Apartment Development, Scholarstown, Rathfarnham, Dublin.

Traffic & Transport Assessment.

Document Control Sheet

Client	Developer Clancy Homes & Client Emmaville Ltd.
Project Title	Apartment Development Scholarstown, Dublin.
Document Title	Traffic and Transport Assessment
Document No.	2205-TTA-D01
Job No.	2205TT
Date	20th October 2022
Status	Final Issue

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Consulting Engineers.

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1.0 Introduction

Martin Hanley Traffic and Transportation Consulting Engineers have been engaged by Developer Clancy Homes & Client Emmaville Ltd. to prepare a Traffic and Transport Assessment (TTA) for a proposed new Apartment Development located at Scholarstown House, Co. Dublin 16. This report has been prepared as part of the planning application.

The development consists of the construction of 75 No. apartments including 1-bedroom, 2-bedroom and 3- bedroom apartments. Parking for the facility will be located at surface level.

Traffic counts were carried out by Traffinomics Ltd. on Wednesday 11th May 2022 for the morning peak hours of 07:30 - 09:30 and the evening peak hours of 16:30-18:30. Counts were undertaken at the at the roundabout junction of Scholarstown Road / St Colmcille's Way.

It is also noted that a recent planning permission for 490 residential units on lands to the north east of this application site has been granted planning permission by ABP and traffic generation from this development has been included in the general growth rate of traffic in the area.

The expected year of completion for the development is taken to be 2024. In accordance with the "Traffic and Transport Assessment Guidelines, TII 2014", a traffic analysis was carried out for the AM & PM peak hours for the following time periods,

Base Year 2022

Opening Year 2024

Opening Year + 5 Year Forecast 2029.

Opening Year + 15 Year Forecast 2039.

This report has been prepared in accordance with the TII's 2014 publication "Traffic and Transport Assessment Guidelines" and the "Guidelines for Traffic Impact Assessments" as published by the Institution of Highways & Transportation U.K. in 1994. The purpose of a TTA is to assess the traffic impact of a development on the existing road network and propose any necessary mitigation measures to best accommodate the expected traffic volumes generated by the proposed development.

1.1 Conclusion Non- Technical Summary

The following are the main conclusions of the LinSig traffic analysis.

Development Access Junction / Orlagh Grove

- For the design year 2039, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 3 development exit. The degree of saturation is measured at only 25.6% with a mean maximum car queue length of 0.2 vehicles for the evening peak hour 16:30-17:30.

- Junction sight distance of 45m to the north and south will be provided at 2.4m back from the road edge measured for design speed of 50km/hr in accordance with DMURS.

- The access junction to the development will be raised to provide a level crossing for pedestrians. See drawing SH-DA-P01 & SH-DA-P02 in appendix E of the report.

Roundabout Junction of Scholarstown Road / St Colmcille's Way

- The Arcady traffic analysis shows that the maximum degree of saturation increases over time for the design years 2024, 2029 & 2039. The Arcady traffic analysis shows that the maximum degree of saturation occurs on Arm D Colmcille's Way R113. The degree of saturation is

measured at 76.70% with a mean maximum car queue length of 3.2 vehicles for the morning peak hour 07:30-08:30 for the design year 2039.

- The Orlagh arm of the roundabout has a degree of saturation of 21.2% in the design year 2039.
- The roundabout is operation within capacity for all design years 2024, 2029 & 2039. No changes to the roundabout are required to facilitate the proposed development.

2.0 Policy Context

2.1 Introduction

In order to demonstrate that the development of the site complies with current national and local transport planning policy, a review was undertaken of the following documents:

- South Dublin County Development Plan 2022-2028
- Urban Design Manual: A Best Practice Guide 2009
- Smarter Travel - A Sustainable Transport Future 2009-2020
- Spatial Planning & National Roads – Guidelines for Planning Authorities 2012

2.2 Urban Design Manual: A Best Practice Guide 2009

This guide "focuses on creating well-designed, sustainable neighbourhoods that will stand the test of time". This can also extend to industrial developments and provides a strong foundation for the design of such sites in relation to their accessibility – in particular walking and cycling. The manual follows a set of criteria of which the following are directly linked to this Transport Assessment.

- There are attractive routes in and out for pedestrians and cyclists
- The development is located in or close to a mixed-use centre
- The development's layout makes it easy for a bus to serve the scheme
- The layout links to existing movement routes and the places people will want to get to
- Appropriate density, dependant on location, helps support efficient public transport

The manual recognises the need for planners to facilitate connections between new and existing developments, as well as key locations around the sites. These connections should be of high quality, direct, safe, secure and facilitate existing movement and desired routes. Furthermore, public transport and sustainable transport is prioritised over private cars. Quality interchanges are highly desirable in promoting the uptake of public transport, including integration with sustainable transport modes, such as cycle parking/storage.

A bus stop is also located directly outside of the site serving Dundrum Town, and Dublin City centre.

2.3 Smarter Travel – A Sustainable Transport Future 2009-2020

Smarter Travel is "designed to show how Ireland can reverse current unsustainable transport and travel patterns and reduce the health and environmental impacts of current trends and improve our quality of life". The plan outlines the current transport trends and statistics in Ireland and focuses on policies which aim to increase transport sustainability by 2020.

Key goals of the policy include.

- Improving quality of life and accessibility to transport for all and, in particular, people with reduced mobility and those who may experience isolation due to lack of transport.
- Improving economic competitiveness through maximising the efficiency of the transport system and alleviating congestion and infrastructure bottlenecks.
- Minimising the negative impacts of transport on the local and global environment through reducing localised air pollutants and greenhouse gas emissions.
- Reducing overall travel demand and commuting distances travelled by the private car.

In Chapter 3 of the Smarter Travel Document the Government reaffirms its vision for sustainability in transport and sets out five key goals:

(i) to reduce overall travel demand,
(ii) to maximise the efficiency of the transport network,
(iii) to reduce reliance on fossil fuels,
(iv) to reduce transport emissions and
(v) to improve accessibility to transport.

To achieve these goals and to ensure that we have sustainable travel and transport by 2020, the Government sets the following key targets:

- Future population and employment growth will predominantly take place in sustainable compact forms, which reduce the need to travel for employment and services.
- 500,000 more people will take alternative means to commute to work to the extent that the total share of car commuting will drop from 65% to 45%
- Alternatives such as walking, cycling and public transport will be supported and provided to the extent that these will rise to 55% of total commuter journeys to work.
- The total kilometres travelled by the car fleet in 2020 will not increase significantly from current levels.
- A reduction will be achieved on the 2005 figure for greenhouse gas emissions from the transport sector.

2.4 South Dublin County Development Plan 2022-2028

Data indicates that a significant majority of trips (62%) originating in South Dublin County are by private transport and are mainly car-based. Cycling accounts for a very small proportion of journeys at 5% while walking comprises 13% of trips. Approximately one fifth (20%) of trips are taken by public transport which breaks down as 17% bus and 3% rail.

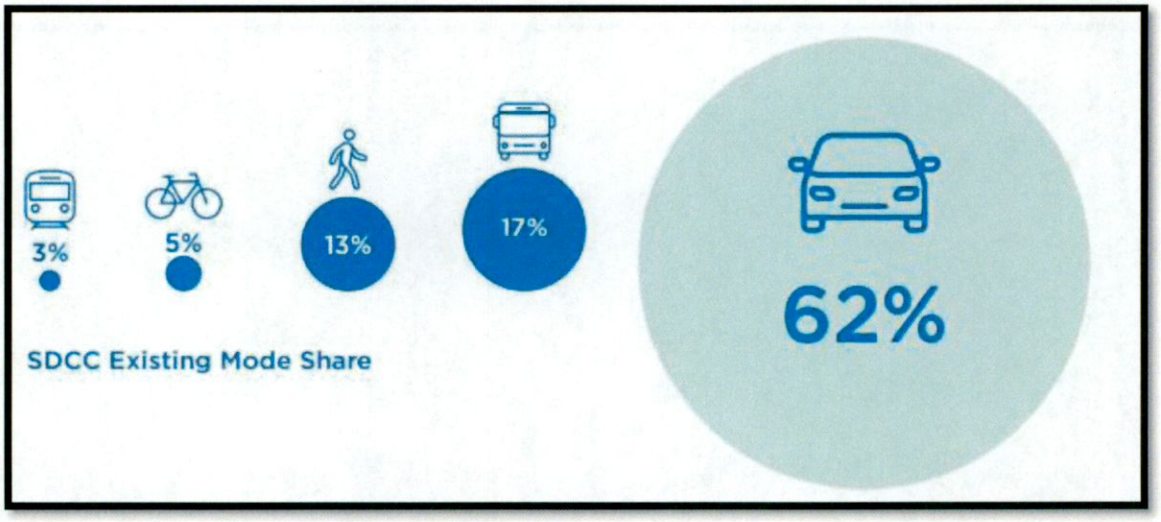


Table 2.1: SDCC Means of Travel Census 2016 POWSCAR data (Place of Work, School, or College Census of Anonymised Records)

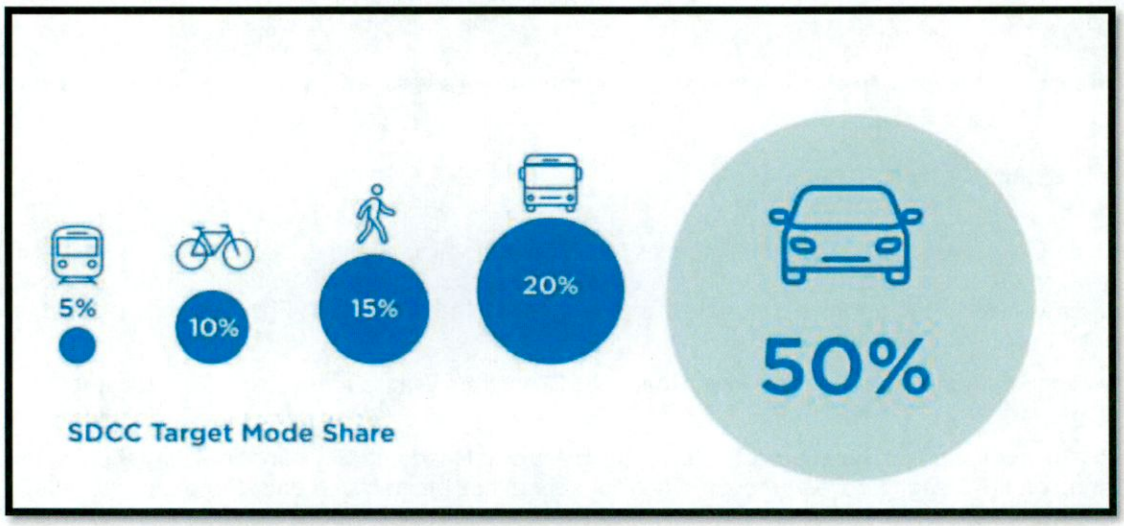


Table 2.2: SDCC Target Mode Share

South Dublin County has set out the target transport mode share as shown in Table 2.2 above. This development will be well served by public transport with 175 & 15 Bus service available on the R113 Scholarstown Road. The Dundrum Luas Station is 8.8km away.

3.0 Existing Conditions

3.1 Local Road Network

The proposed development site is located in Scholarstown. The development access will be onto Orlagh Road approx. 80m south of the Scholarstown Roundabout R113. The site is part of the lands of original Scholarstown House.

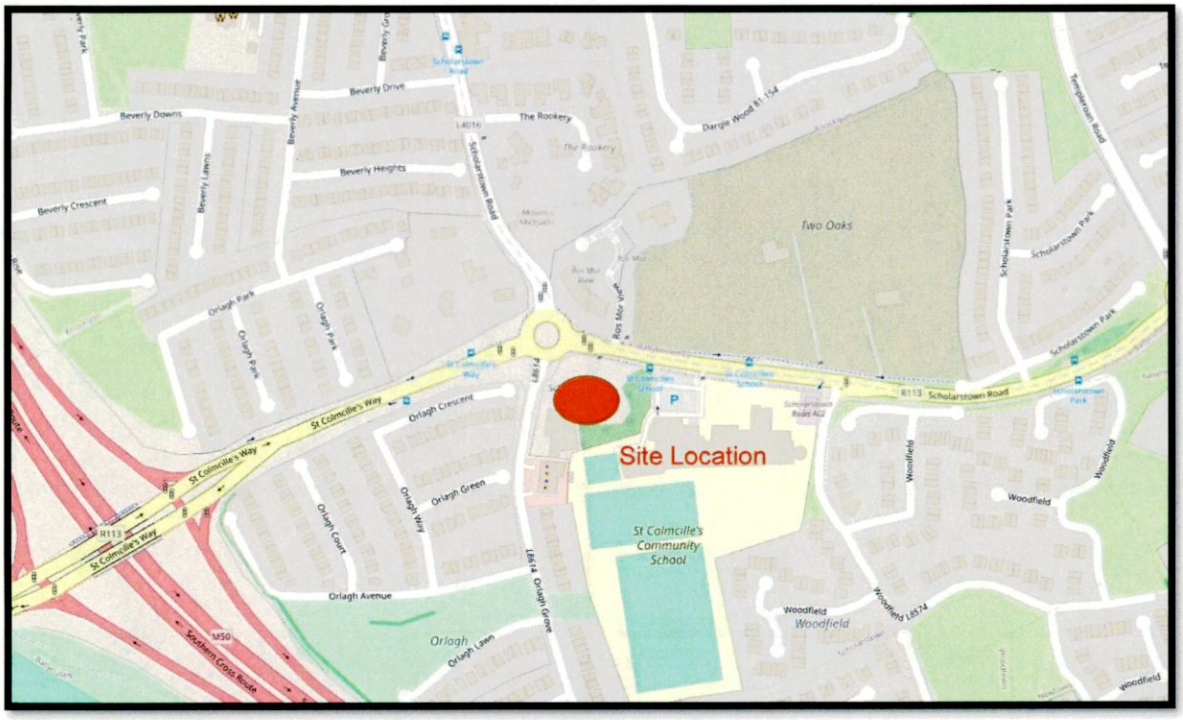


Fig 3.1: Local Road Network

3.2 Existing Traffic Conditions

Traffic counts were carried out by Traffinomics Ltd. for the morning peak hours of 07:30 - 09:30 and the evening peak hours of 16:30-18:30 at the existing roundabout signalised junction on Scholarstown Road. These traffic counts were undertaken on Wednesday 11th May 2022. Full traffic count data can be found in appendix A of this report.

