along Coolock Drive is 50 km/h in the vicinity of the development site. There are currently speed bumps situated along the carriageway to enhance the traffic calming features of the road. Figure 2.2 and 2.3 illustrate the exiting conditions of the road.

Figure 2.2 Coolock Drive Facing North

Figure 2.3 Existing Access off Coolock Drive

Greencastle Road runs along the northern boundary of the proposed site, it is a single carriageway, approx. 8m wide kerb-to-kerb. The road is subject to a 60km/h speed limit with traffic calming road humps. Existing footpaths are situated on both sides of the carriageway. There is a mini roundabout connecting Greencastle Road to Greencastle Avenue Figures 2.4 and 2.5 illustrate the exiting conditions of the road.

Figure 2.4 Greencastle Road Facing East showing junction with Coolock Drive

Figure 2.5 Greencastle Road Facing West showing mini roundabout with Greencastle Ave

Oscar Traynor Road runs along the southern boundary of the proposed site, it is subject to a 60km/h speed limit and connects to Coolock Drive via a signalised T-Junction in the west and Regional Road 107 in the east via a signalised crossroads.

The road is a single carriageway road with an approx. width of 8.5m, the road widens to two lanes when heading eastbound at the approach to the T-junction with Coolock Drive. Signalised pedestrian crossings are provided at both junctions at either end of Oscar Traynor Road. Figures 2.6 and 2.7 illustrate the exiting conditions of the road.

Figure 2.6 Existing Pedestrian Crossing on Oscar Traynor Road

Figure 2.7 Oscar Traynor Road Facing East at the junction with Coolock Drive

2.4 Existing Site Access

Vehicular access into the site is available off Coolock Drive as illustrated in Figure 2.8. The access is a staggered junction with Adare Road, as shown in Figure 2.9.

Figure 2.8 Existing Vehicular Site Access

Figure 2.9 Adare Road staggered junction arm

2.5 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 and identifies any potential safety concerns in relation to the existing road network.

Traffic collision data was obtained for the period 2005 – 2014, which is the most recent data available from the RSA website. The incidents are categorised into class of severity, which includes minor, serious or fatal collisions. The analysis is shown in Figure 2.10.

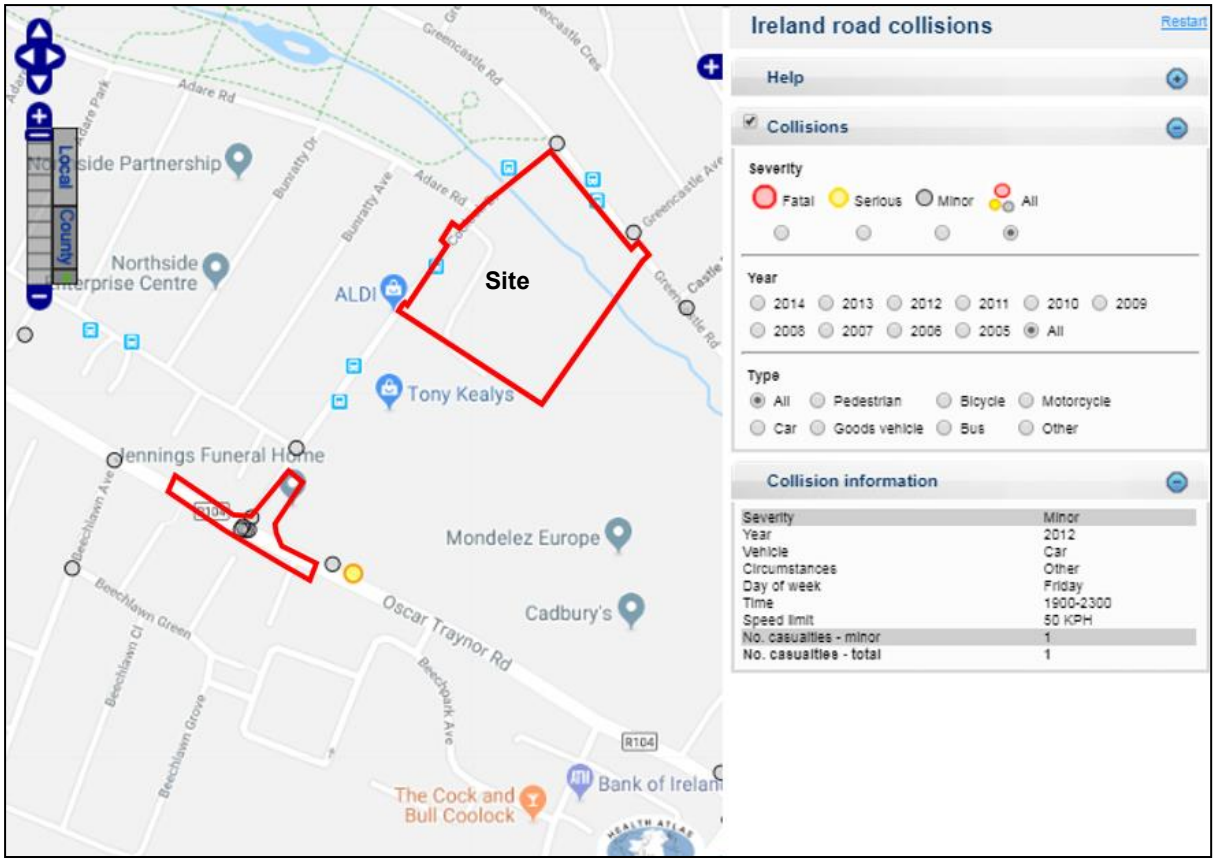


Figure 2.10 Road Collision Statistics (Source: RSA Website)

Figure 2.10 shows that no collisions occurred in the vicinity of the site access junction over the surveyed 10 year period. Highway safety is therefore not considered to warrant further investigation.

A small number of minor collisions and one serious collision occurred along Oscar Traynor Road, to the south of the site. The proposed upgrade to the Oscar Traynor Road/ Coolock Drive signalised road will enhance the road safety at this location.

2.6 Traffic Survey Data

During pre-planning scoping discussions with DCC, it was confirmed that traffic surveys would be required to establish existing traffic conditions of the adjacent road network. Junction Turning Count surveys were carried out on Thursday 14th September 2017. The survey was carried out over a 12-hour period between 07:00 and 19:00 to ascertain the peak hour flows for all traffic movements at the 2 No. junctions.

The surveys indicated that the weekday morning peak occurred between 08:00 and 09:00 with the evening peak occurring between 16:00 and 17:00 – these were observed to be the timeframes during which the junctions were most heavily loaded. The following analysis is based on these peak periods.

The morning and evening peak hour flows for Thursday 14th September 2017 for both critical junctions are detailed in Figures 2.11 and 2.12 respectively.

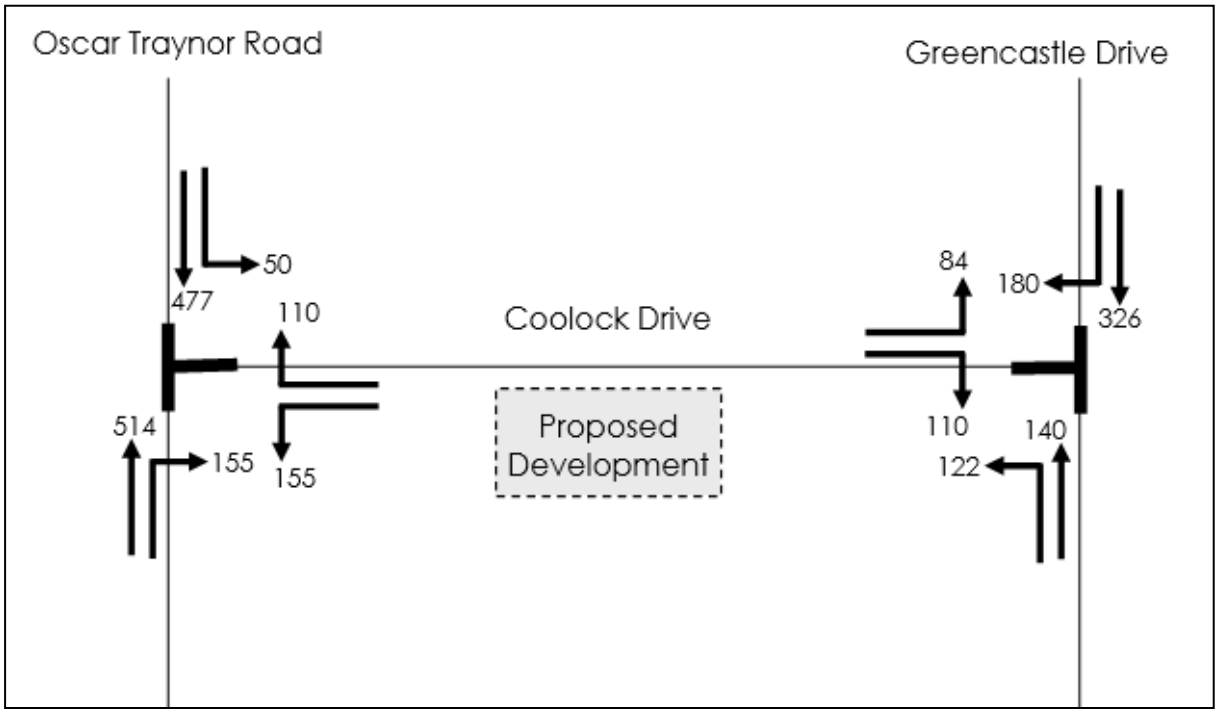


Figure 2.11 Existing Flows during AM Peak Hour (08:00 - 09:00)

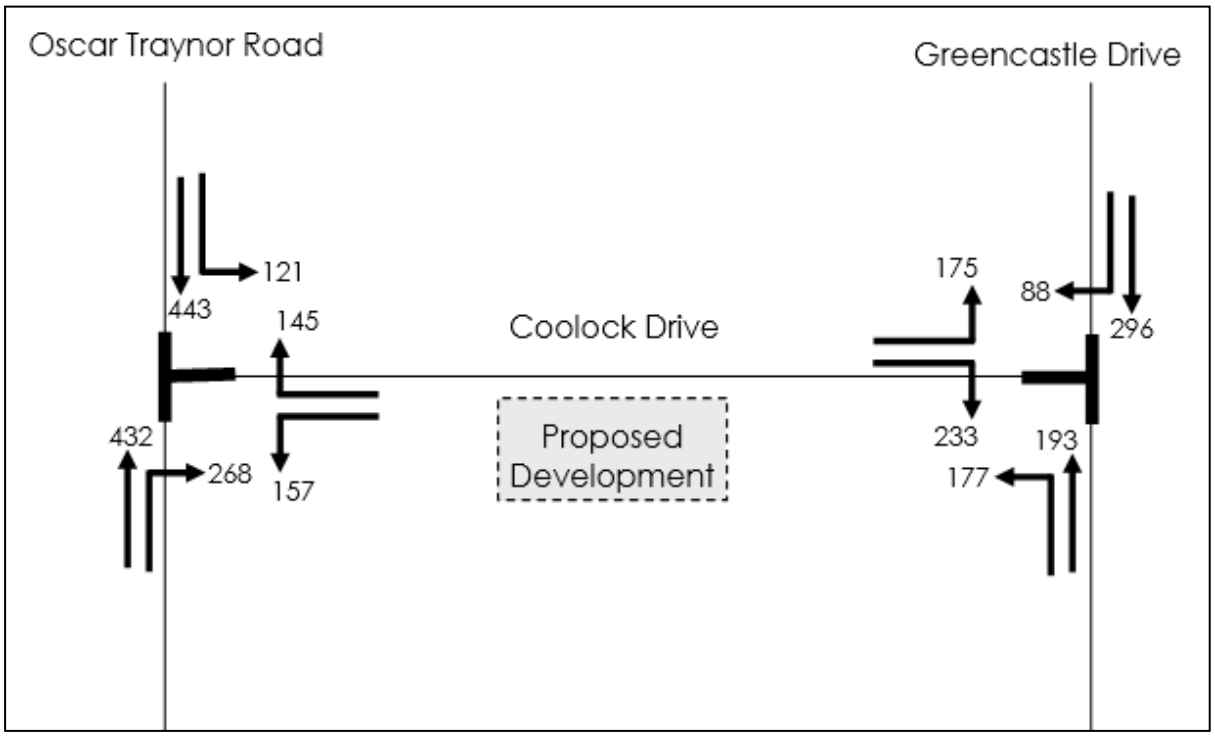


Figure 2.12 Existing Flows during PM Peak Hour (16:00 - 17:00)

3. Baseline Accessibility Data

3.1 Pedestrian Facilities

At present, there are well-established footpaths linking Coolock Drive with Greencastle Road and on to Malahide Road. The total footpath length along these three links is 1.6 km approximately.

Footpaths are situated on either side of all carriageways surrounding the proposed development, i.e. Coolock Drive, Greencastle Road which are both immediately adjacent to the site and Malahide Road (approx. 500m to the east) and Oscar Traynor Road (approx. 500m to the southwest). The footpaths along all roads are approx. 3m in width, accommodating two way pedestrian flows.

A controlled crossing facility is situated at the Coolock Drive / Oscar Traynor Road signalised junction. Tactile paving has recently been installed at the eastern arm of the Oscar Traynor Road junction. Signalised pedestrian crossing facilities are also available at the Greencastle Road / Malahide Road junction and the Oscar Traynor Road / Malahide Road junction in the form of tactile paving, dropped kerbs and 'Look Left / Right' markings, to further support pedestrian movements.

Figure 3.1 Greencastle / Malahide

Figure 3.2 OTR / Coolock Drive

Figure 3.3 OTR / Malahide Road

3.2 Cycle Facilities

Advanced cycle stop markings have been implemented on the Oscar Traynor Road / Coolock Drive signalised junction. There are also shared bus / cycle lanes along Greencastle Road.

There is also a cycle track on the Regional Malahide Road in both directions which runs along the western boundary of the proposed site. This cycle track provides a link to Dublin City Centre approx. 6 km in length.

Furthermore, there is currently a proposal with DCC to open the Santry River Greenway which will run along Greenside Road connecting to Coolock Drive and Greencastle Road. Figure 3.4 illustrates the existing cycle facilities surrounding the proposed site.

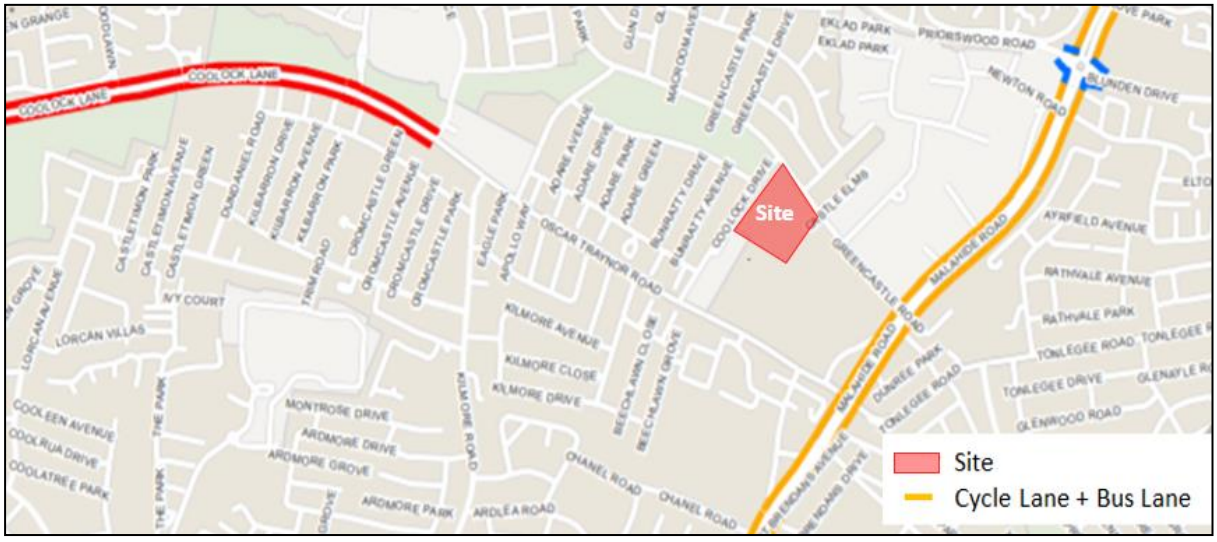


Figure 3.4 Existing Cycling Facilities, National Transport Authority

3.3 Public Transport

3.6.1 Dublin Bus

The site is ideally located to benefit from local bus services. Bus stops for both northbound and southbound services are located on Coolock Drive, within 60m of the site entrance.

Further bus stops are also available at Greencastle Road, situated approximately 130m west of the site boundary and two on Malahide Road within 500m from the northeastern boundary of the site. Table 3.1 illustrates the services available from the Coolock Drive and Greencastle Road bus stops including the available routes, destinations and typical frequencies and proximity to the site.

Table 3.1 Bus Services

Service Number / Bus Stop Location	Route / Destination	Proximity to / from the Site	Mon – Fri Peak Hour Frequency (approx.)	Saturday Frequency (approx.)	Sunday Frequency (approx.)
43 – Malahide Rd	Artane roundabout towards Swords Business Park	500m from northeastern boundary	Every 15 Minutes	Every Hour	Every Hour
15 – Malahide Rd	Clongriffin to Ballycullen Road	540m from northeastern boundary	Every 12 Minutes	Half Hourly	Every 20 Minutes
17a – Malahide Rd	Clare Hall to Jobstown	430m from the southwestern pedestrian access	Every 10 Minutes	Every 10 Minutes	Every 15 Minutes
42– Malahide Rd	Talbot St to Sands Hotl	500m from northeastern boundary	Every 30 Minutes	Every 30 Minutes	Every 30 Minutes
27x – Greencastle Rd, Coolock Drive, Malahide Rd	Clare Hall to Jobstown	190m from northeastern boundary	Every 10 Minutes	Every 10 Minutes	Every 15 Minutes

Table 3.1 shows that regular bus services are available, connecting the site to Dublin City Centre during the typical weekday peak hour periods. Bus services will therefore provide a viable alternative to private car travel from the proposed site to Dublin City Centre.

3.6.1 Bus Connects

The NTA has established Bus Connects, which comprises a strategy to develop continuous bus lanes along a series of bus corridors. This initiative is proposed along the Malahide Road and the NTA envisages that the benefits will include improved bus service frequency and reliability. The figure below illustrates the NTA's plans for upgrading Malahide Road, approximately 500m from the subject site, via Greencastle Road.

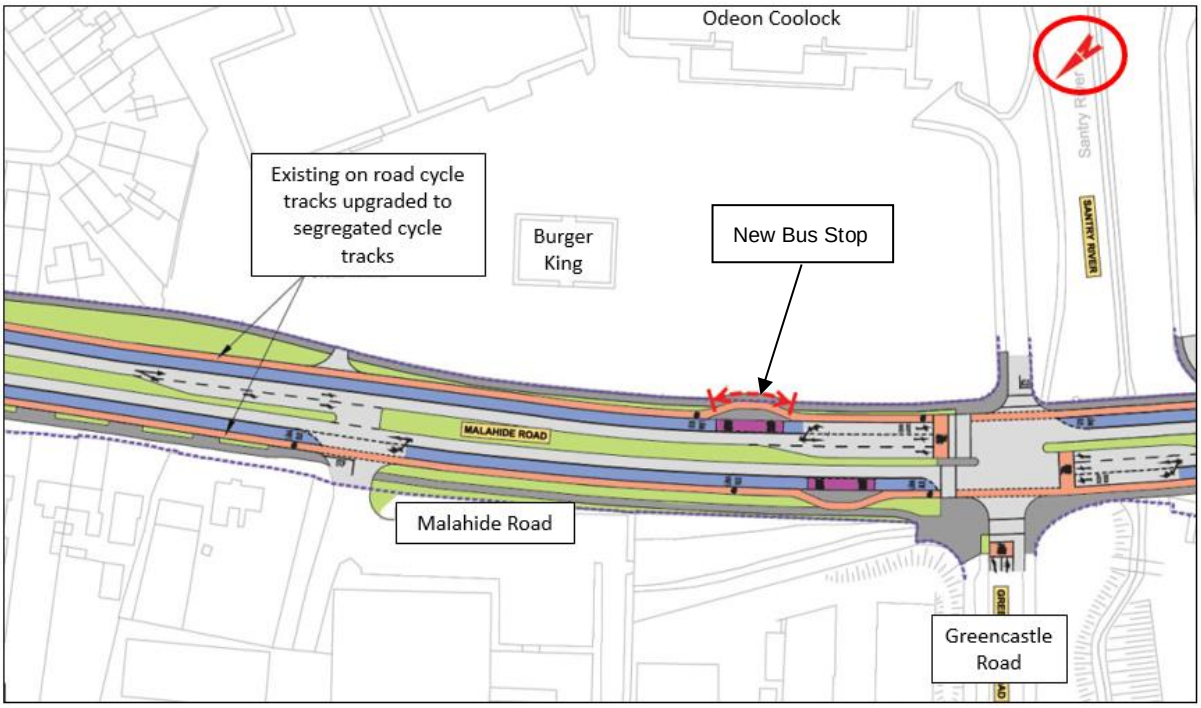


Figure 3.5 Bus Connects Malahide Road

All Quality Bus Corridors radiate from the city centre outwards. Figure 3.6 below illustrates the various pedestrian links from the site towards the Malahide Road QBC, including the proposed pedestrian crossing facilities along Greencastle Road and Coolock Drive, as part of the proposed development.

Figure 3.6 Pedestrian Linkages

3.6.2 Train

The Harmanston DART station is within 1.9km of the propose site. Table 3.2 illustrates the available services and typical frequencies available from this stop.

Table 3.2 Rail Service Frequencies

Route / Destination	Peak Hour Frequency	Saturday Frequency	Sunday Frequency
Dublin – Bray – Greystones	Every 15 Mins	Every hour	Every Hour

3.4 Accessibility

Figure 3.7 provides an overview of the available bus infrastructure and land marks within a 1km walking catchment of the site.

Figure 3.7 Accessibility of Site

3.5 Intermediate Urban Location

The Sustainable Urban Housing Design of New Apartments guidelines (March 2018) identify 3 different location categories, having regard to the proximity and accessibility of a site. Of particular relevance is the Intermediate Urban Location category, which is given to locations "*within easy walking distance (i.e. up to 5 minutes or 400 – 500m) of reasonably frequent (min 15 minute peak hour frequency) urban bus services.*"

Based on the assessment outlined within this Chapter, it is evident that the proposed site location benefits from an array of existing and future sustainable transport infrastructure including:

- Walking and cycling, an existing cycle lane and footpath is located on both sides of Coolock Drive as well as all other roads surrounding the proposed development, providing connectivity from the site to surrounding Dublin Bus stops and employment locations.
- Dublin Bus stops on Coolock Drive north and southbound are located within 100m of the site entrance. These stops provide a high frequency bus service to Dublin City Centre and further afield.
- Harmanston DART station is within 1.9km from the site, where services are available to Greystones and Bray.
- The NTA's proposed Santry River Greenway will improve connectivity of the proposed site, by enhancing existing cycle infrastructure.
- The NTA's proposed Bus Connects stops on Malahide Road will help facilitate additional demand for public transport in the local vicinity of the site.

The above sustainable travel infrastructure demonstrates that the subject site is considered to fall into the Intermediate Urban Location" category. Sustainable travel to the site will be a viable mode of travel, thus reducing the reliance on private vehicular modes to access the site.

4. Proposed Schedule of Accommodation

4.1 Introduction

The following paragraphs describe the scale and nature of the proposed development. This includes a review of the schedule of accommodation, access arrangements and proposed parking provision.

4.2 Development Proposal

The proposed apartments will be split across 4 no. proposed blocks (Blocks A1, A2, B and C), as illustrated within the Architect's site layout plan. In addition the scheme includes for a service building including a crèche (300 sq. m), café (34 sq. m) and gym (412 sq. m) at the northwest corner of the site.

The proposed schedule of accommodation comprises of the following breakdown:

- 61 no. studio apartments;
- 150 no. 1 Bedroom apartments;
- 178 no. 2 Bedroom apartments;
- 106 no. 3 Bedroom apartments;
- Service building including a crèche (300 sq. m GFA), gym (412 sq. m GFA); and café (34 sq. m).

Figure 4.1 Proposed Ground Floor Elevation (Source: Plus Architecture)

4.3 Site Access

It is proposed to retain the existing vehicular access arrangements at the site. The vehicular access / egress will be formalised by the introduction of Stop signs and line to ensure that vehicles approach to a stop and perform the necessary checks for an acceptable gap in traffic before completing their movement to join Coolock Drive, in accordance with DMURS recommendations. It is proposed to provide dropped kerbing with tactile paving for pedestrians to cross the new access.

A secondary access has also been included within the southwestern corner of the site, as shown in Figure 4.1 above. The access will be predominately for pedestrians and cyclists accessing the site and will be prohibited to vehicular movements with the exception of emergency access.

AECOM has submitted drawings no. PR385358-ACM-00-00-DR-CE-10-0101 and PR385358-ACM-00-00-DR-CE-10-0102 to assess the proposed site access arrangements. Please refer to Section 8 of this report for further details.

4.3.1 Visibility Splay

In accordance with DMURS a sightline of 49m is required having regard to the design speed along Coolock Drive (50km/h assumed), from each site access at a setback of 2.4m. These visibility splay requirements are achieved for both accesses, as illustrated in AECOM drawing PR385358-ACM-GA-00-DR-CE-10-0102.

4.3.2 Servicing

An AutoTrack analysis has been carried out at the site access junction to demonstrate its capability to cater for a 10.2m long refuse lorry. The results of the analysis show that the site access junction can accommodate servicing vehicles accessing and exiting the site. This is shown in AECOM drawing no. PR385358-ACM-GA-00-DR-CE-10-0101.

The refuse and servicing strategy is that the bins will be wheeled to the surface for collection, with a setdown at surface level. Please refer to Section 8 for further details.

4.4 Pedestrian and Cyclist Permeability

It is proposed to provide high quality pedestrian accesses throughout the site, from the western boundary at two locations, the northern boundary 2 locations and potential access into the eastern boundary of the site via the public open space. This will ultimately enhance the permeability of the area.

Internal pedestrian crossing facilities will connect the proposed residential development with the service building and the public open space to the north to the adjacent road network. This will provide a safe passage for pedestrian and cyclist movements for the development.

4.5 Proposed Basement

The proposed basement extends across Block B and Block C. Access to the basement car park will be a priority controlled junction arrangement off the internal estate road, leading to a proposed ramp in Block B. The design of the basement has taken into consideration the Dublin City Council Development Plan and the Design Recommendations for Multi-Storey and Underground Car Parks (Fourth Edition, published by the Institute of Structural Engineers. The key design parameters of the basement are summarised as follows:

- 6.0m wide internal carriageway;
- Ramp designed as per the Design Recommendations for Multi-Storey and Underground Car Parks with a gradient of between 1:6 and 1:10 with 3.0m transition zones at 50% of the ramp gradient;
- Dedicated Disabled parking spaces located near to the lifts.

4.6 Car Parking Provision

It is proposed to provide a total of 396 car parking spaces on site, 391 no. spaces dedicated to the 495 no. residential units and 5 no. spaces dedicated to the service building for the proposed crèche, as outlined below.

4.6.1 Residential Car Parking

The proposed car parking provision for the residential element of the development has been identified in relation to the guidance received from the DCC TPD.

It is proposed to provide a quantum of 0.79 car parking spaces per residential dwelling. The proposed break down of residential car parking provision is as follows:

Ground Floor Block B:	124 no. spaces;
Ground Floor Block C:	58 no. spaces;
External Ground Floor:	28 no. spaces;
Basement Level (Block B & C):	181 no. spaces;
Total Residential Parking:	**391 no. spaces** (i.e. 0.79 spaces per 495 residential units).

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

It is proposed to provide the following as per the DCC Development Plan:

- 22 no. mobility impaired spaces (i.e. over 5% of the total spaces);
- 16 no. motorcycle spaces (i.e. 4% of the total spaces); and
- 24 no. spaces available for electric vehicle charging points (i.e. 6% of the total spaces).

It is also proposed to provide 10 no. car club spaces and 14 no. visitor spaces on the external surface level, for the proposed residential development.

4.6.2 Service Building Car Parking

Crèche: Whilst there is no particular standard for a crèche land use within the DCC Development Plan, it is acknowledged that the parking requirements are based on maximum for a school land use (i.e. a maximum of 1 space per classroom). It is envisioned that the proposed crèche will cater for approximately 81 no. children of at least 5 classrooms. It is therefore proposed to provide **5 no. spaces** for the crèche.

It should be noted that the majority of the crèche users will be perspective residents of the development and will therefore will likely be accessing the building on foot.

Gym and Café: Given that the proposed gym (412 sq. m GFA) and café (34 sq. m) are for residential use only, no dedicated car parking has been allocated for these respective land uses. It is acknowledged however that the 5 no. parking spaces proposed for the crèche can facilitate visitors of the gym / café outside the crèche opening hours.

4.7 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 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 (March 2018) have been adhered to when determining a suitable amount of cycle parking for the proposed development.

Table 4.1 illustrates the proposed cycle parking provision against DCC's parking standards.

Table 4.1 Cycle Parking Standards

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)	495 Apartment Units	1 cycle space per unit	495	495
	Visitor Spaces	TBD on case by case	NA	
The Sustainable Urban Housing Design of New Apartments guidelines (March 2018)	Bedrooms	1 cycle space per bedroom	495	885
	Visitor Spaces	1 cycle space per 2 units	150	

A total of **650 cycle parking spaces** are proposed within the site to cater for the proposed development.

Table 4.1 above demonstrates that the cycle parking provision of 650 no. spaces is compliant with the DCC Development Plan standards (495 no. spaces) but below 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 Mobility Management Plan 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:

Basement level (across Block B & C) 634 no. spaces in secure bike storage;

Ground Floor (adjacent to service building) 16 no. spaces in the form of Sheffield stands.

Access of the basement level cycle parking will be permitted into the bike stores 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.

5. Car Parking Policy

5.1 General

As stated previously, the proposed car parking provision is below the DCC Development Plan (Maximum) car parking standards, which recommends 1 space per unit. This section sets out the various policy and research documents used to establish that the proposed car parking quantum of 0.79 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. Research was also undertaken by Go Car, and the Census Data statistics in relation to car ownership of residents in apartments. The findings from the various policy and research are documented below.

5.2 DCC Development Plan Parking 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."*

5.3 Design Standards for New Apartments

The design team has taken into consideration the Dept. of Housing, Planning and Local Government '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 Intermediate urban locations within the policy (Section 4.2.1) is documented as follows:

- *"In suburban / urban locations served by public transport or close to town centres or employment areas and particularly for housing schemes with more than 45 dwellings per hectare net (18 per acre), planning authorities must consider a reduced overall car parking standard and apply an appropriate maximum car parking standard.*

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.

5.3.1 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, which is included in Appendix F. 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 10 no dedicated Car Cub parking spaces within the Coolock Drive residential scheme. The car club spaces will be located at surface level within the permitted internal estate road, to ensure the car club spaces are clearly visible to future residents, which will assist to promote their uptake and usage, as opposed to locating the spaces within a basement. On the basis of the Go Car research, the provision of 10 no car club spaces has the potential to replace up to 100 – 200 car parking spaces on the site.

5.3.2 Census Data / Car Ownership

Information relating to car ownership for the general area is available from the Central Statistics Office (CSO), specifically Small Area Population Statistics (SAPS) from the 2016 Census.

The SAPS data has been analysed using GIS software, and the following for the following 6 no. Electoral Districts in the general vicinity of the subject site:

- Kilmore C;
- Kilmore D;

- Priorswood D;
- Edenmore;
- Harmonstown A;
- Beaumont C.

The table below indicates the percentage of households in each of these districts with no car.

Table 5.1: Percentage of households adjacent to subject site with no car

Electoral District	Total No. of households	No. of households with no car	% households with no car	Car Ownership Rate (%)
Kilmore C	**513**	**222**	**43**	**57**
Priorswood D	**936**	**317**	**34**	**66**
Kilmore D	793	164	21	79
Edenmore	1000	300	30	70
Harmonstown A	1068	222	21	79
Beaumont C	1318	262	20	80

Figure 5.1 graphically represents the parking demand within each district with respect to the subject site.

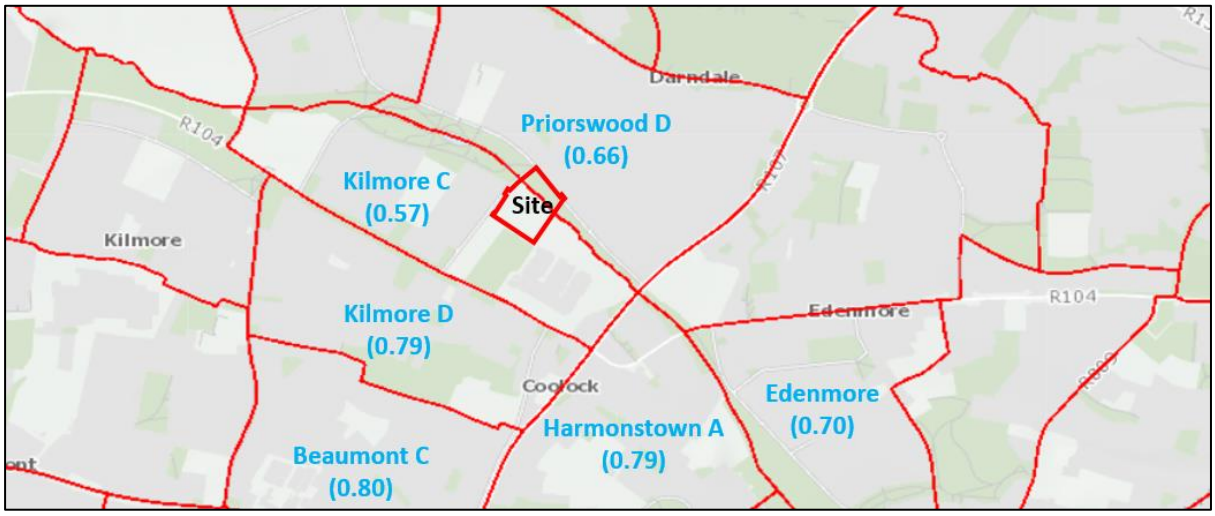


Figure 5.1 Electoral Districts in Areas Surrounding Site

The Electoral District within which the subject site is contained contains 43% of households with no car. Taking an average of the values for the 6 No. Electoral Districts detailed, a figure of 0.72 is obtained.

5.4 Local Infrastructure

A review has been undertaken of the site specific characteristics and the nearby services and infrastructure, which can reduce the requirements for car parking provision. The outputs from AECOM's findings are summarised below:

- Proximity to Dublin City Centre, the site location is located approximately 5km from the City Centre,
- Proximity to Public Transport, a high frequency bus service is located along Malahide Road, which is located approximately 500m from the site. A Heavy Rail Station (Raheny) is also located approximately 2km from the site or a 20 minute walk;
- Nature of the Development, the development compromises of a residential land use where the opportunity for promoting sustainable travel to future residents will be high;
- Appropriate Mix of Land Uses surrounding the development, the site is situated within 3.0km from major employment locations including Malahide Industrial Estate, Northside Shoping Centre and Beaumont Hospital;
- Implementation of an Outline Residents Travel Plan will be prepared prior to occupation of the site;
- Walking and Cycling Infrastructure; high quality pedestrian and cycle links are available along Malahide Road, which will assist to promote sustainable travel to and from the site. It is proposed to provide 650 cycle parking spaces which is above the minimum requirements of the DCC Development Plan; and

- Car Clubs; it is proposed to provide 10no car club spaces within the proposed development.

5.5 Car Parking Management

5.5.1 Car Parking Allocation

It is initially proposed to allocate residential car parking spaces for all the 2 and 3 bedroom units, which can be summarised as follows:

- 1 space per 3 bed units (106 units);
- 1 space per 2 bed units (178 units).

Therefore 284 no. spaces will be allocated for the 2 and 3 bedroom units. In addition to this, 71 no. car parking spaces will be allocated to the designated car club (10 spaces), visitor (14 spaces), mobility impaired spaces (22 spaces) and Electric Vehicle charging points (24 spaces). The remaining 37 no. spaces will be allocated to 36 of the 150 no. 1-bedroom units. Consequently 114 no. 1-bedroom units will not have a parking space, and no car parking will be allocated to the studio apartments. Table 5.2 outlines the proposed car parking allocation for the overall development.

Table 5.2 Proposed Car Parking Allocation

Land Use	Allocation	Scale of Development	Proposed Parking (basement)	Proposed Parking (ground floor)	Proposed Parking Overall
Apartments	Studio	61 units	0	0	0
	1 bedroom	150 units	36	1	37
	2 bedrooms	178 units	101	77	178
	3 bedrooms	106 units	20	86	106
	Visitor		0	14	14
	Car Club		0	10	10
	Electric Vehicle		24	0	24
	Mobility Impaired		0	22	22
Service Building	Crèche	300 sq. m	0	4	4
	Café	34 sq. m	0	0	0
	Gym	412 sq. m	0	0	0
	Mobility Impaired		0	1	1
Total			**181**	**215**	**396**

5.5.2 Parking Restrictions

Perspective residents will be made aware of the car parking arrangement. The management company will be responsive for enforcing the above arrangement. This will include measures such as the following:

- Regular car registration checks against assigned parking space and clamping enforcements.
- Internal warning signs to be erected to warn visitors of parking restrictions in place.
- Letters to be sent to all residents informing them of the agreed car parking strategy.
- Double yellow lines along the vehicular access off Coolock Drive to mitigate on-street car parking.

5.6 Car Parking Summary

This section sets out the various policy and research documents used to establish that the proposed car parking quantum of 0.79 spaces per unit will cater for the projected car parking demand and the amenity at the site.

It is proposed to provide 10 no. Go Car spaces within the proposed development. The Go Car guidance identifies that each Go Car has the potential to replace approximately 10 – 20 private cars subject to location. On this basis, provision of 10 no. car club spaces has the potential to replace up to 100 - 200 car parking spaces on the site.

The Central Statistics Office (CSO) information determined that an average figure of 72% of households in the adjacent area own private vehicles.

Mitigation measures such as double yellow lines, clamping and car registration checks against assigned parking space will be put in place to restrict the potential for overspill car parking on the local road network and within the development.

Following this car parking policy assessment, it is determined that the proposed quantum of 0.79 car parking spaces per residential dwelling is sufficient to cater for the anticipated demand of perspective residents of the site.

6. Proposed External Road Improvements

6.1 General

As part of the application, it is also proposed to introduce a number of upgrades to the existing pedestrian crossing infrastructure along the local public road network. The proposed infrastructure improvements are summarised as follows:

- Upgrading of the site and signals at the junction of Coolock Drive and Oscar Traynor Road;
- Provision of a signalised pedestrian crossing to the south of the site entrance on Coolock Drive; and
- Provision of a signalised pedestrian crossing at the proposed pedestrian entrance to the park, off Greencastle Road.

6.2 Oscar Traynor Road / Coolock Drive

The existing Oscar Traynor Road / Coolock Drive 3-arm signalised junction is to be upgraded to allow for a 2-lane approach and pedestrian crossing on the Oscar Traynor Road Western Arm and a 2-lane approach and pedestrian crossing tie-in on the Coolock Drive.

The design has been prepared in compliance with the TII Design Guidelines and the DCC Transport Modelling team. The footpath and lane widths have been reduced in order to achieve this design. The proposed junction geometry is illustrated in the figure below. Please refer to Appendix B for further details.

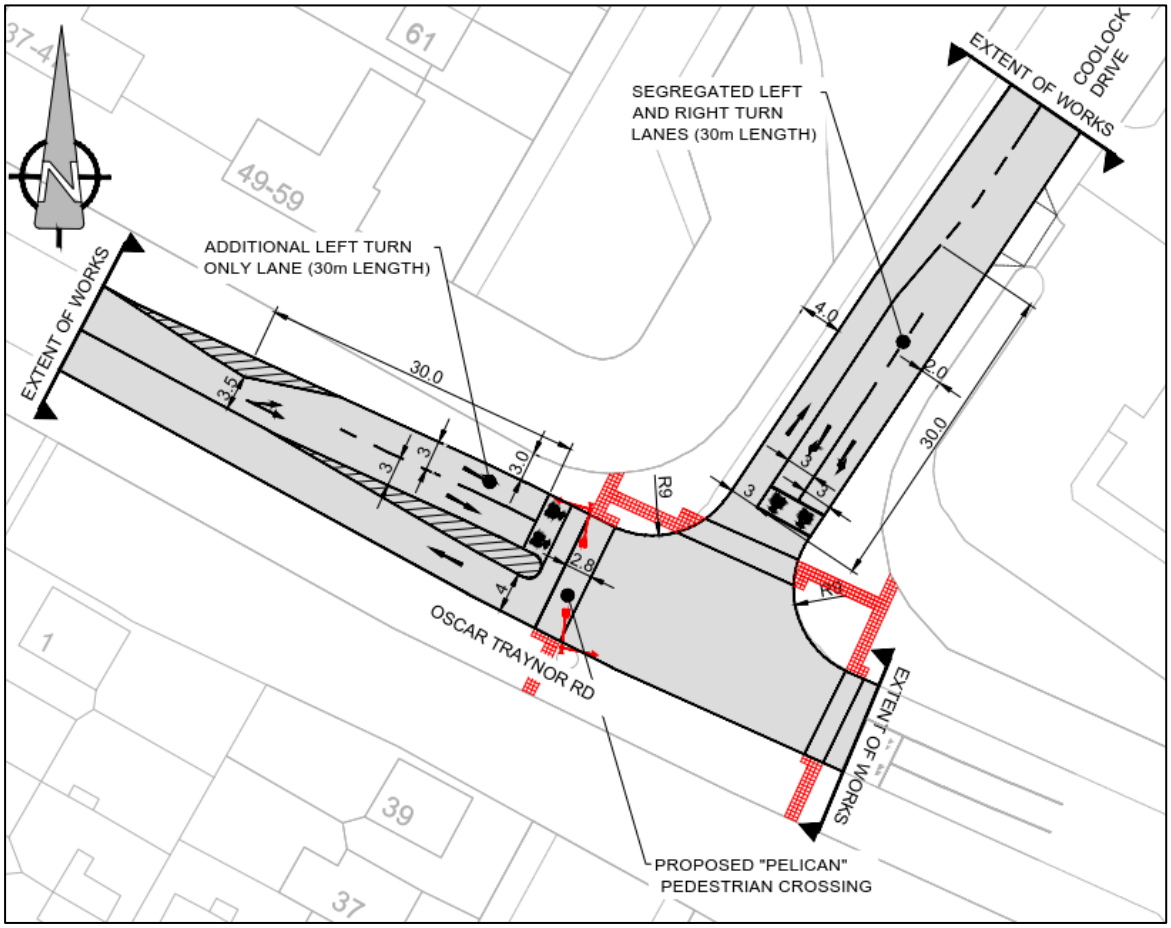


Figure 6.1 Proposed Oscar Traynor Road / Coolock Drive Upgrade

6.3 Coolock Drive Pedestrian Crossing

As per DCC's request, it is proposed to provide a signalised pedestrian crossing to the south of the site entrance on Coolock Drive. The design has been prepared in compliance with the DCC Transport Modelling team. The proposed junction geometry is illustrated in the figure below. Please refer to Appendix B for further details.

6.4 Greencastle Road Pedestrian Crossing

As per DCC's request, it is also proposed to provide a signalised pedestrian crossing to the south of the site entrance on Greencastle Road to the north of the site. The design has been prepared in compliance with the DCC Transport Modelling team. The proposed junction geometry is illustrated in the figure below. Please refer to Appendix B for further details.

7. DMURS Statement of Compliance

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: *Please submit a statement indicating, in the prospective applicant's opinion, the proposal is consistent with the Design Manual for Urban Roads and Streets (Department of Transport, Tourism and Sport & Department of Environment, Community and Local Government, 2013)."* AECOM's response to this request is as follows:

7.1 Proposed External Upgrades

The planning application comprises proposals to upgrade the Oscar Traynor Road / Coolock Drive signalised junction, which takes cognisance of the DCC recommendations, TII Design Guidelines and the Traffic Signs Manual. Pedestrian crossing facilities are proposed on all approaching arms of the signalised junction.

The lane widths proposed for the signalised junction comply with the minimum standard of 3.0m for arterial and link streets, in order to reduce the speed on oncoming traffic, as per Section 4.4.1 of DMURS.

Additional pelican pedestrian crossing points are proposed on Coolock Drive, to the south of the site access to facilitate perspective residents accessing the land uses to the south of the site and on Greencastle Road, to facilitate pedestrians accessing the public transport facilities along Malahide Road.

7.2 Internal Proposed Development Layout

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:

Pedestrian Capability: As per Figure 4.34 of DMURS, the internal footpaths have been proposed at a minimum width of 1.8m, which is the space required to allow two buggies or wheelchairs to pass each other or travel side by side.

Carriageway Widths: The internal carriageway width is typically 5.5m as per the DMURS guidelines (Section 4.4.1) for a local street. The carriageway width increases to 6m at the approach to the priority junction at the site entrance. The increased 6m width is to facilitate refuse lorries accessing the proposed site off Coolock Drive, and also in locations where there is perpendicular parking, where 6m is required for a vehicle to reverse.

Pedestrian Crossings: There are a number of pedestrian crossings proposed throughout the site, which comprise of tactile paving and flushed kerbs to facilitate pedestrian movements crossing the carriageways at the junctions and at the crèche area. Raised tables are proposed in a number of locations to let vehicular and pedestrian / cycling traffic know that they are entering an area of conflict and must proceed with caution.

Corner Radii: The proposed corner radii at the junctions comply with DMURS (Section 4.3.3) to 4.0 – 6.0m in order to reduce vehicular speeds and reduce pedestrian crossing distances.

Car Parking: Car parking provision is mainly proposed off street for residents, with the exception of the crèche parking, the mobility impaired spaces to the south of Blocks A1 and A2 and the visitor / Car Club spaces in between Block B and C. These on street parking spaces are proposed to reduce overspill parking / parking on footpaths and effectively calm traffic. All car parking spaces are proposed at the required dimensions i.e. 2.4m x 4.8m for a standard parking space. The standard length of the parallel parking spaces is 6m.

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 site access roads to provide a sense of enclosure. There's also a public open space within the northern portion of the development which also comprises of pedestrian and cycle way facilities.

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. All carriageways, footpaths and tactile paving will be of visually contrasting colour. It should also be noted that the proposed turning head to the east, catering for large refuse vehicles has been incorporated into the landscape design as a combined basketball and mini goal unit. The road markings will be flush so as to permit refuse vehicles and fire tenders manoeuvring within the development infrequently.

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.

8. Servicing Strategy

8.1 General

The purpose of this chapter is to set out the servicing strategy for the waste and delivery management of the proposed development. In preparing this chapter, consideration has been given to the Eastern Midlands Region Waste Management Plan 2015 – 2021.

AECOM also contacted Thornton's Waste Management with regard to the anticipated servicing strategy of the proposed development.

8.2 Waste Generation

Waste will be generated by the occupants of the 495 apartments, crèche, gym and café and by the management staff. The types of bins which will be provided within the development are 1100litre bins. An example of these bins is shown in Figure 8.1 below.

Figure 8.1 Example of 1100 litre bin provided within development

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 car parks have not been designed to cater for a refuse lorry to access the undercroft or basement. Consequently a standard pick up vehicle such as a Toyota Dyna (2.2 m height, 4.4m length) will be required to transport the refuse bins from the undercroft and basement to surface level.

At surface level, a designated area for a refuse lorry is proposed immediate north of the hammerhead. The refuse area will accommodate a refuse lorry, whilst the smaller Dyna will transfer refuse to and from the basement. Figure 8.2 below illustrates a standard vehicle which Thornton's has identified, whilst AECOM Drawing No. PR385356-ACM-00-00-DR-CE-10-0101 (Viewport A) illustrates the surface level servicing area.

Figure 8.2 Toyota Dyna (2.2 Height, 4.4m Length)

9. Trip Generation and Distribution

9.1 General

The purpose of this section is to determine the overall number of trips that will be generated by the proposed development. Following quantification of the trip generation, these trips will be distributed onto the adjoining road network to allow a robust traffic assessment of the site access junction off Coolock Drive.

9.2 Existing Traffic Flows

It should be noted that the site is currently not in use and therefore does not generate any traffic flows. The subject site previously was a large industrial site with car / HGV movements associated with the existing site access throughout the day.

9.3 Base Traffic Flows

Junction Turning Count (JTC) traffic surveys were undertaken on 14th September 2017 from 07:00hrs – 19:00hrs to understand existing traffic conditions in the vicinity of the site. Figure 9.1 illustrates the count locations in the context of the development site.

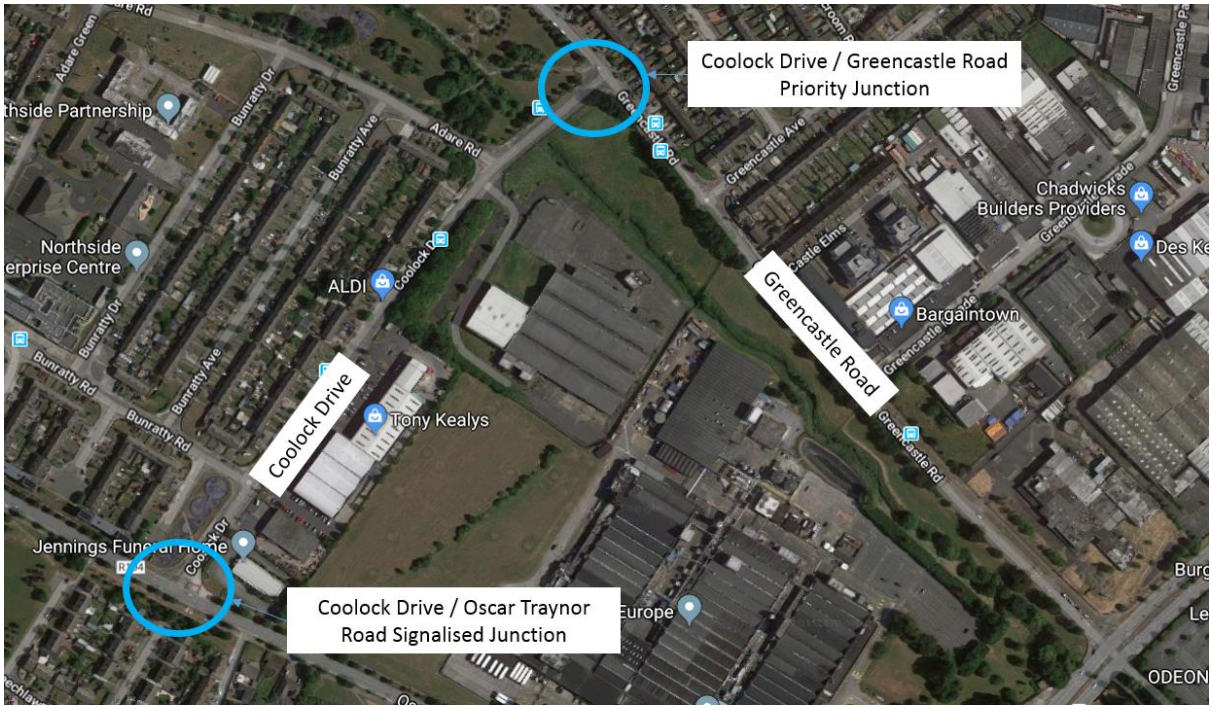


Figure 9.1 Junction Survey Locations

For the base traffic flows, the typical weekday morning (08:00 – 09:00) and evening (16:00 – 17:00) peak hour periods have been identified in terms of traffic volumes on the road network. These are the periods when traffic flows are greatest, and therefore will be used for the purpose of the modelling analysis.

9.4 Proposed Development Trip Generation

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 17:00 – 18:00 respectively), so as to determine the maximum impact of the proposed development on the surrounding road network.

The full TRICS outputs are shown in Appendix C, whilst the proposed trip rates for the AM and PM peaks can be found in Table 9.1.

Table 9.1 Proposed Trip Rate

TRICS Land Use	Rate	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
		Arrivals	Departures	Arrivals	Departures
Residential - Apartment	Per Dwelling	0.056	0.214	0.198	0.278
Crèche	Per Child	0.295	0.224	0.1990	0.237

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 9.2.

It is envisaged that the majority of users accessing the crèche will be residents of the apartment units. Therefore there is a significant element of double counting associated with the trip rates of the proposed crèche.

Table 9.2 Trip Generations

Proposed Land Use	Quantum	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
		Arrivals	Departures	Arrivals	Departures
Apartments (units)	495	28	106	98	40
Crèche	81	24	18	15	19
Two Way Trips		176		172	

The estimated total two way movements generated by the proposed development during the morning and evening peak hour is 176 and 172 trips respectively.

9.5 Trip Distribution

To understand the potential distribution of trips arriving and departing the site, the base traffic survey results have been interrogated. In the evening peak, the trend is reversed, with trips predominately travelling northbound exiting the city centre. The proposed development distribution is illustrated in Table 9.3 below.

Table 9.3 Trip Distribution

Peak Period	Arm	Access		Egress	
		From North	From South	To North	To South
AM	Main Access	60%	40%	40%	60%
PM	Main Access	57%	43%	43%	57%

Figure 9.2 and Figure 9.3 below illustrate the vehicular trips dissipated on the local road network. Please refer to Appendix D for further details.

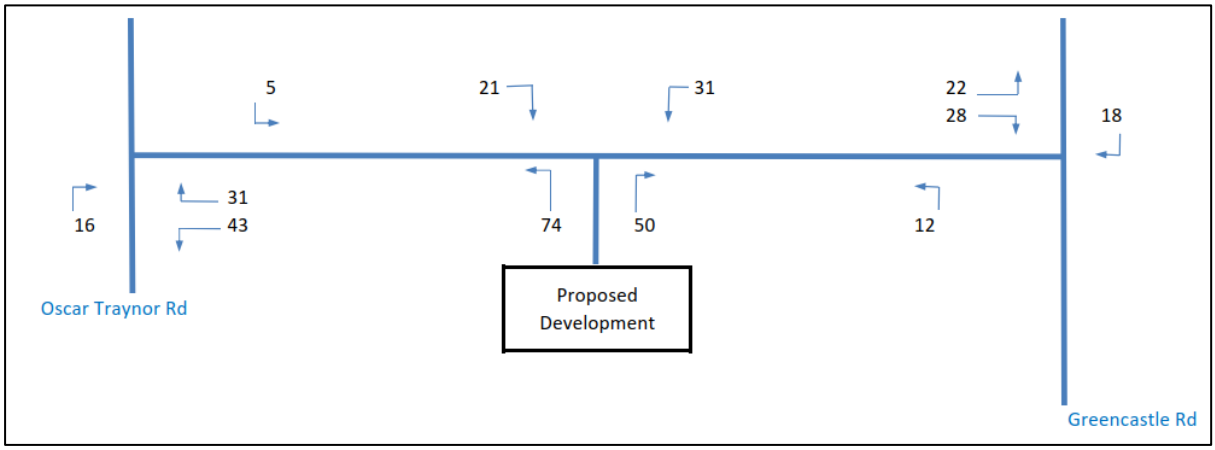


Figure 9.2 AM Peak Trip Distribution of the Proposed Development

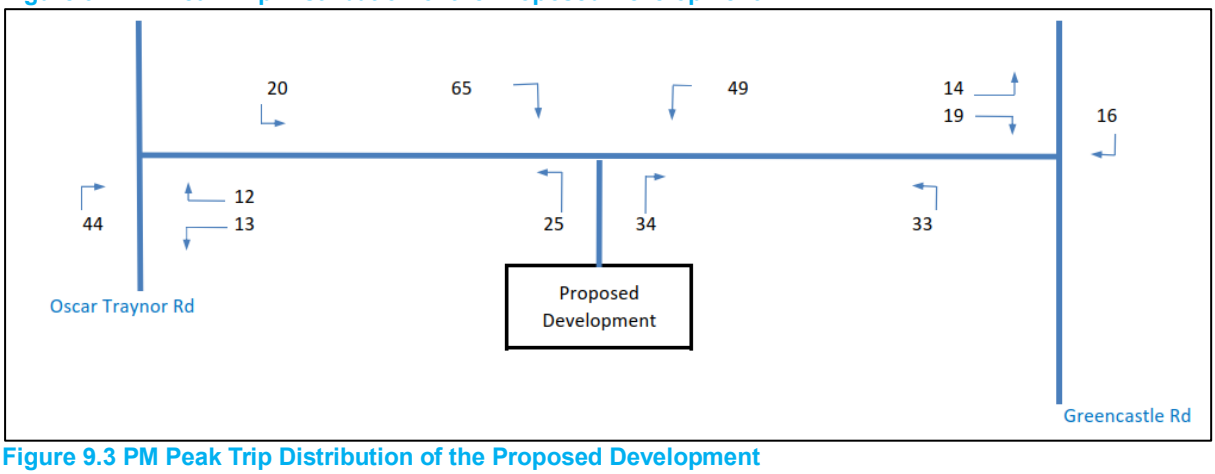


Figure 9.3 PM Peak Trip Distribution of the Proposed Development

9.6 Vehicular Traffic Growth

The Transport Infrastructure Ireland (TII) '*Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2016)*' provides guidance on the preparation of future travel demand projects for use in scheme modelling and appraisal. The guidelines presents in Table 5.3.2 Growth Rates based on an annual factor per region.

The guidelines have been interrogated by AECOM to determine a suitable growth factor for the proposed opening year (assumed 2022) and the horizon assessment years, which are the Opening Year + 5 Years (2027) and + 15 Years (2037) as per the TII Traffic Assessment Guidelines.

Given the site is located within Region 1 'Dublin' it is proposed to apply a Central Growth Annual Factor to the base traffic flows (2018). It is proposed to apply the 'LV' (light vehicles) growth factor given the characteristics of the surrounding road network which typically serves car and light vehicular traffic associated with residential and commuting journeys.

The Central Growth Rate for the Dublin Region is projected as 1.0134 (1.34%) growth per annum from 2013 – 2030, and 1.0038 (0.3%) per annum from 2030 – 2050. The applied growth rates to the base traffic surveys are summarised as follows:

- 2022 Opening Year, Growth Rate: 1.069 (i.e. 7%);
- 2027 Horizon Year, Growth Rate: 1.142 (i.e. 14%);
- 2037 Horizon Year, Growth Rate: 1.216 (i.e. 22%).

The growth factors have been applied to the base traffic flows, and Appendix D presents the Network Flow Diagrams for the future base years (2022, 2027 and 2037).

9.7 Percentage Impact of Development

AECOM has compared the peak hours of traffic recorded from the baseline traffic surveys (i.e. 08:00 – 09:00 and 16:00 – 17:00) with the traffic generated by the proposed development during the peak hour of generation, calculated by TRICS (i.e. 08:00 – 09:00 and 17:00 – 18:00).

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 traffic flow on the adjoining highway, where traffic congestion exists or will exist within the assessment period or in other sensitive locations".*

Table 9.4 Percentage Impacts

Junction	Peak Period	Base Two Way Flow (Opening Year 2022)	Additional Development Two Way Flow	Percentage Impact
Junction 1: Coolock Drive / Greencastle Road T-Junction	AM (8:00 – 9:00)	1027	81	8%
	PM (16:00 – 18:00)	1241	82	7%
Junction 2: Coolock Drive / Oscar Traynor Road 3arm signalised junction	AM (8:00 – 9:00)	1561	95	6%
	PM (16:00 – 18:00)	1673	90	5%

The percentage impact of the proposed development flows upon the 2022 base movements, as shown in Table 9.4 identifies a maximum of 8% impact upon the morning base on Junction 1. Whilst in the PM peak hour, the max percentage impact is 7% upon the existing base.

The percentage impact of additional traffic generated by the proposed development is less than 10% on both junctions assessed during the AM and PM peak hours. This is less than the TII percentage impact standards to warrant detailed assessment of the proposed access junctions (over 10%, of the existing two-way flows on the adjoining highway).

For robustness, AECOM has undertaken a detailed junction modelling analysis using LinSig and Junctions 9 on the Oscar Traynor Road / Coolock Drive signalised junction and the proposed site access respectively. The assumed Opening Year (2022) and Future Year scenarios (2027 and 2037) 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 result of the junction analysis undertaken is outlined in Section 10 overleaf.

10. Junction Analysis

10.1 Introduction

In this section an assessment is carried out of the capacity of the proposed site access onto Coolock Drive. The geometric parameters of the junctions were obtained from a google aerial images and onsite observation Junction analysis was undertaken using the traffic flows described in the previous section and illustrated in the Diagrams in Appendix D.

The industry standard junction modelling package LinSig was used to model the proposed priority junctions in unison with the signalised gyratory system. The results of the analysis package are expressed in terms of Ratio of Flow to Capacity (RFC) and Queue Lengths (vehicles). An RFC value of 85% is generally regarded as the practical limit for approach roads at a junction, however DMURS (Section 3.4.2) notes that junctions within urban areas such as Dublin may have to operate above this for short periods of time.

10.2 Scenario Testing

It is proposed to perform traffic analysis for weekday morning and evening peak hour periods. Analysis has been undertaken for the following scenarios:

- 2022 Opening Year: Without and With Proposed Development;
- 2027 Opening Year +5 Without and With Proposed Development; and
- 2037 Opening Year +15, Without and With Proposed Development.

10.3 Operational Assessment

The results of the LinSig analysis of the Oscar Traynor Road / Coolock Drive signalised junction for the AM and PM peak hours with and without the development are displayed in Table 10.1 and Table 10.2.

AECOM obtained SCATS traffic control data from the DCC Transport Modelling team to understand the existing operations of the junction. A basic 4-phase signal cycle is in place at the junction, as observed within the September 2017 survey, configured as follows:

- Phase 1 - All north-westbound and south-eastbound traffic (Arms A and C) along the Oscar Traynor Road approaches have priority (right-turners from Arm C opposed) whilst the traffic at Coolock Drive is stopped.
- Phase 2 - All north-westbound traffic exiting Oscar Traynor Road South-East (Arm C) has priority (right-turners unopposed), whilst all other approaches are stopped.
- Phase 3 - All traffic exiting Coolock Drive has priority whilst Oscar Traynor Road traffic is stopped.
- Phase 4 - Pedestrian priority phase. All vehicular traffic is stopped.

The above signal arrangement is consistent with the existing SCATS data obtained from the DCC ITS division, as illustrated in the below figure.

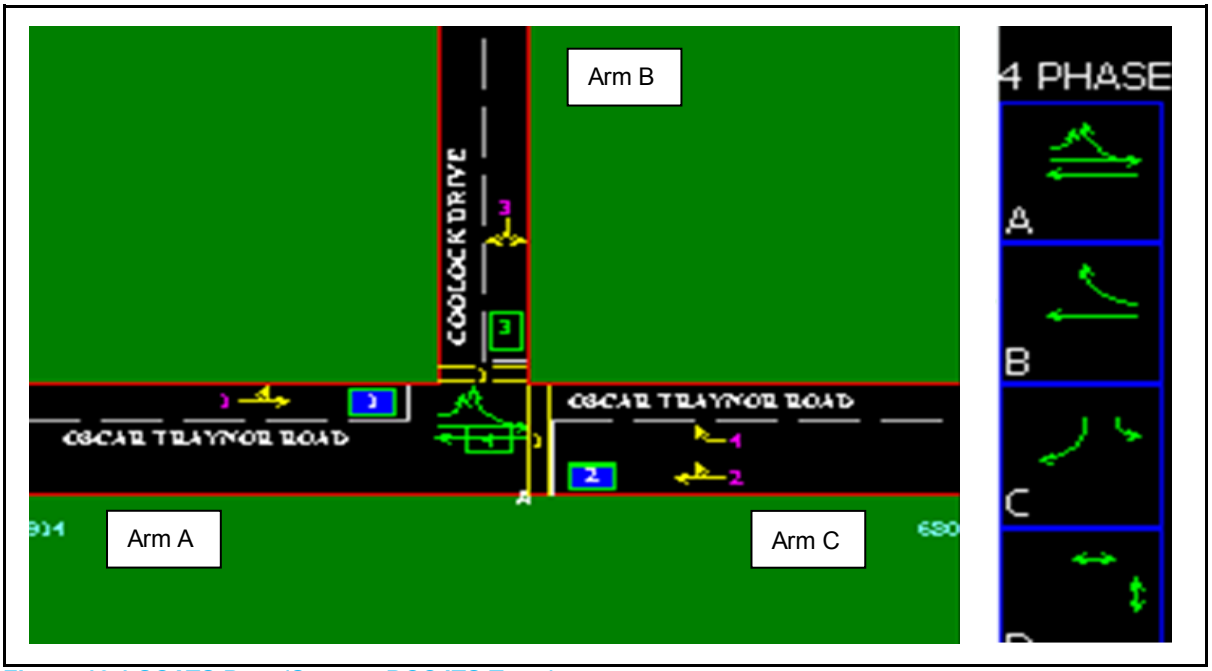


Figure 10.1 SCATS Data (Source: DCC ITS Team)

Table 10.1 Modelling Results – Oscar Traynor Road / Coolock Drive Signalised Junction (AM Peak Hour)

Year	Arm of Junction	Base AM without Development		Base with Development AM	
		Degree of Saturation	Max Queue Length (vehicles)	Degree of Saturation	Max Queue Length (vehicles)
2022	Oscar Traynor Nth, Ahead left-turn	58%	10	62%	11
	Coolock Drive Right Left	69%	5	75%	6
	OTR (Southeastern Arm) Ahead Right	72%	13	78%	15
2027	OTR Nth, Ahead left-turn	62%	11	65%	12
	Coolock Drive Right Left	73%	6	83%	8
	OTR (Southeastern Arm) Ahead Right	77%	15	81%	17
2037	OTR Nth, Ahead left-turn	66%	12	69%	13
	Coolock Drive Right Left	78 %	6	87%	9
	OTR (Southeastern Arm) Ahead Right	82%	17	86%	19

It can be seen that the DoS on all arms is less than 90% for the 2022, 2027 and 2037 development scenarios for the morning peak hour. The max DoS during the AM 2037 Base + Operational scenario will be 0.871 (87%) on the Oscar Traynor Road Southeastern Arm. The maximum queue is 21 vehicles. It should be acknowledged that this is a negligible increase from the base scenario and is likely due to the high proportion of existing traffic travelling along the Oscar Traynor Road travelling to and from Malahide Road.

Table 10.2 Modelling Results – Oscar Traynor Road / Coolock Drive Signalised Junction (PM Peak Hour)

Year	Arm of Junction	Base PM without Development		Base with Development PM	
		Degree of Saturation	Max Queue Length (vehicles)	Degree of Saturation	Max Queue Length (vehicles)
2022	Oscar Traynor Nth, Ahead left-turn	60%	10	62%	10
	Coolock Drive Right Left	71%	5	76%	6
	OTR (Southeastern Arm) Ahead Right	71%	12	74%	12
2027	Oscar Traynor Nth, Ahead left-turn	65%	11	66%	11
	Coolock Drive Right Left	75%	6	80%	7
	OTR (Southeastern Arm) Ahead Right	76%	13	79%	14
2037	Oscar Traynor Nth, Ahead left-turn	69%	12	70%	13
	Coolock Drive Right Left	80%	7	85%	8
	OTR (Southeastern Arm) Ahead Right	81%	16	84%	17

It can be seen from Table 10.2 that the degree of saturation (DoS) on all arms at 85% for the PM scenarios. The highest DoS value will be 85.3% (17 max queue) during the 2037 PM peak hour. This however is for a limited period during the PM peak, outside of the peak hour the traffic volumes reduce significantly. DMURS (Section 3.4.2) notes that junctions in urban areas may have to operate at saturation levels for short periods.

Furthermore, the TII High Traffic Growth rates have been applied to the 2018 base flows to identify a 2022, 2027 and 2037 future base. Given the existing high traffic volumes along Oscar Traynor Road, it could be argued that the application of traffic growth factors is robust, as Oscar Traynor Road only has a finite amount of capacity. The application of traffic growth rates therefore assumes a worst case for the future year scenarios.

AECOM is therefore satisfied that the modelling assessment indicates a worst case scenario and the modelling analysis results demonstrate that the proposed signalised junction will operate with sufficient practical reserve capacity during all assessed scenarios.

11. Mobility Management Plan

11.1 General

This section presents an overview of measures to be put in place by the Applicant in order to encourage and support more sustainable travel patterns among both residents and visitors of the proposed development.

A review has been undertaken of the projected travel patterns of the proposed development, the existing capacity of the local road network and the key measures and policies to be undertaken by the Applicant in order to reduce the reliance on private vehicular modes of transport for future residents.

11.2 Projected Travel Patterns

In order to establish an indicative understanding of how residents will access and egress the proposed development, AECOM has undertaken a modal split assessment using the latest version of the Trip Rate Information Computer System 7.6.1 (TRICS). As previously discussed, TRICS is an industry standard tool comprising a database of trip rates for developments in Ireland and the United Kingdom. The database is specifically used to quantify the trip generation of new developments for transport planning purposes.

While TRICS is predominantly used for calculating the vehicle trip generation of a land use, it can also be used to interrogate the estimated trip rates for pedestrians, cyclists and public transport users of a new development.

The modal split estimated for residents of the subject site, taking into account its nature, scale and location is presented in Figure 11.1 below. The parameters applied to achieve the below estimations can be found in Appendix C.

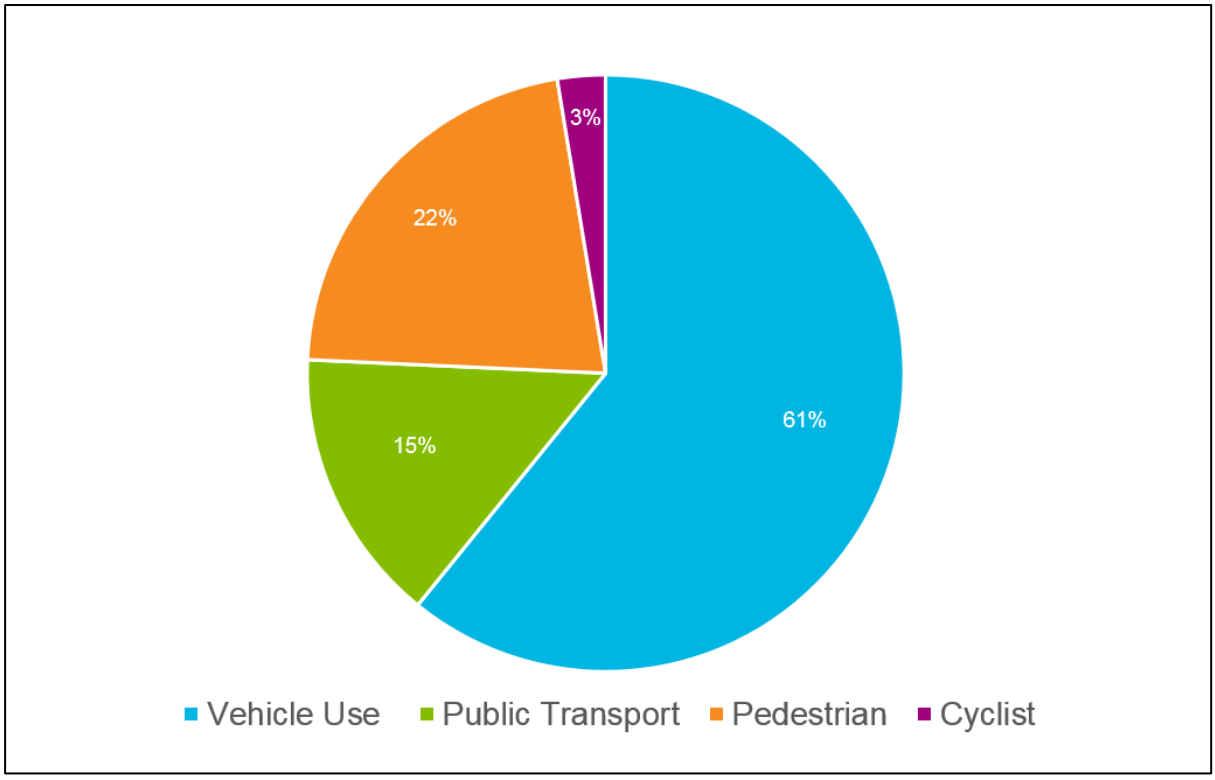


Figure 11.1 TRICS Projected Modal Split of Proposed Development

As shown in the Figure above, 61% of the residents are expected to travel to and from the site via car, i.e. through single use occupancy or multi use occupancy. Approximately 22% are expected to travel to and from the site on foot, 15% via public transport and 3% via cycling. It should be noted that the above is an estimation based upon trip rate information from existing residential developments within similar locations as the proposed development. There is a high chance that the level of residents using sustainable modes of transport (i.e. public transport, walking and cycling) will be higher than outlined above.