The existing roundabout at Scholarstown Road / St Colmcille's Way.is a four-arm roundabout junction.

There is minor flaring on the approaches from Scholarstown Road and St Colmcille's Way R113 with no flaring on the Orlagh Grove approach. The roundabout has an inscribed diameter of approx. 40m.

The existing roundabout junction is operating within capacity in the base year 2022 for the morning peak hour. The Arcady traffic analysis shows that the maximum degree of saturation occurs on Arm D St Colmcille's Way R113 as can be seen in Fig 3.2 below. The degree of saturation is measured at 65.4% with a mean maximum car queue length of 1.9 vehicles for the morning peak hour 07:30-08:30. For full Arcady results see appendix D on the report.

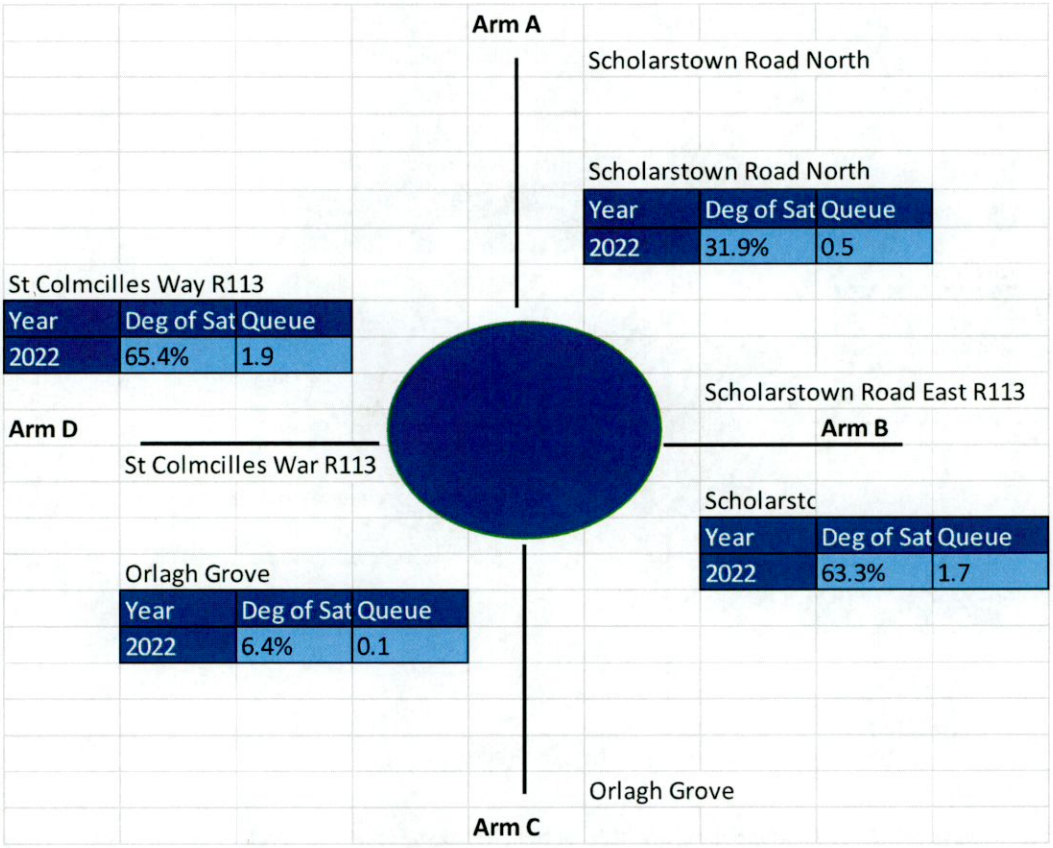


Fig 3.2: Arcady Analysis AM 2022. Roundabout Junction of Scholarstown Road / St Colmcille's Way.

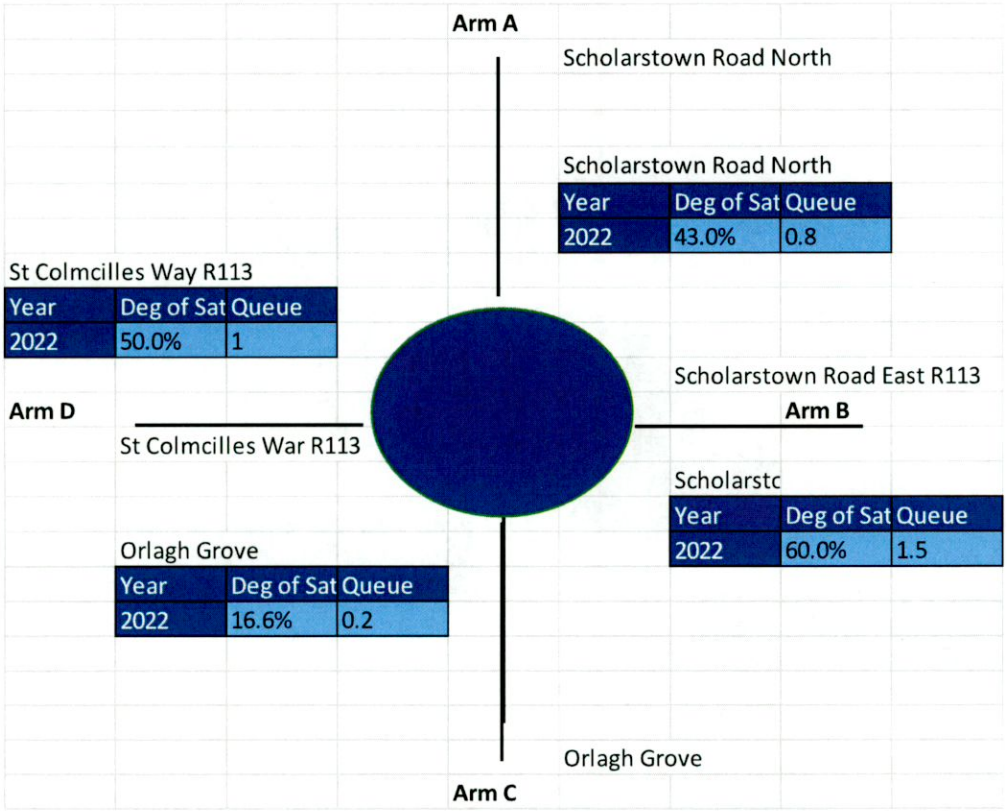


Fig 3.3: Arcady Analysis PM 2022. Roundabout Junction of Scholarstown Road / St Colmcille's Way.

The existing roundabout junction is operating within capacity in the base year 2022 for the evening peak hour. The Arcady traffic analysis shows that the maximum degree of saturation occurs on Arm B Scholarstown Road East as can be seen in Fig 3.3 above. The degree of saturation is measured at 60.0% with a mean maximum car queue length of 1.5 vehicles for the evening peak hour 16:30-17:30. For full Arcady results see appendix D on the report.

4.0 Proposed Development

The proposed development consists of the construction of a 75No apartment complex.

The parking for the development will be at surface level. See drawings No. SH-DA-P01 and SH-DA-P01, Appendix E for the site layout plan.

The development will consist of a residential development consisting of 75 units including
31 No 1-bed apartments
37 No 2-bed apartments
7 No 1-bed apartments

The proposed development will also provide 38No car parking spaces and 164No cycle spaces and all associated works.
It is also noted that a recent planning permission for 490 residential units on lands to the north east of this application has been granted planning permission by ABP and traffic generation from this development has been included in the general growth rate of traffic in the area.

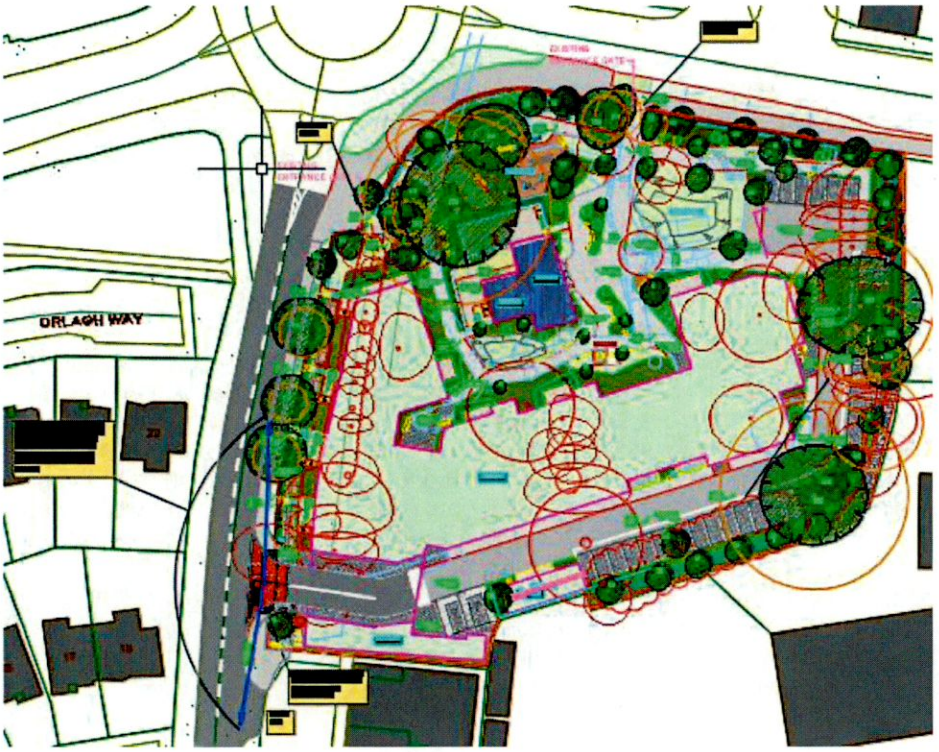


Fig 4.1 Proposed Development Layout.

5.0 Trip Generation, Modal Split and Trip Distribution.

5.1 Trip Generation

TII's 2014 publication "Traffic and Transport Assessment Guidelines" states that for new developments a traffic analysis should be carried out during the busiest hours which have been identified from traffic counts as 07:30-08:30 and 16.30-17.30.

The TRICS database was used to calculate the trip generation for this development. TRICS is a well-established UK and Irish national database which holds in excess of 2,100 site locations and 4,700 survey counts with over 98 separate land use sub-categories. The TRICS program was used to estimate the number of car trips which would be generated by this development during the morning and evening peak hours. Table 4.1 below shows the total number of trips generated during the peak hours for the proposed development. The output sheets from TRICS can be seen in Appendix B.

Apartment Development, Scholarstown		AM ARRIVAL 07:30-08:30	AM DEPARTURES 07:30-08:30	PM ARRIVAL 16:30-17:30	PM DEPARTURES 16:30-17:30
75 Apartments	per unit	0.046	0.256	0.218	0.043
	No.	75	75	75	75
	Trips	3	19	16	3
		AM ARRIVAL	AM DEPARTURES	PM ARRIVAL	PM DEPARTURES
TOTAL TRIPS PEAK HOURS		3	19	16	3

Table 5.1: Trip Generation from proposed Development

5.2 Modal Split

In order to predict the level of traffic that will be generated by the proposed development, the means of transport (modal split) and quantity of traffic generated (trip attraction) must be considered. Given the location of the proposed development, the peak hour trips generated will primarily be by public transport and private car. In terms of modal split and national policies for the promotion of sustainable transport solutions, a reduction in car trips would be expected, with improvement in pedestrian / cycle facilities as well as improvement in public transport. In order to provide a robust traffic analysis, no reduction in car traffic volumes has been assumed in this report.

National policies, strategies, and guidelines for improvements to public transport systems and reductions in car usage are outlined in the Department of Transport Tourism and Sport's Planning Guidelines for Spatial Planning and National Roads 2012 and the Department of Transport, Tourism and Sport's Smarter Travel: A Sustainable Transport Future. In addition, the document a New Policy for Ireland 2009-2020 states that the key aims of any development plan must be to secure more sustainable residential development that reduces overall demand for transport by car and encourage modal shift towards sustainable travel modes (e.g., walking, cycling and public transport), whilst also ensuring the strategic traffic function of national roads is maintained."

The proposed development meets these requirements in terms of proximity to local services, convenience shopping within 1km and numerous amenities such as sports fields/clubs and public parks within 1.5km. Given the nature of the development, a reduction in car trips would be expected over time with improvement to public transport.

5.3 Trip Distribution

The current distribution of traffic along the Scholarstown Road will be used to determine directional split to and from the proposed development for both morning and evening peak hours. This peak hour directional split pattern is assumed to remain constant with the passage of time.

6.0 Traffic Growth

In order to predict likely future traffic conditions so that the impact of a development proposal on the road and transport network can be predicted and assessed, traffic forecasting considers the possible traffic flows generated by a development proposal as well as the existing background network traffic which is factored up.

The assessment years considered in this report are the Base Year (2022), which is the year the baseline traffic surveys were undertaken, the proposed Opening Year, which is the year of expected completion for the proposed development (2024) and the Design Years, taken as the opening year plus 5 years (2029) & the opening year plus 15 years (2039).

Transport Infrastructure Irelands publication "Project Appraisal Guidelines for National Roads Unit 5.3" 2019 was used to calculate growth factors for the background road network traffic. These Guidelines state that for the years 2016-2030 within Dublin, a growth rate of 1.46% per annum can be assumed. This changes to 0.34% beyond 2030. The original traffic counts from 2019 were factored up using these projected growth rates. The effects of traffic growth on the existing network plus the additional traffic generated by the proposed development have been compiled to provide a robust set of data for the traffic analysis.

Table 6.1 below shows the calculated growth factors based on a growth rate measured from the current year 2022.

Location		2024	2029	2039
Metropolitan Dublin	Growth Rate From 2022	102.94%	110.68%	115.40%

Table 6.1: TII Traffic Growth Rates Dublin

7.0 Assignment of Development Trips

The proposed development will generate trips as outlined in section 5 of this report. As outlined in section 5.2 and 5.3, the expected modal split has been assumed to remain as it is at present with no increase in modal shift towards more sustainable transport patterns. This will provide the worst case scenario from traffic generation viewpoint.

7.1 Traffic Assignment Roundabout Junction

Traffic models were produced using Arcady for the existing Roundabout junction for the scenarios outlined below. These models incorporate the measured traffic flows. Theses traffic flows have been factored up as per the predicted growth factors, along with predicted development traffic.

The list of traffic models built for the proposed development traffic assessment are:

- Base Year 2022
- Opening Year 2024
- Opening Year + 5 Year Forecast 2029
- Opening Year + 15 Year Forecast 2039

Four zones were used to construct the Arcady model labelled A to D. The development traffic will enter and exit zone C.

		Entry Flow					
		A	B	C	D	Total	Veh/Min
	A	0	128	6	285	419	6.98
	B	33	0	16	579	628	10.47
	C	38	28	0	74	140	2.33
Exit Flow	D	142	476	28	0	646	10.77
	Total	213	632	50	938		
	Veh/Min	3.55	10.53	0.83	15.63		

Table 7.1: Traffic Assignment for AM Peak 2022

		Entry Flow					
		A	B	C	D	Total	Veh/Min
	A	0	112	49	101	262	4.37
	B	103	0	33	402	538	8.97
	C	22	42	0	41	105	1.75
Exit Flow	D	203	494	41	0	738	12.30
	Total	328	648	123	544	1643	
	Veh/Min	5.47	10.80	2.05	9.07		

Table 7.2: Traffic Assignment for PM Peak 2022

		Entry Flow					
		A	B	C	D	Tot	Veh/Min
	A	0	132	6	293	431	7.19
	B	34	0	17	596	647	10.79
Exit Flow	C	39	35	0	76	150	2.50
	D	146	490	29	0	665	11.08
	Tot	219	657	52	966	1894	
	Veh/Min	3.65	10.94	0.87	16.09		

Table 7.3: Traffic Assignment for AM Peak 2024

		Entry Flow					
		A	B	C	D	Tot	Veh/Min
	A	0	121	50	104	276	4.60
	B	107	0	35	415	557	9.28
Exit Flow	C	23	49	0	42	114	1.90
	D	209	515	42	0	766	12.76
	Tot	339	685	128	561	1712	
	Veh/Min	5.64	11.42	2.13	9.35		

Table 7.4: Traffic Assignment for PM Peak 2024

		Entry Flow					
		A	B	C	D	Tot	Veh/Min
	A	0	142	7	317	465	7.76
	B	37	0	19	643	699	11.64
Exit Flow	C	48	37	0	88	173	2.89
	D	158	529	31	0	717	11.96
	Tot	243	708	57	1048	2055	
	Veh/Min	4.04	11.80	0.94	17.46		

Table 7.5: Traffic Assignment for AM Peak 2029

		Entry Flow					
		A	B	C	D	Tot	Veh/Min
	A	0	130	54	112	297	4.95
	B	115	0	38	447	601	10.01
Exit Flow	C	24	53	0	46	123	2.04
	D	225	555	46	0	826	13.76
	Tot	365	738	138	605	1846	
	Veh/Min	6.09	12.30	2.29	10.09		

Table 7.6: Traffic Assignment for PM Peak 2029

		Entry Flow					
		A	B	C	D	Tot	Veh/Min
	A	0	148	8	329	485	8.08
	B	38	0	19	668	726	12.10
Exit Flow	C	50	38	0	91	180	2.99
	D	164	549	33	0	746	12.44
	Tot	252	735	61	1088	2136	
	Veh/Min	4.20	12.26	1.01	18.14		

Table 7.7: Traffic Assignment for AM Peak 2039

		Entry Flow					
		A	B	C	D	Tot	Veh/Min
	A	0	135	57	117	308	5.14
	B	120	0	39	465	624	10.40
Exit Flow	C	25	54	0	47	127	2.12
	D	234	576	47	0	858	14.29
	Tot	380	766	143	629	1917	
	Veh/Min	6.33	12.76	2.38	10.48		

Table 7.8: Traffic Assignment for PM Peak 2039

7.2 Traffic Assignment Development Access Junction

Traffic models were produced using Linsig for the proposed access junction for the scenarios outlined below. These models incorporate the measured traffic flows outlined in section 2, factored up as per section 6.0, along with predicted development traffic as described in section 5.1.

The list of traffic models built for the proposed development traffic assessment are:

- Base Year 2022
- Opening Year 2024
- Opening Year + 5 Year Forecast 2029
- Opening Year + 15 Year Forecast 2039

Three zones were used to construct the LinSig network labelled A to C. The development is represented by zone B.

		Destination Zone			
		A	B	C	Tot
	A	0	143	0	143
	B	51	0	3	54
Origin	C	0	19	0	19
Zone	Tot	51	162	3	217

Table 7.1: Traffic Assignment for AM Peak 2024

		Destination Zone			
		A	B	C	Tot
	A	0	154	0	154
	B	56	0	3	59
Origin	C	0	19	0	19
Zone	Tot	56	173	3	232

Table 7.2: Traffic Assignment for AM Peak 2029

		Destination Zone			
		A	B	C	Tot
	A	0	160	0	160
	B	58	0	3	61
Origin	C	0	19	0	19
Zone	Tot	58	179	3	240

Table 7.3: Traffic Assignment for AM Peak 2039

		Destination Zone			
		A	B	C	Tot
	A	0	101	0	101
	B	122	0	16	138
Origin	C	0	3	0	3
Zone	Tot	122	104	16	242

Table 7.4: Traffic Assignment for PM Peak 2024

		Destination Zone			
		A	B	C	Tot
	A	0	109	0	109
	B	132	0	16	148
Origin	C	0	3	0	3
Zone	Tot	132	112	16	260

Table 7.5: Traffic Assignment for PM Peak 2029

		Destination Zone			
		A	B	C	Tot
	A	0	113	0	113
	B	137	0	16	153
Origin	C	0	3	0	3
Zone	Tot	137	116	16	269

Table 7.6: Traffic Assignment for AM Peak 2039

8.0 Road Impact

8.1 LinSig Analysis Development Access / Orlagh Road.

In order to assess the capacity of the proposed development access Junction / Orlagh Grove, was analysed using LinSig. LinSig is a computer software program dealing with capacities, mean max queue lengths (pcu) and delays at uncontrolled and signalised junctions.

The output results sheets from LinSig consist of tables of demand flow, capacities, queues and delays for the morning and evening peak hour analysis, for each arm of the junction. These tables contain start and finish times for each arm, traffic demand, Degree of Saturated Flow (DOS %), start queue length and queuing delay.

The DOS provides the basis for judging the acceptability of junction design and the capacity of existing junctions. In general, a DOS of 85% or less for controlled junctions is considered acceptable during the peak periods. A DOS of this value would indicate that at peak times the junction is at 85% of its operational capacity and therefore has a practical reserve capacity of 10%. This reserve capacity of 15% is considered by traffic engineers to be the level of reserve capacity at a junction required to cater for periods of unusually high traffic flows such as bank holiday weekends, public entertainment, and sporting events etc.

The results from the LinSig analysis are shown in the pages which follow for the following traffic scenarios.

Scenario 1 AM 2024 Design Year
Scenario 2 AM 2029 Design Year
Scenario 3 AM 2039 Design Year
Scenario 4 PM 2024 Design Year
Scenario 5 PM 2029 Design Year
Scenario 6 PM 2039 Design Year

The full output from Linsig traffic analysis is available in Appendix C

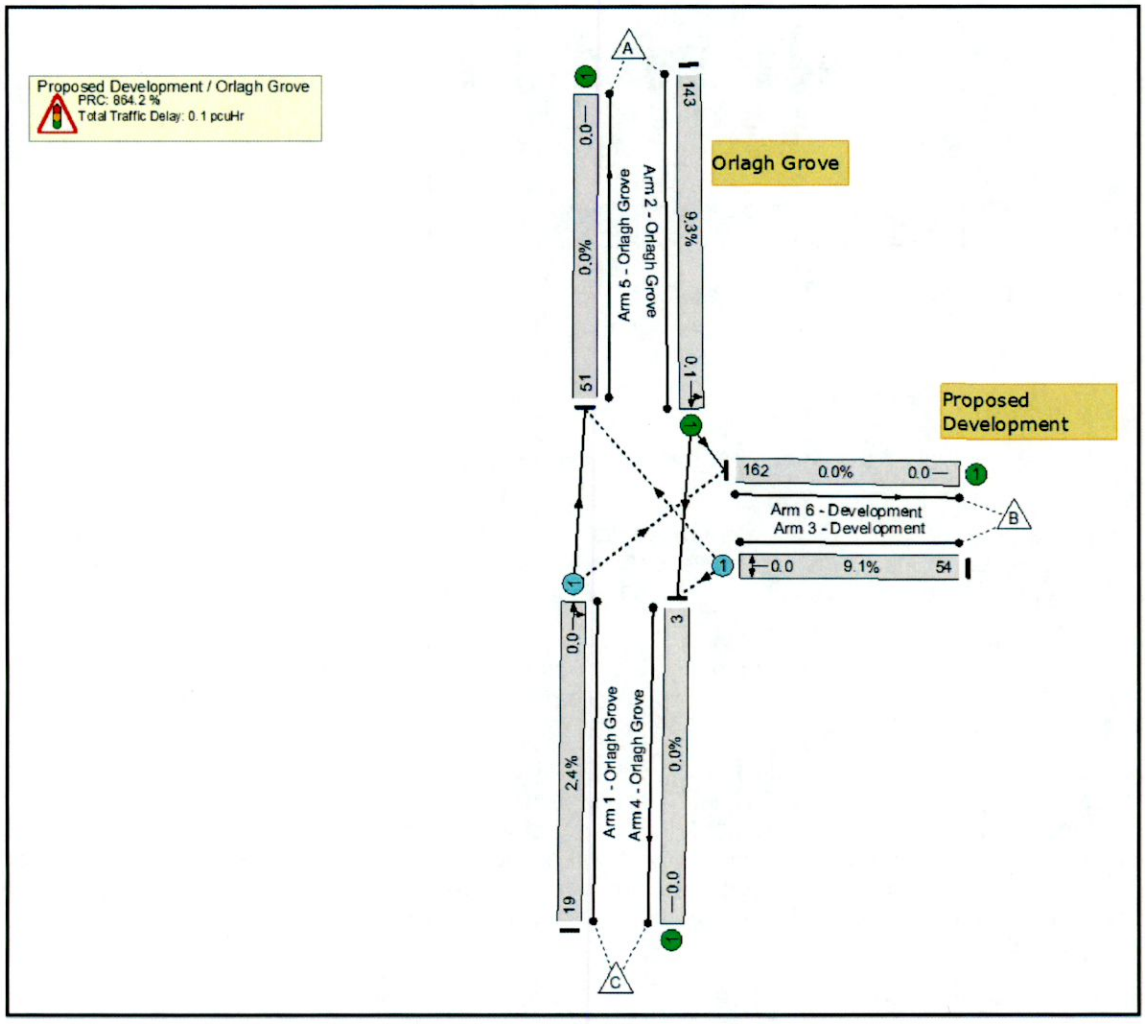


Fig 8.1: 'Scenario 1 AM 2024' Network Layout Diagram

For the design year 2024, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 2 Orlagh Road. The degree of saturation is measured at only 9.3% with a mean maximum car queue length of 0.1 vehicles for the morning peak hours 07:30-08:30. The development exit has a degree of saturation which is measured at only 9.1%.

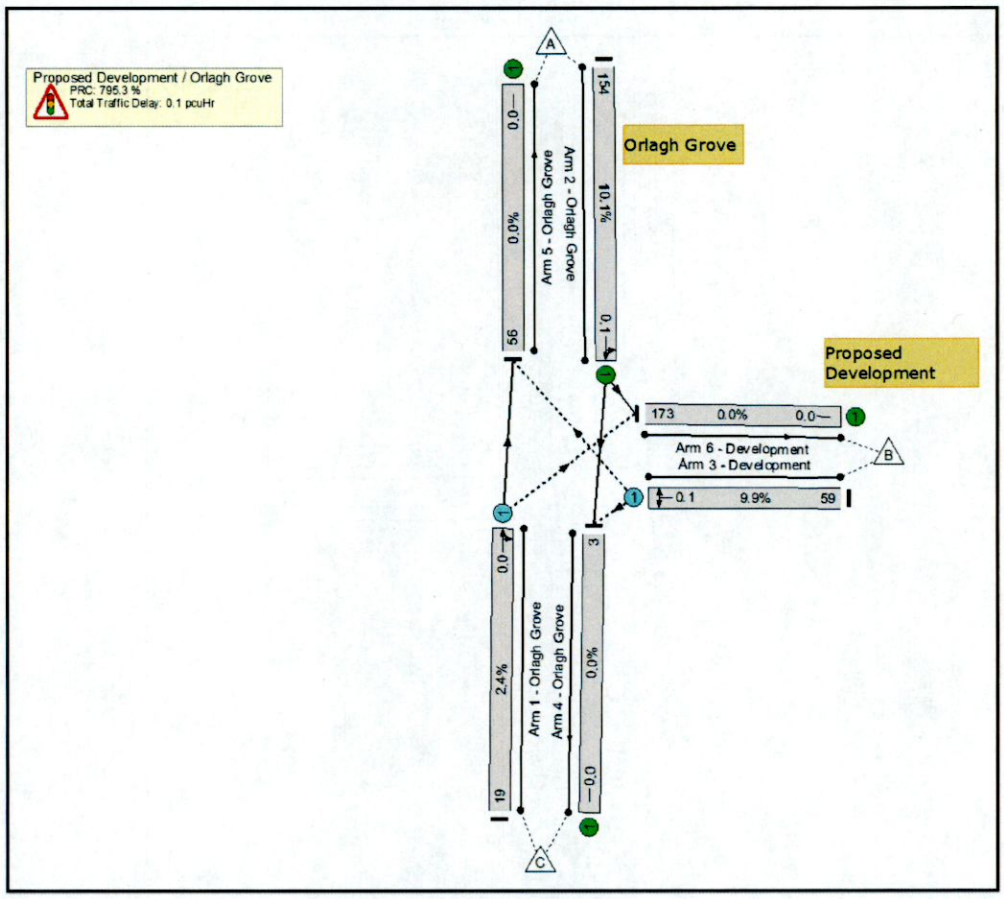


Fig 8.2: 'Scenario 2 AM 2029' Network Layout Diagram

For the design year 2029, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 2 Orlagh Road. The degree of saturation is measured at only 10.1% with a mean maximum car queue length of 0.1 vehicles for the morning peak hours 07:30-08:30. The development exit has a degree of saturation which is measured at only 9.9%.