11.3 Public Transport Users

The TRICS outlined above has been interrogated further to calculate the projected public transport users likely to be generated by the development during the peak hours of the day, when the existing public transport services are at their most frequent.

Table 11.1 overleaf presents a summary of the proposed trip rates for public transport users (i.e. bus, tram, coach, rail) per dwelling, while Table 11.2 presents a summary of the resulting trip generations for the proposed development of 495 no. units.

Table 11.1 Public Transport Users

TRICS Land Use	Rate	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
		Arrivals	Departures	Arrivals	Departures
Residential - Apartment	Per Dwelling	0.011	0.16	0.105	0.033

Table 11.2 Trip Generations

Proposed Land Use	Quantum	AM Peak (08:00-09:00)		PM Peak (17:00-18:00)	
		Arrivals	Departures	Arrivals	Departures
Apartments (units)	495	5	79	52	16
Two Way Trips		**85**		**68**	

The estimated total number of public transport users (two-way) generated by the proposed development during the morning and evening peak hours is 85 and 68 trips respectively.

11.3.1 Capacity of Existing Public Transport

In light of the above, the existing capacity of public transport services available to residents and visitors at the proposed development is outlined below.

Dublin Bus

All Quality Bus Corridors radiate from the city centre outwards. The existing bus services and frequencies are detailed within Section 3 of this report. It should be noted that one standard double decker Dublin Bus has the capacity to cater for up to 125 no. public transport users.

From onsite observation the existing Dublin Bus services adjacent to the site are currently well utilised and benefits from residual capacity for future residents of the site. The main Dublin Bus routes accessible from the bus stops are Routes 15, 27, 42 and 43. The origin, destination and frequency of these 4 No. routes at peak times are detailed below within Table 11.3.

Table 11.3 O - D Dublin Bus Information for the Subject Site

Route	Origin	Destination	Frequency during peak hours
15	Clongriffin	Ballycullen Road	10 per hour
27	Clare Hall	Jobstown	6 per hour
42	Artane Roundabout	Portmarnock (Sand's Hotel)	4 per hour
43	Talbot Street	Swords Business Park	4 per hour
		Total	**24 per hour**

It is clear from Table 11.3 that that the subject site will be well served by the Malahide Quality Bus Corridor, providing high frequency routes both towards the city centre and towards the Swords / Portmarnock areas during the morning peak, with return services in the evening. Approximately 24 no. bus services will be available per hour during the peak hours of the weekday, catering for up to 3,000 public transport users.

The proposed pedestrian access through the site onto Greencastle Road will result in a 500 m walk for residents from the north-eastern boundary of the site to the nearest Malahide QBC bus stop. This translates to a walking time of 8 minutes from subject site to frequent bus service. The 2018 Apartment Guidelines defines an intermediate location as one within 400 – 500m of reasonably frequent (min 15 minute peak hour frequency) urban bus services.

Dublin Area Rapid Transit (DART)

The DART extends along the coastline of the South Dublin area, extending from the centre of town to Ballsbridge, Sandymount, Merrion, Booterstown, Blackrock, Monkstown, Dun Laoghaire, Dalkey, Ballybrack, Shankhill, Bray and Greystones, and along the coastline of the north Dublin area extending from the town centre to Clontarf, Sutton, Howth and Malahide.

The Harmanstown DART Station is within 1.9 km (19 minutes' walk) of the subject site. From here, Connolly Station can be accessed in a further 9 minutes and Tara Street in 12 minutes. The DART operates a service to the city centre every 12 to 15 minutes during the morning and evening peak hours.

It should be noted that one tram has the capacity for up to 300 passengers, resulting in the capacity for approximately 1200 passengers per hour.

It should also be noted that the DART service caters for interurban rail by connecting the Harmanston and Connolly Stations. The following interurban lines are accessible via Connolly Station:

- Intercity from Derry and Belfast: 1 train arriving every 2 hours approximately;

- Intercity from Sligo Town in County Sligo: 1 train arriving every 2 hours approximately;
- Intercity from Rosslare County Wexford: 1 train arriving during morning peak.

Bus Connects

It should also be noted that the NTA's proposed Bus Connects stops on Malahide Road will help facilitate additional demand for public transport in the local vicinity of the site.

11.3.2 Public Transport Summary

The estimated total number of public transport users (two-way) generated by the proposed development during the morning and evening peak hours is 85 and 68 trips respectively. This demand can be facilitated through the existing public transport facilities within the area. The proposed development is situated within an ideal location and currently benefits from existing sustainable travel facilities such as Dublin Bus (immediately adjacent to the site) and the DART (19 minute walk).
Dublin Bus caters for approximately 1,200 passengers per hour, through the existing 4 bus routes whilst the DART caters for at least 1,200 passengers per hour.
From onsite observation the existing public transport services immediately adjacent to the site are currently well utilised and benefit from residual capacity during the peak hours of the day.
The NTA's proposed Bus Connects stops on Malahide Road will also help facilitate additional demand for public transport in the local vicinity of the site.

11.4 Mobility Management Plan

In order to encourage perspective residents of the site to use sustainable modes of transport, it is proposed to employ the well documented 'Carrot and Stick' approach, the former incorporates improvements in alternative modes of travel, effectively opening up transport options for commuters. 'Stick' measures include car parking restraint and other physical measures. Both elements of this approach are required to achieve a successful result for the proposed development.

11.5 Objectives

The objectives of this section are as follows:

- To discourage private car as a means of travel to and from the development;
- To increase and facilitate the number of people choosing to walk, cycle or travel by public transport to the development;
- To work with DCC, the National Transport Authority and public transport providers to support and encourage resident and staff up take;
- To develop an integrated and unified public transport, private vehicle, business fleet management and suppliers of commercial services to the development; and
- To liaise and co-operate with adjacent developments in relation to a coordinated approach to Mobility Management between the various employment areas.

To achieve the above targets, measures have been proposed for the specific modes of transport. These are based on existing infrastructure and public transport systems. These objectives are preliminary and will be further developed in the light of ongoing monitoring as the proposed development is occupied and information becomes available on future travel behaviour of residents and staff.

It is recommended that an Action Plan Coordinator is appointed, as someone who will take ownership of implementing the measures. The Action Plan Coordinator would oversee the following measures:

- Develop a marketing and communications plan (this could include keeping residents up to date on progress, developments and achievements made in relation to travel).
- Hold Green / Active commuters coffee mornings.
- Include travel information in residents post and online in an easily accessible location.
- Provide incentives for active commuters.

Table 11.4 overleaf presents a list of recommended measures and actions.

Table 11.4 Travel Plan Measures

Walking		
Initiatives	Responsibility / Ownership	Timescale
Provision of details on how to access the site on foot. Details would include safe walking routes and location of the nearest bus stops/rail station. Promote walking events / lunchtime walks for residents Annual Team Walking Events for residents e.g. Pedometer Challenge Provide umbrella for residents of the apartment block on wet days	The Action Plan Co-ordinator	This will be established within 3 months of occupation.
Cycling		
Initiatives	Responsibility / Ownership	Timescale
Launch Cycle to Work scheme for Staff of development Establish a Staff/Resident Bicycle User Group Encourage establishment of a cycling club / society Provision for cyclist equipment i.e. pump, allen keys, lights, puncture repairs Display maps of local cycle network on notice boards Participate in National Cycle Week Survey and monitor cycle parking occupancy Install and or upgrade cycle lockers, showers and drying rooms	The Action Plan Co-ordinator	This will be established within 3 months of occupation.

Public Transport		
Initiatives	Responsibility / Ownership	Timescale
Provision of public transport maps and timetables in prominent locations on site. Information should be kept up to date. This information could also be available online. Provision of information to residents on savings that can be made by using Leap Card and details on where Leap Cards can be purchased. Re-advertise and promote the Tax saver monthly and annual commuter tickets for public transport to staff of the development. Include a one month trial ticket for public transport and timetable information. Display a local area map with public transport stops / route numbers marked. Publicise real time passenger information apps and websites where relevant. Discuss with public transport operators fare structures and ticketing options. Publicise door-to-door multi modal journey planner website Liaise with public transport operators regarding service frequencies to the residential development. Provide attractive, good quality waiting areas.	The Action Plan Co-ordinator	This will be established within 3 months of occupation.

Car Sharing		
Initiatives	Responsibility / Ownership	Timescale
Encouragement of residents, employees and visitors of the development to use other modes of travel other than private car. Where it is necessary for car use to travel to and from work, residents and staff should be made aware of other people who are either within close proximity of their homes (for staff) or on their route into work (for residents). Hold a coffee morning / launch event for potential car sharers Offer a guaranteed ride home in emergencies	The Action Plan Co-ordinator	This will be established within 3 months of occupation.
Construction Phase		
Initiatives	Responsibility / Ownership	Timescale
Provide a preliminary Construction Traffic Management Plan to provide detailed mitigation of construction traffic associated with the proposed development.	The Contractor / DCC Roads & Traffic Department	This will be established and agreed prior to construction.

12. Outline Construction Traffic Management Plan

This chapter of the report deals directly with the impacts of construction of the subject development. As with any construction project, the contractor will be required to prepare a comprehensive traffic management plan 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.

This chapter provides a high level overview of the likely routing of construction vehicles, based on a most likely scenario of construction. It should be noted that this chapter sets out the measures to manage the expected construction phase only. Chapter 6 of the EIAR report submitted as part of this application outlines in greater detail the traffic impacts of the construction phase of the proposed development.

It will be the contractor's responsibility to prepare a Traffic Management Plan for the approval of Dublin City Council in advance of any works.

12.1 Likely Construction Programme & Phasing

The construction programme is expected to require approximately 36 months to complete from enabling works / demolition stage to occupation of the site.

It is acknowledged that the construction process will need to be cognisance of the permitted residential houses being occupied, which is a standard requirement of the construction management process.

12.2 Construction Route

To minimise construction impacts upon the surrounding road network, it is recommended that a 'left in / left out vehicular access arrangement is in operation at the site entrance. This will assist the flow of vehicles accessing and exiting the site, thus reducing any delays onto the surrounding road network. Access into the construction site will be via a designated route, as illustrated in Figure 12.1 below.

Figure 12.1 Proposed Construction Route

12.3 Parking

All contractors' vehicles will park within the development site area in a designated parking area on the hard standing. There will be no contractor parking on the public roads.

12.4 Mitigation Measures

A construction management plan will be developed by the contractor prior to the commencement of work on site, and will be prepared in consultation with Dublin City Council.

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.

12.5 Construction Traffic Generation

In order to inform the overall traffic generation for the construction phase of the proposed development, AECOM obtained the anticipated volumes of demolition and excavation of the site from CORA Consulting Engineers. For the purpose of this assessment, the following assumptions have been applied:

- The main construction works (i.e. enabling works, demolition, excavation and construction) will take place over an approximate 36 month period within which the majority of truck movements will occur.
- The demolition and excavation stages will produce the greatest number of HGV movements in and out of the site.
- The demolition stage will produce a total of 200 no. HGV trips to and from the site.
- During the excavation stage approximately 62,500 sq. m of topsoil / material will be exported from the subject site to an appropriate and suitably approved facility.
- A bulking factor of 10% has been applied to the excavation volume figures in order to assess a worst case scenario.
- The combined demolition and excavation phases will occur over a short period of time (4 months) within the overall 36 month construction period.

AECOM has assessed the traffic impacts of the proposed development for the most onerous phase of development (i.e. the combined demolition and excavation stage). The assessment has been undertaken in terms of HGV traffic and site operative traffic, as outlined below.

12.5.1 Hours of Operation

It is envisaged that the site and building works required to implement the development shall only be carried out between the hours of:

- Monday to Fridays – 07:00 to 18:00;
- Saturday – 08:00 to 14:00;
- Sunday and Public Holidays – No activity on site.

Deviation from these times will only be allowed in exceptional circumstances where prior written approval has been received from DCC. Such approval may be given subject to conditions pertaining to the particular circumstances being set by DCC.

12.5.2 Daily Traffic Flows during Demolition / Excavation Stage

Using the assumption that a HGV carries up to 30 tonnes in weight and that there are 20 working days in each month, the key traffic flows per day, during the peak stage of construction (i.e. the demolition / excavation stage) are as follows:

- 2-way HGV movements per day: 84; and
- 2-way cars / site operative movements per day: 20.

12.5.3 Daily Traffic Flows during Construction Stage

The construction phase will generate 100 site operatives. It has been assumed that 25% of staff will access the site via public transport. The remainder will comprise of site operatives travelling to and from the site via car and van. It has been assumed that vehicle occupancy for the construction staff is typically 2 persons per vehicle. During the construction phase the key traffic flows per day are as follows:

- 2-way HGV movements per day: 30; and
- 2-way cars / site operative movements per day: 76.

12.5.4 Hourly Profile of Arrivals and Departures

In order to quantify the number of traffic flows accessing the site during the peak traffic periods, typical construction site arrival and departure profiles have been applied for site operatives and HGV traffic, which are outlined within the following sections. The profiles have been quantified against the peak daily number of site operative and HGV traffic i.e. 84 no. 2-way movements for HGV traffic and 76 no. site operative traffic for site operatives. Exact times will be contained within the Contractor's Construction Traffic Management Plan.

Site Operative Traffic: The following arrivals and departures information has been assumed:

- Arrivals, considerable proportion of site operatives will commence work at 08:00hrs.
- Departures, approximately 30% of departures between 16:00 and 17:00, 20% between 17:00 – 18:00hrs and 50% between18:00 – 19:00hrs.

The majority of site operatives will be arriving into the proposed construction site prior to the morning peak hour (08:00 – 09:00hrs) on the surrounding road network and in the evening peak hour, 80% of site operatives are projected to depart outside of the evening peak hour (16:00 – 17:00) on the surrounding road network. This will assist to minimise the impacts on the peak hours on the surrounding road network. The table below illustrates the projected site operative traffic flows per day.

Table 12.1 Daily Car / Van Trips for Construction Phase

Peak Hour	Car / Van Arrivals	Car / Van Departures	Total Car / Van Movements
AM Period			
07:00 - 08:00	20	0	20
08:00 - 09:00	**18**	**0**	**18**
PM Period			
16:00 - 17:00	0	11	**11**
17:00 - 18:00	0	8	8
18:00 - 19:00	0	19	19
19:00 – 20:00	0	0	0
	38	38	**76**

Table 12.1 demonstrates that during the peak period for site operatives, approximately 18 no. vehicle movements will occur during the peak AM period and 11 no. HGV movement will occur during the peak PM period.

HGV Traffic: To understand the predicted hourly arrival and departure profile of HGVs accessing and exiting the construction site during the peak excavation period, AECOM has interrogated traffic survey results of the construction phase from a similar development. The below figure identifies the anticipated times that HGVs will arrive and exit the construction site.

Table 12.2 Anticipated Hourly Profile of HGV Movements during the Day

Peak Hour	HGV Arrivals	HGV Departures	Total HGV Movements
07:00 - 08:00	3	3	6
08:00 - 09:00	5	5	10
09:00 - 10:00	3	4	7
10:00 - 11:00	6	5	11
11:00 - 12:00	4	3	7
12:00 - 13:00	5	5	9
13:00 - 14:00	5	6	11
14:00 - 15:00	5	4	9
15:00 - 16:00	5	4	9
16:00 - 17:00	3	3	6
17:00 - 18:00	0	1	1
18:00 - 19:00	0	0	0
Total	**42**	**42**	**84**

Table 12.2 demonstrates that during the peak period for HGV movements approximately 10 no. HGV movements will occur during the peak AM period and 6 no. HGV movement will occur during the peak PM period.

12.6 Percentage Impacts of Peak Construction Traffic

AECOM has reviewed the above average figures with the baseline flows on the local road network and the resulting percentage impact is shown in the table below.

Table 12.3 Percentage Impact during the Construction Phase of Development

Junction	Peak Period	Opening Year	Peak Site Operative Traffic	Peak HGV Traffic	Total Two Way Flow	Percentage Impact
Junction 1: Coolock Drive / Greencastle Road T-Junction	AM (08:00 – 09:00)	869	18	10	28	3.22%
	PM (16:00 – 18:00)	1241	11	6	17	1.37%

Table 12.3 demonstrates that the increase in traffic volumes at the site access is below 5% during the AM peak hour and PM peak hours. Therefore it is considered appropriate to define the impacts of the construction phase upon the local environment to be short term.

It should be noted that the above figures take the peak figures from both the demolition / excavation stage and the construction stage, to assess a worst case scenario. In reality, when the HGV flows are at their peak, the site operative traffic will be lower and visa versa. Further detail will be contained within the appointed Contractor's Construction Traffic Management Plan.

12.7 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 construction management plan.

- 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;
- 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 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.

13. Summary & Conclusion

13.1 Overview

This Traffic and Transport Assessment (TTA) has been compiled for a planning application to ABP for a proposed strategic housing development comprising of 495 no. Build to Rent residential apartment units, residential service amenities, open space, a café, gym and crèche at the former Chivers Factory site on Coolock Drive, Coolock, Dublin 17. The site currently comprises a vacant brownfield site with an existing vehicular access to the site located off Coolock Drive.

The proposed 495 no. residential apartments comprises 61 no. studios, 150 no. 1-beds, 178 no. 2-beds, 106 no. 3-bedroom apartments. The proposed apartments will be split across 4 no. proposed blocks (A1, A2, B and C), as illustrated within the Architect's site layout plan.

In addition the scheme includes for a crèche (300 sq. m), gym (412 sq. m) and café (34 sq. m), all of which are located within the service building to the north of the site access.

The purpose of this TTA is to quantify the existing transport environment and to detail the results of the assessment to identify the potential level of traffic impact generated by the proposed development. The TTA has included an assessment of the Opening Year 2022 and future design years 2027 and 2037 as per TII guidelines.

13.2 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.

13.2.1 Vehicular Access

It is proposed to retain the existing access arrangements. The main vehicular access / egress to serve the development will be a stagger priority junction with Coolock Drive / Adare Road.

A secondary access has also been included within the southwestern corner of the site. The access will be predominately for pedestrians and cyclists accessing the site and will be prohibited to vehicular movements with the exception of emergency access.

13.2.2 Accessibility

The proposed development is situated within an ideal location to benefit from existing sustainable travel facilities. High frequency bus services are available from Coolock Drive and Greencastle Road, which connect the site to numerous local destinations including Dublin City Centre. In addition, Rail services are located approximately 1.9km from the site, further enhancing the accessibility of the site.

Furthermore, the NTA propose several additional Bus Connects stops along Malahide Road, approximately 500m walking distance from the proposed development. The NTA envisages that the benefits will include improved bus service frequency and reliability. The scheme will comprise of a strategy to develop continuous bus lanes along a series of bus corridors.

13.2.3 Car Parking

It is proposed to provide a total of 396 car parking spaces for the overall site, 391 no. spaces for the residential units and 5 no. spaces for the crèche. A car parking policy assessment was undertaken to demonstrate that the proposed quantum of car parking is considered sufficient to cater for the anticipated demand based on the site location and the array of public transport infrastructure within the immediate vicinity of the site.

13.2.4 Cycle Parking

A total of 650 no. cycle parking spaces are proposed for the development. The cycle parking provision is proposed in secure bike storage facilities in a communal area within the basement level car park (634 no. spaces) and in the form of Sheffield stands in the external ground floor area (16 no. spaces).

It should also be noted that the proposed development includes 16 no. motor cycle spaces within the basement level car parking area.

13.2.5 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. A servicing strategy has been undertaken to demonstrate that the waste and delivery management of the proposed development can be safely facilitated on site.

13.2.6 Trip Generation

The overall development will generate a resultant trip generation of 176 and 172 two way movements during the AM and PM peak hours respectively. These figures were obtained using the Trip Rate Information Computer System (TRICS 7.6.1).

The percentage impact of additional traffic generated by the proposed development is less than 10% on both junctions assessed during the AM and PM peak hours. This is less than the TII percentage impact standards to warrant detailed assessment of the proposed access junctions (over 10%, of the existing two-way flows on the adjoining highway).

13.2.7 Operational Assessment

For robustness, AECOM has undertaken a detailed junction modelling analysis using LinSig and Junctions 9 on the Oscar Traynor Road / Coolock Drive signalised junction and the proposed site access respectively. The assumed Opening Year (2022) and Future Year scenarios (2027 and 2037) 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 result of the junction analysis undertaken demonstrates that traffic from the proposed development can be accommodated on the surrounding road network without any material or adverse impact on the road infrastructure.

13.2.8 Mobility Management Plan

A Mobility Management Plan has been submitted within this TTA. The Plan presents the projected travel patterns of the proposed development, the existing capacity of the local road network and the key measures and policies to be undertaken by the Applicant in order to reduce the reliance on private vehicular modes of transport for future residents. Given that the site is highly accessible via walking, cycling and public transport, the proposed development is well placed to promote sustainable travel from the onset.

13.3 Overall Conclusions

The TTA has considered the transport implications of the proposed development. It demonstrates that the development can be readily accessed by sustainable modes and that the surrounding road network has the capacity to accommodate the vehicular traffic generated as a result of the proposed development.

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 in the DCC Development Plan Standards (2016 – 2022) and the Sustainable Urban Housing Design of New Apartments guidelines (March 2018).

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 generation volumes are below 10%, and the junction analysis undertaken demonstrates that traffic from the proposed development can be accommodated on the surrounding road network without any material or adverse impact on the road infrastructure.

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.

Appendix A Response to DCC and ABP Opinions

Response to DCC Transportation Planning Division Opinion

1. Introduction

AECOM has prepared a response to the Dublin City Council's (DCC) Transportation Planning Division Opinion in relation to the proposed Strategic Housing Development at Chivers Factory, Ref No: ABP – 302757-18. This response should be read in conjunction with AECOM's Traffic and Transport Assessment which has been updated to include the respective feedback from both An Bord Pleanala and DCC.

AECOM met with Edel Kelly, Gareth Hyland and Marie Downs, DCC Roads Transportation Planning Department on 9th January 2019 to discuss the respective items. AECOM attended a further meeting on 17th January 2019 with Karen Hosie, Colum Kavanagh and Andrew Hyland of the DCC ITS team in relation to the pedestrian crossing items. The feedback from the respective meetings have been used to inform the production of this response.

2. AECOM Responses to DCC Recommendations

2.1 Traffic Assessment, Parking and Mobility Report

The applicant shall revise the Traffic Assessment, Parking and Mobility Report to accurately reflect the number of units proposed on site.

AECOM Response

AECOM has prepared an updated Traffic and Transport Assessment (TTA) to accurately reflect the number of units on the site, whilst also incorporating the feedback received from DCC Transport Planning Division, which is illustrated in detail within the following subsections. Note that the updated TTA incorporates the parking strategy and mobility management plan for the proposed development.

2.2 Car Parking Management

"A clear car parking management strategy shall be provided which sets out how car parking spaces will be assigned and managed from a long term perspective. This should clearly demonstrate a commitment by the Management Company to continual management of car parking within the development. It should be noted that on-street spaces cannot be assigned to individual units/uses in the event that the scheme is taken in charge."

AECOM Response

The pre planning submission to ABP had proposed 434 no. car parking spaces to serve the 535 Build to Rent units, which equates to a ratio of 0.81 space per unit. It is noted this ratio of spaces to units was accepted by DCC in the Transportation Planning Division Report.

Following feedback from ABP, the proposed no of units reduced from 535 to 495 units. Consequently the no. of proposed parking spaces is 391 to serve the 495 residential units, which equates to a ratio of 0.79 space per unit. Whilst this is a marginal reduction in the parking spaces per unit, the reason being is that the applicant proposes to increase the number of cycle parking provision from 600 no. to 650 no. cycles.

The proposed break down of residential car parking provision is as follows:

Ground Floor Block B:	124 no. spaces;
Ground Floor Block C:	58 no. spaces;
External Ground Floor:	28 no. spaces;
Basement Level (Block B & C):	181 no. spaces;
Total Residential Parking:	**391 no. spaces** (i.e. 0.79 spaces per 495 residential units).

It is initially proposed to allocate residential car parking spaces for all the 2 and 3 bedroom units, which can be summarised as follows:

- 1 space per 3 bed units (106 units);
- 1 space per 2 bed units (178 units).

Therefore 284 no. spaces will be allocated for the 2 and 3 bedroom units. In addition to this, 71 no. car parking spaces will be allocated to the designated car club (10 spaces), visitor (14 spaces), mobility impaired spaces (22 spaces) and Electric Vehicle charging points (24 spaces). The remaining 37 no. spaces will be allocated to 36 of the 150 no. 1-bedroom units. Consequently 114 no. 1-bedroom units will not have a parking space, and no car parking will be allocated to the studio apartments. The Table overleaf outlines the proposed car parking allocation for the overall development.

Proposed Car Parking Allocation

Land Use	Allocation	Scale of Development	Proposed Parking (basement)	Proposed Parking (ground floor)	Proposed Parking Overall
Apartments	Studio	61 units	0	0	0
	1 bedroom	150 units	36	1	37
	2 bedrooms	178 units	101	77	178
	3 bedrooms	106 units	20	86	106
	Visitor		0	14	14
	Car Club		0	10	10
	Electric Vehicle		24	0	24
	Mobility Impaired		0	22	22
Service Building	Crèche	300 sq. m	0	4	4
	Café	34 sq. m	0	0	0
	Gym	412 sq. m	0	0	0
	Mobility Impaired		0	1	1
Total			**181**	**215**	**396**

Perspective residents will be made aware of the car parking arrangement. The management company will be responsive for enforcing the above arrangement. This will include measures such as the following:

- Regular car registration checks against assigned parking space and clamping enforcements.
- Internal warning signs to be erected to warn visitors of parking restrictions in place.
- Letters to be sent to all residents informing them of the agreed car parking strategy.
- Double yellow lines along the vehicular access off Coolock Drive to mitigate on-street car parking.

2.3 Car-Club

"The applicant shall submit confirmation from a Car Club provider confirming the commitment of a car share scheme for the development and detailing the number of vehicles allocated to the proposed development. The location of the car club parking spaces shall be clearly indicated on the site layout plan."

AECOM Response

A letter of commitment has been provided by a Car Club provider and included in Appendix F. The letter from Go Car confirms a commitment to provide 10 no. Go Car vehicles within the proposed 10 no. Car Club spaces. It is proposed to allocate the Car Club vehicles at surface level and this will be denoted by road markings and signage. The proposed Car Club parking spaces are illustrated on AECOM Drawing No. PR385358-ACM-GA-00-DR-CE-10-0001.

2.4 Residential Travel Plan

"Having regard to the reduced quantum of cycle parking proposed at the site proactive residential travel planning is of critical importance. The applicant is requested to provide a Residential Travel Plan Framework which identifies potential measures which could be implemented to promote sustainable travel amongst future residents."

AECOM Response

A Residential Travel Plan has been prepared and included within AECOM's TTA (Chapter 11). The Travel Plan includes a package of measures to promote sustainable travel amongst future residents of the proposed development, with a view of reducing the reliance on private vehicular modes.

2.5 Junction Upgrades & Improvements

"The applicant shall provide for the following upgrades/improvements as part of the development:

- *Upgrading of the site and signals at the junction of Coolock Drive and Oscar Traynor Road.*
- *Provision of a signalised pedestrian crossing to the south of the site entrance.*
- *Provision of a signalised pedestrian crossing at the proposed pedestrian entrance to the park off Greencastle Road.*

The applicant is advised to liaise with the Transportation Planning Division and the ITS Section of the Environment and Transportation Department in this regard prior to submission of a planning application. The applicant is advised

that it may be necessary to extend the red line boundary of the application site to include this land. A letter of consent from Dublin City Council is required in this regard."

AECOM Response

As per the request of DCC, it is proposed to introduce upgrades to the existing pedestrian crossing infrastructure along the public road network. The proposed infrastructure improvements are illustrated on AECOM drawing number PR385358-ACM-GA-00-DR-CE-10-0001, which are in summary:

- Upgrading of the site and signals at the junction of Coolock Drive and Oscar Traynor Road, with the provision of a signalised pedestrian crossing on the western arm of the junction, thus ensuring pedestrian crossing facilities across all arms of the junction;
- Provision of a signalised pedestrian crossing to the south of the site entrance on Coolock Drive.
- Provision of a signalised pedestrian crossing at the proposed pedestrian entrance to the park off Greencastle Road.

AECOM attended a meeting with DCC Transport Planning Division on Wednesday 9th January 2019 to present the proposals for the development and associated infrastructure works, which were agreed in principle with the Council.

AECOM had another follow up meeting with DCC Transport Modelling team on Thursday 16th January 2019 to discuss the requirements of the upgrade at the Oscar Traynor Road. It was acknowledged that the Oscar Traynor Road would require road widening, double lane approaches and pedestrian crossing facilities on the northern and western arms to improve the pedestrian facilities for the proposed development.

Following our consultation with DCC, a letter of consent was obtained from Edel Kelly of the Transportation Planning Division, as shown in Appendix G of the TTA.

2.6 Engineering Drawings

A full suite of engineering drawings shall be provided which shall include the following:

- *Details of sightlines at the 2 no. vehicular accesses off Coolock Drive.*
- *Auto track drawings demonstrating that the site is fully accessible by fire tenders and servicing vehicles.*
- *Road construction details including details of shared surfaces.*

Details as to how priority will be afforded to pedestrians across both vehicular accesses off Coolock Drive.

AECOM Response

As per the request of DCC, AECOM has prepared a full suite of engineering drawings to accompany the planning application. These are summarised as follows:

- General Arrangement of Proposed Roads Layout and the adjacent junction upgrades, including indication of road geometries, road markings, signage and parking provision, AECOM drawing no. PR385358-ACM-GA-00-DR-CE-10-0001;
- Swept Path Analysis of Proposed Roads Layout for a refuse vehicle for the main entrance off Coolock Drive and a fire tender for the secondary access further south of Coolock Drive, AECOM Drawing no. PR385358-ACM-GA-00-DR-CE-10-0101;
- Visibility Splay Assessments of the sight lines at both site access points off Coolock Drive, AECOM drawing no. PR385358-ACM-GA-00-DR-CE-10-0102; and
- The servicing strategy of the proposed development is illustrated in AECOM drawing no. PR385356-ACM-00-00-DR-CE-10-0103.

2.7 Roads Layout

The applicant shall provide further details as to how traffic utilising the vehicular access to Block B will be managed. This division has serious concerns regarding the c. 12m width of this access which could give rise to a traffic hazard if traffic is not managed appropriately.

AECOM Response

As per the request of DCC, the entrance to Block B has been revised. Note that the 12m access width has been reduced to 6.0m. Furthermore, the junction corner radii have been reduced, a stop sign and road markings have been introduced and pedestrian facilities are proposed at this location to ensure pedestrians are given priority over vehicles, thus ensuring a safer roads layout design and removing the potential traffic hazard.

2.8 Basement Access

The applicant shall clarify how the access to the basement level will be managed to prevent conflicts arising with traffic utilising the ground level parking within Block B. The applicant shall also clarify whether the ramp will be sloped for the fully extent or whether there will be a level platform at entry/egress and shall clarify whether there will be sufficient visibility at the egress having regard to the adjacent wall.

AECOM Response

The design of the proposed basement ramp in Block B has been amended to allow for a level platform of approximately 5.5m at the top of ramp. The benefit of this redesign is to allow for visibility for vehicles travelling from basement to surface level, thus reducing the risk of a potential conflict between vehicles and ensuring a self-regulating arrangement.

Furthermore it is proposed to introduce give way marking within the undercroft car park, which gives priority for vehicles travelling from the basement over motorists within the under croft, as illustrated in AECOM Drawing No. PR385358-ACM-GA-00-DR-CE-10-0001. The introduction of give way markings will enhance driver caution, thus reducing the potential for internal conflicts.

It should be noted that in designing the ramp to the basement, the proposal has been undertaken in accordance with the 'Design Recommendations for Multi Storey and Underground Car Parks – Fourth Edition', allowing a gradient of between 1:6 and 1:10 and 3.0m transition zones at 50% of the ramp gradient.

2.9 Cycle Access

The applicant shall clarify whether segregated cycle access to basement level will be provided.

AECOM Response

It is not proposed to provide segregated cyclist access into the basement car park. The ramp has been designed to 6.5m wide, which is ample room to accommodate two way movements. The maximum speed limit within the undercroft and basement will be 10km/h and this will be denoted by signage, encourage low traffic speeds amongst the road users.

2.10 Crèche Drop Off

The applicant is requested to submit details regarding drop off and collection arrangements for the proposed crèche.

AECOM Response

The following design principles have been adopted for the proposed crèche drop off and collection point:

- A 6.0m wide carriageway has been proposed to facilitate the manoeuvrability of vehicles accessing the perpendicular car parking spaces to the west.
- 5 no. car parking spaces have been proposed, including 1 no. mobility impaired space, directly adjacent to the crèche to facilitate for drop off / pick up; and
- Pedestrian footpath facilities are proposed to continue from the proposed car parking spaces to the crèche building to facilitate the drop off and collection arrangements for parents and guardians.

2.11 Servicing Strategy

The applicant is requested to submit a Servicing Strategy for the proposed development.

AECOM Response

AECOM have prepared a Servicing Strategy and incorporated this within the Traffic and Transport Assessment (Chapter 8). In summary the proposed site will be serviced by a standard sized refuse lorry (10.2m length). All refuse collections and pick ups will be undertaken at surface level. AECOM have prepared a swept path analysis drawing indicating the refuse lorries will be able to manoeuvre within the internal roads layout, using the designated turning head within the eastern part of the site.

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 car park has not been designed to cater for a refuse lorry to access the undercroft or basement. Consequently a standard pick up vehicle such as a Toyota Dyna (2.2 m height, 4.4m length) will be required to transport the refuse bins from the undercroft and basement to surface level.

At surface level, a designated area for a refuse lorry is proposed immediate north of the hammerhead. The refuse area will accommodate a refuse lorry, whilst the smaller Dyna will transfer refuse to and from the basement. AECOM Drawing No. PR385356-ACM-00-00-DR-CE-10-0103 illustrates the surface level servicing area.

Response to An Bord Pleanala

ABP Opinion, Note 4, Car Parking

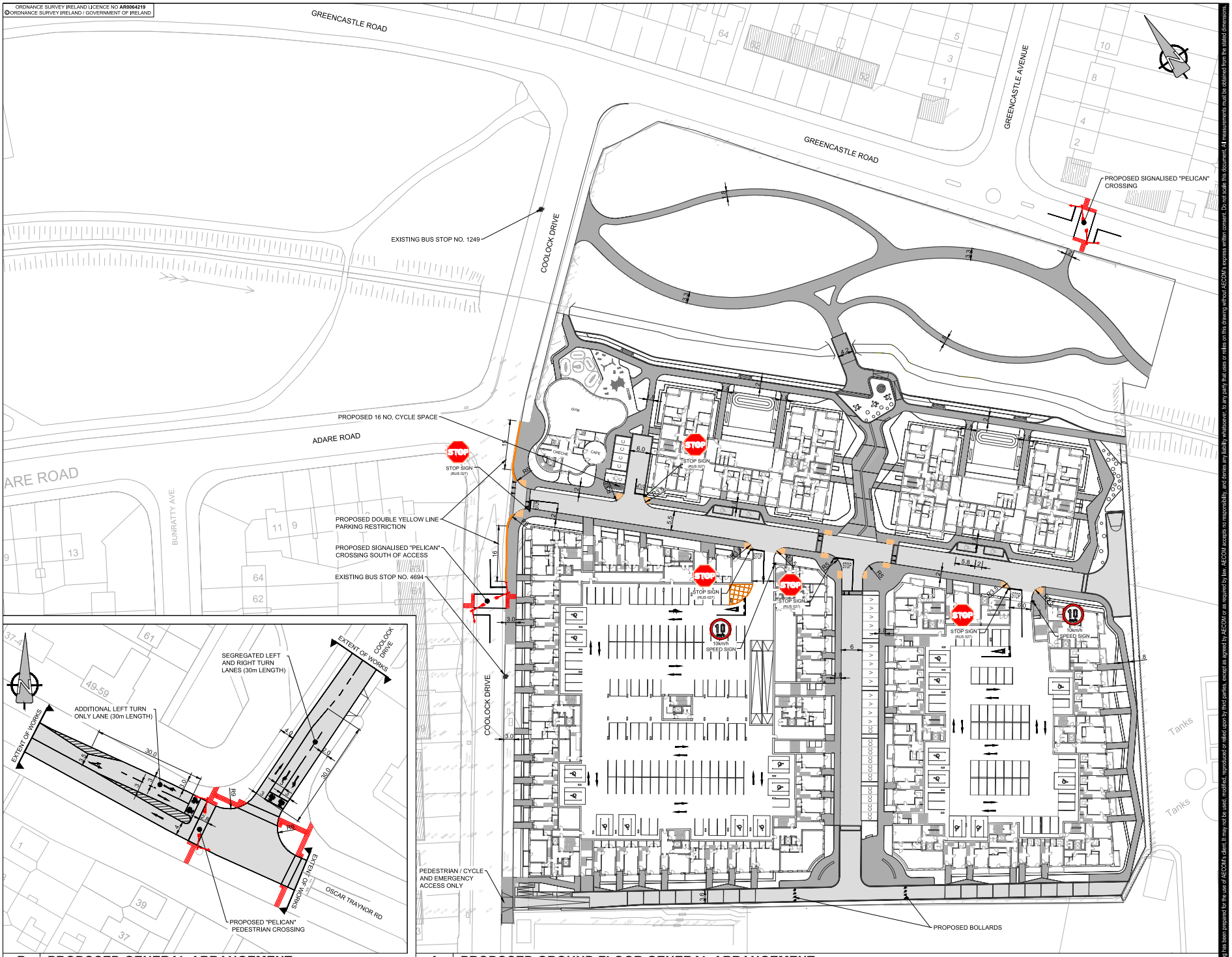
Further consideration and / or justification of the documents as they relate to the proposed car parking strategy for the proposed development, having particular regard to the level of parking proposed, how it is intended that it is assigned and managed and measures proposed to address shared car parking and visitor parking.