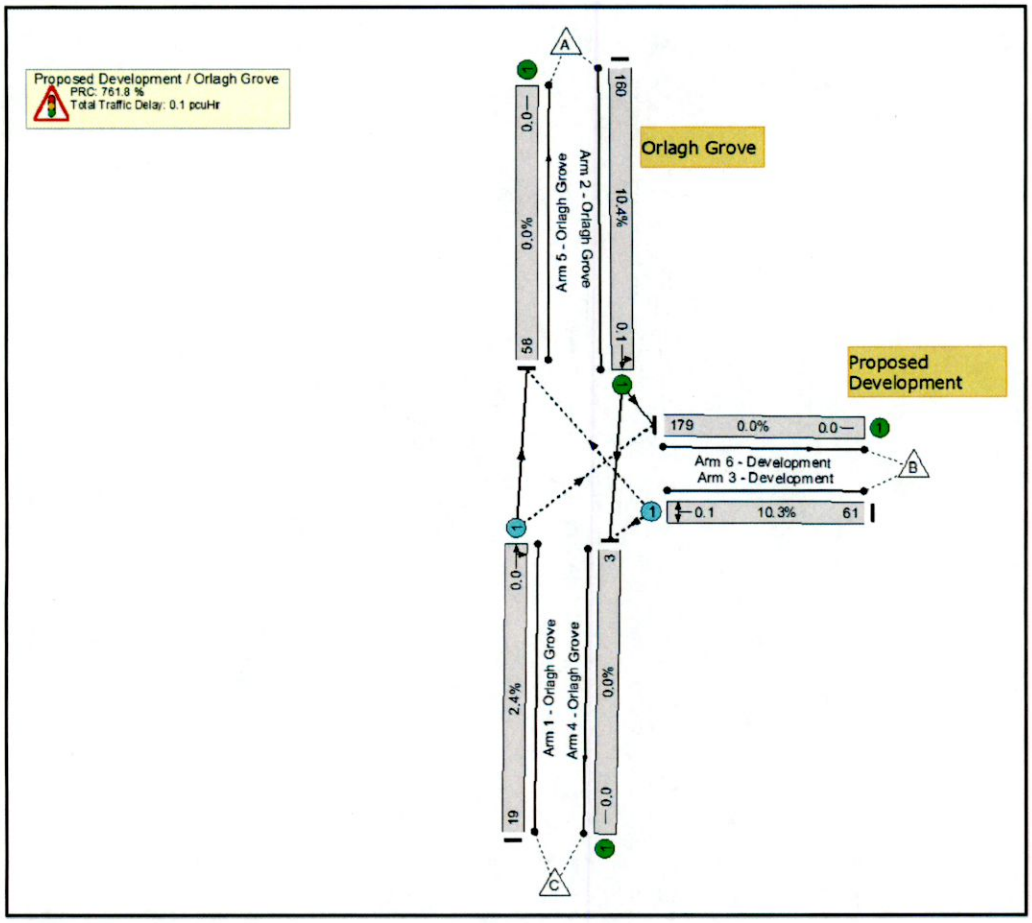


Fig 8.3: 'Scenario 3 AM 2039' Network Layout Diagram

For the design year 2039, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 2 Orlagh Road. The degree of saturation is measured at only 10.4% with a mean maximum car queue length of 0.1 vehicles for the morning peak hours 07:30-08:30. The development exit has a degree of saturation which is measured at only 10.3%.

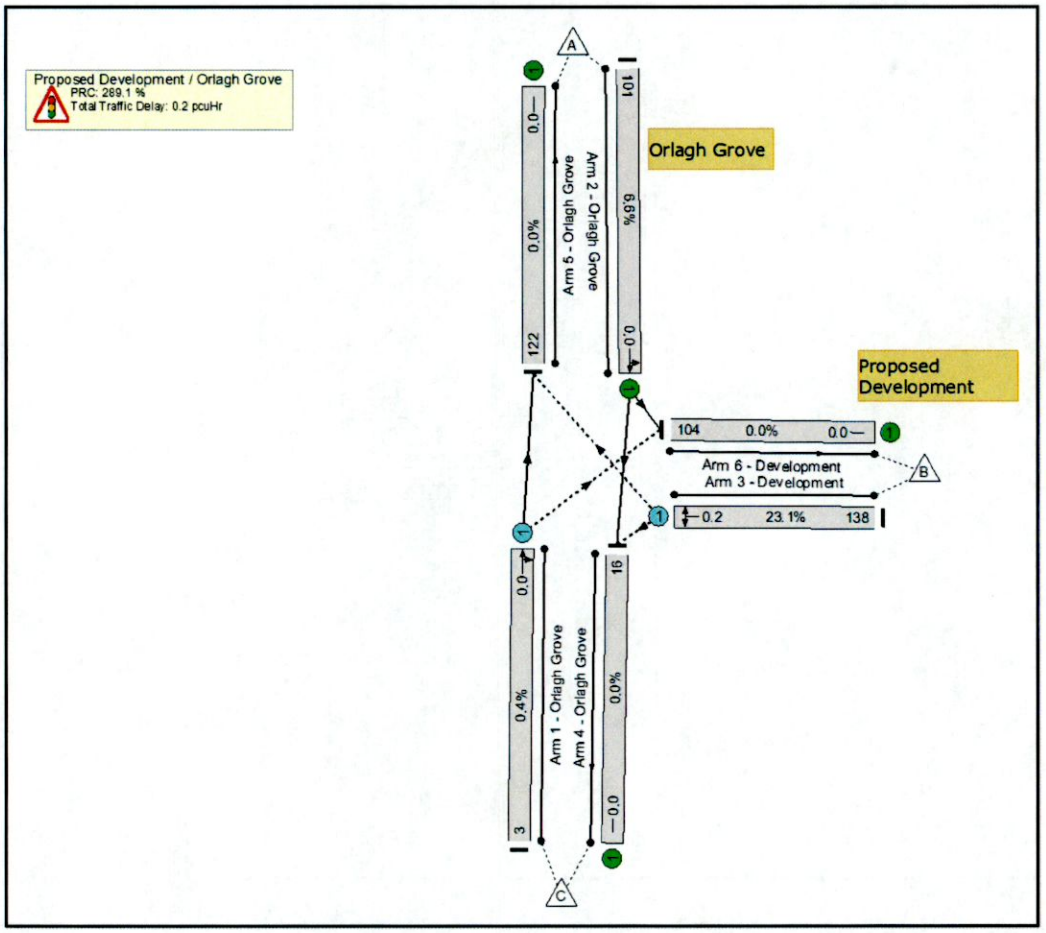


Fig 8.4: 'Scenario 4 PM 2024' Network Layout Diagram

For the design year 2024, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 3 development exit. The degree of saturation is measured at only 23.1% with a mean maximum car queue length of 0.2 vehicles for the evening peak hour 16:30-17:30.

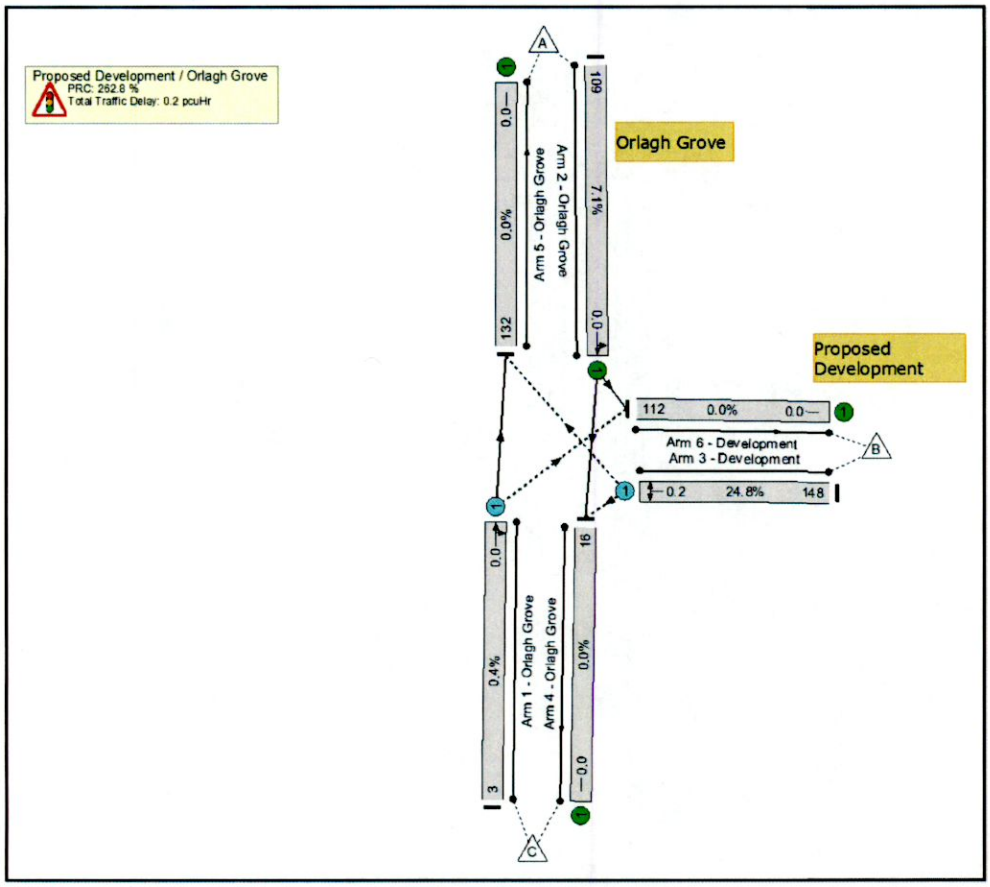


Fig 8.5: 'Scenario 5 PM 2029' Network Layout Diagram

For the design year 2029, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 3 development exit. The degree of saturation is measured at only 24.8% with a mean maximum car queue length of 0.2 vehicles for the evening peak hour 16:30-17:30.

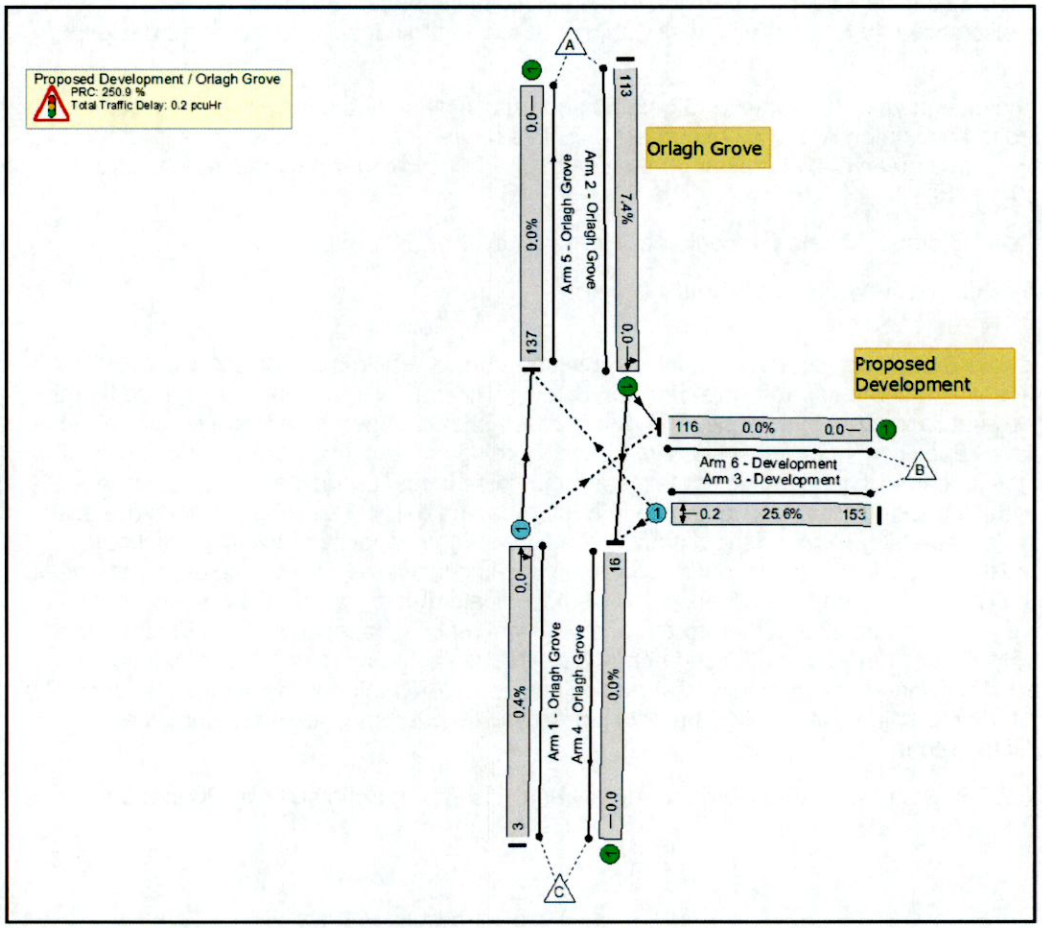


Fig 8.6: 'Scenario 6 PM 2039' Network Layout Diagram

For the design year 2039, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 3 development exit. The degree of saturation is measured at only 25.6% with a mean maximum car queue length of 0.2 vehicles for the evening peak hour 16:30-17:30.

The LinSig analysis shows how the saturation of the junctions increases over time, however, all junctions are also shown to be operating well within or at maximum capacity for all future design years.

- For the design year 2039, the LinSig traffic analysis shows that the maximum degree of saturation occurs on Arm 3 development exit. The degree of saturation is measured at only 25.6% with a mean maximum car queue length of 0.2 vehicles for the evening peak hour 16:30-17:30.

The detailed LinSig output sheets are contained in Appendix C of the report.

8.2 Arcady Scholarstown Roundabout Analysis

In order to assess the capacity of the roundabout junction, Arcady traffic analysis software by TRL was used. Arcady is a computer software program dealing with capacities, mean max queue lengths (pcu) and delays at roundabout junctions. The output result sheets from the software consist of tables of demand flow, capacities, queues and delays for the morning and evening peak hour analysis, for each arm of the junction. These tables contain start and finish times for each arm, traffic demand, Ratio of Flow to Capacity (RFC), start queue length and queuing delay. The RFC provides the basis for judging the acceptability of roundabout junction design and the capacity of existing junctions. Generally, an RFC of 85% or less for roundabout junctions is considered acceptable during the peak period for priority junctions. An RFC of this value would indicate that at peak times the junction is at 85% of its operational capacity and therefore has a practical reserve capacity of 15%. This reserve capacity of 15% is considered by traffic engineers to be the level of reserve capacity at a junction required to cater for periods of unusually high traffic flows, such as bank holiday weekends, public entertainment, and sporting events etc. The detailed Arcady output data sheets are contained in Appendix D of the report.

Fig 8.7 and 8.8 below shows the result of the Arcady analysis for the Scholarstown Roundabout

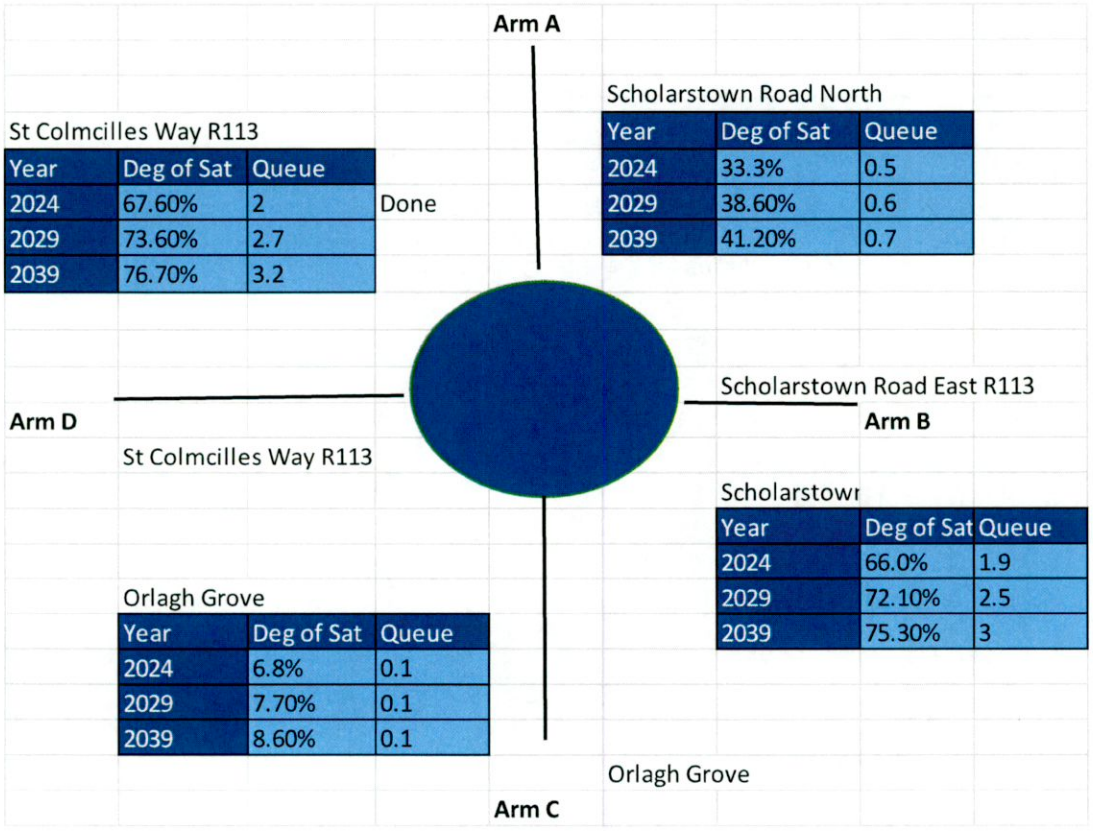


Fig 8.7: AM Roundabout Analysis for Design years 2024,2029 & 2039.

The Arcady analysis shows how the saturation of the junction increases over time. The following is a summary of the analysis.

The Arcady traffic analysis shows that the maximum degree of saturation increases over time for the design years 2024, 2029 & 2039. The Arcady traffic analysis shows that the maximum degree of saturation occurs on Arm D Colmcille's Way R113 as can be seen in Fig 8.7 above. The degree of saturation is measured at 76.70% with a mean maximum car queue length of 3.2 vehicles for the morning peak hour 07:30-08:30 for the design year 2039.

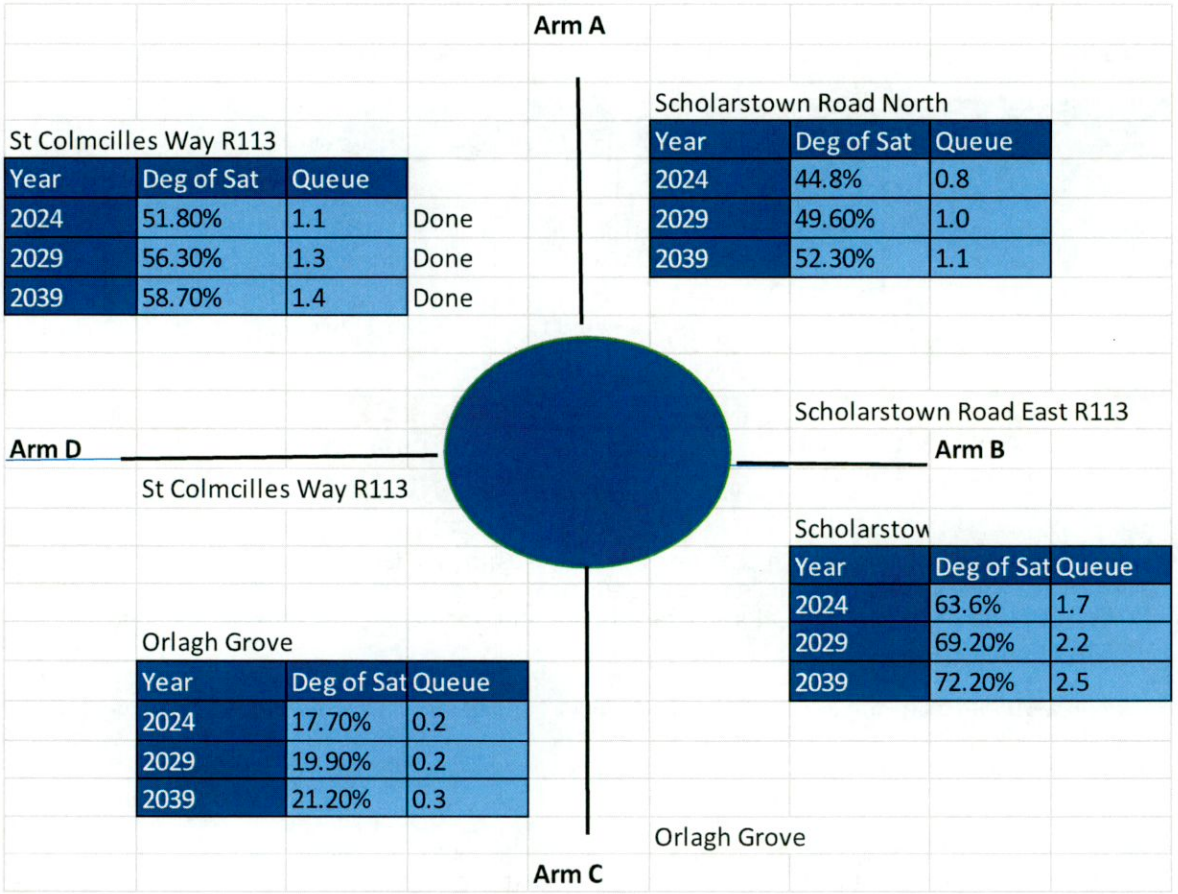


Fig 8.8: PM Roundabout Analysis for Design years 2024,2029 & 2039.

The Arcady traffic analysis shows that the maximum degree of saturation increases over time for the design years 2024, 2029 & 2039. The Arcady traffic analysis shows that the maximum degree of saturation occurs on Arm B Scholarstown Road R113 as can be seen in Fig 8.8 above for the evening peak hour. The degree of saturation is measured at 72.20% with a mean maximum car queue length of 2.5 vehicles for the evening peak hour 16:30-17:30 for the design year 2039. For full Arcady results see appendix D on the report.

9.0 Internal layout & Parking

The South Dublin County Council Development Plan 2022-2028 gives guidance on car parking standards for new developments. Table 13.25 of the Plan sets the car space allocation for various types of development including apartments. The Plan sets out the parking standards for development within Zone 2. This zone included developments within town and village centres, within 400 metres of a high-quality public transport service (includes a train station, Luas station or bus stop with a high-quality service). Lands within Zone 2 can have more restrictive parking rates applied.

Table 8.1 below shows a schedule of car parking spaces as set out by the Development Plan.

Land Use Category	South Dublin County Council Development Plan 2022-2028 - Car Parking Standards	Total Spaces Per Unit	Total Units	Parking spaces required
RESIDENTIAL				
1 Bedroom	0.75 space	0.75	31	23
2 Bedroom	1.0 spaces	1	37	37
3 Bedroom	1.25 spaces	1.25	7	9
I House	1.5 spaces	1.5	1	2
Total			76	71

Table 8.1: Car parking allocation

Sustainable Urban Housing Design Standards for New Apartments Guidelines for Planning Authorities issued under Section 28 of the Planning and Development Act, 2000 (as amended) December 2020 describes that for Intermediate Urban Locations that the appropriate car parking standards are 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 total number of parking spaces provided will be 38 which includes visitor parking spaces.
The parking provision in the development plan is considered to be a maximum and given the proximity of the Development to both Bus and Luas services this level of parking is considered to be adequate.
The design and layout of the car park is mindful of ensuring that the space provides a safe and efficient environment and is convenient for all those who use it. It is intended that all parking for the development will be facilitated within the site, at surface level.. All car parking spaces are required to be a minimum 2.4m x 4.8m in size.
EV charging shall be provided in all residential, mixed use and commercial development and shall comprise 15% - 20% of the total parking spaces provided, with higher provision within this range required in urban areas. This is equivalent to 8No EV parking bays

10.0 Pedestrians / Cyclists / Access for People with Disabilities

Dropped kerbs, dished footpaths, raised pedestrian crossings and tactile paving will be provided at appropriate locations such as at the entrances to the Development. A total of 164 bicycle stands will be provided as part of the Development.

South Dublin County Council Development Plan 2022-2028 - Cycle Parking Standards	Total Spaces Per Unit	Total Units	Min Cycle spaces required
1 per bedroom for 1-bed apartments	1	31	31
1 per bedroom for 2-bed apartments	2	37	74
1 per bedroom for 3-bed apartments	3	7	21
1 short stay visitor space per 2 apartments	0.5	75	38
Total			164

Table 10.1: Bicycle parking Standards.

11.0 References

Transport Infrastructure Ireland (2014) Traffic and Transport Assessment Guidelines TII, Dublin

Institution of Highways & Transportation (1994) Guidelines for Traffic Impact Assessment IHT, London

Transport Infrastructure Ireland (revised 2015) Design Manual for Roads and Bridges TII, Dublin

TRICS – A Trip Generation Database for Development Control, JMP, London

Transport Infrastructure Ireland (November 2004) Draft Traffic and Transport Assessment Guidelines TII, Dublin

Transport Infrastructure Ireland Project Appraisal Guidelines TII, Dublin 2010

Department of Tourism Transport and Sport "Design Manual for Urban Roads and Streets" (DMURS - 2013) DTTaS, Dublin

National Transport Authority "National Cycle Manual" (NCM - 2011) NTA, Dublin

Mr Martin Hanley, BE CEng MIEI

Signed: .....

Senior Transportation Engineer.
Date: 20/10/2022.

12.0 Appendices

13.0 Appendix A – Traffic Count Data

14.0 Appendix B – Trics Data

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	8	116	0.045	**8**	**116**	**0.256**	**8**	**116**	**0.301**
08:00 - 09:00	8	116	0.046	8	116	0.254	8	116	0.300
09:00 - 10:00	8	116	0.055	8	116	0.101	8	116	0.156
10:00 - 11:00	8	116	0.030	8	116	0.057	8	116	0.087
11:00 - 12:00	8	116	0.044	8	116	0.045	8	116	0.089
12:00 - 13:00	8	116	0.069	8	116	0.080	8	116	0.149
13:00 - 14:00	8	116	0.084	8	116	0.073	8	116	0.157
14:00 - 15:00	8	116	0.078	8	116	0.067	8	116	0.145
15:00 - 16:00	8	116	0.113	8	116	0.061	8	116	0.174
16:00 - 17:00	8	116	0.141	8	116	0.057	8	116	0.198
17:00 - 18:00	**8**	**116**	**0.218**	8	116	0.043	8	116	0.261
18:00 - 19:00	8	116	0.192	8	116	0.055	8	116	0.247
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.115			1.149			2.264

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:	20 - 340 (units:)
Survey date date range:	01/01/11 - 22/11/16
Number of weekdays (Monday-Friday):	8
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.