Further regard should be had to the interface and potential conflict between car users and pedestrians at the entrance to proposed Block B. The further consideration of these issues may require an amendment to the documents and / or design proposals submitted at application stage.

AECOM Response to ABP Opinion, Note 4, Car Parking

Please refer to AECOM's response to the DCC Transportation Planning Division Opinion, which covers the above opinions from the Board.
Section 2.2 (Car Parking Management) provides justification and allocation of the car parking provision of the development.
Section 2.7 (Roads Layout) outlines the amendments made to the proposed development to consider the potential conflict between car users and pedestrians at the entrance to Block B.
The Traffic and Transport Assessment and associated drawings have been updated to include the respective feedback from both An Bord Pleanala.

Appendix B Drawings



B 0001 — **PROPOSED GENERAL ARRANGEMENT AT OSCAR TRAYNOR ROAD JUNCTION** — Scale: 1:500

A 0001 — **PROPOSED GROUND FLOOR GENERAL ARRANGEMENT** — Scale: 1:500

AECOM

PROJECT
PROPOSED STRATEGIC HOUSING DEVELOPMENT AT CHIVERS FACTORY SITE, COOLOCK, DUBLIN 17

CLIENT
PLATINUM LAND LIMITED.

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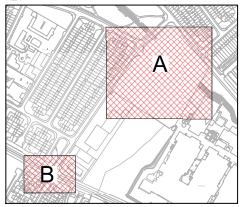
LEGEND
- PROPOSED FOOTPATH
- PROPOSED CARRIAGEWAY
- CC — CAR CLUB PARKING (10 NO. SPACES)
- C — CRÈCHE PARKING (5 NO. SPACES)
- V — VISITORS PARKING (14 NO. SPACES)
- 16 NO. CYCLE PARKING SPACES ON GROUND FLOOR

AECOM PLANNING

KEY



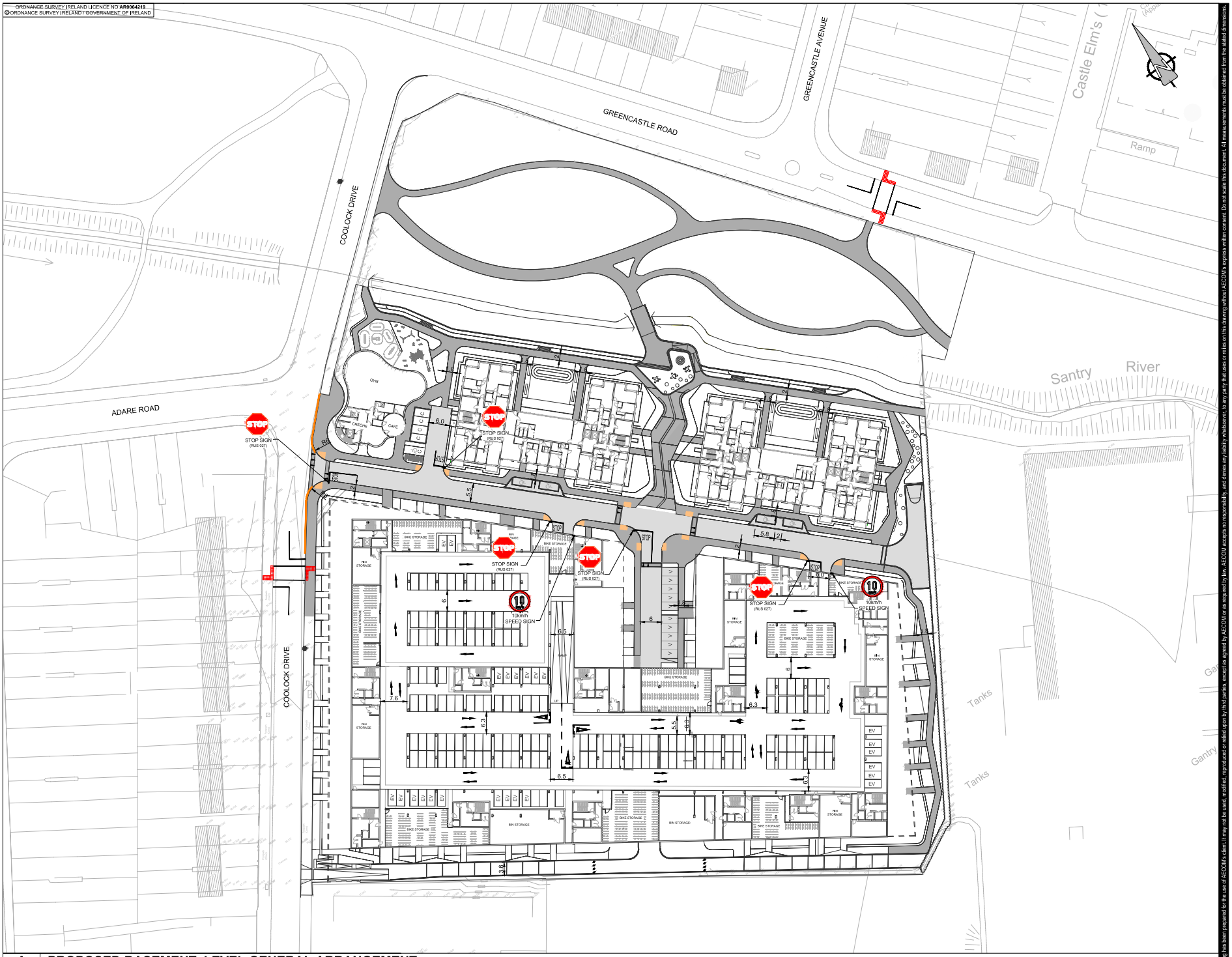
ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	29.03.2019	ISSUED FOR PLANNING

PROJECT NUMBER
60594375

SHEET TITLE
PROPOSED GROUND FLOOR GENERAL ARRANGEMENT

SHEET NUMBER
PR385358-ACM-GA-00-DR-CE-10-0001



A PROPOSED BASEMENT LEVEL GENERAL ARRANGEMENT

0002

Scale: 1:500

AECOM

PROJECT

PROPOSED STRATEGIC HOUSING DEVELOPMENT AT CHIVERS FACTORY SITE, COOLOCK, DUBLIN 17

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LEGEND

- PROPOSED FOOTPATH
- PROPOSED CARRIAGEWAY
- EV — 24 NO.ELECTRIC VEHICLE SPACES
- C — CRÈCHE PARKING (5 NO. SPACES)
- 634 NO. CYCLE PARKING SPACES ON BASEMENT LEVEL

AECOM PLANNING

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SHEET TITLE

PROPOSED BASEMENT LEVEL GENERAL ARRANGEMENT

SHEET NUMBER

PR385358-ACM-00-00-DR-CE-10-0002

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A **PROPOSED SERVICING STRATEGY**
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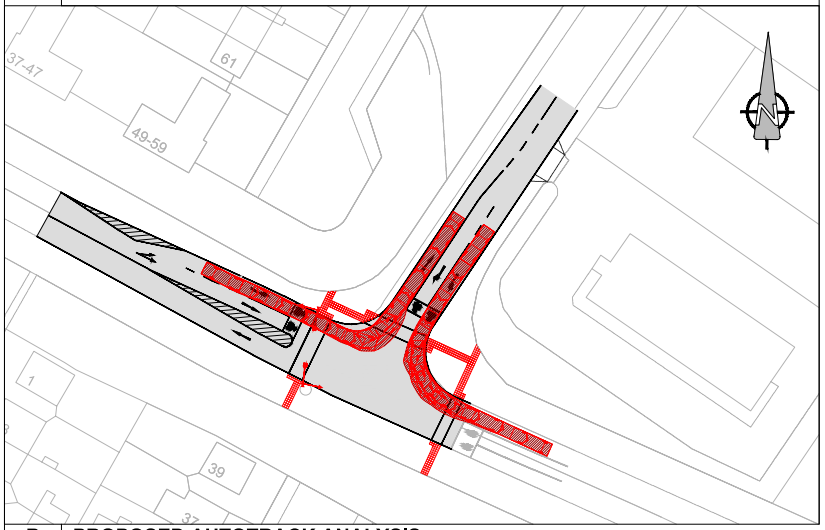
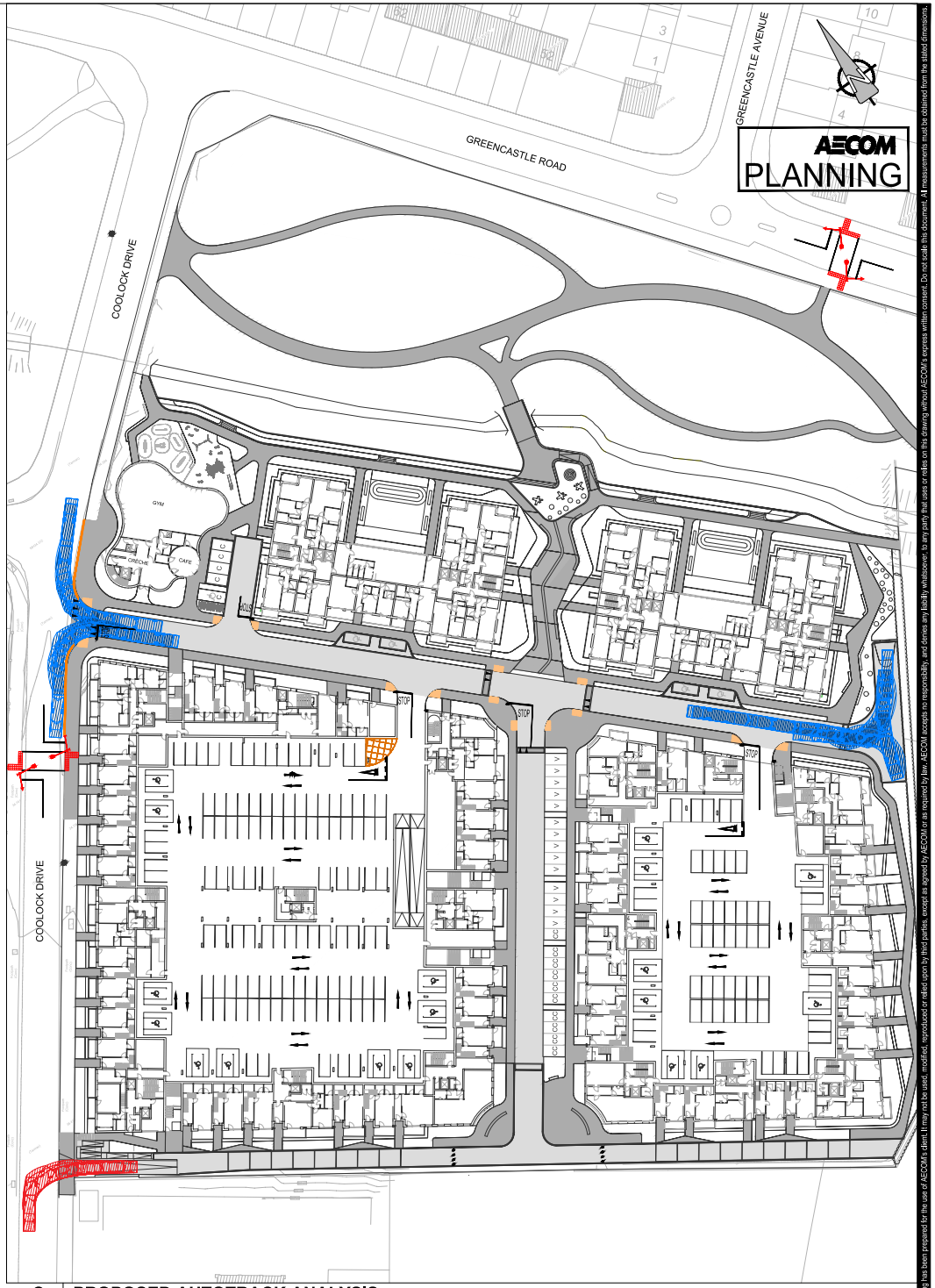


B **PROPOSED AUTOTRACK ANALYSIS**
0101 Scale: 1:500



C **PROPOSED AUTOTRACK ANALYSIS**
0101 Scale: 1:500

AECOM

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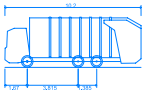
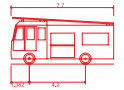
LEGEND

Phoenix 2 Duo (P2-12W with Elite 6x4 chassis)



Overall Length	10.200m
Overall Width	2.530m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	**7.800m**

Dennis Sabre Fire Tender (LWB)



Overall Length	7.700m
Overall Width	2.430m
Overall Body Height	3.512m
Min Body Ground Clearance	0.397m
Track Width	2.380m
Lock to Lock Time	5.00 sec
Kerb to Kerb Turning Radius	7.400m

TOYOTA DYNA

Overall Length	5.040m
Overall Width	1.750m
Overall Body Height	2.190m
Min Body Ground Clearance	0.289m
Track Width	1.710m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	5.900m

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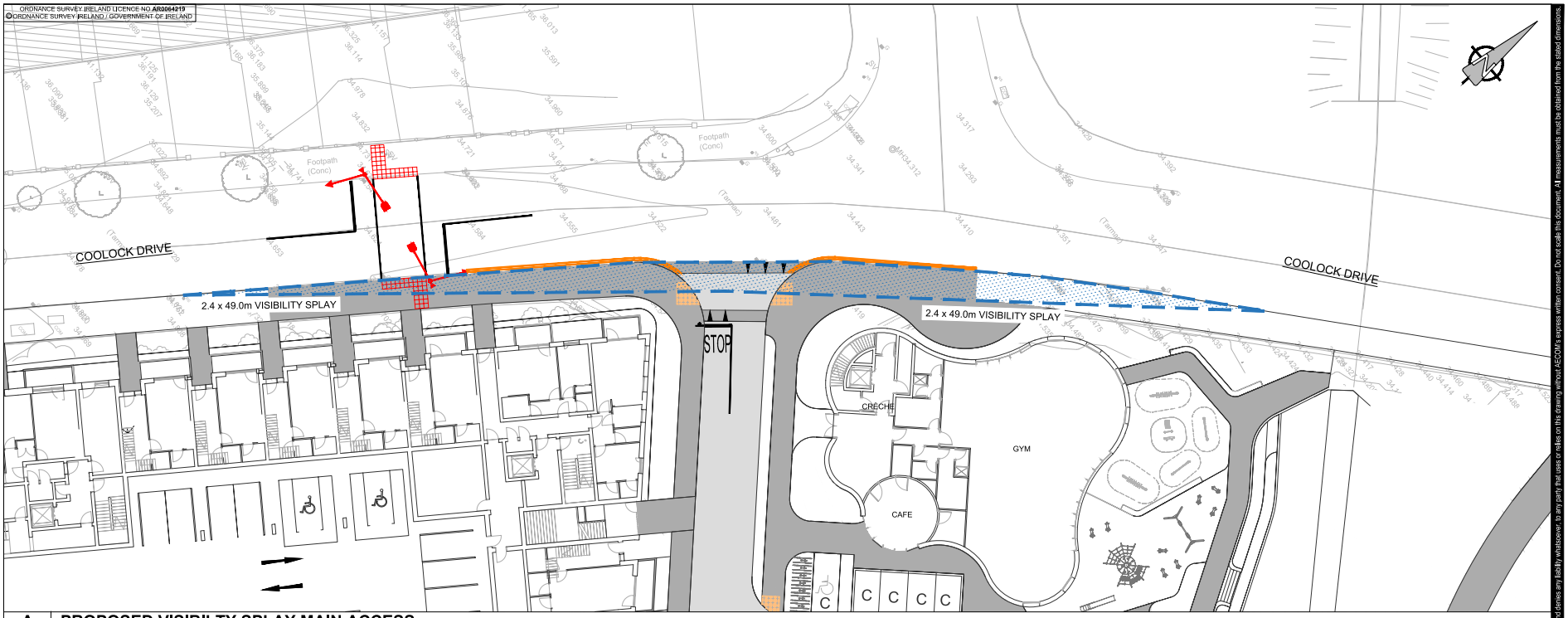
SHEET NUMBER
PR385358-ACM-GA-00-DR-CE-10-0101



A **PROPOSED VISIBILTY SPLAY MAIN ACCESS**
0102 Scale: 1:200

B **PROPOSED VISIBILITY SPLAY EMERGENCY ACCESS**
0102 Scale: 1:200

AECOM

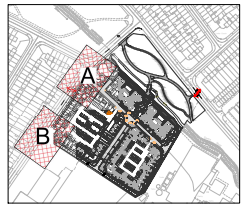
PROJECT
PROPOSED STRATEGIC HOUSING DEVELOPMENT AT CHIVERS FACTORY SITE, COOLOCK, DUBLIN 17

CLIENT
PLATINUM LAND LIMITED.

CONSULTANT
AECOM
4th Floor Adelphi Plaza,
George's Street Upper,
Dun Laoghaire,
Co Dublin
Tel:+353 (0)1 2383100 Fax:+353(0)1 2383199
www.aecom.com

NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS, ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.

KEY



AECOM
PLANNING

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	29.03.2019	ISSUED FOR PLANNING

PROJECT NUMBER
60594375

SHEET TITLE
VISIBILITY SPLAY ASSESSMENT

SHEET NUMBER
PR385358-ACM-GA-00-DR-CE-10-0102

ISO A1 594mm x 841mm
Approved: SG
Checked: AM
Designer: MS
Project Management Initials:
Last saved by: STOCKUNASM(2019-03-28) Last Plotted: 2019-03-29
Filename: \\EU.AECOMNET.COM\EMEA\UK\IE\DBL2\JOBS\PR-385356_CHIVERS_FACTORY_SITE\900_CAD_GIS\900_CAD\904_CE\01_WIP\02_SHEETS\PR385358-ACM-00-00-DR-CE-10-0102.DWG
Printed on ___% Post-Consumer Recycled Content Paper

Appendix C TRICS Data

Calculation Reference: AUDIT-204602-190404-0443

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
03	SOUTH WEST		
	DC	DORSET	1 days
	DV	DEVON	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	2 days
	NF	NORFOLK	1 days
	SF	SUFFOLK	2 days
05	EAST MIDLANDS		
	NT	NOTTINGHAMSHIRE	2 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	RI	EAST RIDING OF YORKSHIRE	1 days
09	NORTH		
	CB	CUMBRIA	2 days
	TV	TEES VALLEY	1 days
10	WALES		
	CO	CONWY	1 days
	DB	DENBIGHSHIRE	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	8 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

Secondary Filtering selection:

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

Parameter:	Number of dwellings
Actual Range:	6 to 340 (units:)
Range Selected by User:	6 to 372 (units:)

Parking Spaces Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 05/06/18

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

Selected survey days:

Monday	6 days
Tuesday	18 days
Wednesday	7 days
Thursday	5 days
Friday	6 days

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

Selected survey types:

Manual count	42 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	18
Suburban Area (PPS6 Out of Centre)	18
Edge of Town	3
Neighbourhood Centre (PPS6 Local Centre)	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:

Residential Zone	27
Built-Up Zone	5
No Sub Category	10

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	42 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	4 days
5,001 to 10,000	3 days
10,001 to 15,000	9 days
15,001 to 20,000	4 days
20,001 to 25,000	3 days
25,001 to 50,000	18 days
50,001 to 100,000	1 days

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

Secondary Filtering selection (Cont.):

Population within 5 miles:

5,001 to 25,000	2 days
25,001 to 50,000	4 days
50,001 to 75,000	12 days
75,001 to 100,000	2 days
125,001 to 250,000	7 days
250,001 to 500,000	8 days
500,001 or More	7 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	13 days
1.1 to 1.5	29 days

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

Travel Plan:

Yes	1 days
No	41 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	42 days

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

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	42	67	0.046	42	67	0.175	42	67	0.221
08:00 - 09:00	42	67	0.056	**42**	**67**	**0.214**	42	67	0.270
09:00 - 10:00	42	67	0.070	42	67	0.103	42	67	0.173
10:00 - 11:00	42	67	0.057	42	67	0.076	42	67	0.133
11:00 - 12:00	42	67	0.068	42	67	0.075	42	67	0.143
12:00 - 13:00	42	67	0.092	42	67	0.085	42	67	0.177
13:00 - 14:00	42	67	0.081	42	67	0.086	42	67	0.167
14:00 - 15:00	42	67	0.083	42	67	0.083	42	67	0.166
15:00 - 16:00	42	67	0.105	42	67	0.071	42	67	0.176
16:00 - 17:00	42	67	0.127	42	67	0.077	42	67	0.204
17:00 - 18:00	**42**	**67**	**0.198**	42	67	0.080	**42**	**67**	**0.278**
18:00 - 19:00	42	67	0.172	42	67	0.085	42	67	0.257
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.155			1.210			2.365

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 - 340 (units:)
Survey date date range:	01/01/11 - 05/06/18
Number of weekdays (Monday-Friday):	42
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.

Calculation Reference: AUDIT-204602-190404-0437

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	1 days
03	SOUTH WEST		
	WL	WILTSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	LE	LEICESTERSHIRE	1 days
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	WK	WARWICKSHIRE	1 days
09	NORTH		
	TV	TEES VALLEY	1 days
	TW	TYNE & WEAR	1 days
10	WALES		
	BG	BRIDGEND	1 days
11	SCOTLAND		
	DU	DUNDEE CITY	1 days
	SR	STIRLING	1 days
12	CONNAUGHT		
	RO	ROSCOMMON	1 days
15	GREATER DUBLIN		
	DL	DUBLIN	1 days
17	ULSTER (NORTHERN IRELAND)		
	DE	DERRY	1 days

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

Secondary Filtering selection:

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

Parameter: Number of pupils
Actual Range: 18 to 110 (units:)
Range Selected by User: 18 to 450 (units:)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/11 to 12/07/18

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

Selected survey days:

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

Suburban Area (PPS6 Out of Centre)	7
Edge of Town	7
Neighbourhood Centre (PPS6 Local Centre)	1
Free Standing (PPS6 Out of Town)	1

This data displays the number of surveys per main location category within the selected set. The main location categories

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	3 days
5,001 to 10,000	2 days
10,001 to 15,000	1 days
15,001 to 20,000	2 days
20,001 to 25,000	1 days
25,001 to 50,000	5 days
50,001 to 100,000	1 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	4 days
1.1 to 1.5	11 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.

TRIP RATE for Land Use 04 - EDUCATION/D - NURSERY
VEHICLES
Calculation factor: 1
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	Trip Rate	No. Days	Ave. PUPILS	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	40	0.013	2	40	0.000	2	40	0.013
07:00 - 08:00	16	53	0.140	16	53	0.073	16	53	0.213
08:00 - 09:00	**16**	**53**	**0.295**	16	53	0.224	**16**	**53**	**0.519**
09:00 - 10:00	16	53	0.140	16	53	0.132	16	53	0.272
10:00 - 11:00	16	53	0.044	16	53	0.029	16	53	0.073
11:00 - 12:00	16	53	0.053	16	53	0.041	16	53	0.094
12:00 - 13:00	16	53	0.099	16	53	0.120	16	53	0.219
13:00 - 14:00	16	53	0.077	16	53	0.104	16	53	0.181
14:00 - 15:00	16	53	0.068	16	53	0.065	16	53	0.133
15:00 - 16:00	16	53	0.083	16	53	0.103	16	53	0.186
16:00 - 17:00	16	53	0.127	16	53	0.139	16	53	0.266
17:00 - 18:00	16	53	0.190	**16**	**53**	**0.237**	16	53	0.427
18:00 - 19:00	15	55	0.016	15	55	0.064	15	55	0.080
19:00 - 20:00	1	50	0.000	1	50	0.000	1	50	0.000
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.345			1.331			2.676

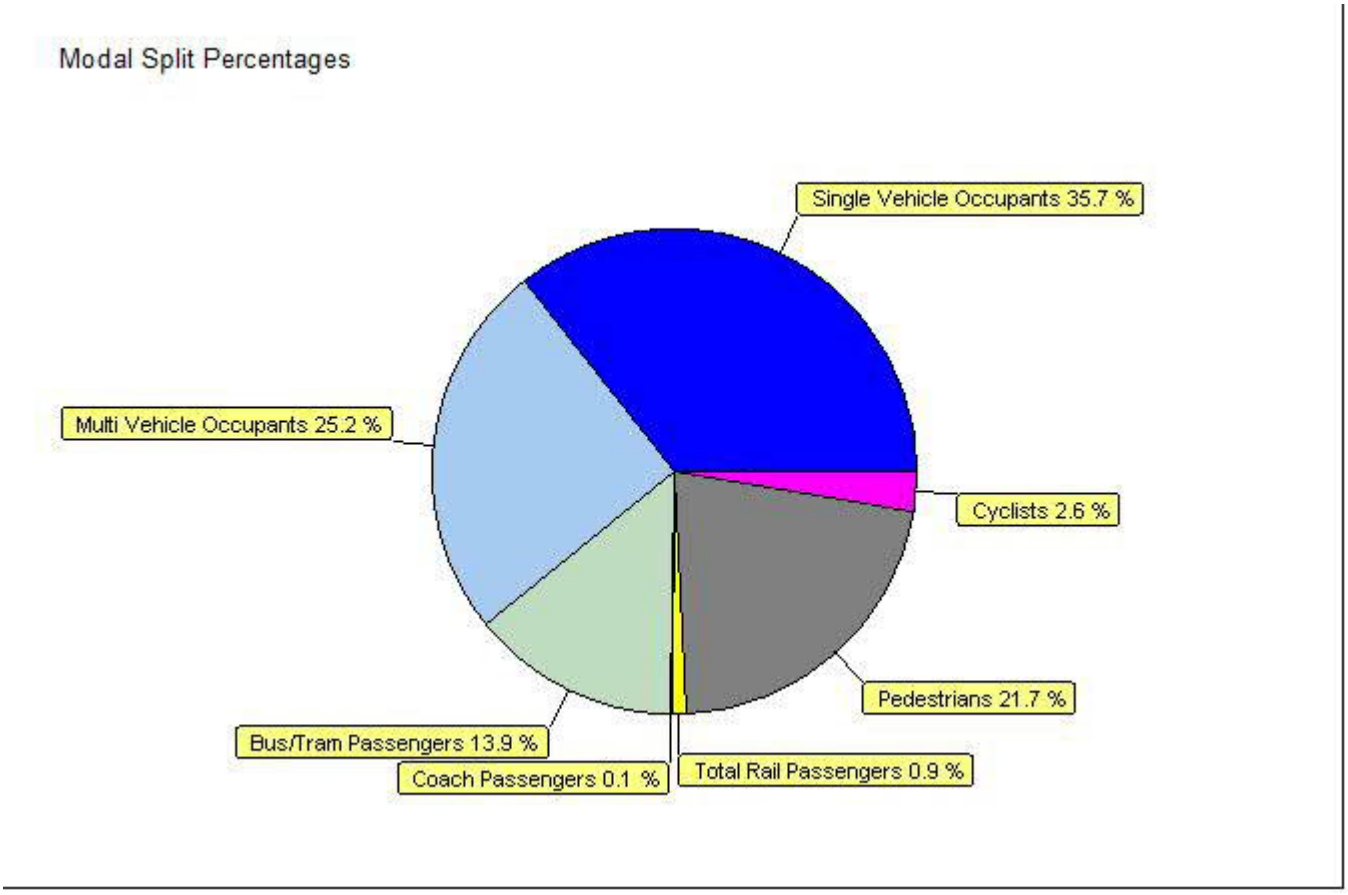
This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are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

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

Parameter summary

Trip rate parameter range selected:	18 - 110 (units:)
Survey date date range:	01/01/11 - 12/07/18
Number of weekdays (Monday-Friday):	16
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.



Time Range/Peak Period Selection
Direction: Totals / Use All Times

Appendix D Traffic Flows

Diagram 1 - 2017 AM Peak Base (08:00 - 09:00)

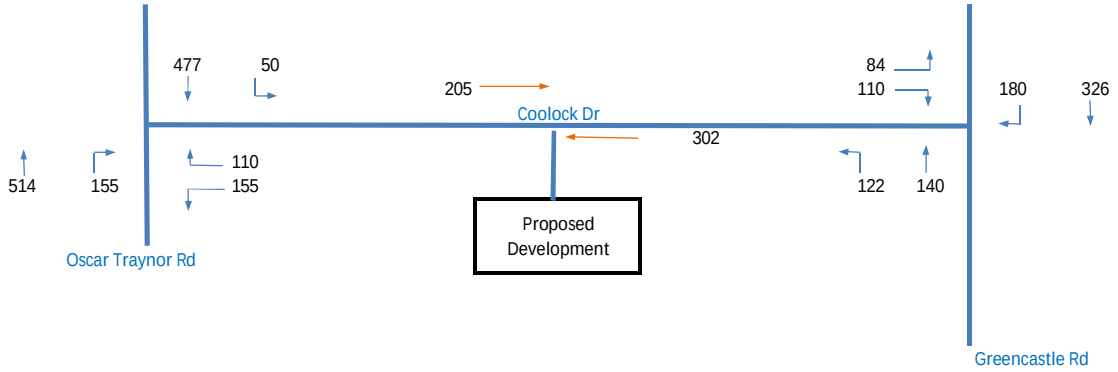


Diagram 2 - 2017 PM Peak Base (16:00 - 17:00)

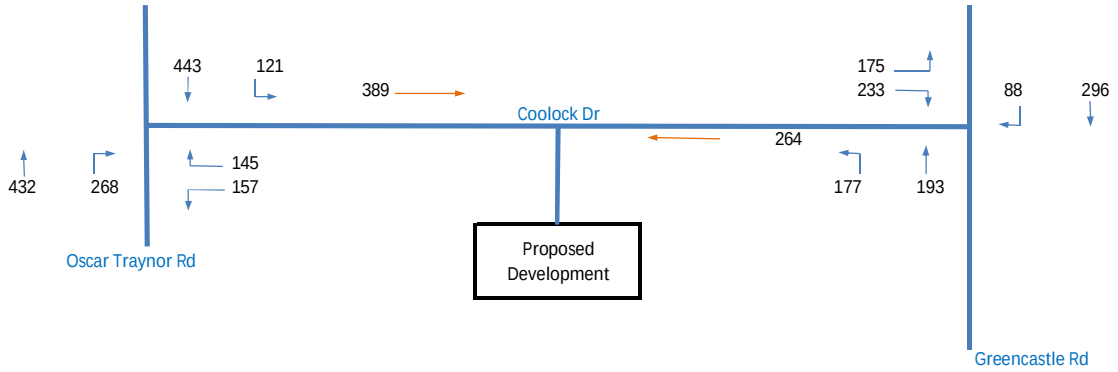


Diagram 3 - AM Peak Development Distribution (08:00 - 09:00)

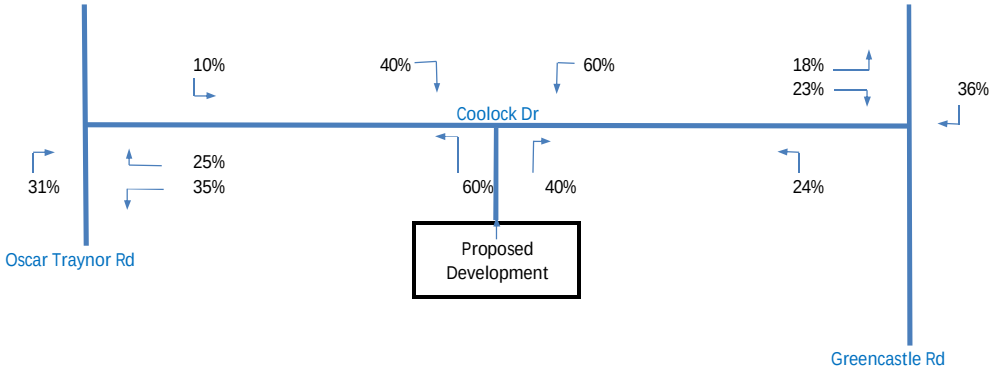


Diagram 4 - PM Peak Development Distribution (16:00 - 17:00)

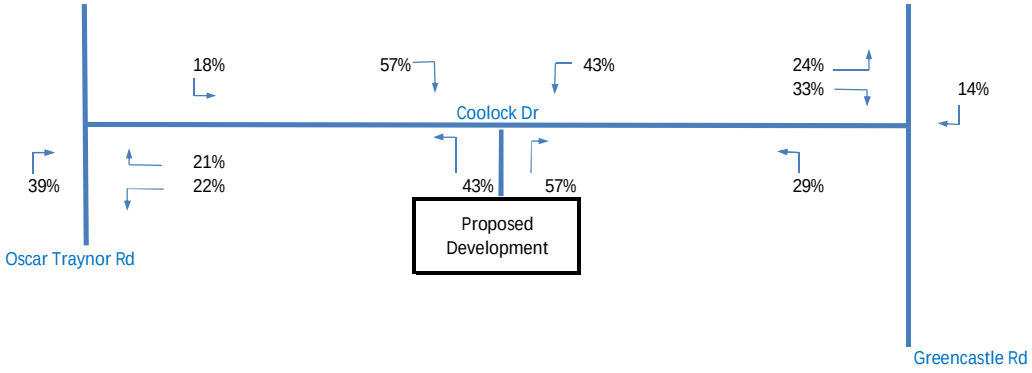


Diagram 5 - AM Peak Development Trips (08:00 - 09:00)

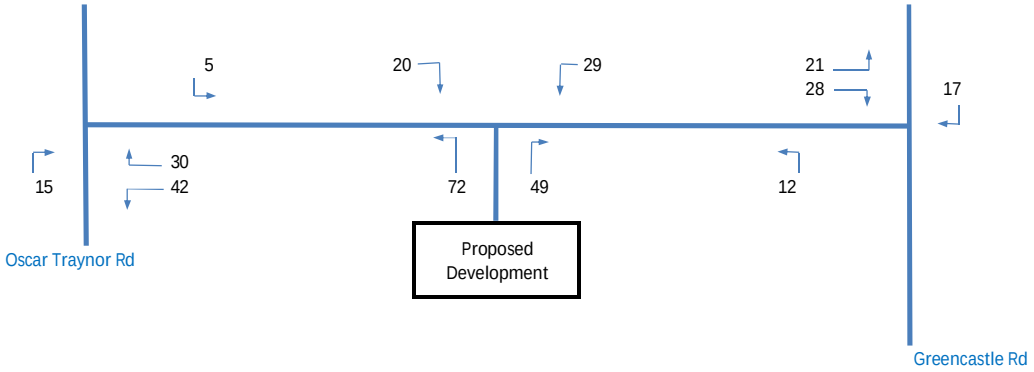
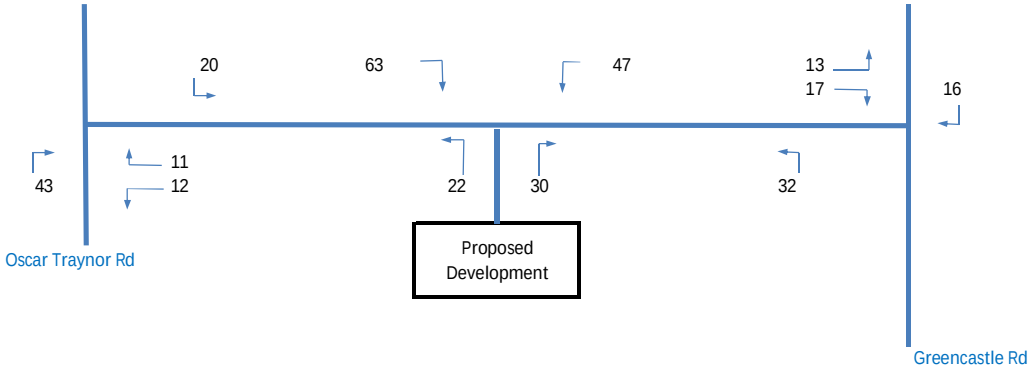