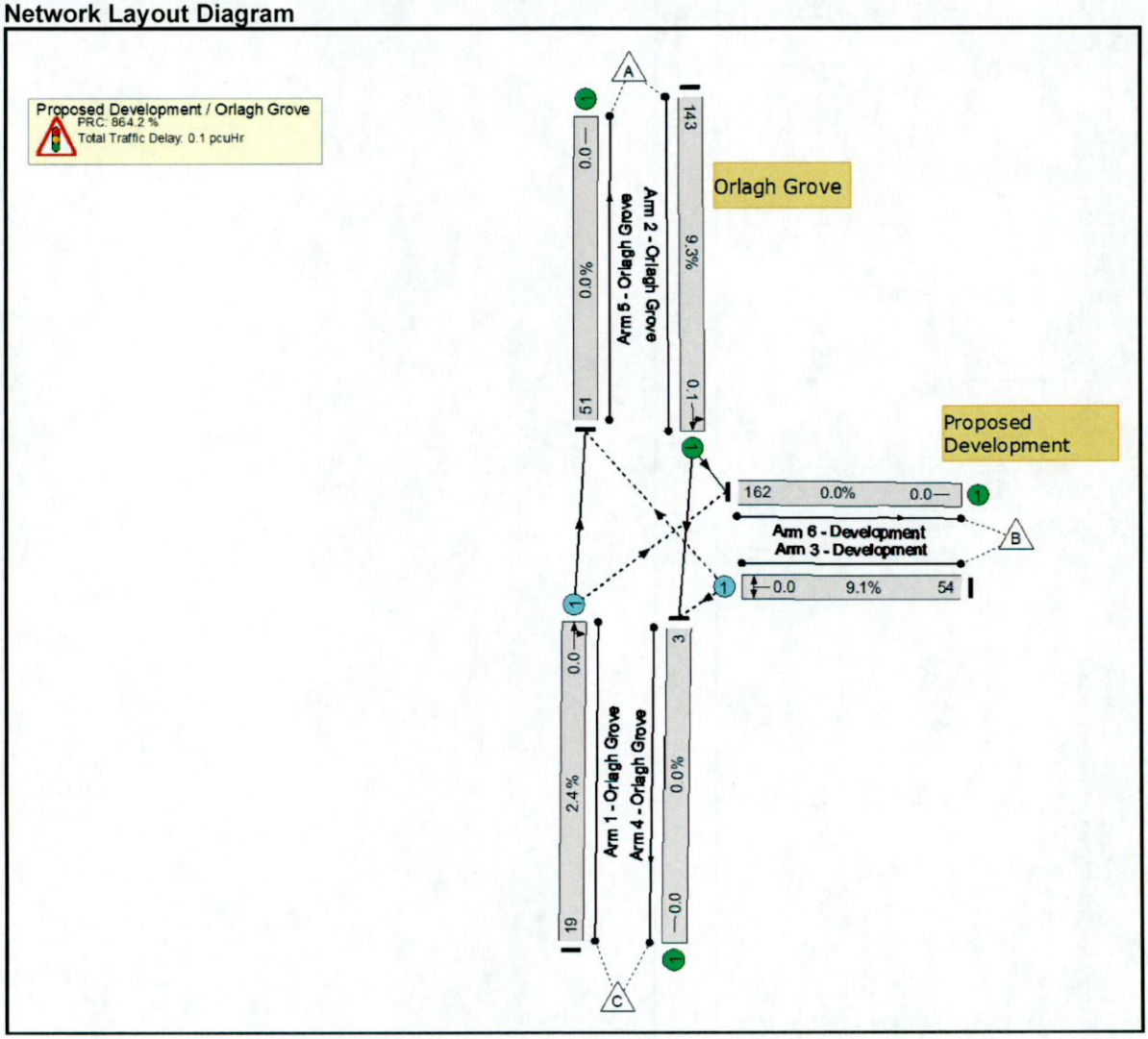
15.0 Appendix C – Linsig Output Data

Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Scholarstown Entrance.lsg3x
Author:	
Company:	
Address:	

Scenario 1: 'Scenario 1 AM 2024' (FG1: 'AM 2024', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**9.3%**	**73**	**0**	**0**	**0.1**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**9.3%**	**73**	**0**	**0**	**0.1**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	19	1741	800	2.4%	19	0	0	0.0	2.3	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	143	1532	1532	9.3%	-	-	-	0.1	1.3	0.1
3/1	Development Left Right	O	-		-	-	-	54	1728	595	9.1%	54	0	0	0.0	3.3	0.0

C1

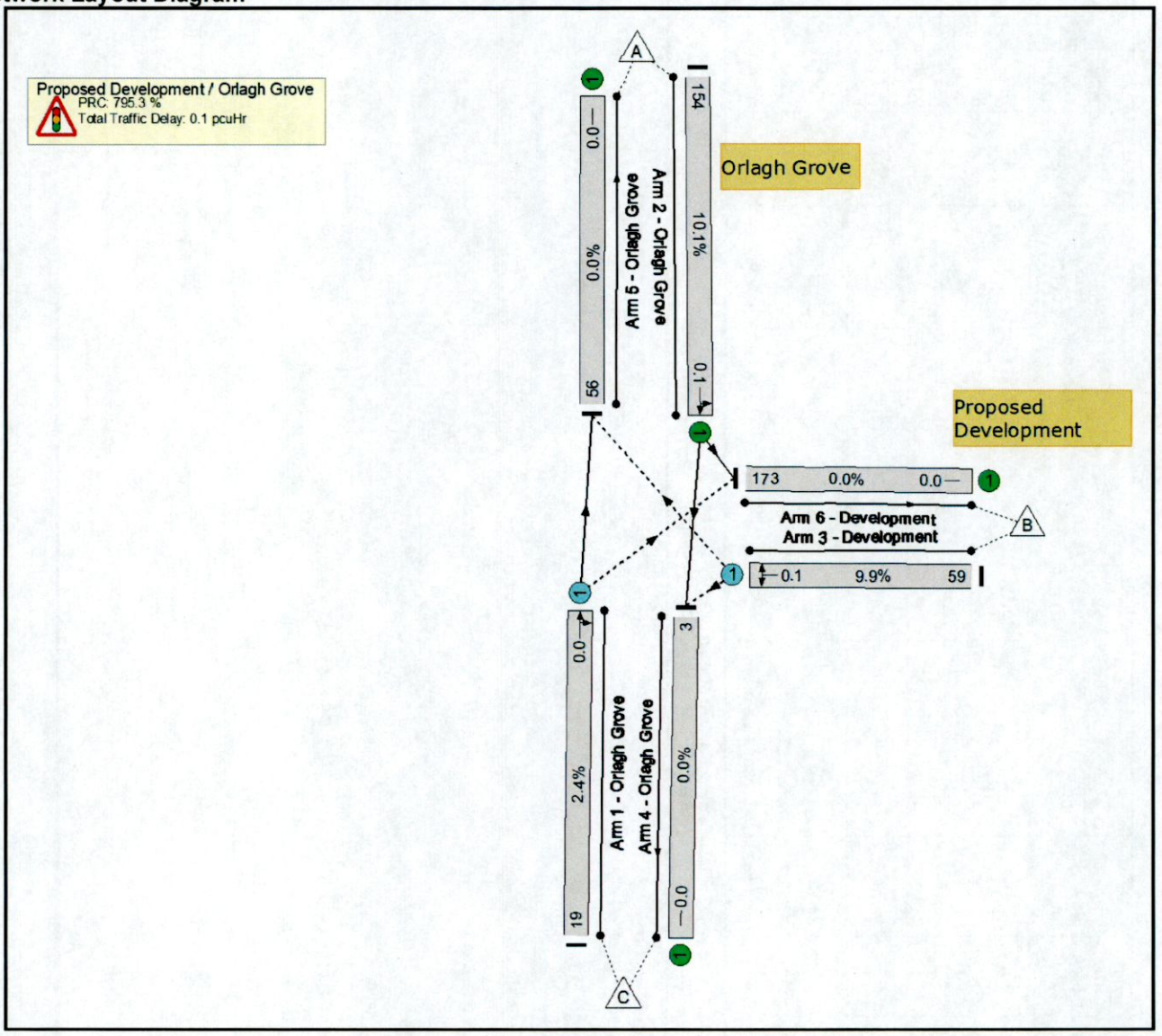
PRC for Signalled Lanes (%): 0.0 | Total Delay for Signalled Lanes (pcuHr): 0.00 | Cycle Time (s): 90

PRC Over All Lanes (%): 864.2 | Total Delay Over All Lanes(pcuHr): 0.11

Basic Results Summary

Scenario 2: 'Scenario 2 AM 2029' (FG2: 'AM 2029', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**10.1%**	**78**	**0**	**0**	**0.1**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**10.1%**	**78**	**0**	**0**	**0.1**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	19	1741	796	2.4%	19	0	0	0.0	2.3	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	154	1532	1532	10.1%	-	-	-	0.1	1.3	0.1
3/1	Development Left Right	O	-		-	-	-	59	1729	595	9.9%	59	0	0	0.1	3.4	0.1

C1

PRC for Signalled Lanes (%): 0.0
PRC Over All Lanes (%): 795.3

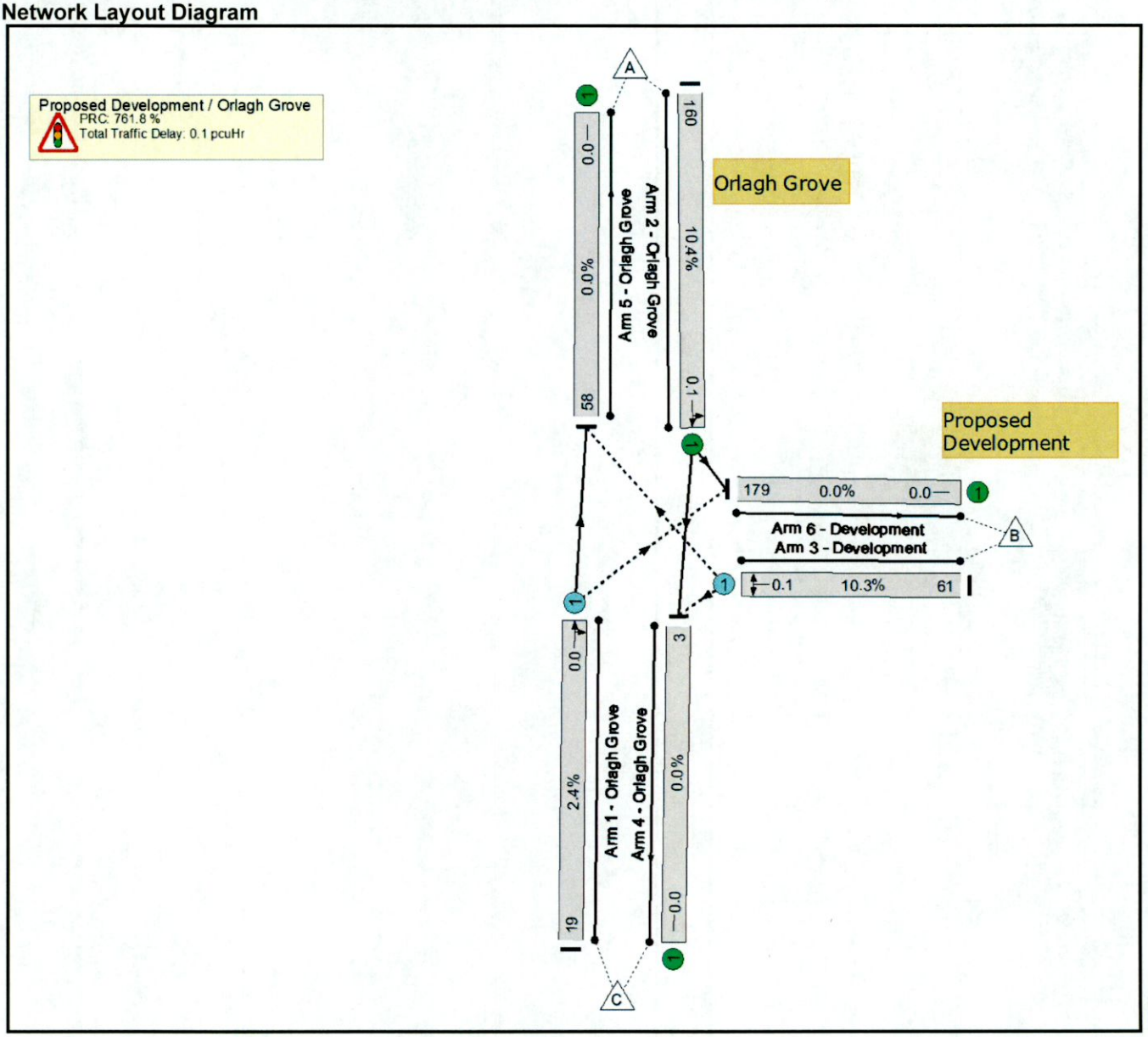
Total Delay for Signalled Lanes (pcuHr): 0.00
Total Delay Over All Lanes(pcuHr): 0.12

Cycle Time (s): 90

Basic Results Summary

Scenario 3: ' Scenario 3 AM 2039' (FG3: 'AM 2039', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



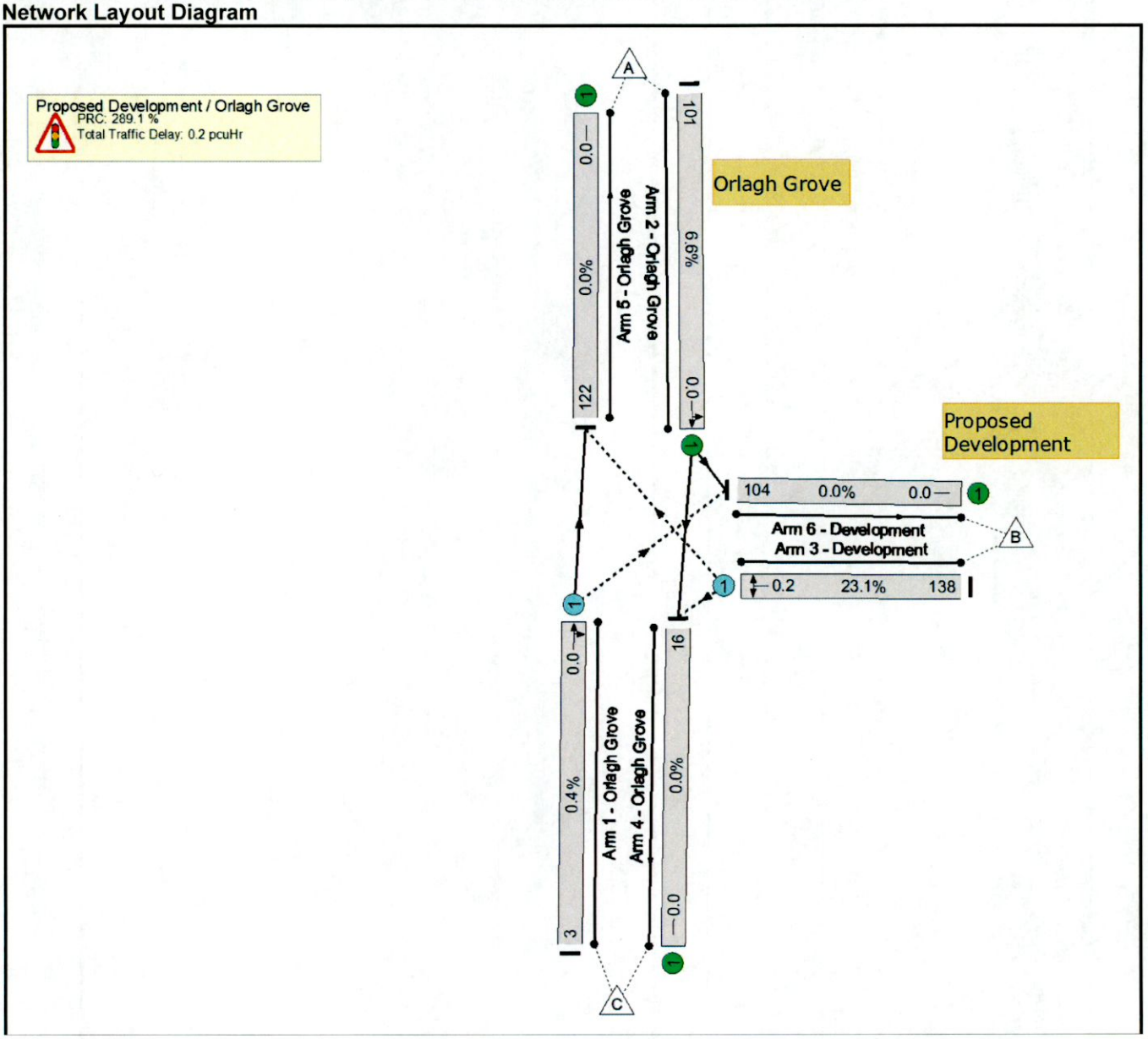
Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**10.4%**	**80**	**0**	**0**	**0.1**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**10.4%**	**80**	**0**	**0**	**0.1**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	19	1741	794	2.4%	19	0	0	0.0	2.3	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	160	1532	1532	10.4%	-	-	-	0.1	1.3	0.1
3/1	Development Left Right	O	-		-	-	-	61	1729	595	10.3%	61	0	0	0.1	3.4	0.1

C1 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90
PRC Over All Lanes (%): 761.8 Total Delay Over All Lanes(pcuHr): 0.13

Basic Results Summary
Scenario 4: 'Scenario 4 PM 2024' (FG4: 'PM 2024', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

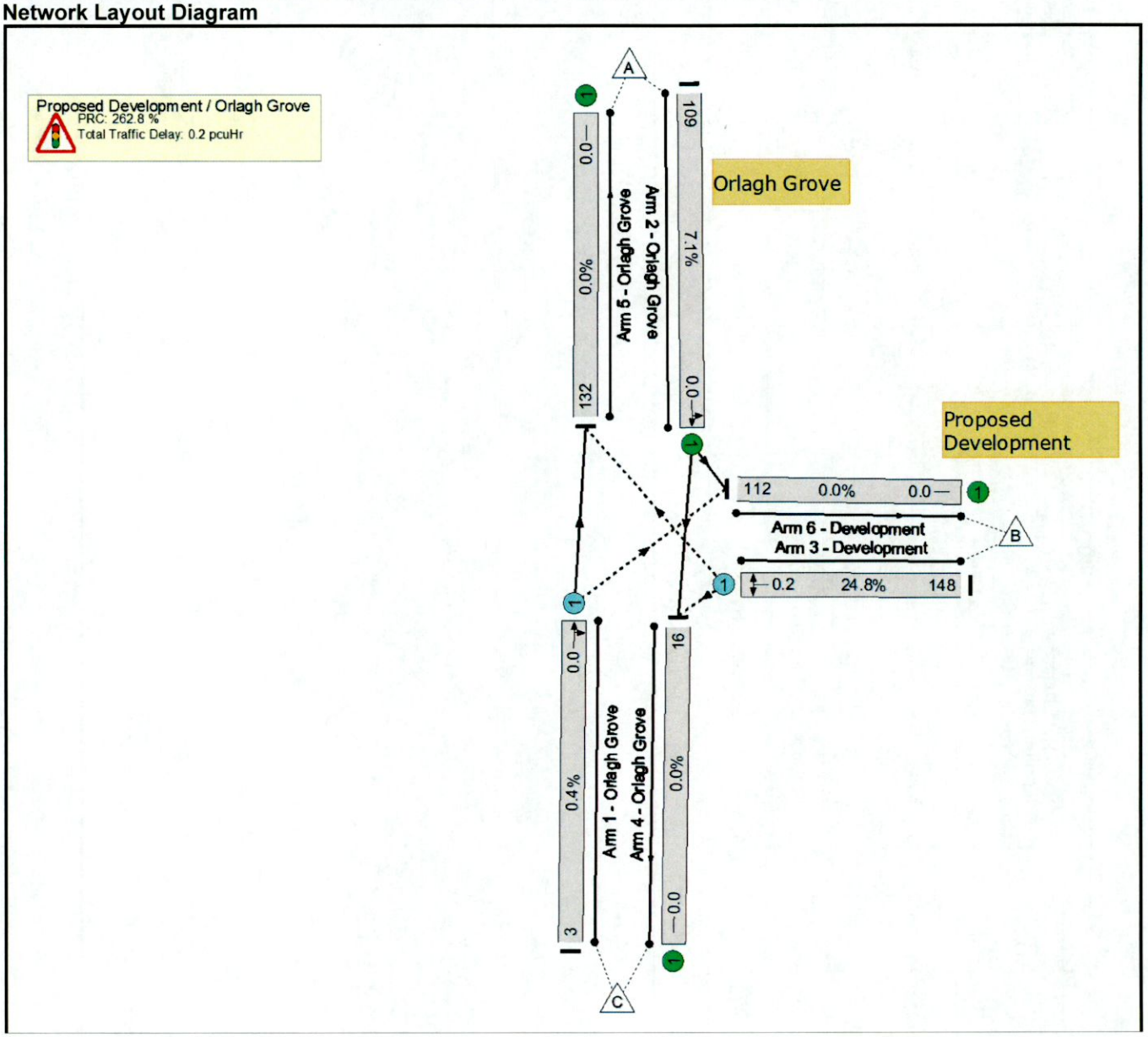
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**23.1%**	**141**	**0**	**0**	**0.2**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**23.1%**	**141**	**0**	**0**	**0.2**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	3	1741	815	0.4%	3	0	0	0.0	2.2	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	101	1532	1532	6.6%	-	-	-	0.0	1.3	0.0
3/1	Development Left Right	O	-		-	-	-	138	1714	597	23.1%	138	0	0	0.2	3.9	0.2

C1 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90

PRC Over All Lanes (%): 289.1 Total Delay Over All Lanes(pcuHr): 0.19

Basic Results Summary
Scenario 5: 'Scenario 5 PM 2029' (FG5: 'PM 2029', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**24.8%**	**151**	**0**	**0**	**0.2**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**24.8%**	**151**	**0**	**0**	**0.2**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	3	1741	812	0.4%	3	0	0	0.0	2.2	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	109	1532	1532	7.1%	-	-	-	0.0	1.3	0.0
3/1	Development Left Right	O	-		-	-	-	148	1716	597	24.8%	148	0	0	0.2	4.0	0.2

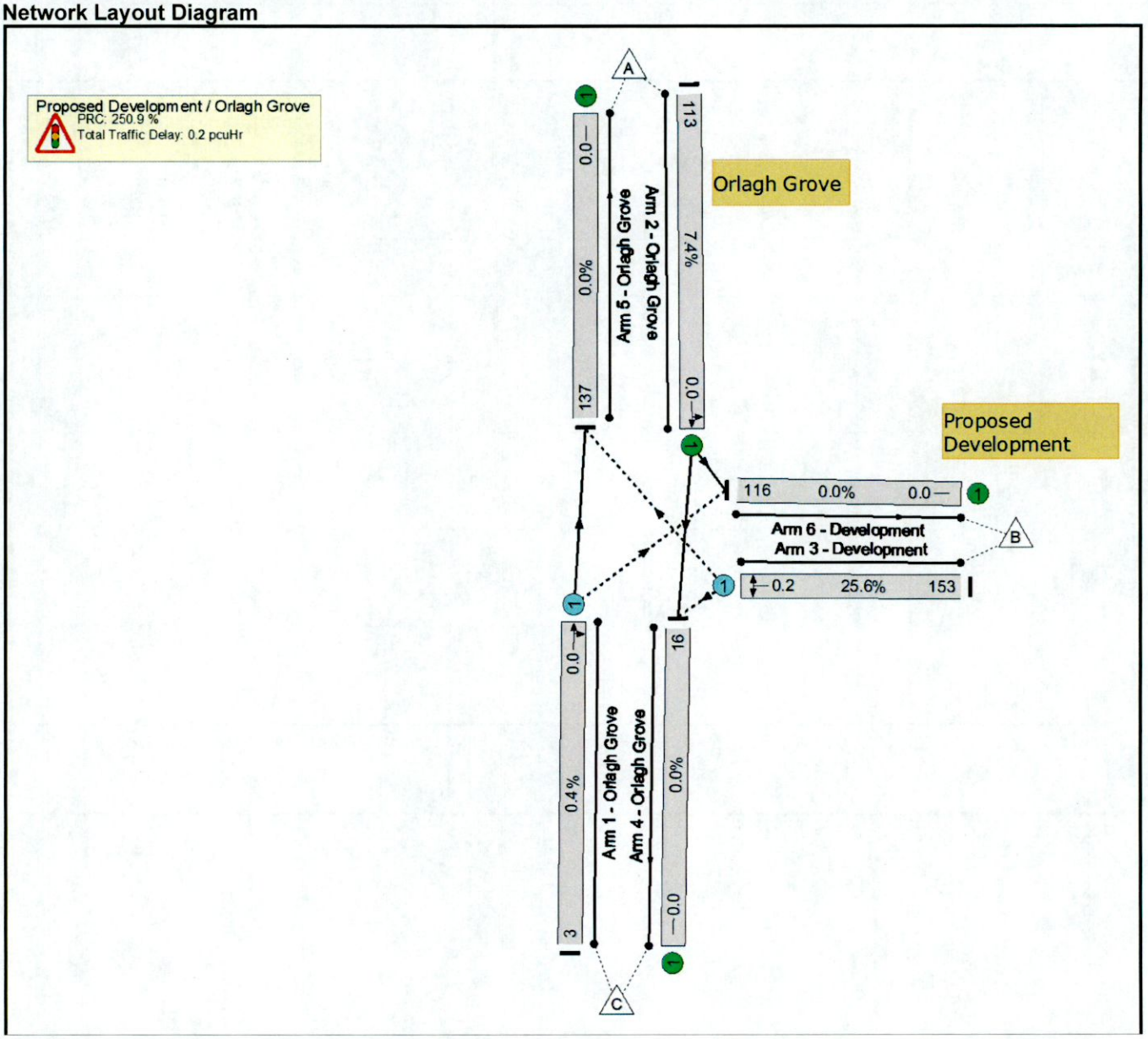
C1 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90

PRC Over All Lanes (%): 262.8 Total Delay Over All Lanes(pcuHr): 0.21

Basic Results Summary

Scenario 6: 'Scenario 6 PM 2039' (FG6: 'PM 2039', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcu Hr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**25.6 %**	**156**	**0**	**0**	**0.2**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**25.6 %**	**156**	**0**	**0**	**0.2**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	3	1741	810	0.4 %	3	0	0	0.0	2.2	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	113	1532	1532	7.4 %	-	-	-	0.0	1.3	0.0
3/1	Development Left Right	O	-		-	-	-	153	1716	597	25.6 %	153	0	0	0.2	4.1	0.2

C1 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr):
0.00Cycle Time (s): 90
PRC Over All Lanes (%): 250.9 Total Delay Over All Lanes(pcuHr):
0.21

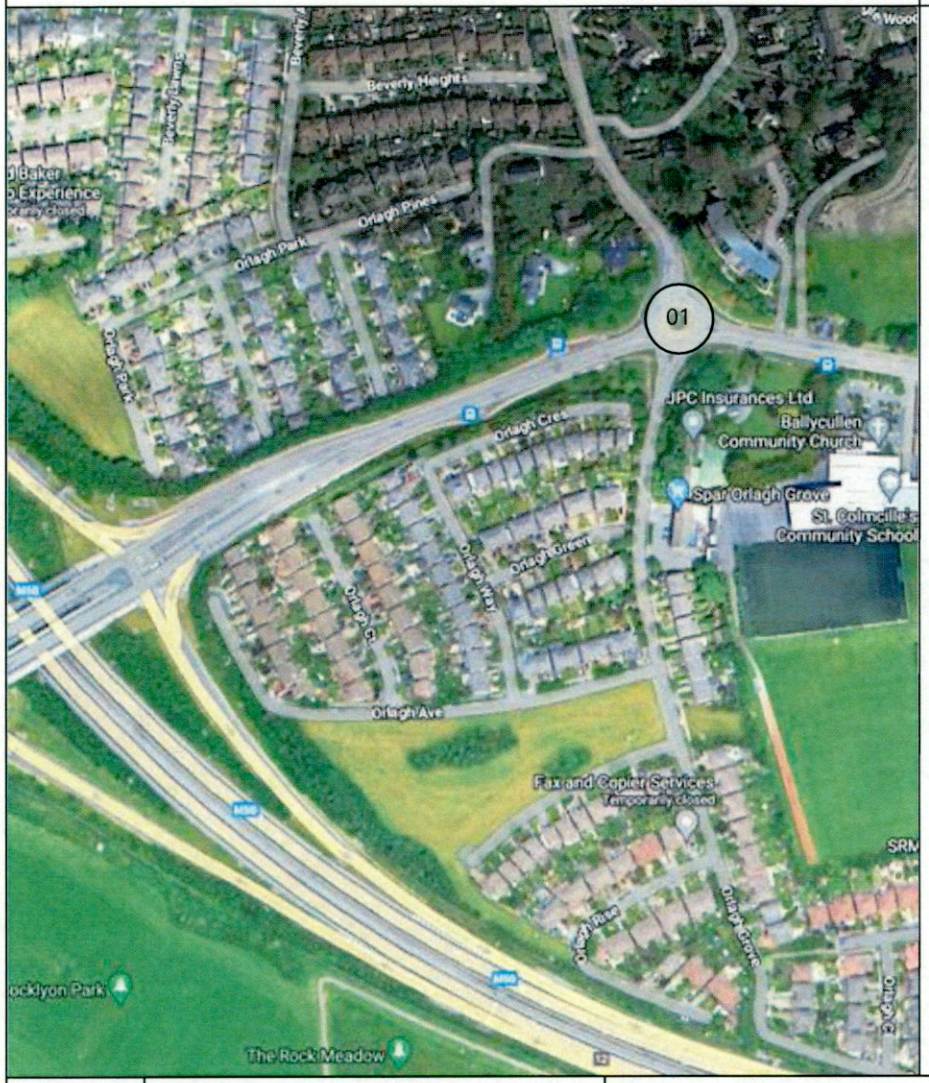
16.0 Appendix D – Roundabout Arcady Analysis Output Data