Diagram 6 - PM Peak Development Trips (16:00 - 17:00)



Annual Average Daily Traffic Flows - 2017 Traffic Surveys

TII Expansion Factor - Dublin		
0.081	Hour ending - 08:00	**See Page 17 of TII Guidelines
0.088	Hour ending -17:00	**See Page 17 of TII Guidelines
0.93	Weekly Flow Index - Thursday	**See Page 32 of TII Guidelines
0.96	Monthly Flow Index - September	**See Page 35 of TII Guidelines

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	205	302	507	389	264	653
	24 Hour	2525	3728	6253	4418	3000	7418
	Weekly Average Day	2348	3467	5815	4109	2790	6899
	Annual Average Daily Traffic (AADT)	2254	3329	5583	3945	2678	6623
	Peak Annual Average Daily Traffic (AADT)						6623

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	262	506	768	370	383	753
	24 Hour	3235	6241	9475	4199	4352	8551
	Weekly Average Day	3008	5804	8812	3905	4048	7953
	Annual Average Daily Traffic (AADT)	2888	5572	8460	3749	3886	7634
	Peak Annual Average Daily Traffic (AADT)						8460

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	669	527	1196	699	565	1264
	24 Hour	8260	6505	14765	7948	6417	14365
	Weekly Average Day	7682	6050	13732	7391	5968	13359
	Annual Average Daily Traffic (AADT)	7375	5808	13183	7096	5729	12825
	Peak Annual Average Daily Traffic (AADT)						13183

Annual Average Daily Traffic Flows - 2022 Opening Year (Without Development)

TII Expansion Factor - Dublin	
1.068819823	2017 - 2022

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	219	323	541	416	282	698
	24 Hour	2698	3985	6683	4722	3206	7929
	Weekly Average Day	2510	3706	6216	4392	2982	7374
	Annual Average Daily Traffic (AADT)	2409	3558	5967	4216	2863	7079
	Peak Annual Average Daily Traffic (AADT)						7079

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	280	540	820	395	409	804
	24 Hour	3457	6670	10127	4488	4652	9140
	Weekly Average Day	3215	6203	9418	4174	4326	8500
	Annual Average Daily Traffic (AADT)	3087	5955	9042	4007	4153	8160
	Peak Annual Average Daily Traffic (AADT)						9042

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	715	563	1278	748	604	1351
	24 Hour	8829	6953	15782	8495	6859	15353
	Weekly Average Day	8211	6466	14677	7900	6379	14279
	Annual Average Daily Traffic (AADT)	7883	6207	14090	7584	6123	13707
	Peak Annual Average Daily Traffic (AADT)						14090

Annual Average Daily Traffic Flows - 2027 Opening Year + 5 (Without Development)

TII Expansion Factor - Dublin	
1.142375813	2017 - 2027

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	234	345	579	444	302	746
	24 Hour	2884	4259	7143	5047	3427	8474
	Weekly Average Day	2682	3961	6643	4694	3187	7881
	Annual Average Daily Traffic (AADT)	2575	3803	6378	4506	3060	7566
	Peak Annual Average Daily Traffic (AADT)						7566

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	299	577	877	422	438	860
	24 Hour	3695	7129	10824	4797	4972	9769
	Weekly Average Day	3436	6630	10067	4461	4624	9085
	Annual Average Daily Traffic (AADT)	3299	6365	9664	4282	4439	8721
	Peak Annual Average Daily Traffic (AADT)						9664

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	764	602	1366	799	645	1444
	24 Hour	9437	7431	16868	9079	7331	16410
	Weekly Average Day	8776	6911	15687	8444	6818	15261
	Annual Average Daily Traffic (AADT)	8425	6634	15059	8106	6545	14651
	Peak Annual Average Daily Traffic (AADT)						15059

Annual Average Daily Traffic Flows - 2037 Opening Year + 15 (Without Development)

TII Expansion Factor - Dublin	
1.215822613	2017 - 2037

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	249	367	616	473	321	794
	24 Hour	3070	4533	7603	5372	3647	9019
	Weekly Average Day	2855	4216	7070	4996	3392	8388
	Annual Average Daily Traffic (AADT)	2741	4047	6788	4796	3256	8052
	Peak Annual Average Daily Traffic (AADT)						8052

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	319	615	933	449	466	915
	24 Hour	3933	7588	11520	5105	5292	10397
	Weekly Average Day	3657	7056	10714	4748	4921	9669
	Annual Average Daily Traffic (AADT)	3511	6774	10285	4558	4724	9282
	Peak Annual Average Daily Traffic (AADT)						10285

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	814	641	1454	850	687	1537
	24 Hour	10043	7909	17952	9663	7802	17465
	Weekly Average Day	9340	7355	16695	8987	7256	16242
	Annual Average Daily Traffic (AADT)	8967	7061	16028	8627	6966	15593
	Peak Annual Average Daily Traffic (AADT)						16028

Annual Average Daily Traffic Flows - 2022 Opening Year (With Development)

Development Flows		North	South	Two Way
Coolock Drive	AM Peak Hour	69	101	170
	PM Peak Hour	92	70	162
Greencastle Road	AM Peak Hour	33	45	78
	PM Peak Hour	44	33	77
Oscar Traynor Road	AM Peak Hour	45	47	92
	PM Peak Hour	54	31	85

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	287	424	712	508	352	790
	24 Hour	2767	4086	6854	4814	3276	8021
	Weekly Average Day	2578	3807	6386	4484	3052	7466
	Annual Average Daily Traffic (AADT)	2478	3659	6137	4308	2932	7171
	Peak Annual Average Daily Traffic (AADT)						7171

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	349	642	990	487	479	896
	24 Hour	3526	6772	10298	4580	4721	9232
	Weekly Average Day	3284	6305	9589	4266	4396	8592
	Annual Average Daily Traffic (AADT)	3155	6057	9212	4099	4223	8252
	Peak Annual Average Daily Traffic (AADT)						9212

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	784	665	1448	840	673	1443
	24 Hour	8898	7054	15952	8587	6928	15446
	Weekly Average Day	8280	6567	14847	7992	6448	14371
	Annual Average Daily Traffic (AADT)	7951	6309	14260	7676	6193	13800
	Peak Annual Average Daily Traffic (AADT)						14260

Annual Average Daily Traffic Flows - 2027 Opening Year (With Development)

Development Flows		North	South	Two Way
Coolock Drive	AM Peak Hour	69	101	170
	PM Peak Hour	92	70	162
Greencastle Road	AM Peak Hour	33	45	78
	PM Peak Hour	44	33	77
Oscar Traynor Road	AM Peak Hour	45	47	92
	PM Peak Hour	54	31	85

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	302	446	749	536	371	838
	24 Hour	2953	4361	7314	5139	3497	8567
	Weekly Average Day	2751	4063	6813	4786	3257	7973
	Annual Average Daily Traffic (AADT)	2644	3904	6548	4598	3129	7658
	Peak Annual Average Daily Traffic (AADT)						7658

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	368	679	1047	514	507	952
	24 Hour	3764	7231	10995	4889	5041	9861
	Weekly Average Day	3505	6732	10237	4553	4693	9177
	Annual Average Daily Traffic (AADT)	3368	6466	9834	4375	4508	8814
	Peak Annual Average Daily Traffic (AADT)						9834

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	833	703	1536	891	715	1536
	24 Hour	9505	7533	17038	9171	7400	16502
	Weekly Average Day	8845	7012	15857	8536	6887	15353
	Annual Average Daily Traffic (AADT)	8494	6736	15230	8198	6614	14743
	Peak Annual Average Daily Traffic (AADT)						15230

Annual Average Daily Traffic Flows - 2027 Opening Year (With Development)

Development Flows		North	South	Two Way
Coolock Drive	AM Peak Hour	69	101	170
	PM Peak Hour	92	70	162
Greencastle Road	AM Peak Hour	33	45	78
	PM Peak Hour	44	33	77
Oscar Traynor Road	AM Peak Hour	45	47	92
	PM Peak Hour	54	31	85

Scenario		AM Peak Hour			PM Peak Hour		
		Northbound	Southbound	Two Way	Northbound	Southbound	Two Way
Coolock Drive	Peak Hour Flow	317	469	786	565	391	886
	24 Hour	3138	4635	7773	5464	3717	9111
	Weekly Average Day	2923	4317	7241	5088	3462	8480
	Annual Average Daily Traffic (AADT)	2809	4149	6958	4888	3326	8145
	Peak Annual Average Daily Traffic (AADT)						8145

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Greencastle Road	Peak Hour Flow	387	716	1103	541	535	1007
	24 Hour	4001	7689	11690	5197	5361	10489
	Weekly Average Day	3726	7158	10884	4840	4991	9761
	Annual Average Daily Traffic (AADT)	3580	6876	10455	4650	4794	9374
	Peak Annual Average Daily Traffic (AADT)						10455

Scenario		AM Peak Hour			PM Peak Hour		
		North-West bound	South-East bound	Two Way	North-West bound	South-East bound	Two Way
Oscar Traynor Road	Peak Hour Flow	882	742	1624	943	756	1629
	24 Hour	10112	8010	18122	9755	7872	17557
	Weekly Average Day	9409	7457	16866	9079	7325	16335
	Annual Average Daily Traffic (AADT)	9035	7162	16198	8719	7035	15685
	Peak Annual Average Daily Traffic (AADT)						16198

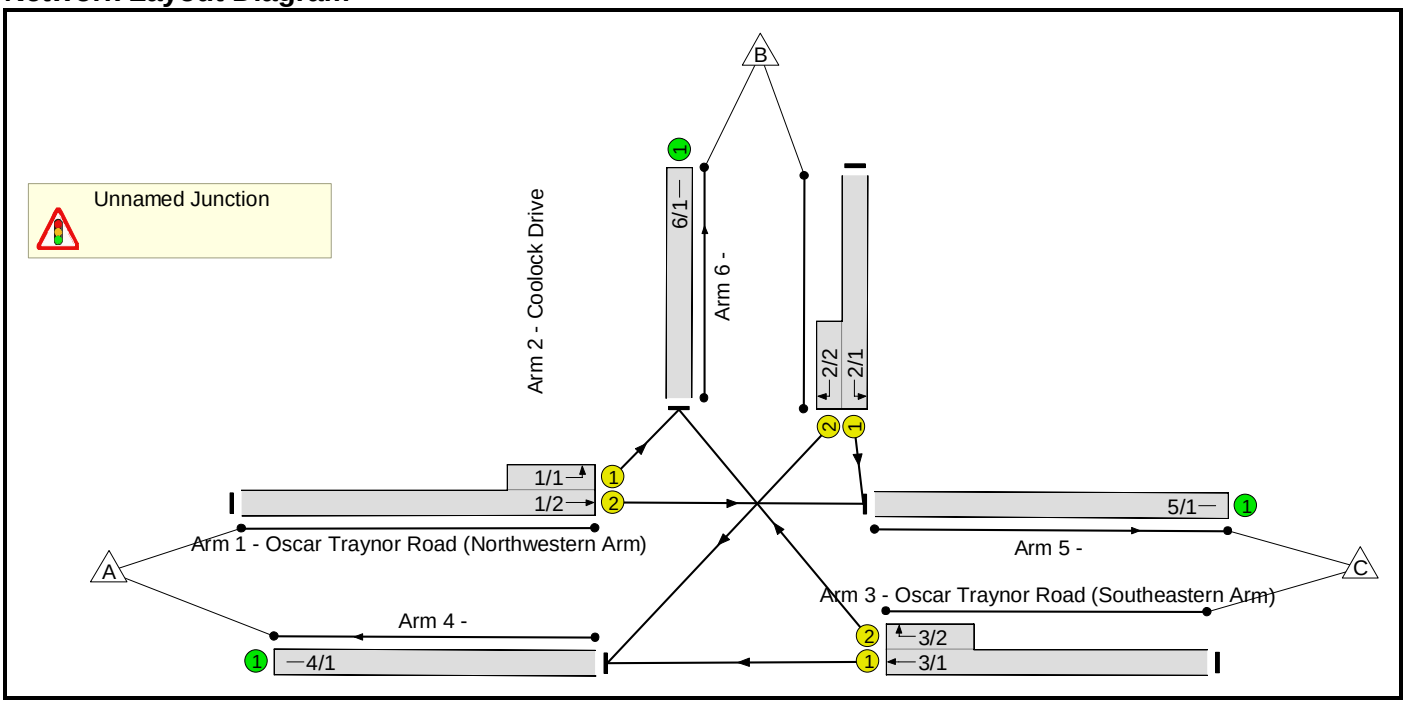
Appendix E Junction Modelling Results

Full Input Data And Results

User and Project Details

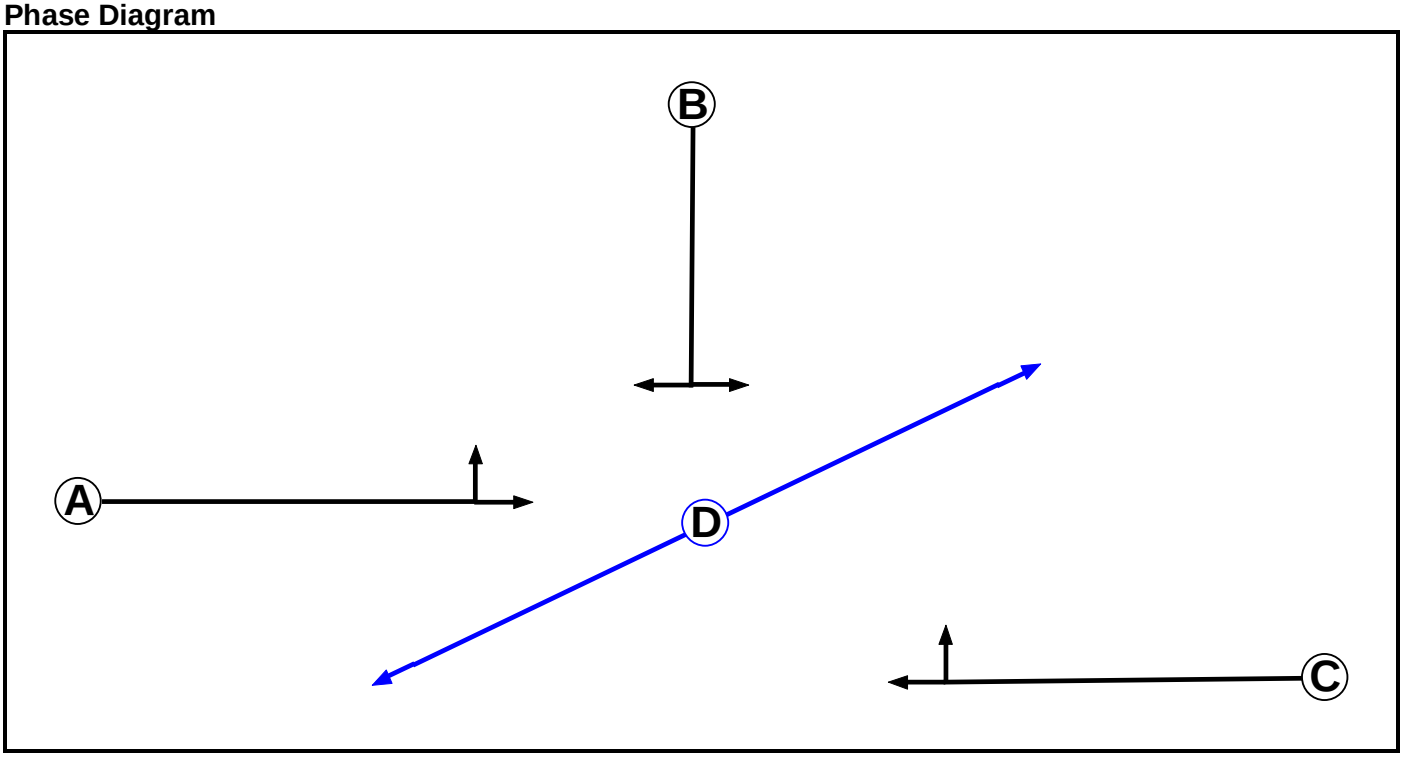
Project:	**Proposed SHD at the Former Chivers Factory Site, Coolock Drive, D17**
Title:	**Oscar Traynor Road / Coolock Drive Signalised Junction**
Location:	Coolock
Additional detail:	Upgraded Oscar Traynor Road Junction
File name:	Upgraded Signalised Junction
Author:	A.Mannion
Company:	AECOM
Address:	Adelphi Plaza, Georges Street Upper, Dun Laoghaire, 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	Traffic		7	7
C	Traffic		7	7
D	Pedestrian		7	7

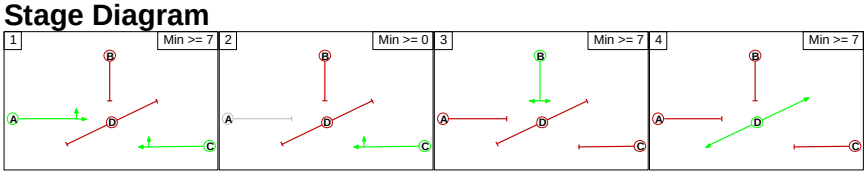
Phase Intergreens Matrix

		Starting Phase			
		A	B	C	D
Terminating Phase	A		7	-	10
	B	7		7	10
	C	-	7		10
	D	10	10	10	

Phases in Stage

Stage No.	Phases in Stage
1	A C
2	C
3	B
4	D

Stage Diagram



Full Input Data And Results

Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage \ To Stage	1	2	3	4
1		0	7	10
2	2		7	10
3	7	7		10
4	10	10	10	

Full Input Data And Results

Give-Way Lane Input Data

Junction: Unnamed Junction
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: Unnamed Junction

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 (Oscar Traynor Road (Northwestern Arm))	U	A	2	3	5.2	Geom	-	3.30	0.00	Y	Arm 6 Left	12.00
1/2 (Oscar Traynor Road (Northwestern Arm))	U	A	2	3	60.0	Geom	-	3.30	0.00	Y	Arm 5 Ahead	Inf
2/1 (Coolock Drive)	U	B	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 5 Left	10.00
2/2 (Coolock Drive)	U	B	2	3	5.2	Geom	-	3.10	0.00	Y	Arm 4 Right	Inf
3/1 (Oscar Traynor Road (Southeastern Arm))	U	C	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Ahead	Inf
3/2 (Oscar Traynor Road (Southeastern Arm))	U	C	2	3	5.2	Geom	-	3.25	0.00	Y	Arm 6 Right	10.00
4/1	U		2	3	60.0	Inf	-	-	-	-	-	-
5/1	U		2	3	60.0	Inf	-	-	-	-	-	-
6/1	U		2	3	60.0	Geom	-	3.00	0.00	Y		

Full Input Data And Results

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2017 AM Peak Hour'	08:00	09:00	01:00	
2: '2017 PM Peak Hour'	16:00	17:00	01:00	
3: '2022 AM Peak Hour'	08:00	09:00	01:00	F1*1.06882
4: '2022 PM Peak Hour'	16:00	17:00	01:00	F2*1.06882
5: '2027 AM Peak Hour'	08:00	09:00	01:00	F1*1.142
6: '2027 PM Peak Hour'	16:00	17:00	01:00	F2*1.142
7: '2037 AM Peak Hour'	08:00	09:00	01:00	F1*1.216
8: '2037 PM Peak Hour'	16:00	17:00	01:00	F2*1.216
9: 'Dev Flows AM'	08:00	09:00	01:00	
10: 'Dev Flows PM'	16:00	17:00	01:00	
11: '2022 AM Base + Dev'	08:00	09:00	01:00	F3+F9
12: '2022 PM Base + Dev'	16:00	17:00	01:00	F4+F10
13: '2027 AM Base + Dev'	08:00	09:00	01:00	F5+F9
14: '2027 PM Base + Dev'	16:00	17:00	01:00	F6+F10
15: '2037 AM Base + Dev'	08:00	09:00	01:00	F7+F9
16: '2037 PM Base + Dev'	16:00	17:00	01:00	F8+F10

Scenario 1: '2022 AM Base' (FG3: '2022 AM Peak Hour', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	53	510	563
	B	118	0	166	284
	C	549	166	0	715
	Tot.	667	219	676	1562

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 1: 2022 AM Base
Junction: Unnamed Junction	
1/1 (short)	53
1/2 (with short)	563(In) 510(Out)
2/1 (with short)	284(In) 166(Out)
2/2 (short)	118
3/1 (with short)	715(In) 549(Out)
3/2 (short)	166
4/1	667
5/1	676
6/1	219

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Full Input Data And Results

Scenario 2: '2022 PM Base' (FG4: '2022 PM Peak Hour', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	129	473	602
	B	155	0	168	323
	C	462	286	0	748
	Tot.	617	415	641	1673

Traffic Lane Flows

Lane	Scenario 2: 2022 PM Base
Junction: Unnamed Junction	
1/1 (short)	129
1/2 (with short)	602(In) 473(Out)
2/1 (with short)	323(In) 168(Out)
2/2 (short)	155
3/1 (with short)	748(In) 462(Out)
3/2 (short)	286
4/1	617
5/1	641
6/1	415

Full Input Data And Results

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Scenario 3: '2027 AM Base ' (FG5: '2027 AM Peak Hour', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	57	545	602
	B	126	0	177	303
	C	587	177	0	764
	Tot.	713	234	722	1669

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 3: 2027 AM Base
Junction: Unnamed Junction	
1/1 (short)	57
1/2 (with short)	602(In) 545(Out)
2/1 (with short)	303(In) 177(Out)
2/2 (short)	126
3/1 (with short)	764(In) 587(Out)
3/2 (short)	177
4/1	713
5/1	722
6/1	234

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Full Input Data And Results

Scenario 4: '2027 PM Base ' (FG6: '2027 PM Peak Hour', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	138	506	644
	B	166	0	179	345
	C	493	306	0	799
	Tot.	659	444	685	1788

Traffic Lane Flows

Lane	Scenario 4: 2027 PM Base
Junction: Unnamed Junction	
1/1 (short)	138
1/2 (with short)	644(In) 506(Out)
2/1 (with short)	345(In) 179(Out)
2/2 (short)	166
3/1 (with short)	799(In) 493(Out)
3/2 (short)	306
4/1	659
5/1	685
6/1	444

Full Input Data And Results

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Scenario 5: '2037 AM Base ' (FG7: '2037 AM Peak Hour', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	61	580	641
	B	134	0	188	322
	C	625	188	0	813
	Tot.	759	249	768	1776

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 5: 2037 AM Base
Junction: Unnamed Junction	
1/1 (short)	61
1/2 (with short)	641(In) 580(Out)
2/1 (with short)	322(In) 188(Out)
2/2 (short)	134
3/1 (with short)	813(In) 625(Out)
3/2 (short)	188
4/1	759
5/1	768
6/1	249

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Full Input Data And Results

Scenario 6: '2037 PM Peak Hour' (FG8: '2037 PM Peak Hour', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	147	539	686
	B	176	0	191	367
	C	525	326	0	851
	Tot.	701	473	730	1904

Traffic Lane Flows

Lane	Scenario 6: 2037 PM Peak Hour
Junction: Unnamed Junction	
1/1 (short)	147
1/2 (with short)	686(In) 539(Out)
2/1 (with short)	367(In) 191(Out)
2/2 (short)	176
3/1 (with short)	851(In) 525(Out)
3/2 (short)	326
4/1	701
5/1	730
6/1	473

Full Input Data And Results

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Scenario 7: '2022 Base + Dev AM Hour' (FG11: '2022 AM Base + Dev', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	58	510	568
	B	149	0	209	358
	C	549	182	0	731
	Tot.	698	240	719	1657

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 7: 2022 Base + Dev AM Hour
Junction: Unnamed Junction	
1/1 (short)	58
1/2 (with short)	568(In) 510(Out)
2/1 (with short)	358(In) 209(Out)
2/2 (short)	149
3/1 (with short)	731(In) 549(Out)
3/2 (short)	182
4/1	698
5/1	719
6/1	240

Lane Saturation Flows

Junction: Unnamed Junction

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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Full Input Data And Results

Scenario 8: '2022 Base + Dev PM Hou' (FG12: '2022 PM Base + Dev', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	149	473	622
	B	167	0	181	348
	C	462	330	0	792
	Tot.	629	479	654	1762

Traffic Lane Flows

Lane	Scenario 8: 2022 Base + Dev PM Hou
Junction: Unnamed Junction	
1/1 (short)	149
1/2 (with short)	622(In) 473(Out)
2/1 (with short)	348(In) 181(Out)
2/2 (short)	167
3/1 (with short)	792(In) 462(Out)
3/2 (short)	330
4/1	629
5/1	654
6/1	479

Full Input Data And Results

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Scenario 9: '2027 Base + Dev AM Hou' (FG13: '2027 AM Base + Dev', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	62	545	607
	B	157	0	220	377
	C	587	193	0	780
	Tot.	744	255	765	1764

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 9: 2027 Base + Dev AM Hou
Junction: Unnamed Junction	
1/1 (short)	62
1/2 (with short)	607(In) 545(Out)
2/1 (with short)	377(In) 220(Out)
2/2 (short)	157
3/1 (with short)	780(In) 587(Out)
3/2 (short)	193
4/1	744
5/1	765
6/1	255

Lane Saturation Flows

Junction: Unnamed Junction

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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Full Input Data And Results

Scenario 10: '2027 Base + Dev PM Hou' (FG14: '2027 PM Base + Dev', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	158	506	664
	B	178	0	192	370
	C	493	350	0	843
	Tot.	671	508	698	1877

Traffic Lane Flows

Lane	Scenario 10: 2027 Base + Dev PM Hou
Junction: Unnamed Junction	
1/1 (short)	158
1/2 (with short)	664(In) 506(Out)
2/1 (with short)	370(In) 192(Out)
2/2 (short)	178
3/1 (with short)	843(In) 493(Out)
3/2 (short)	350
4/1	671
5/1	698
6/1	508

Full Input Data And Results

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Scenario 11: '2037 Base + Dev AM Hou' (FG15: '2037 AM Base + Dev', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	66	580	646
	B	165	0	231	396
	C	625	204	0	829
	Tot.	790	270	811	1871

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 11: 2037 Base + Dev AM Hou
Junction: Unnamed Junction	
1/1 (short)	66
1/2 (with short)	646(In) 580(Out)
2/1 (with short)	396(In) 231(Out)
2/2 (short)	165
3/1 (with short)	829(In) 625(Out)
3/2 (short)	204
4/1	790
5/1	811
6/1	270

Lane Saturation Flows

Junction: Unnamed Junction

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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Full Input Data And Results

Scenario 12: '2037 Base + Dev PM Hou' (FG16: '2037 PM Base + Dev', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	167	539	706
	B	188	0	204	392
	C	525	370	0	895
	Tot.	713	537	743	1993

Traffic Lane Flows

Lane	Scenario 12: 2037 Base + Dev PM Hou
Junction: Unnamed Junction	
1/1 (short)	167
1/2 (with short)	706(In) 539(Out)
2/1 (with short)	392(In) 204(Out)
2/2 (short)	188
3/1 (with short)	895(In) 525(Out)
3/2 (short)	370
4/1	713
5/1	743
6/1	537

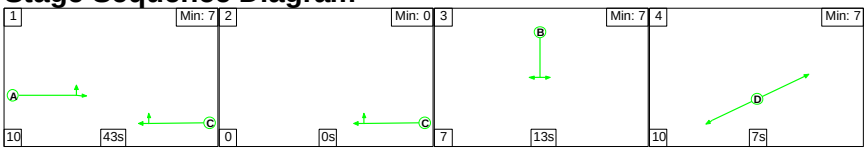
Full Input Data And Results

Lane Saturation Flows

Junction: Unnamed Junction								
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 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 6 Left	12.00	100.0 %	1729	1729
1/2 (Oscar Traynor Road (Northwestern Arm))	3.30	0.00	Y	Arm 5 Ahead	Inf	100.0 %	1945	1945
2/1 (Coolock Drive)	3.25	0.00	Y	Arm 5 Left	10.00	100.0 %	1687	1687
2/2 (Coolock Drive)	3.10	0.00	Y	Arm 4 Right	Inf	100.0 %	1925	1925
3/1 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (Oscar Traynor Road (Southeastern Arm))	3.25	0.00	Y	Arm 6 Right	10.00	100.0 %	1687	1687
4/1	Infinite Saturation Flow						Inf	Inf
5/1	Infinite Saturation Flow						Inf	Inf
6/1	3.00	0.00	Y				1915	1915

Scenario 1: '2022 AM Base' (FG3: '2022 AM Peak Hour', Plan 1: 'Network Control Plan 1')

Stage Sequence Diagram

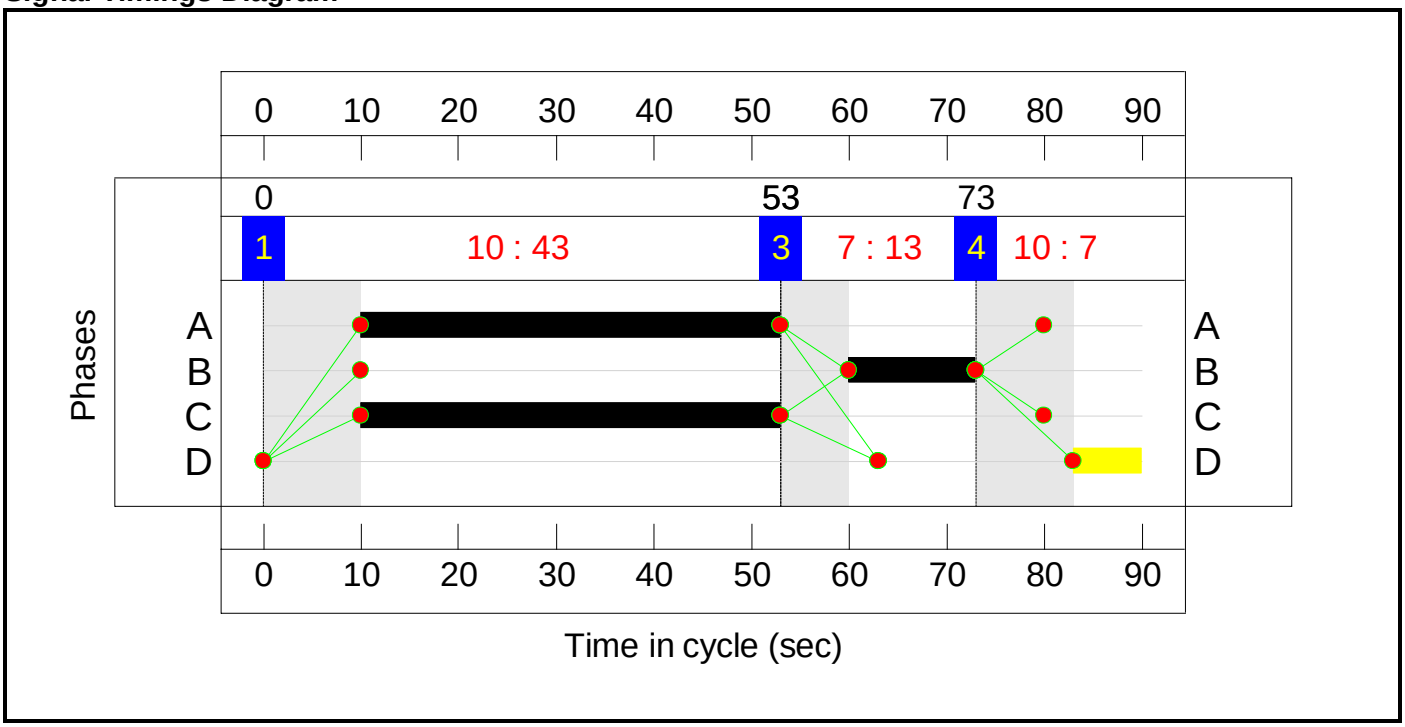


Stage Timings

Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

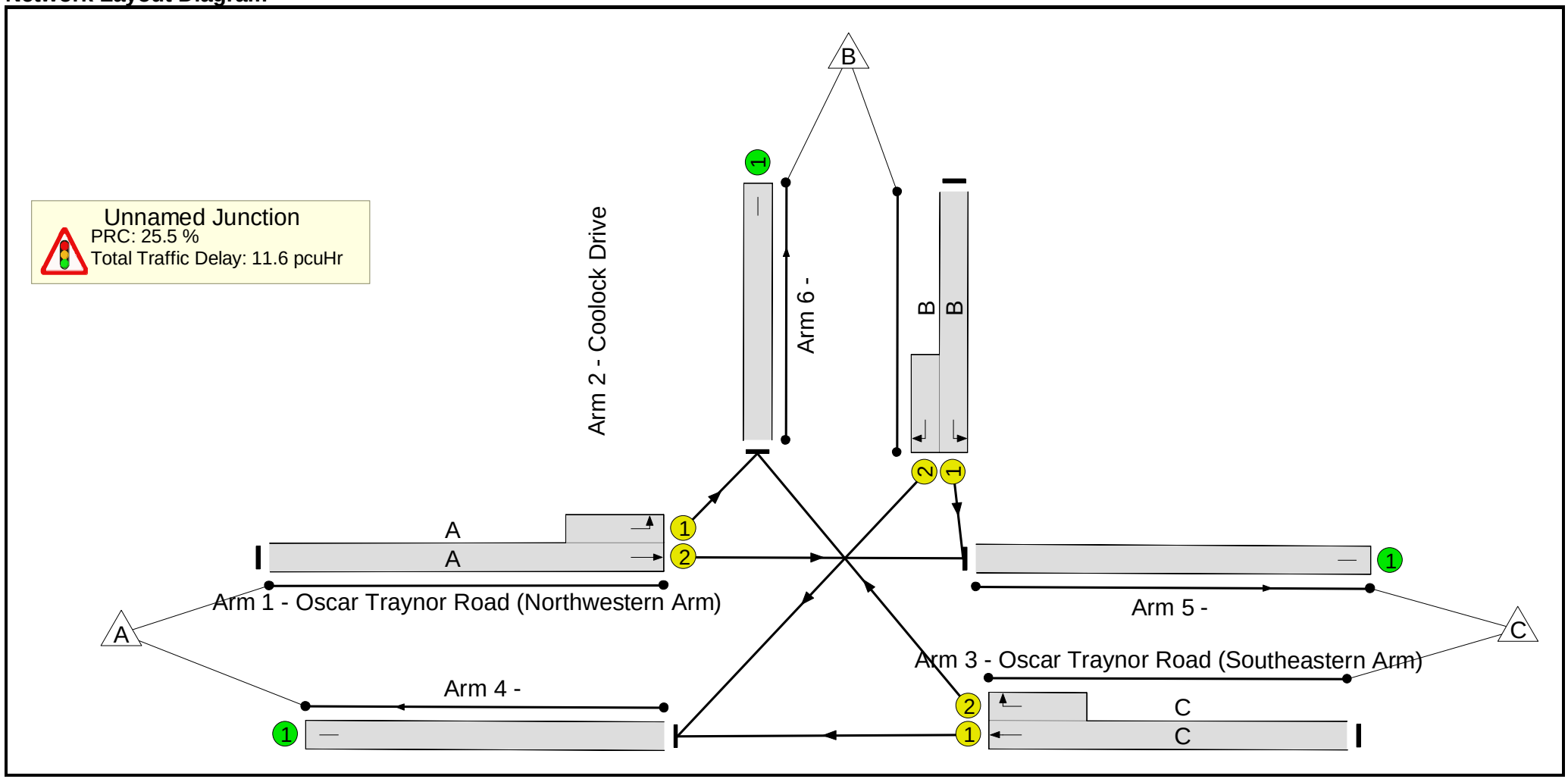
Full Input Data And Results

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.7%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.7%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	563	1945:1729	882+92	57.8 : 57.8%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	284	1687:1925	241+171	68.8 : 68.8%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	715	1940:1687	765+231	71.7 : 71.7%
4/1		U	N/A	N/A	-		-	-	-	667	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	676	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	219	1915	1915	11.4%

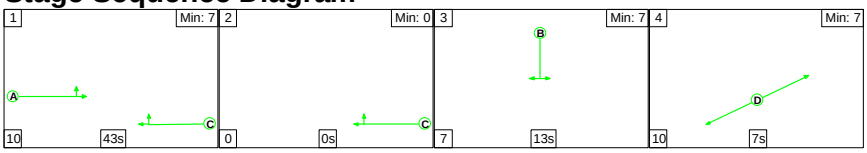
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**8.5**	**3.1**	**0.0**	**11.6**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**8.5**	**3.1**	**0.0**	**11.6**	**-**	**-**	**-**	**-**
1/2+1/1	563	563	-	-	-	2.5	0.7	-	3.2	20.2	9.2	0.7	9.8
2/1+2/2	284	284	-	-	-	2.8	1.1	-	3.8	48.8	3.9	1.1	5.0
3/1+3/2	715	715	-	-	-	3.3	1.3	-	4.6	22.9	11.9	1.3	13.2
4/1	667	667	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	676	676	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	219	219	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 25.5 Total Delay for Signalled Lanes (pcuHr): 11.56 Cycle Time (s): 90
PRC Over All Lanes (%): 25.5 Total Delay Over All Lanes(pcuHr): 11.62

Full Input Data And Results

Scenario 2: '2022 PM Base' (FG4: '2022 PM Peak Hour', Plan 1: 'Network Control Plan 1')

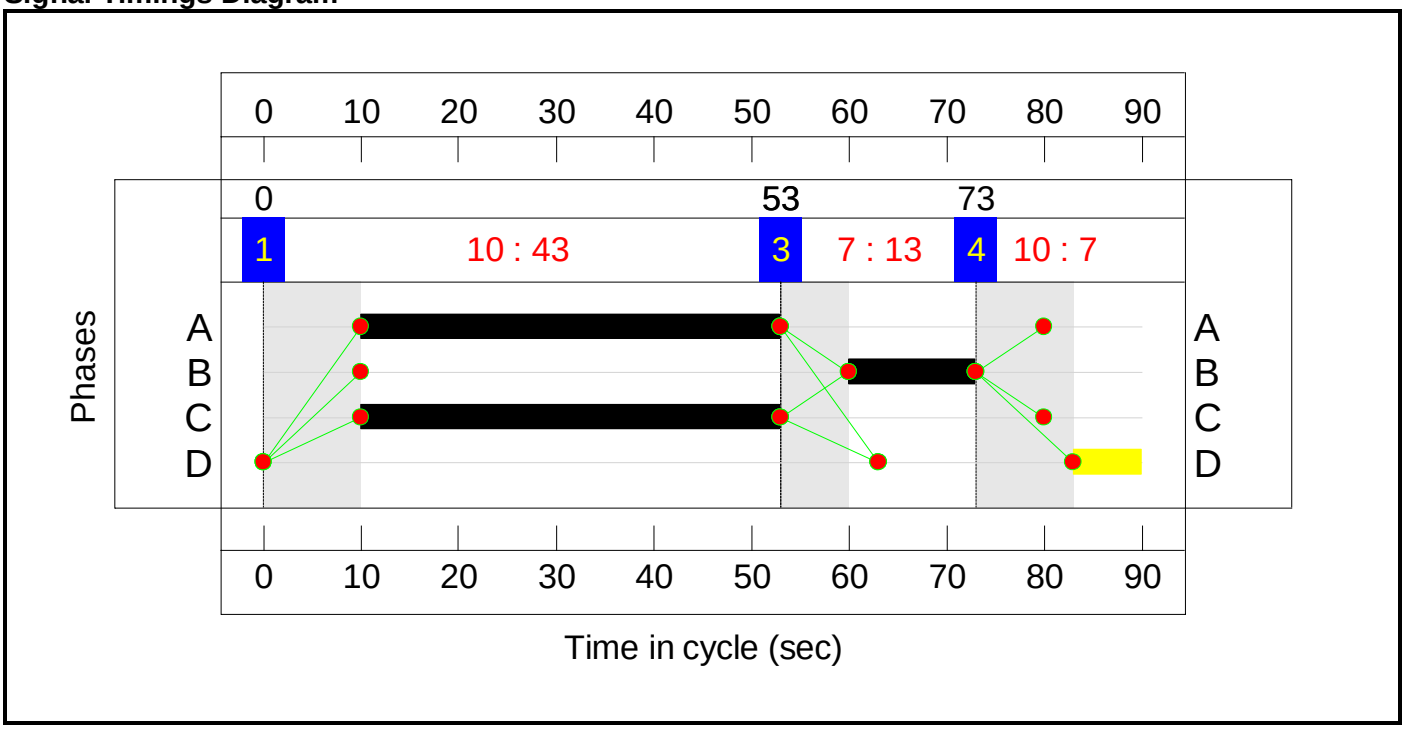
Stage Sequence Diagram



Stage Timings

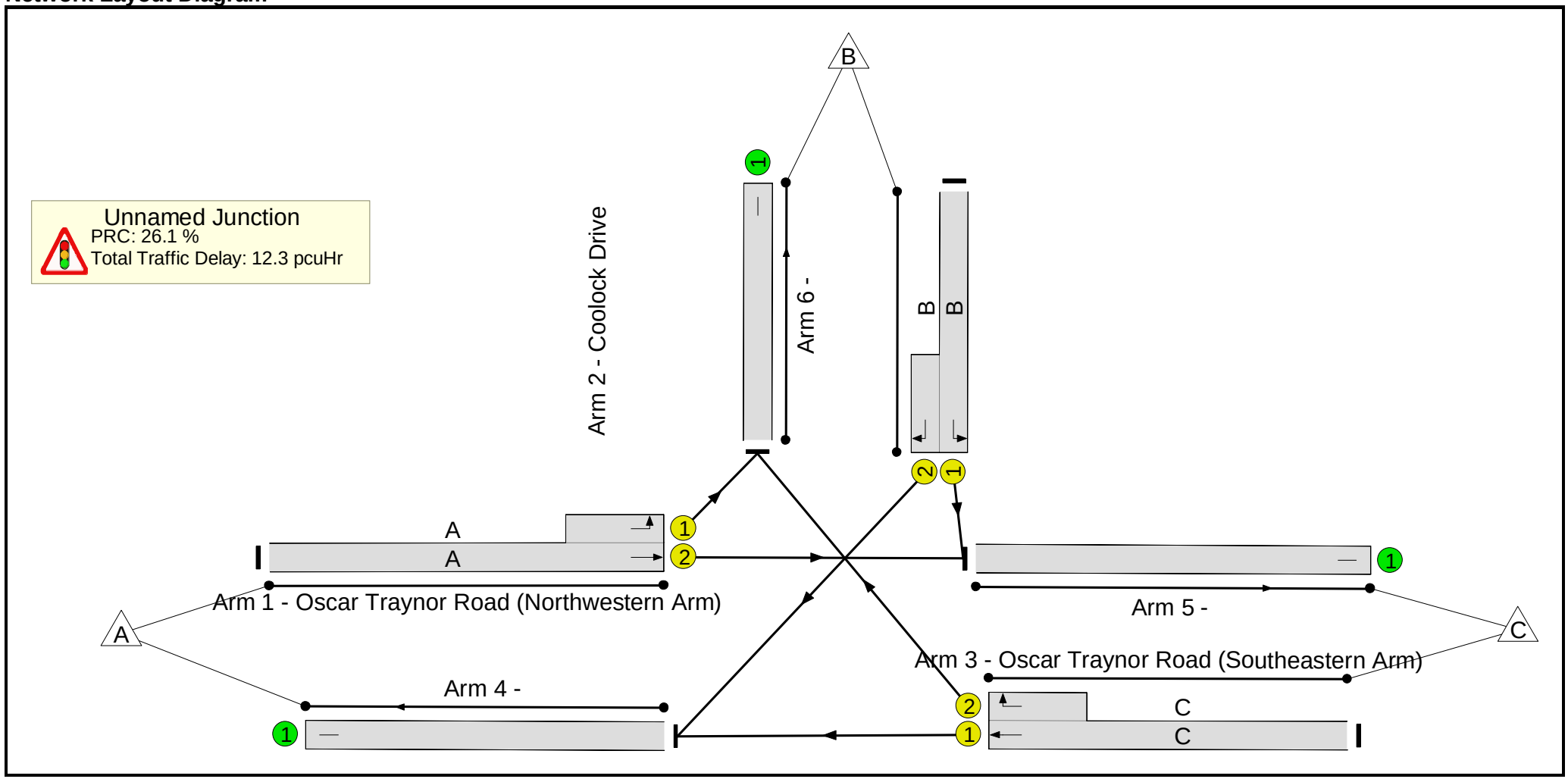
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.4%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**71.4%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	602	1945:1729	784+214	60.3 : 60.3%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	323	1687:1925	238+219	70.6 : 70.6%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	748	1940:1687	647+401	71.4 : 71.4%
4/1		U	N/A	N/A	-		-	-	-	617	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	641	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	415	1915	1915	21.7%

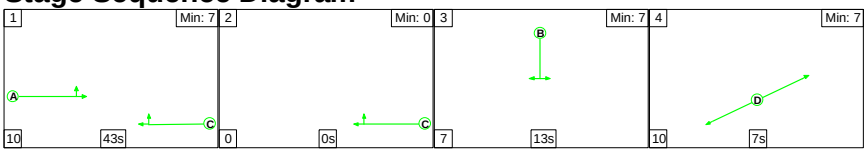
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**9.0**	**3.3**	**0.0**	**12.3**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**9.0**	**3.3**	**0.0**	**12.3**	**-**	**-**	**-**	**-**
1/2+1/1	602	602	-	-	-	2.6	0.8	-	3.3	19.9	8.9	0.8	9.7
2/1+2/2	323	323	-	-	-	3.2	1.2	-	4.3	48.5	3.9	1.2	5.1
3/1+3/2	748	748	-	-	-	3.2	1.2	-	4.5	21.6	10.3	1.2	11.5
4/1	617	617	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	641	641	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	415	415	-	-	-	0.0	0.1	-	0.2	1.4	4.0	0.1	4.1

C1 PRC for Signalled Lanes (%): 26.1 Total Delay for Signalled Lanes (pcuHr): 12.16 Cycle Time (s): 90
PRC Over All Lanes (%): 26.1 Total Delay Over All Lanes(pcuHr): 12.32

Full Input Data And Results

Scenario 3: '2027 AM Base ' (FG5: '2027 AM Peak Hour', Plan 1: 'Network Control Plan 1')

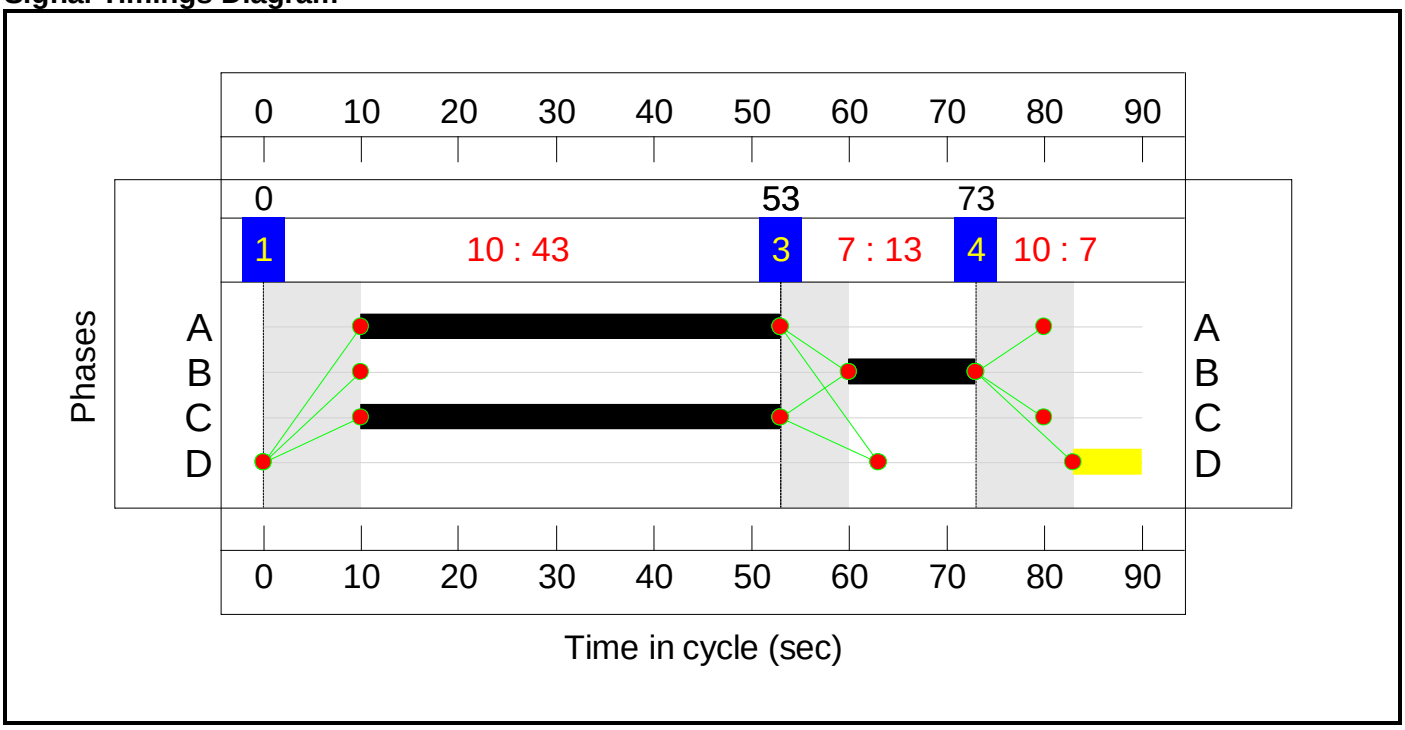
Stage Sequence Diagram



Stage Timings

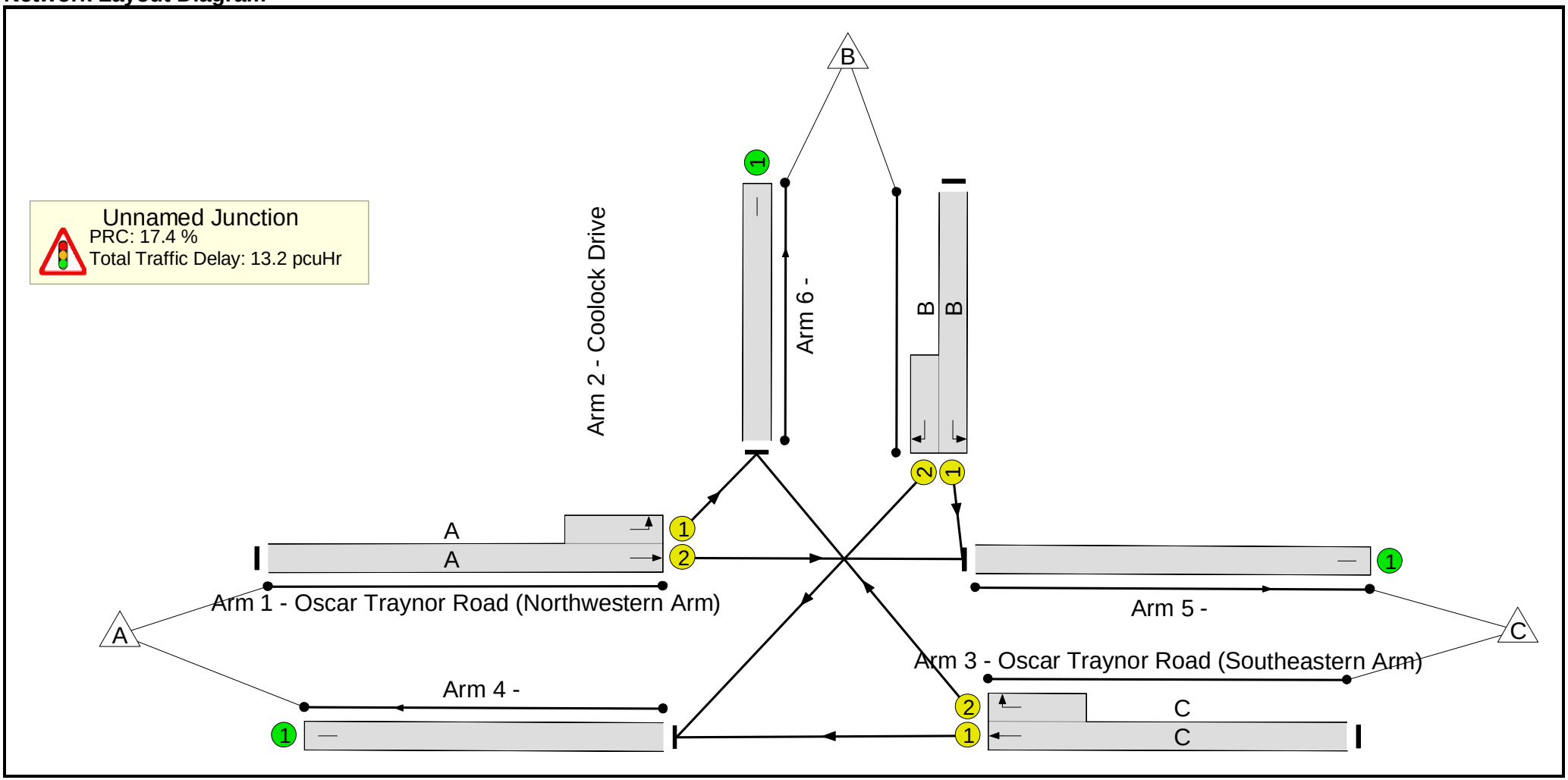
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**76.7%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**76.7%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	602	1945:1729	881+92	61.8 : 61.8%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	303	1687:1925	241+172	73.4 : 73.4%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	764	1940:1687	766+231	76.7 : 76.7%
4/1		U	N/A	N/A	-		-	-	-	713	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	722	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	234	1915	1915	12.2%

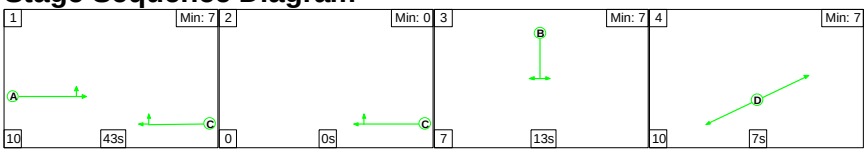
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**9.3**	**3.8**	**0.0**	**13.2**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**9.3**	**3.8**	**0.0**	**13.2**	**-**	**-**	**-**	**-**
1/2+1/1	602	602	-	-	-	2.7	0.8	-	3.5	21.1	10.2	0.8	11.0
2/1+2/2	303	303	-	-	-	3.0	1.3	-	4.3	51.2	4.1	1.3	5.5
3/1+3/2	764	764	-	-	-	3.7	1.6	-	5.3	24.9	13.5	1.6	15.1
4/1	713	713	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	722	722	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	234	234	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 17.4 Total Delay for Signalled Lanes (pcuHr): 13.12 Cycle Time (s): 90
PRC Over All Lanes (%): 17.4 Total Delay Over All Lanes(pcuHr): 13.19

Full Input Data And Results

Scenario 4: '2027 PM Base ' (FG6: '2027 PM Peak Hour', Plan 1: 'Network Control Plan 1')

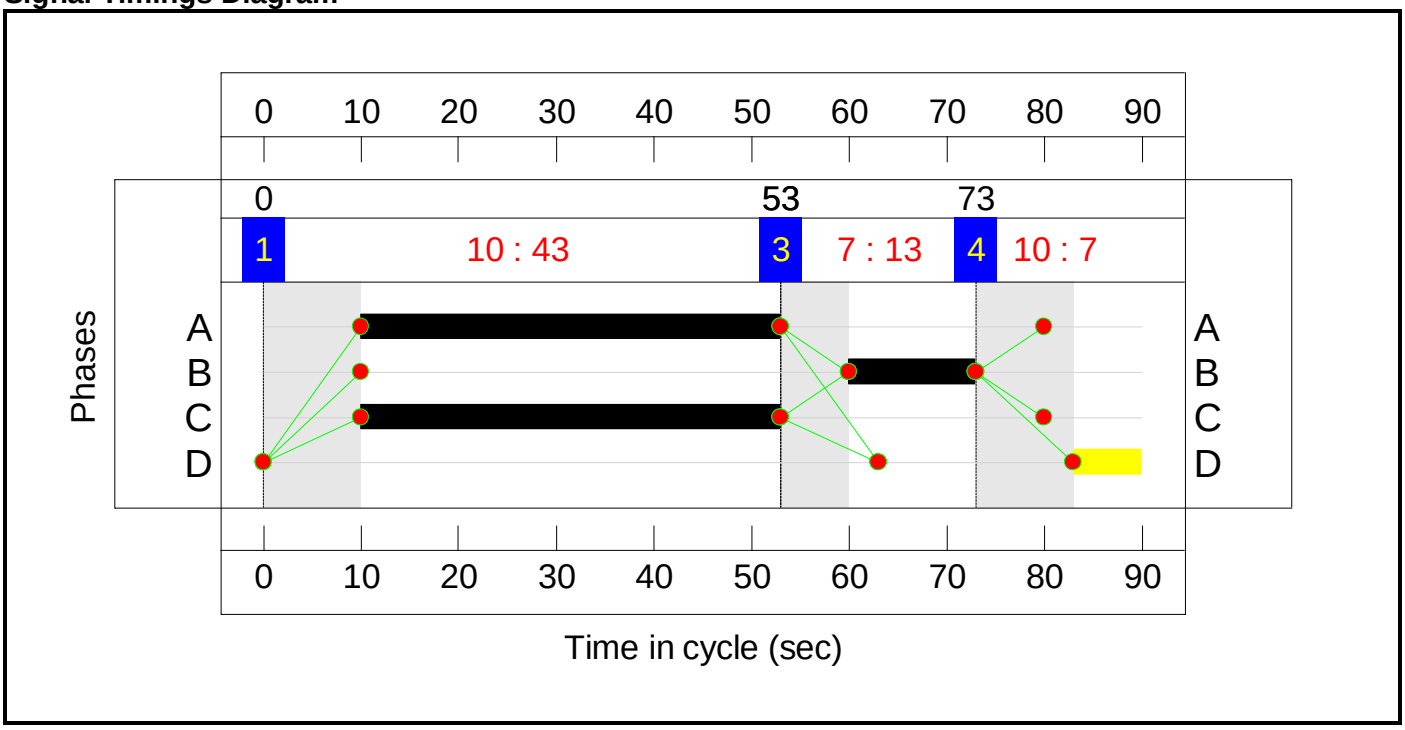
Stage Sequence Diagram



Stage Timings

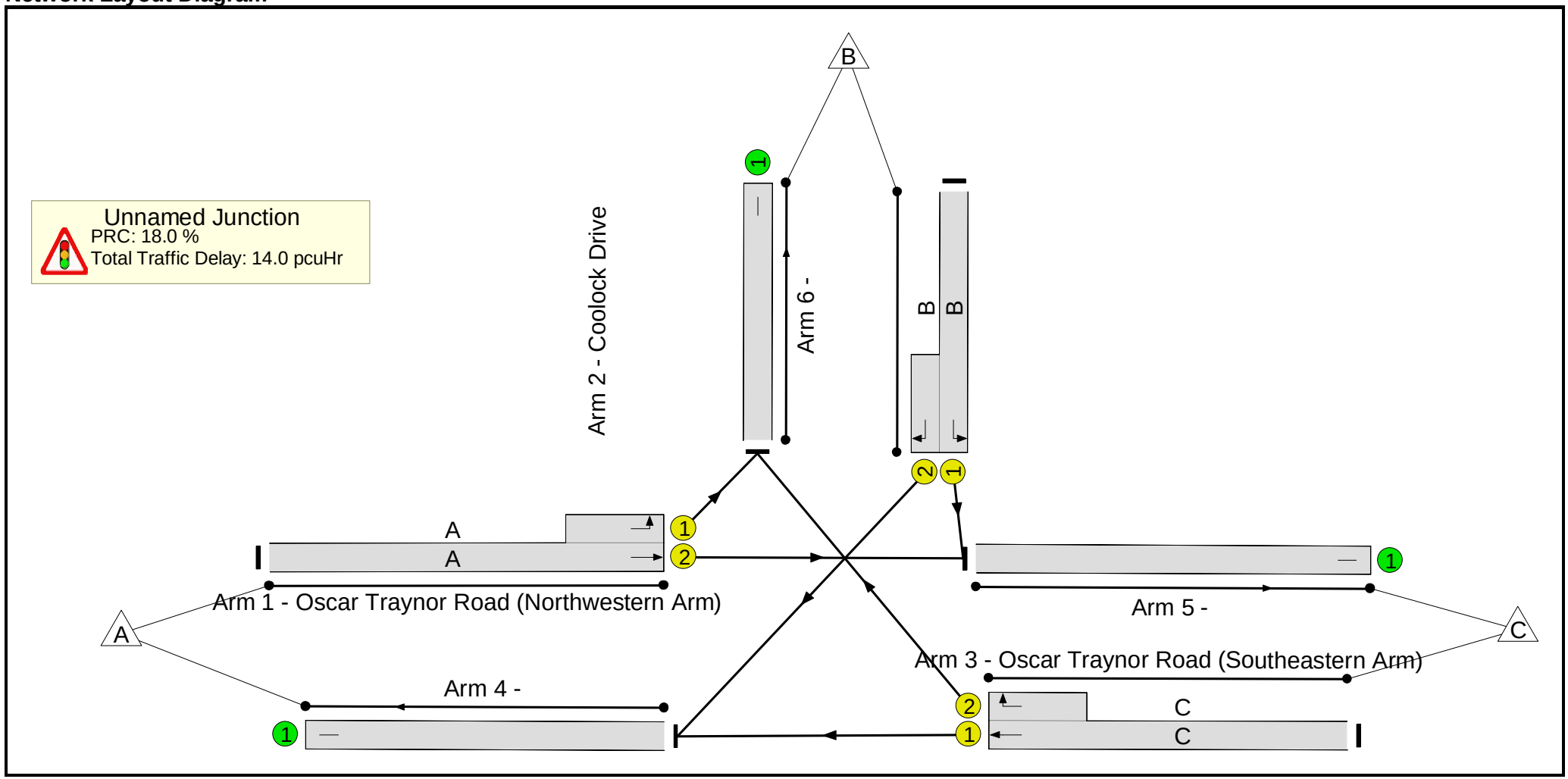
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**76.2%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**76.2%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	644	1945:1729	784+214	64.5 : 64.5%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	345	1687:1925	238+221	75.3 : 75.3%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	799	1940:1687	647+401	76.2 : 76.2%
4/1		U	N/A	N/A	-		-	-	-	659	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	685	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	444	1915	1915	23.2%

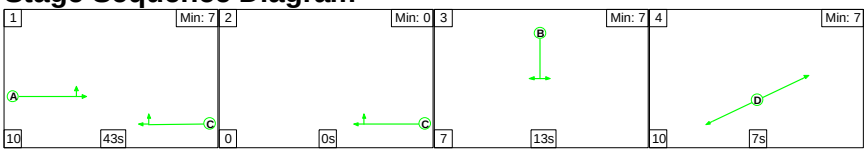
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**9.9**	**4.1**	**0.0**	**14.0**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**9.9**	**4.1**	**0.0**	**14.0**	**-**	**-**	**-**	**-**
1/2+1/1	644	644	-	-	-	2.8	0.9	-	3.7	20.9	10.0	0.9	10.9
2/1+2/2	345	345	-	-	-	3.4	1.5	-	4.9	51.0	4.2	1.5	5.7
3/1+3/2	799	799	-	-	-	3.6	1.6	-	5.2	23.4	11.9	1.6	13.4
4/1	659	659	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	685	685	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	444	444	-	-	-	0.0	0.2	-	0.2	1.4	4.0	0.2	4.1

C1 PRC for Signalled Lanes (%): 18.0 Total Delay for Signalled Lanes (pcuHr): 13.81 Cycle Time (s): 90
PRC Over All Lanes (%): 18.0 Total Delay Over All Lanes(pcuHr): 13.99

Full Input Data And Results

Scenario 5: '2037 AM Base ' (FG7: '2037 AM Peak Hour', Plan 1: 'Network Control Plan 1')

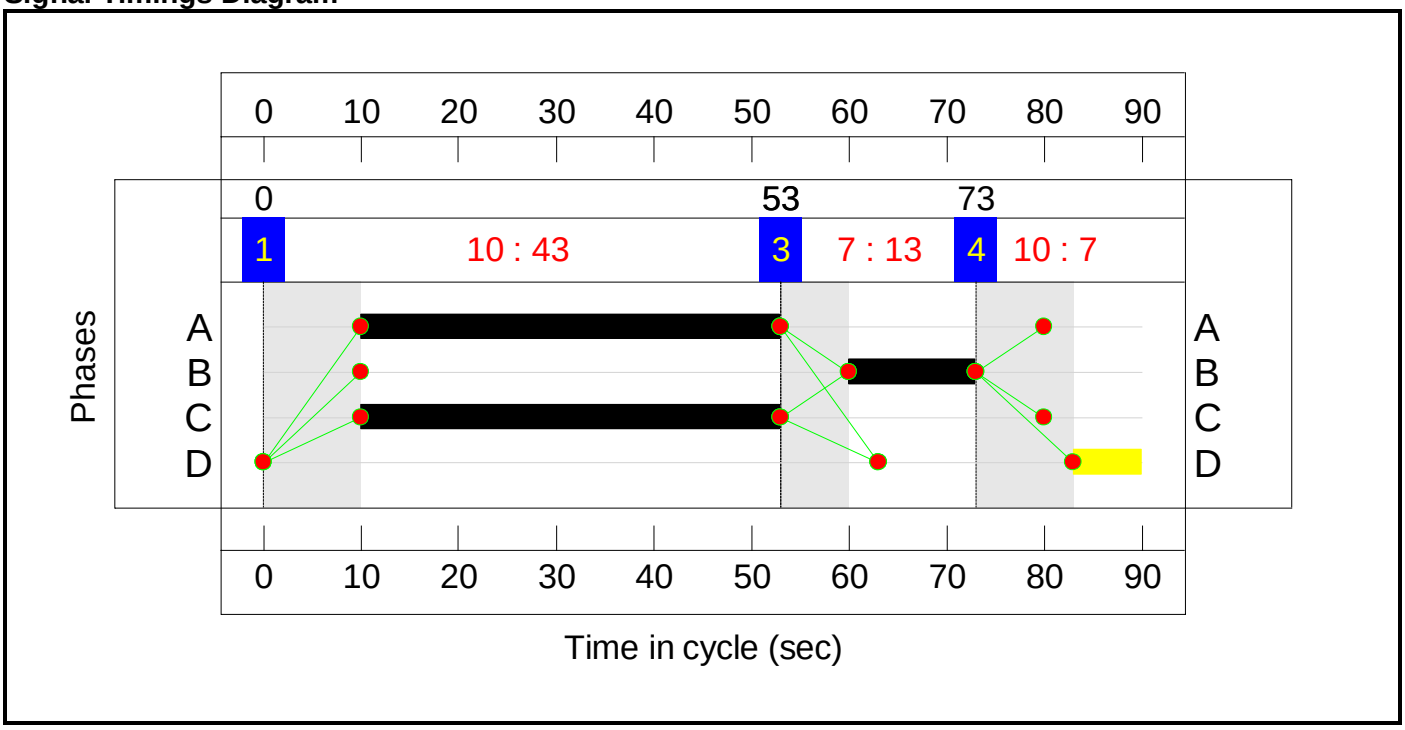
Stage Sequence Diagram



Stage Timings

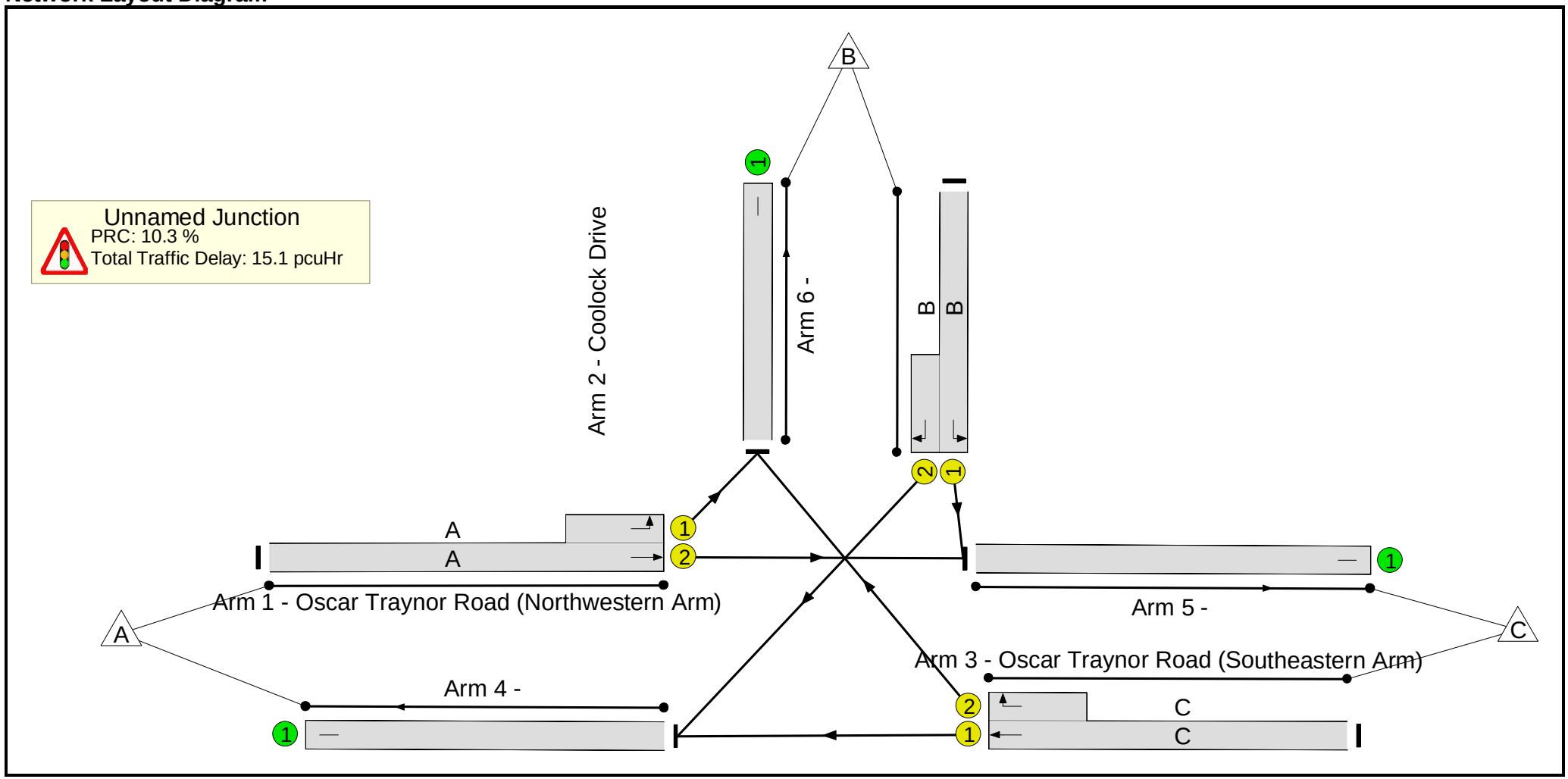
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.6%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.6%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	641	1945:1729	881+93	65.8 : 65.8%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	322	1687:1925	241+172	78.0 : 78.0%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	813	1940:1687	766+230	81.6 : 81.6%
4/1		U	N/A	N/A	-		-	-	-	759	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	768	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	249	1915	1915	13.0%

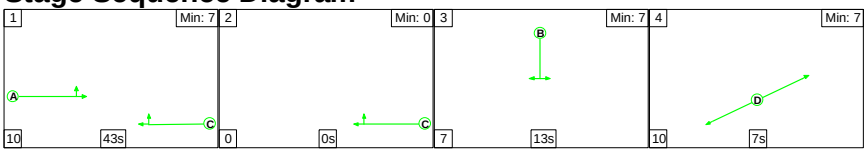
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**10.2**	**4.9**	**0.0**	**15.1**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**10.2**	**4.9**	**0.0**	**15.1**	**-**	**-**	**-**	**-**
1/2+1/1	641	641	-	-	-	3.0	1.0	-	3.9	22.1	11.2	1.0	12.2
2/1+2/2	322	322	-	-	-	3.2	1.7	-	4.9	54.5	4.4	1.7	6.1
3/1+3/2	813	813	-	-	-	4.1	2.2	-	6.2	27.6	15.1	2.2	17.3
4/1	759	759	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	768	768	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	249	249	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 10.3 Total Delay for Signalled Lanes (pcuHr): 15.05 Cycle Time (s): 90
PRC Over All Lanes (%): 10.3 Total Delay Over All Lanes(pcuHr): 15.12

Full Input Data And Results

Scenario 6: '2037 PM Peak Hour' (FG8: '2037 PM Peak Hour', Plan 1: 'Network Control Plan 1')

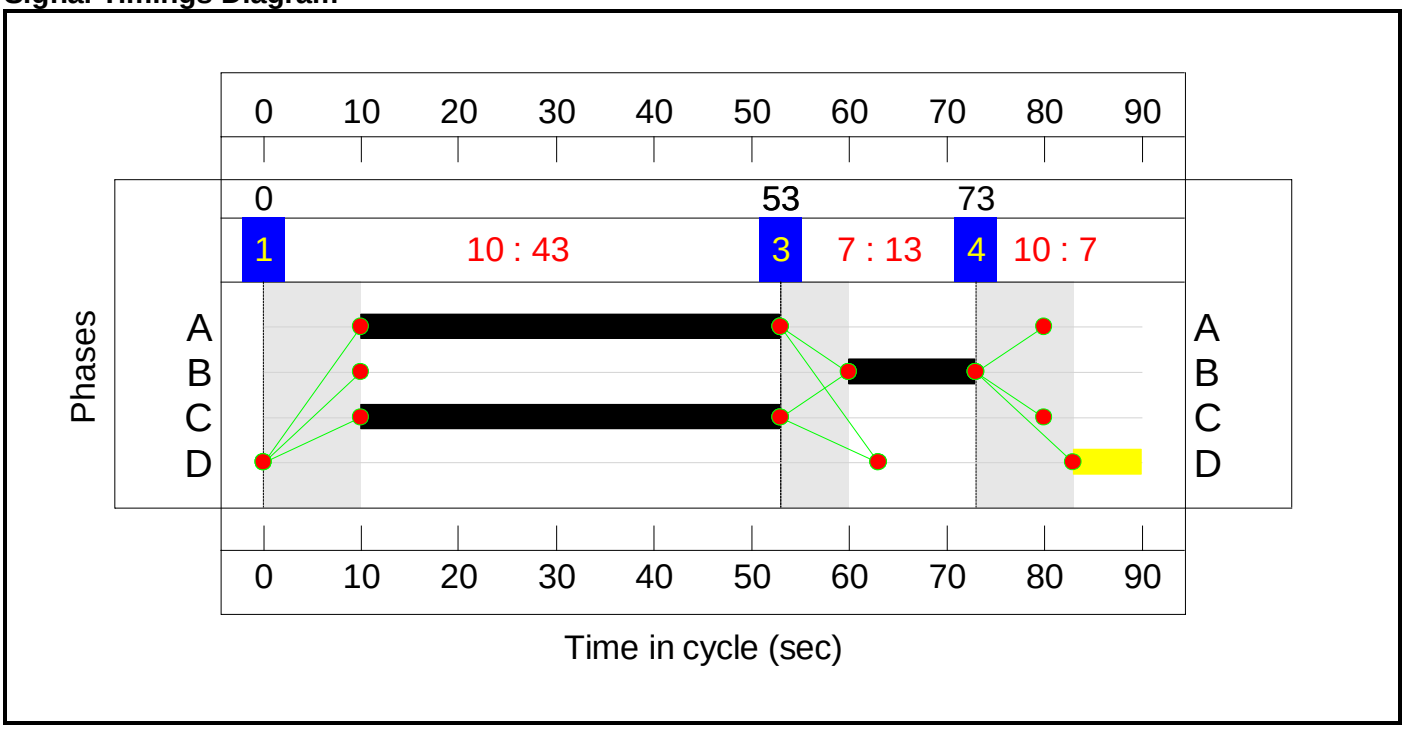
Stage Sequence Diagram



Stage Timings

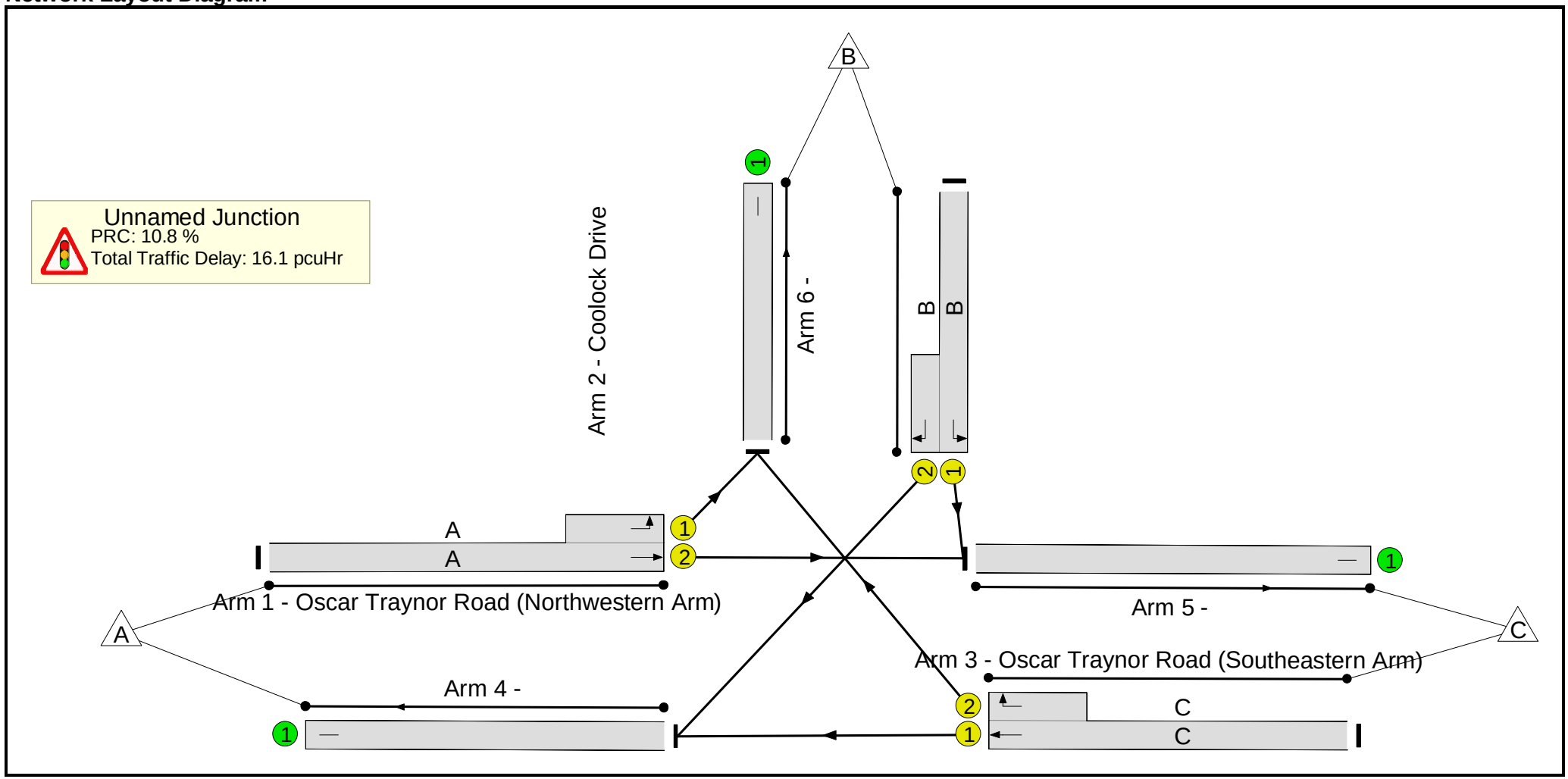
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.2%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**81.2%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	686	1945:1729	784+214	68.7 : 68.7%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	367	1687:1925	238+219	80.3 : 80.3%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	851	1940:1687	647+401	81.2 : 81.2%
4/1		U	N/A	N/A	-		-	-	-	701	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	730	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	473	1915	1915	24.7%

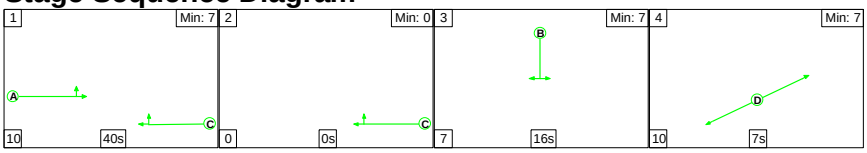
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**10.8**	**5.3**	**0.0**	**16.1**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**10.8**	**5.3**	**0.0**	**16.1**	**-**	**-**	**-**	**-**
1/2+1/1	686	686	-	-	-	3.1	1.1	-	4.2	22.0	11.2	1.1	12.3
2/1+2/2	367	367	-	-	-	3.6	2.0	-	5.6	54.9	4.5	2.0	6.5
3/1+3/2	851	851	-	-	-	4.0	2.1	-	6.1	25.9	13.6	2.1	15.7
4/1	701	701	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	730	730	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	473	473	-	-	-	0.0	0.2	-	0.2	1.5	4.0	0.2	4.2

C1 PRC for Signalled Lanes (%): 10.8 Total Delay for Signalled Lanes (pcuHr): 15.92 Cycle Time (s): 90
PRC Over All Lanes (%): 10.8 Total Delay Over All Lanes(pcuHr): 16.11

Full Input Data And Results

Scenario 7: '2022 Base + Dev AM Hour' (FG11: '2022 AM Base + Dev', Plan 1: 'Network Control Plan 1')

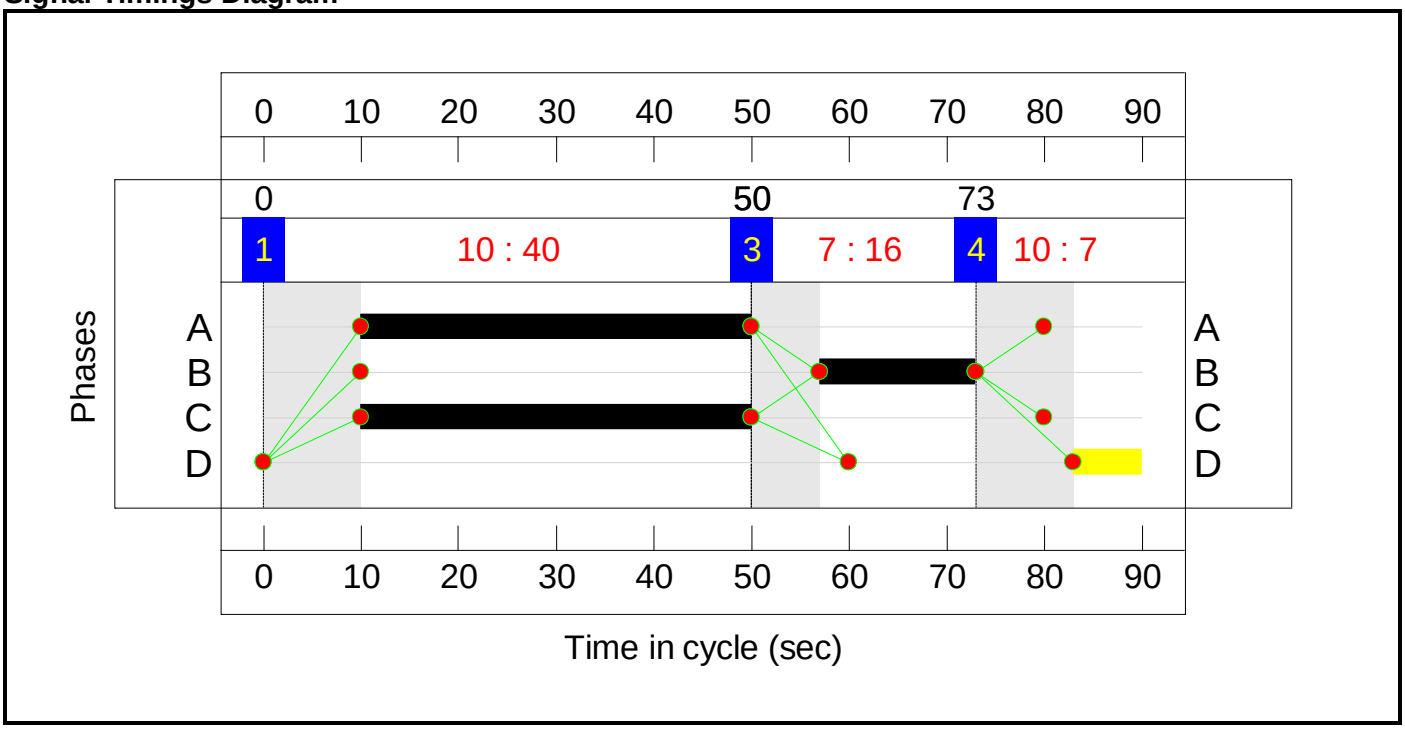
Stage Sequence Diagram



Stage Timings

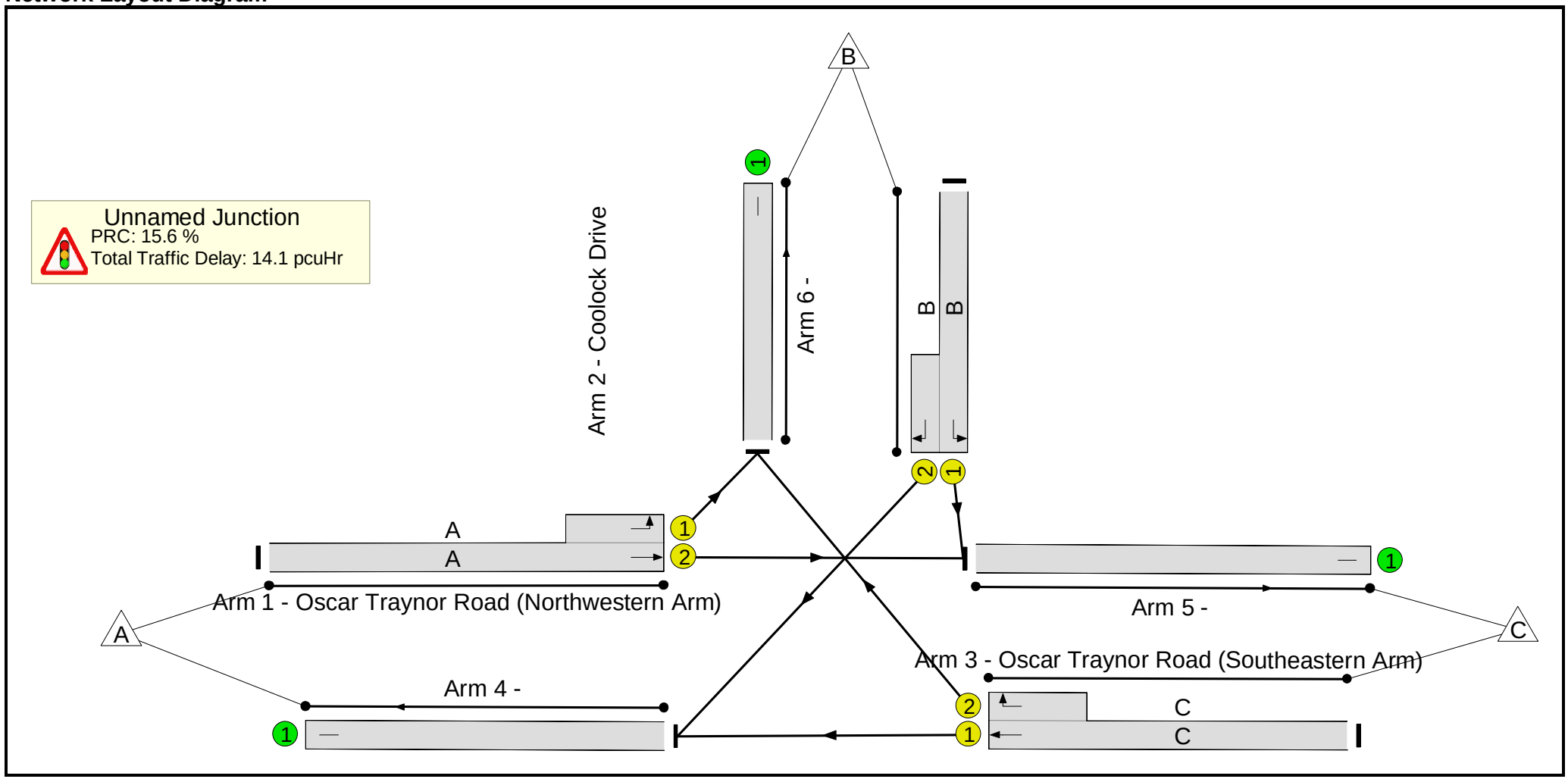
Stage	1	2	3	4
Duration	40	0	16	7
Change Point	0	50	50	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.9%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**77.9%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	40	-	568	1945:1729	818+93	62.4 : 62.4%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	16	-	358	1687:1925	276+197	75.8 : 75.8%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	40	-	731	1940:1687	705+234	77.9 : 77.9%
4/1		U	N/A	N/A	-		-	-	-	698	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	719	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	240	1915	1915	12.5%

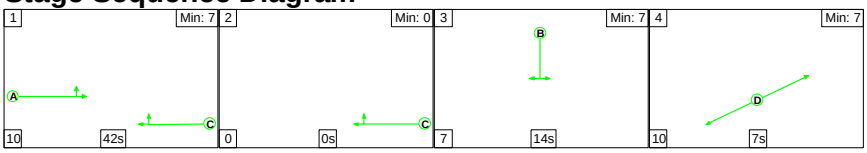
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**10.0**	**4.2**	**0.0**	**14.1**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**10.0**	**4.2**	**0.0**	**14.1**	**-**	**-**	**-**	**-**
1/2+1/1	568	568	-	-	-	2.8	0.8	-	3.7	23.2	10.0	0.8	10.8
2/1+2/2	358	358	-	-	-	3.3	1.5	-	4.8	48.4	4.8	1.5	6.3
3/1+3/2	731	731	-	-	-	3.9	1.7	-	5.6	27.6	13.1	1.7	14.8
4/1	698	698	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	719	719	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	240	240	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 15.6 Total Delay for Signalled Lanes (pcuHr): 14.07 Cycle Time (s): 90
PRC Over All Lanes (%): 15.6 Total Delay Over All Lanes(pcuHr): 14.15

Full Input Data And Results

Scenario 8: '2022 Base + Dev PM Hou' (FG12: '2022 PM Base + Dev', Plan 1: 'Network Control Plan 1')

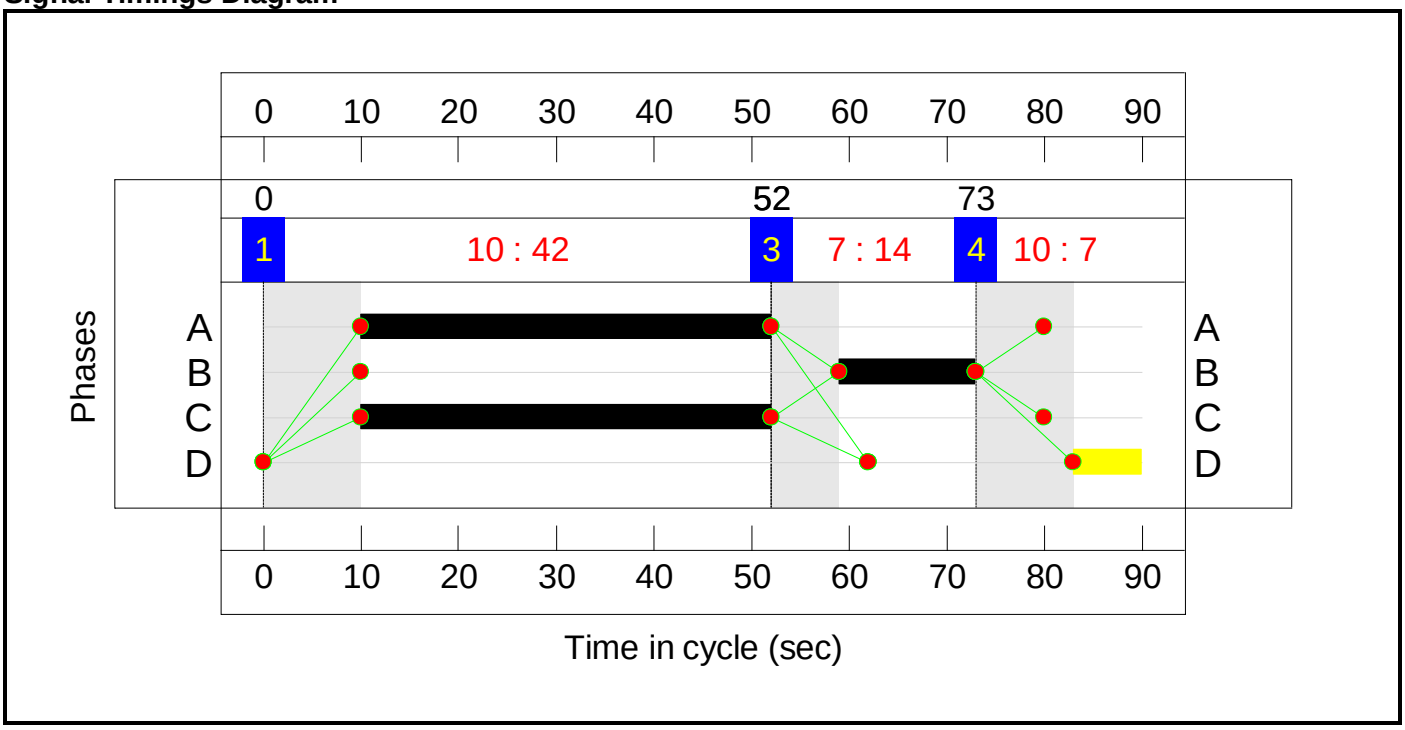
Stage Sequence Diagram



Stage Timings

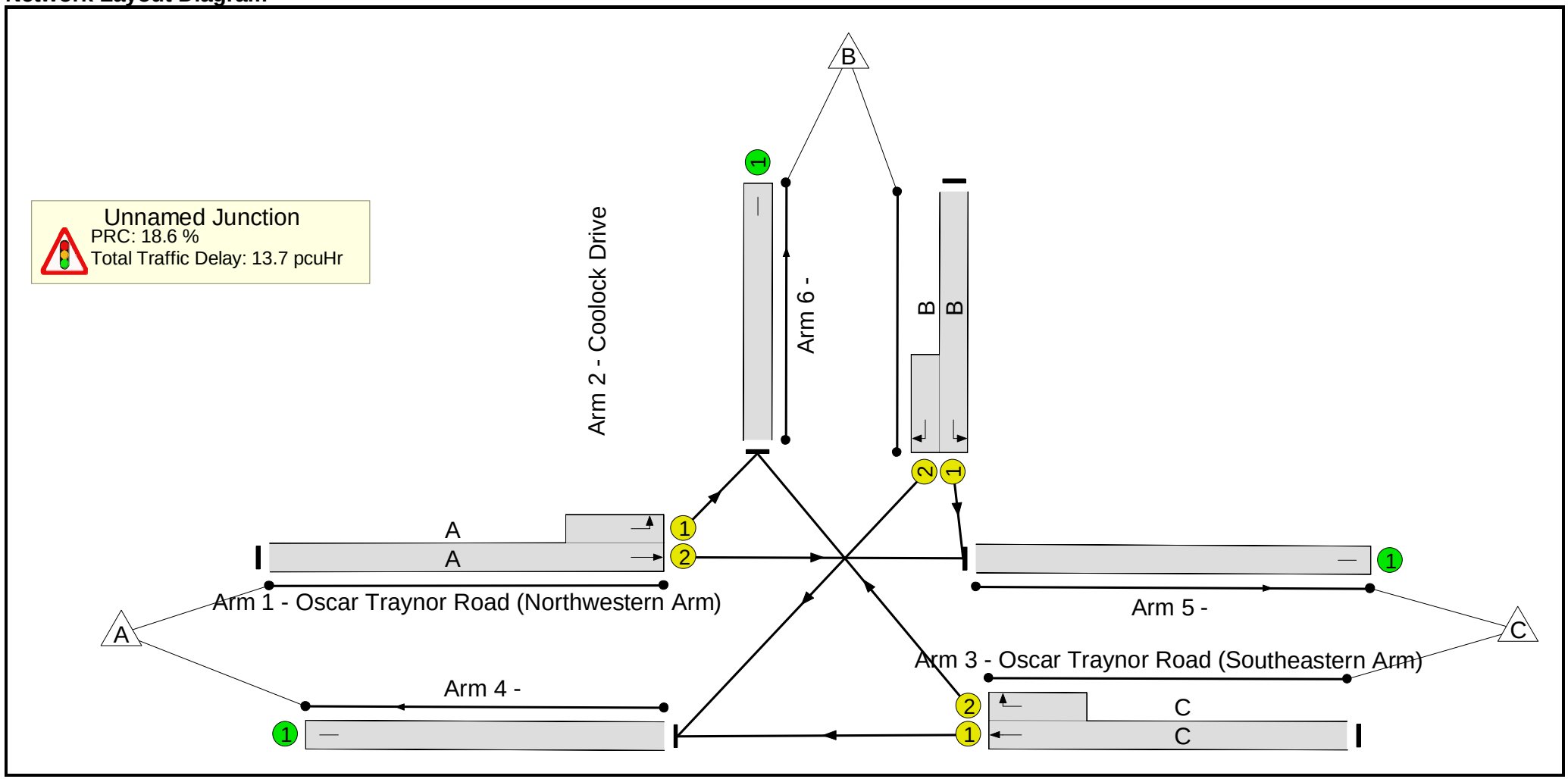
Stage	1	2	3	4
Duration	42	0	14	7
Change Point	0	52	52	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**75.9%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**75.9%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	42	-	622	1945:1729	748+236	63.2 : 63.2%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	14	-	348	1687:1925	248+229	72.9 : 72.9%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	42	-	792	1940:1687	609+435	75.9 : 75.9%
4/1		U	N/A	N/A	-		-	-	-	629	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	654	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	479	1915	1915	25.0%

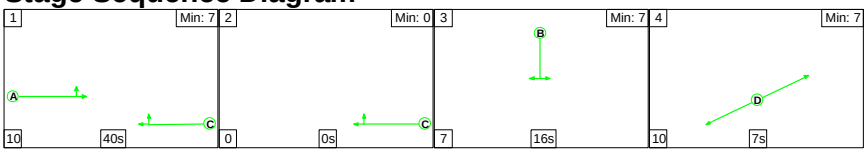
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**9.8**	**3.9**	**0.0**	**13.7**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**9.8**	**3.9**	**0.0**	**13.7**	**-**	**-**	**-**	**-**
1/2+1/1	622	622	-	-	-	2.8	0.9	-	3.6	21.0	9.4	0.9	10.3
2/1+2/2	348	348	-	-	-	3.3	1.3	-	4.7	48.3	4.2	1.3	5.5
3/1+3/2	792	792	-	-	-	3.6	1.6	-	5.2	23.6	11.2	1.6	12.8
4/1	629	629	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	654	654	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	479	479	-	-	-	0.0	0.2	-	0.2	1.6	4.9	0.2	5.1

C1 PRC for Signalled Lanes (%): 18.6 Total Delay for Signalled Lanes (pcuHr): 13.50 Cycle Time (s): 90
PRC Over All Lanes (%): 18.6 Total Delay Over All Lanes(pcuHr): 13.71

Full Input Data And Results

Scenario 9: '2027 Base + Dev AM Hou' (FG13: '2027 AM Base + Dev', Plan 1: 'Network Control Plan 1')

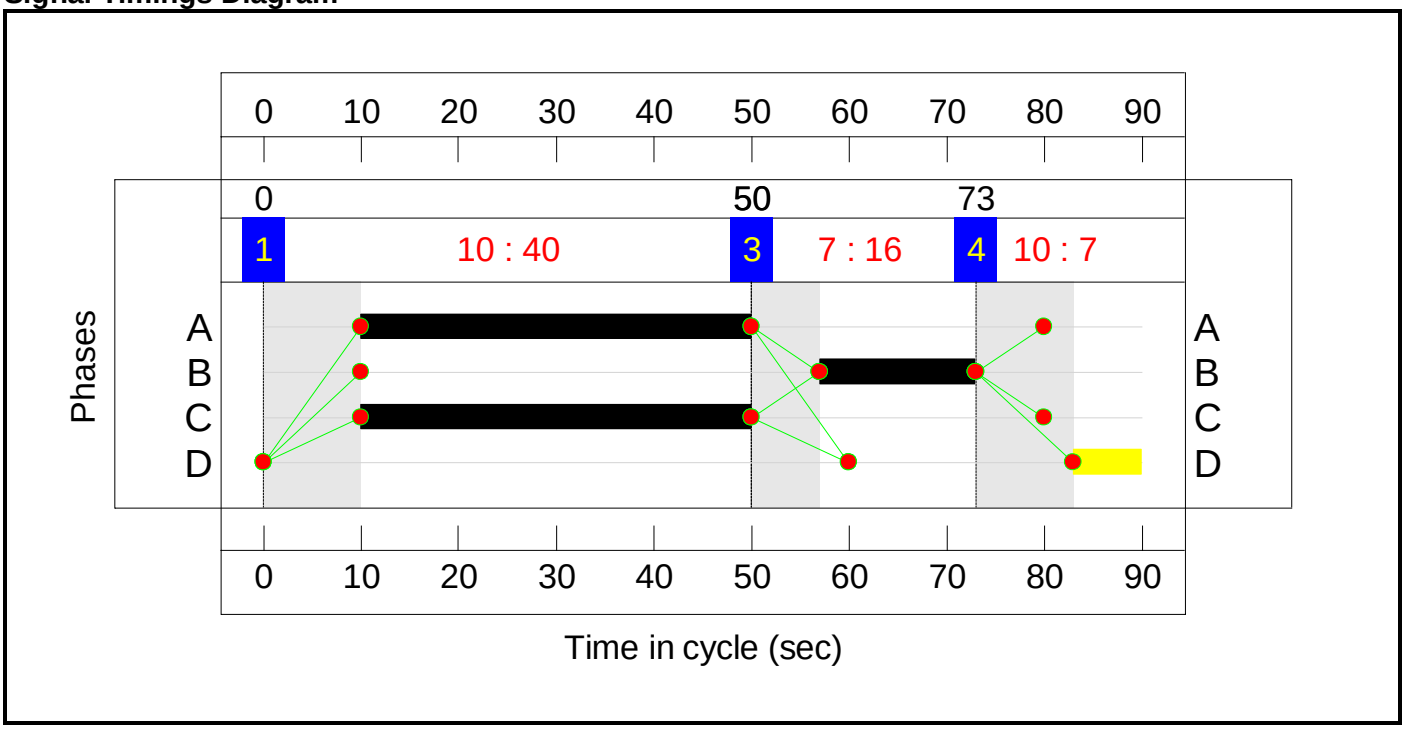
Stage Sequence Diagram



Stage Timings

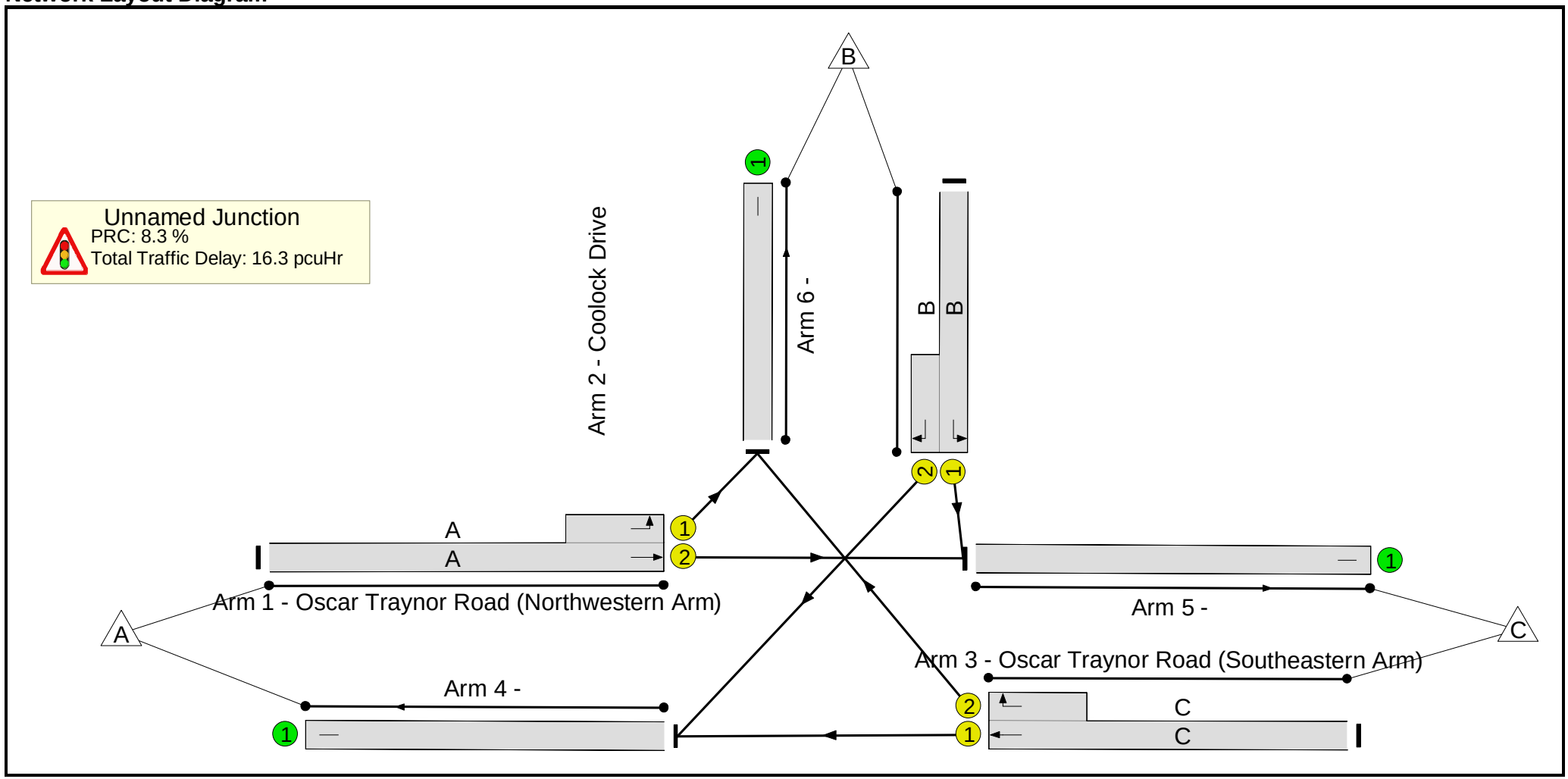
Stage	1	2	3	4
Duration	40	0	16	7
Change Point	0	50	50	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.1%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**83.1%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	40	-	607	1945:1729	818+93	66.7 : 66.7%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	16	-	377	1687:1925	276+197	79.8 : 79.8%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	40	-	780	1940:1687	706+232	83.1 : 83.1%
4/1		U	N/A	N/A	-		-	-	-	744	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	765	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	255	1915	1915	13.3%

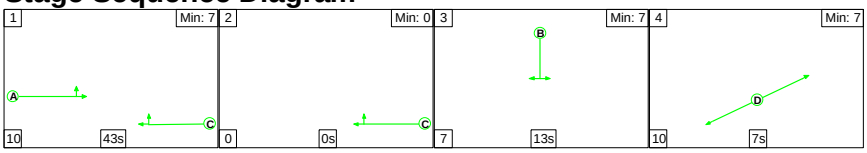
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**10.9**	**5.4**	**0.0**	**16.3**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**10.9**	**5.4**	**0.0**	**16.3**	**-**	**-**	**-**	**-**
1/2+1/1	607	607	-	-	-	3.1	1.0	-	4.1	24.4	11.0	1.0	12.0
2/1+2/2	377	377	-	-	-	3.5	1.9	-	5.4	51.4	5.1	1.9	7.0
3/1+3/2	780	780	-	-	-	4.3	2.4	-	6.7	30.9	14.8	2.4	17.1
4/1	744	744	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	765	765	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	255	255	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 8.3 Total Delay for Signalled Lanes (pcuHr): 16.19 Cycle Time (s): 90
PRC Over All Lanes (%): 8.3 Total Delay Over All Lanes(pcuHr): 16.27

Full Input Data And Results

Scenario 10: '2027 Base + Dev PM Hou' (FG14: '2027 PM Base + Dev', Plan 1: 'Network Control Plan 1')

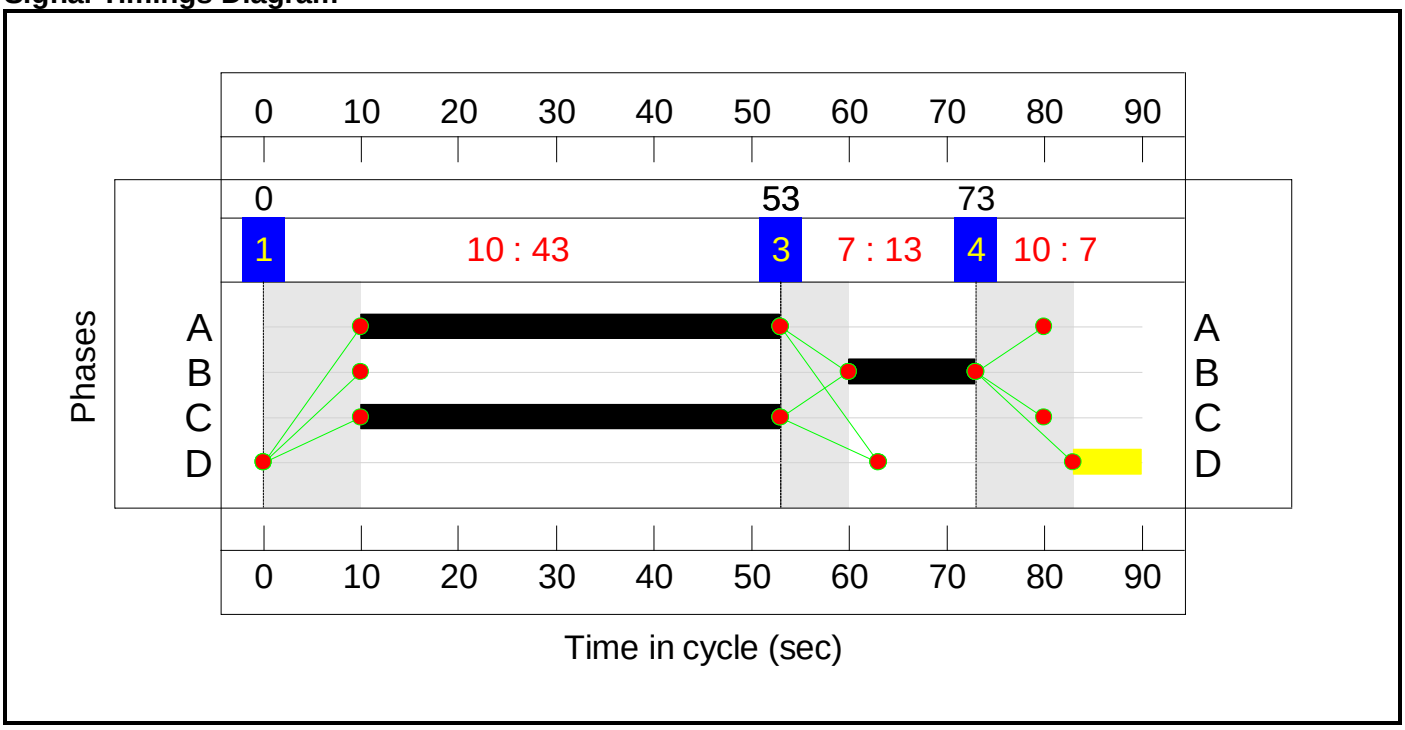
Stage Sequence Diagram



Stage Timings

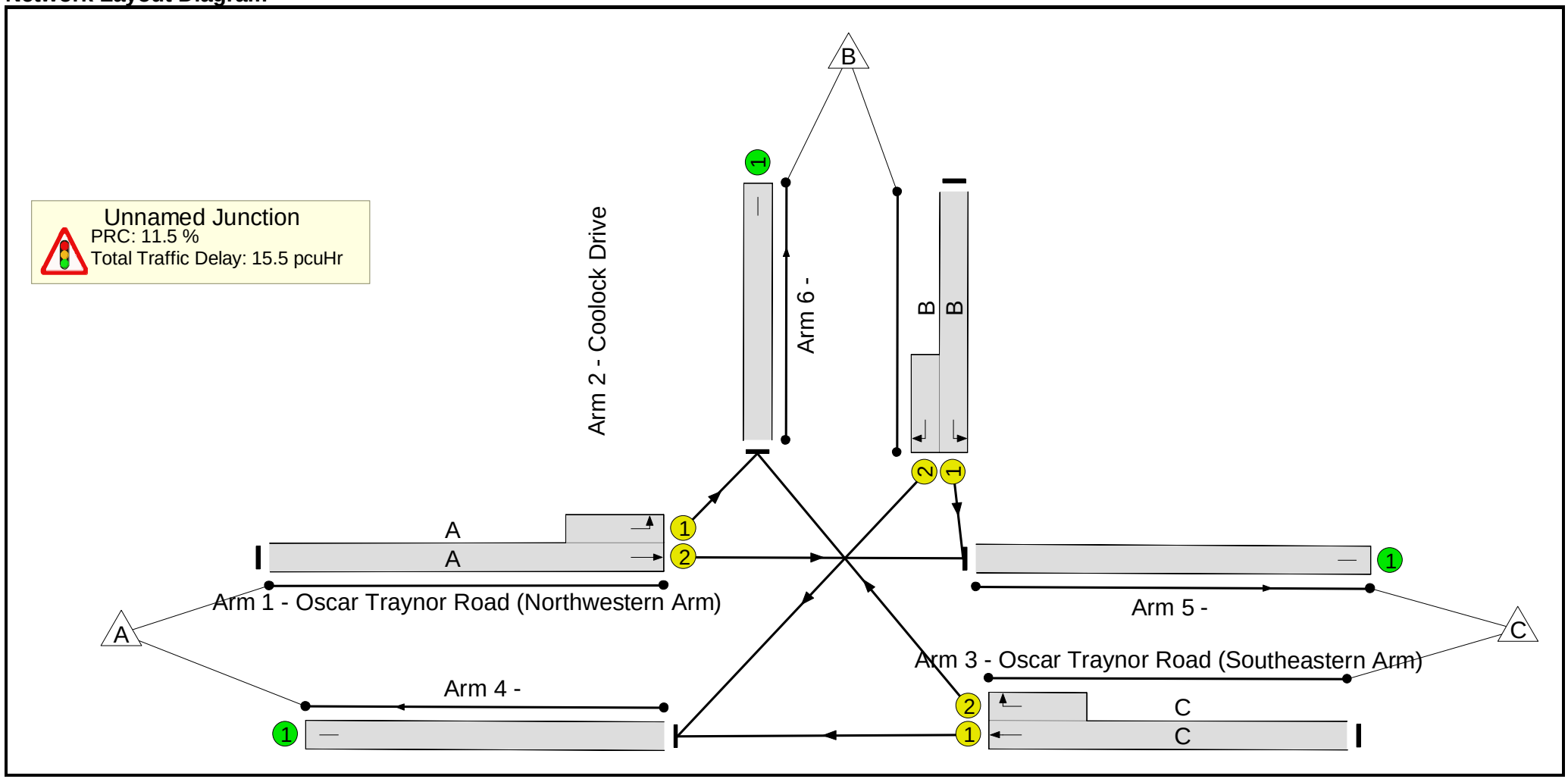
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.7%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**80.7%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	664	1945:1729	765+239	66.1 : 66.1%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	370	1687:1925	238+220	80.7 : 80.7%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	843	1940:1687	622+442	79.3 : 79.3%
4/1		U	N/A	N/A	-		-	-	-	671	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	698	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	508	1915	1915	26.5%

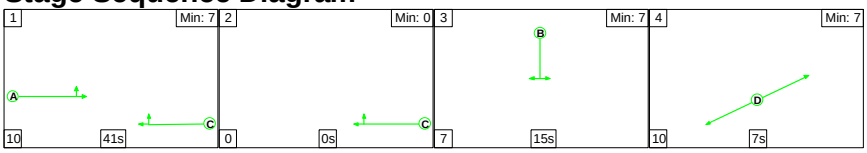
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**10.5**	**5.0**	**0.0**	**15.5**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**10.5**	**5.0**	**0.0**	**15.5**	**-**	**-**	**-**	**-**
1/2+1/1	664	664	-	-	-	2.9	1.0	-	3.9	21.1	10.4	1.0	11.3
2/1+2/2	370	370	-	-	-	3.7	2.0	-	5.7	55.3	4.5	2.0	6.5
3/1+3/2	843	843	-	-	-	3.9	1.9	-	5.7	24.5	12.5	1.9	14.3
4/1	671	671	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	698	698	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	508	508	-	-	-	0.0	0.2	-	0.2	1.6	4.9	0.2	5.1

C1 PRC for Signalled Lanes (%): 11.5 Total Delay for Signalled Lanes (pcuHr): 15.31 Cycle Time (s): 90
PRC Over All Lanes (%): 11.5 Total Delay Over All Lanes(pcuHr): 15.54

Full Input Data And Results

Scenario 11: '2037 Base + Dev AM Hou' (FG15: '2037 AM Base + Dev', Plan 1: 'Network Control Plan 1')

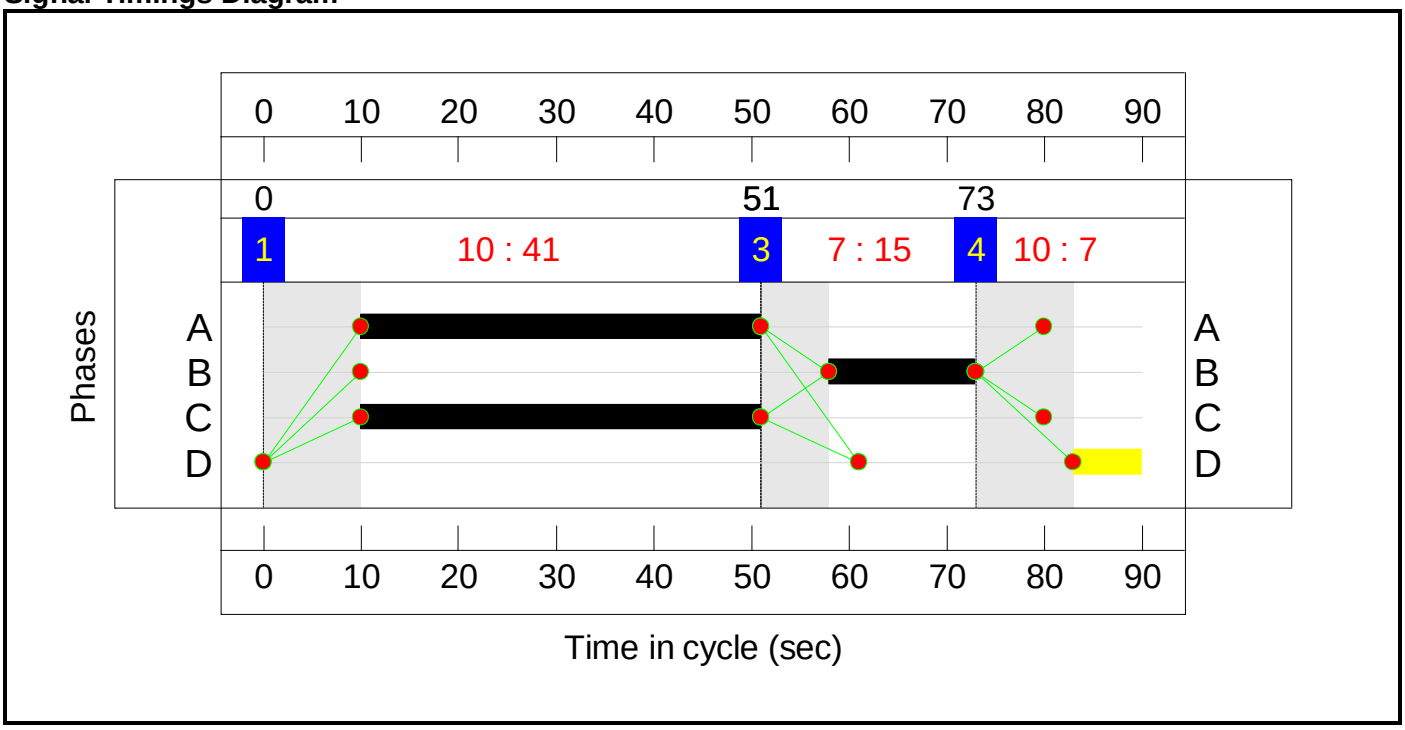
Stage Sequence Diagram



Stage Timings

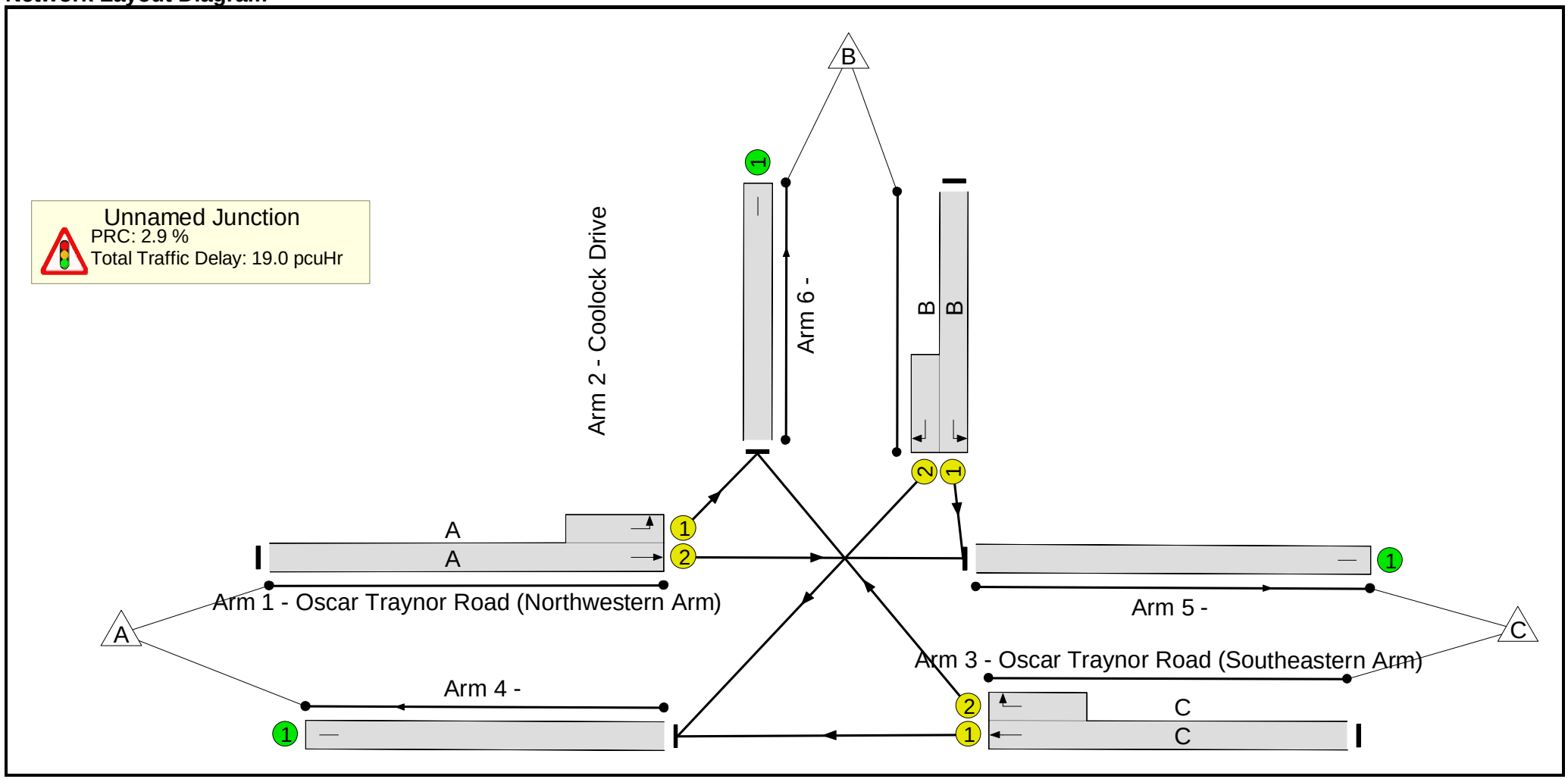
Stage	1	2	3	4
Duration	41	0	15	7
Change Point	0	51	51	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.5%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**87.5%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	41	-	646	1945:1729	837+95	69.3 : 69.3%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	15	-	396	1687:1925	264+189	87.5 : 87.5%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	41	-	829	1940:1687	723+236	86.5 : 86.5%
4/1		U	N/A	N/A	-		-	-	-	790	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	811	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	270	1915	1915	14.1%

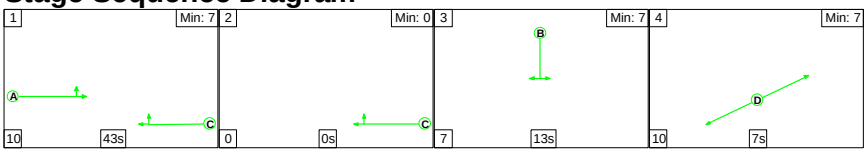
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network	**-**	**-**	**0**	**0**	**0**	**11.6**	**7.4**	**0.0**	**19.0**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**11.6**	**7.4**	**0.0**	**19.0**	**-**	**-**	**-**	**-**
1/2+1/1	646	646	-	-	-	3.3	1.1	-	4.4	24.5	11.8	1.1	12.9
2/1+2/2	396	396	-	-	-	3.8	3.1	-	6.9	63.0	5.9	3.1	9.0
3/1+3/2	829	829	-	-	-	4.6	3.1	-	7.6	33.1	16.3	3.1	19.3
4/1	790	790	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	811	811	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	270	270	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1

C1 PRC for Signalled Lanes (%): 2.9 Total Delay for Signalled Lanes (pcuHr): 18.95 Cycle Time (s): 90
PRC Over All Lanes (%): 2.9 Total Delay Over All Lanes(pcuHr): 19.03

Full Input Data And Results

Scenario 12: '2037 Base + Dev PM Hou' (FG16: '2037 PM Base + Dev', Plan 1: 'Network Control Plan 1')

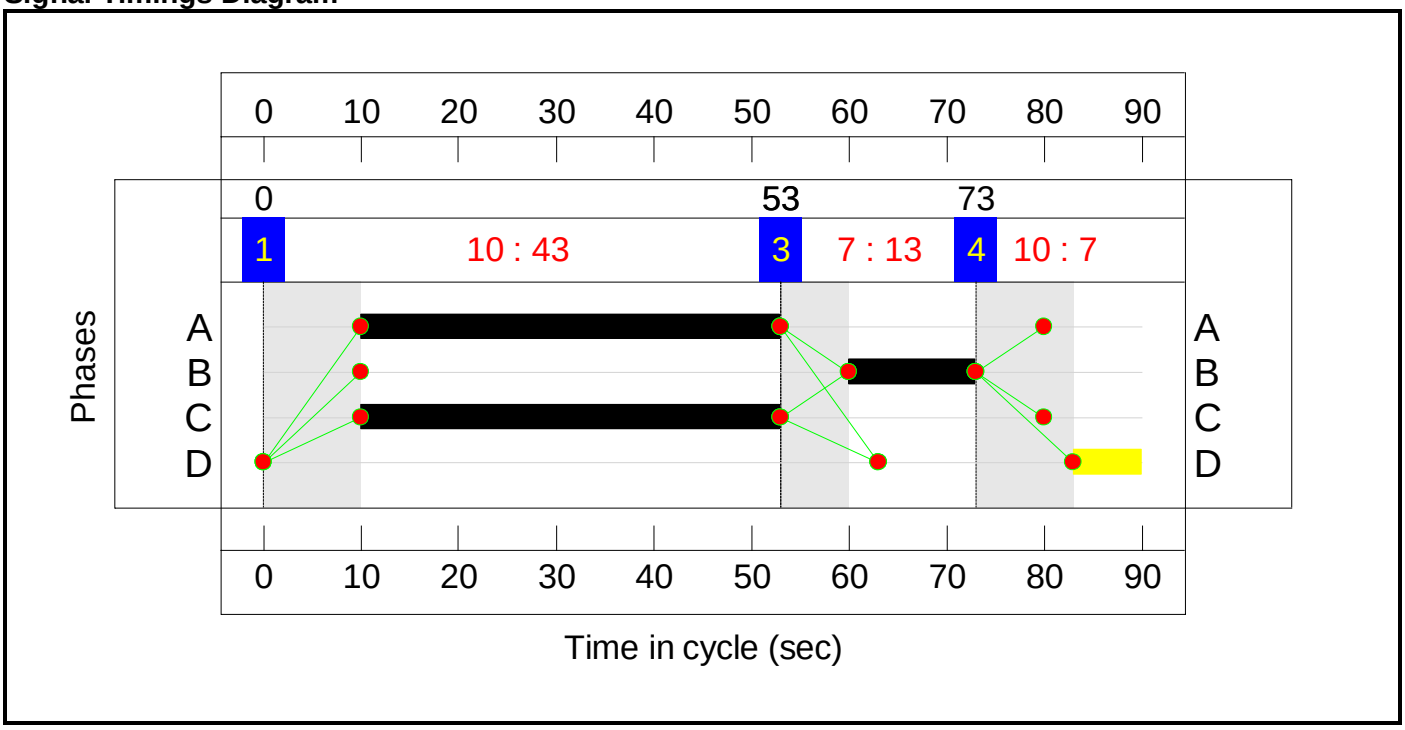
Stage Sequence Diagram



Stage Timings

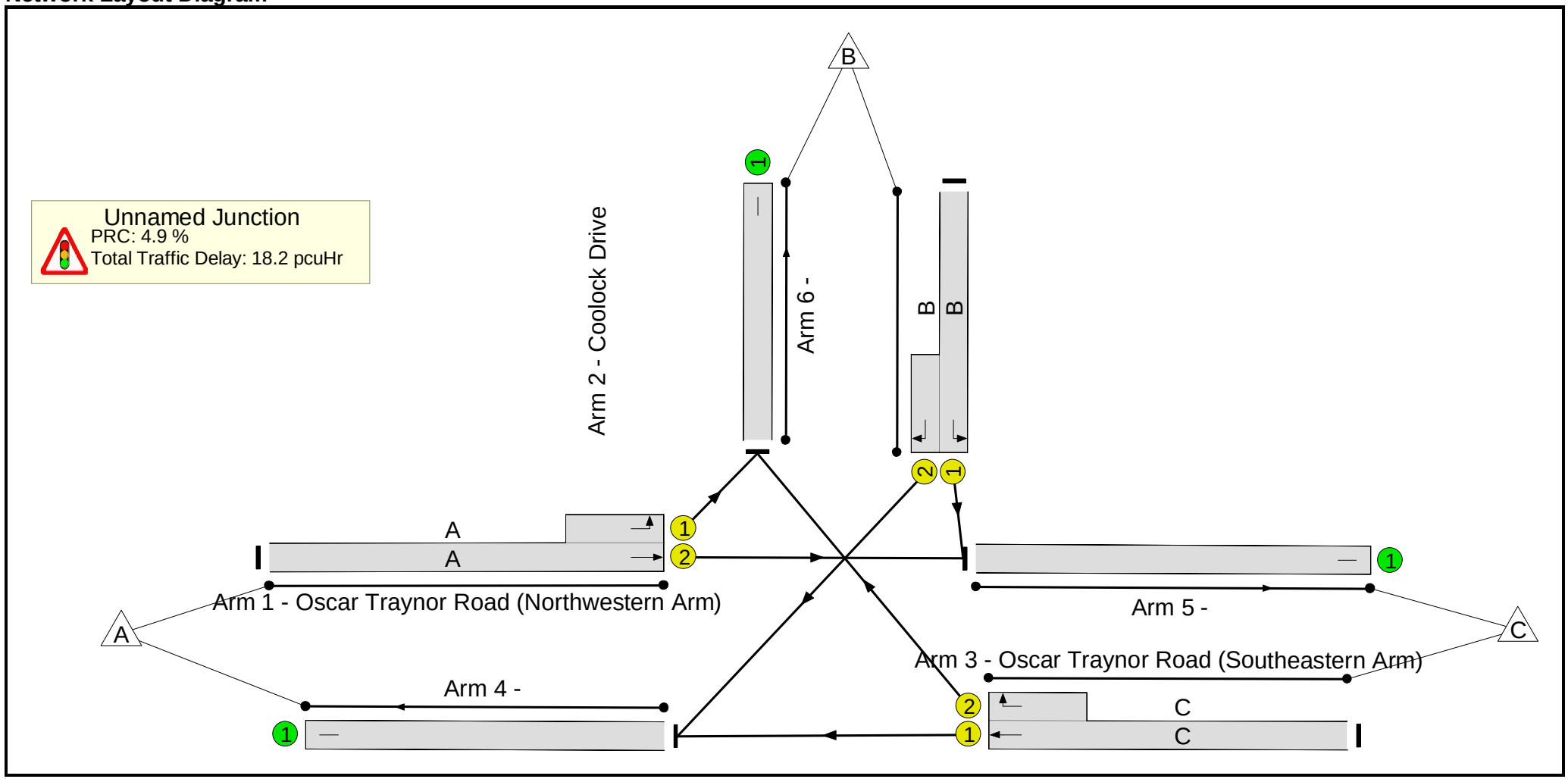
Stage	1	2	3	4
Duration	43	0	13	7
Change Point	0	53	53	73

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	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.8%**
Unnamed Junction	**-**	**-**	**N/A**	**-**	**-**		**-**	**-**	**-**	**-**	**-**	**-**	**85.8%**
1/2+1/1	Oscar Traynor Road (Northwestern Arm) Ahead Left	U	N/A	N/A	A		1	43	-	706	1945:1729	766+237	70.3 : 70.3%
2/1+2/2	Coolock Drive Right Left	U	N/A	N/A	B		1	13	-	392	1687:1925	238+219	85.8 : 85.8%
3/1+3/2	Oscar Traynor Road (Southeastern Arm) Ahead Right	U	N/A	N/A	C		1	43	-	895	1940:1687	623+439	84.2 : 84.2%
4/1		U	N/A	N/A	-		-	-	-	713	Inf	Inf	0.0%
5/1		U	N/A	N/A	-		-	-	-	743	Inf	Inf	0.0%
6/1		U	N/A	N/A	-		-	-	-	537	1915	1915	28.0%

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	**-**	**-**	**0**	**0**	**0**	**11.5**	**6.7**	**0.0**	**18.2**	**-**	**-**	**-**	**-**
Unnamed Junction	**-**	**-**	**0**	**0**	**0**	**11.5**	**6.7**	**0.0**	**18.2**	**-**	**-**	**-**	**-**
1/2+1/1	706	706	-	-	-	3.2	1.2	-	4.4	22.4	11.5	1.2	12.7
2/1+2/2	392	392	-	-	-	3.9	2.8	-	6.7	61.6	4.9	2.8	7.6
3/1+3/2	895	895	-	-	-	4.3	2.6	-	6.9	27.6	14.5	2.6	17.1
4/1	713	713	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
5/1	743	743	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
6/1	537	537	-	-	-	0.0	0.2	-	0.2	1.6	4.9	0.2	5.0

C1 PRC for Signalled Lanes (%): 4.9 Total Delay for Signalled Lanes (pcuHr): 17.96 Cycle Time (s): 90
PRC Over All Lanes (%): 4.9 Total Delay Over All Lanes(pcuHr): 18.20

Appendix F Go Car Letter of Support

To Whom It May Concern,

This is a letter to confirm that GoCar are willing to provide 10 shared car club vehicles in the proposed development at Proposed Strategic Housing Development at the Chivers Factory Site, Coolock Drive, Coolock, Dublin 17, with final terms to be agreed. We believe these vehicles would be well utilised in this development.

GoCar launched in 2008, and is Ireland's leading car sharing service with 40,000 members and over 500 vehicles in 15 counties in Ireland. Every GoCar replaces 10-20 private cars.

The Department Of Housing's Design Standards for New Apartments - Guidelines for Planning Authorities 2018 outline: "For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure... provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles."

GoCar members sign up online and send in a photo of their license. After we verify their account, they can then book cars or vans via the website or mobile app. They unlock the car with their phone or GoCard, and the keys are waiting securely in the glovebox. Rates start from €4 for half an hour, with fuel, insurance and maintenance included. We ask the members to return the car how they would like to find it; returned on time, clean, and with enough fuel. If the fuel drops below a quarter, the members use a fuel card in the car to refuel it, which GoCar pays.

Carsharing is both convenient and cost effective. It allows individuals to have the benefits of a private car, without having the large costs and hassle associated with car ownership. With pay as you go pricing and no subscription charges, GoCar ideal for people or organisations who only need occasional access to a car but don't want to own one, families who need a second car sometimes, as well as others who would like occasional access to a vehicle of a different type than they use day-to-day, like our GoVans. Carsharing is also 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, and frees up land traditionally used for parking spaces. Each GoCar replaces approximately 20 private cars, is environmentally friendly, and creates more liveable cities by encouraging people to sell their cars and only use a car when essential, while walking and using public transport more often too. International studies have also shown a reduction in the number of KMs travelled per year of more than 60% for car-sharing users.

GoCar car club is ideal for commercial and residential developments, as management companies can give staff and residents access to a selection of vehicles with each driver being insured through GoCar, with similar terms to car rental insurance. GoCar can offer these vehicles to be open to the public or dedicated to residents, which would allow property developers and management companies offer a pool car only to residents or companies in their buildings. If a management company wished to arrange this themselves, they would need to take out a personal policy for each person who may be driving the car, and manually keep a log of each time the car is used in case of an accident. GoCar's bespoke software removes these issues and provides management companies and users with a simple solution to get them on the road.

Regards,

Darragh Genockey
Sales & Operations Manager,
GoCar Carsharing Limited

Appendix G Letter of Consent DCC

Comhairle Cathrach
Bhaile Átha Cliath
Dublin City Council

Environment and Transportation,
Civic Offices, Wood Quay, Dublin 8

Roinn Comhshaoil agus Iompair,
Oifigí na Cathrach, An Ché Adhmaid, Baile Átha Cliath 8
T.(01) 2222099 E. trafficplanning@dublincity.ie

AECOM Ireland Ltd
Adelphi Plaza
Upper Georges Street
Dun Laoghaire
Co. Dublin

28th January 2019

Re: Letter of Consent to Planning Application

Site: Strategic Housing Development Application for a Mixed Use Development at the former Chivers Factory, Coolock Drive, Dublin 17

To Whom It May Concern,

I refer to the above intended planning application, the site of which includes lands in the control of Dublin City Council, within the footpath and roadway of the Coolock Drive / Oscar Traynor Road signalised junction, within the footpath and roadway of Coolock Drive and within the footpath and roadway of Greencastle Road as indicated in blue on attached drawing.

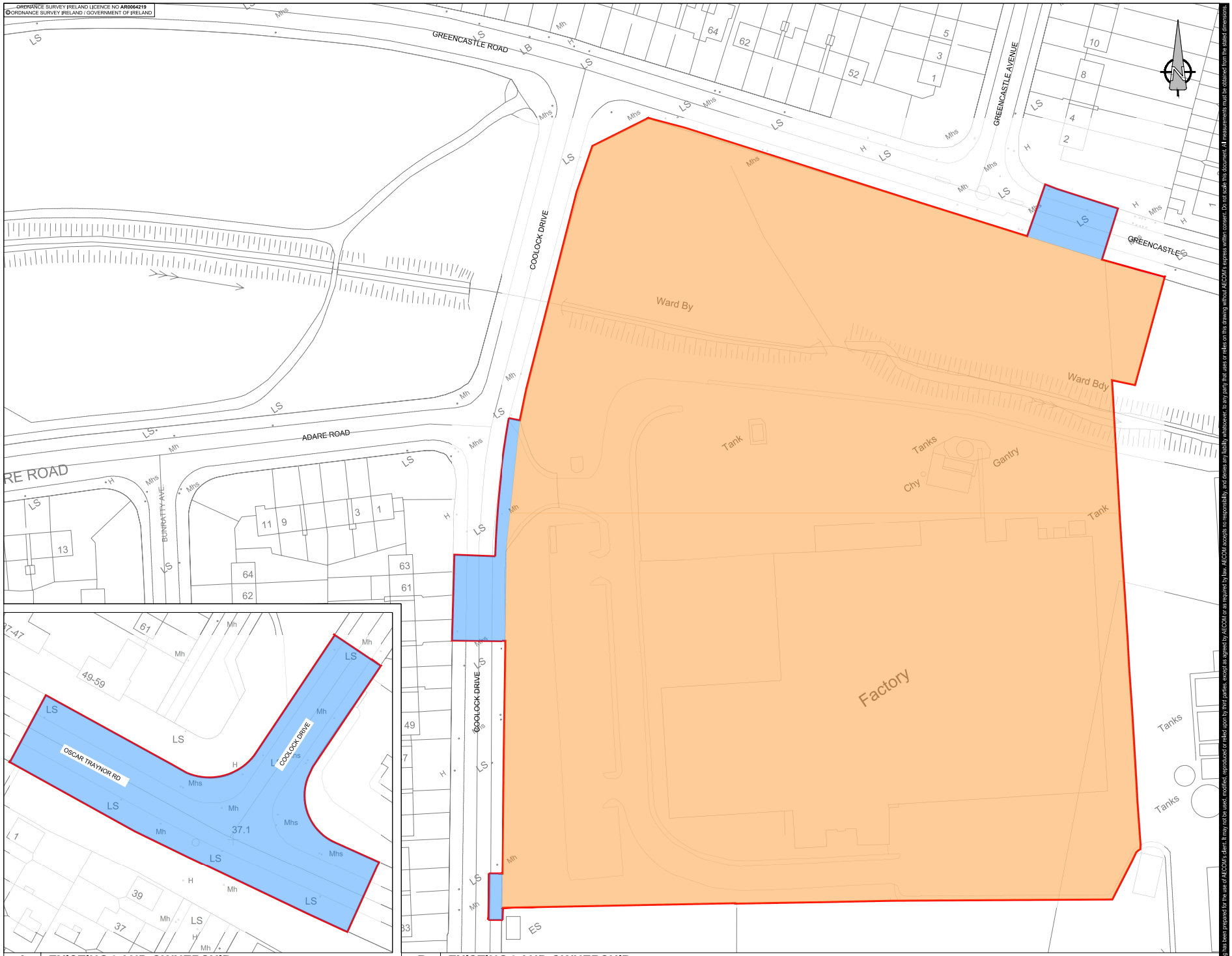
I wish to confirm that the City Council has no objection to the inclusion of these lands for the purpose of making a planning application. This is without prejudice to the outcome of the planning application process.

In the event that planning permission is granted and the development requires acquisition of Dublin City Council property including air rights, disposal will be subject to terms and conditions agreed with the Chief Valuer's Office. Any disposal of Dublin City Council property is also subject to Council approval under Section 183 of the Local Government Act 2001.

Yours faithfully,

pp E. Kelly S.T.O.

John Flanagan
City Engineer



A EXISTING LAND OWNERSHIP AT OSCAR TRAYNOR ROAD — 0004 — Scale: 1:500

B EXISTING LAND OWNERSHIP — 0004 — Scale: 1:500

AECOM

PROJECT
PROPOSED STRATEGIC HOUSING DEVELOPMENT AT CHIVERS FACTORY SITE, COOLOCK, DUBLIN 17

CLIENT
PLATINUM LAND LIMITED.

CONSULTANT
AECOM
4th Floor Adelphi Plaza,
George's Street Upper,
Dun Laoghaire,
Co Dublin
Tel:+353 (0)1 2383100 Fax:+353(0)1 2383199
www.aecom.com

NOTES
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS, ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF THE DESIGNER.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE PRIOR TO COMMENCEMENT OF WORKS.
3. AECOM LIMITED TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORKS ON SITE.
4. DIMENSIONS OF ALL BOUNDARIES AND ADJOINING ROADS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.

LEGEND
- DCC LAND: 4,210m²
- APPLICANT LAND: 36,100m²

ISSUE/REVISION

I/R	DATE	DESCRIPTION
0	25.01.2019	ISSUE FOR INFO

PROJECT NUMBER
60594375

SHEET TITLE
EXISTING LAND OWNERSHIP

SHEET NUMBER
PR385358-ACM-00-00-DR-CE-10-0004

ISO A1 594mm x 841mm
Approved: MD
Checked: SG
Designer: MS
Project Management Initials:
Last saved by: NANU.BURNETT(2019-01-24) Last Plotted: 2019-01-24
Filename: \\EU.AECOMNET.COM\EMEA\UKI\IED\BL2\JOBS\PR-385358_CHIVERS_FACTORY_SITE\900_CAD_GIS\900_CAD\904_CE\01_WIP\02_SHEETS\PR385358-ACM-00-00-DR-CE-10-0004.DWG
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