17.0 Appendix E – Drawing

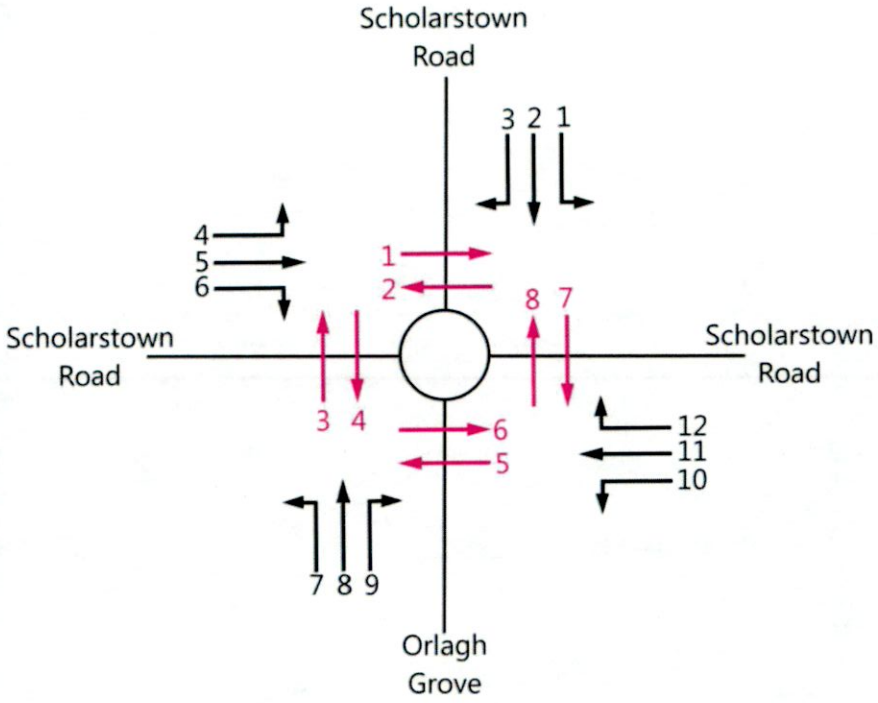
12.0 Appendices

13.0 Appendix A – Traffic Count Data

Site Location

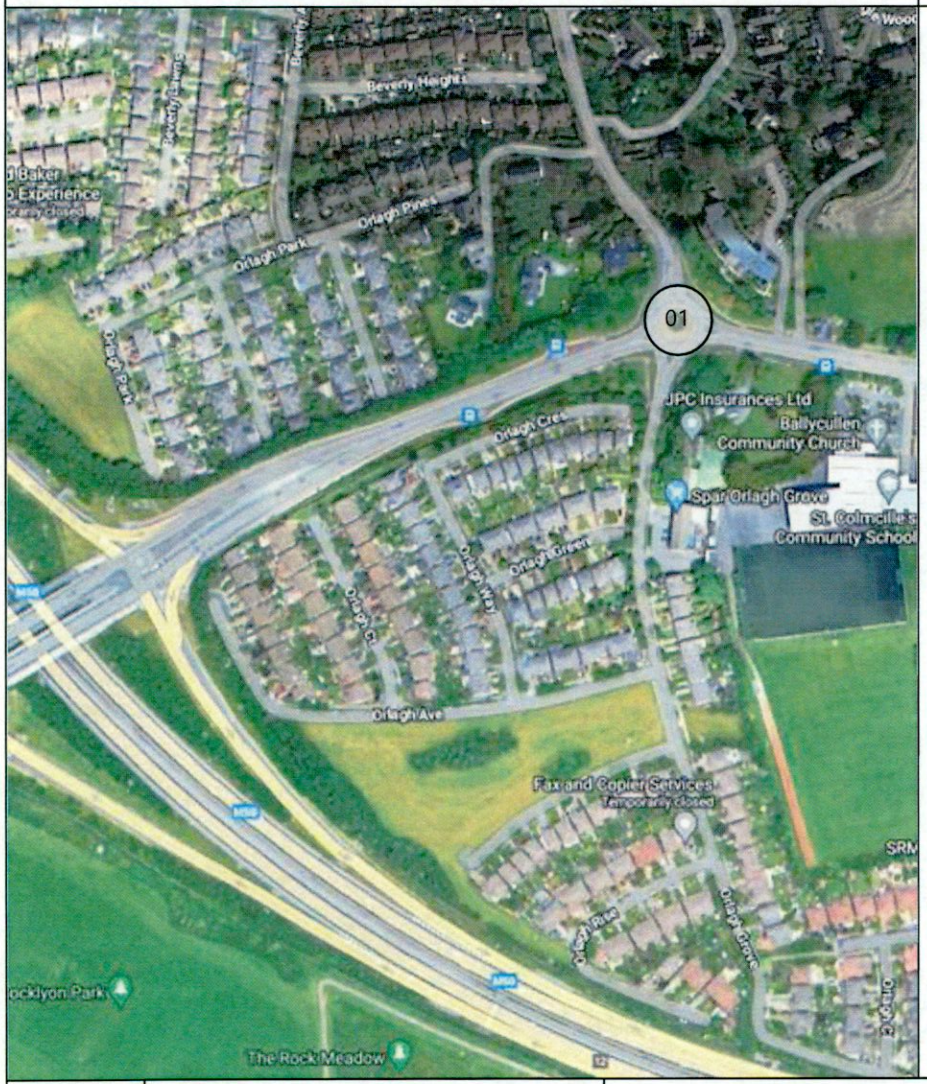


Movement Numbers

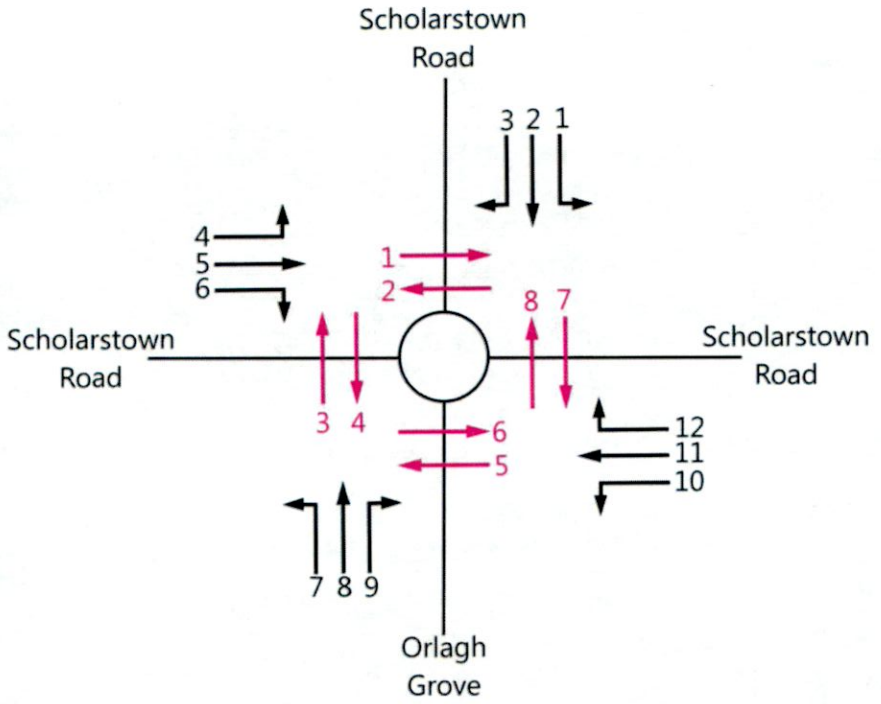


Job number: TRA/22/130	Job Date: 11th May 2022	Drawing No: TRA/22/130-01	traffinomics.ie
Client: Martin Hanley Consulting	Job Day: Wednesday	Author: SPW	

Site Location



Movement Numbers



Job number: TRA/22/130	Job Date: 11th May 2022	Drawing No: TRA/22/130-01	traffinomics.ie
Client: Martin Hanley Consulting	Job Day: Wednesday	Author: SPW	

TRAFFINOMICS LIMITED

SCHOLARSTOWN HOUSE TRAFFIC COUNT **MAY 2022**

MANUAL CLASSIFIED JUNCTION TURNING COUNT **TRA/22/130**

SITE: 01 DATE: 11th May 2022

LOCATION: Scholarstown Road/Orlagh Grove Roundabout DAY: Wednesday

	MOVEMENT 1								MOVEMENT 2								MOVEMENT 3							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
07:30	3	1	29	5	2	1	41	41	0	0	0	1	0	0	1	1	0	0	53	7	0	1	61	62
07:45	1	0	15	2	0	0	18	17	0	0	1	0	0	0	1	1	0	1	53	2	0	2	58	59
08:00	7	0	32	2	0	0	41	35	0	0	2	1	0	0	3	3	0	0	74	5	2	1	82	85
08:15	9	0	15	3	0	1	28	22	0	0	1	0	0	0	1	1	0	0	75	4	3	2	84	89
H/TOT	20	1	91	12	2	2	128	115	0	0	4	2	0	0	6	6	0	1	255	18	5	6	285	295
08:30	7	0	14	2	0	0	23	17	0	0	2	1	0	0	3	3	0	0	92	4	2	1	99	102
08:45	1	0	29	2	1	0	33	33	0	0	6	1	0	0	7	7	0	0	89	5	0	4	98	102
09:00	7	0	30	3	0	0	40	34	0	0	12	0	0	0	12	12	1	1	92	2	2	2	100	103
09:15	13	0	25	1	0	0	39	29	0	0	4	1	0	0	5	5	0	1	38	3	0	2	44	45
H/TOT	28	0	98	8	1	0	135	114	0	0	24	3	0	0	27	27	1	2	311	14	4	9	341	352
P/TOT	48	1	189	20	3	2	263	229	0	0	28	5	0	0	33	33	1	3	566	32	9	15	626	647

	MOVEMENT 1								MOVEMENT 2								MOVEMENT 3							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
16:30	2	0	24	1	0	0	27	25	1	0	9	2	0	0	12	11	0	0	16	2	0	3	21	24
16:45	1	0	27	0	0	0	28	27	1	0	8	0	0	0	9	8	2	0	20	2	0	0	24	22
17:00	0	0	18	1	0	0	19	19	0	0	9	0	0	0	9	9	0	0	30	0	1	2	33	36
17:15	3	0	34	1	0	0	38	36	0	0	19	0	0	0	19	19	0	0	20	1	0	2	23	25
H/TOT	6	0	103	3	0	0	112	107	2	0	45	2	0	0	49	47	2	0	86	5	1	7	101	107
17:30	2	0	22	1	0	0	25	23	1	0	7	1	0	0	9	8	1	0	19	1	0	0	21	20
17:45	2	0	28	0	0	0	30	28	0	0	7	0	0	0	7	7	1	0	13	0	0	2	16	17
18:00	0	0	22	3	0	0	25	25	0	0	10	1	0	0	11	11	0	0	21	0	0	1	22	23
18:15	1	0	27	0	0	0	28	27	0	0	8	0	0	0	8	8	0	0	31	1	1	2	35	38
H/TOT	5	0	99	4	0	0	108	104	1	0	32	2	0	0	35	34	2	0	84	2	1	5	94	98
P/TOT	11	0	202	7	0	0	220	211	3	0	77	4	0	0	84	82	4	0	170	7	2	12	195	206

TRAFFINOMICS LIMITED

SCHOLARSTOWN HOUSE TRAFFIC COUNT **MAY 2022**

MANUAL CLASSIFIED JUNCTION TURNING COUNT **TRA/22/130**

SITE: 01 DATE: 11th May 2022

LOCATION: Scholarstown Road/Orlagh Grove Roundabout DAY: Wednesday

	MOVEMENT 4								MOVEMENT 5								MOVEMENT 6							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
07:30	0	0	23	2	1	2	28	31	4	0	85	27	5	2	123	127	0	0	7	1	0	0	8	8
07:45	0	0	25	0	2	3	30	35	1	0	83	18	7	2	111	119	0	0	4	0	1	0	5	6
08:00	1	0	39	3	0	2	45	46	16	0	88	26	7	5	142	141	0	0	9	2	0	0	11	11
08:15	2	0	32	4	0	1	39	38	16	0	63	15	5	1	100	93	0	0	4	0	0	0	4	4
H/TOT	3	0	119	9	3	8	1.66	151	37	0	319	86	24	10	476	480	0	0	24	3	1	0	28	29
08:30	5	0	42	2	0	4	53	53	5	0	72	13	6	0	96	98	0	0	5	3	0	0	8	8
08:45	7	0	22	1	1	2	33	30	2	0	53	16	4	1	76	79	0	0	5	1	0	0	6	6
09:00	0	0	32	2	0	2	36	38	7	0	63	17	9	2	98	103	0	0	11	0	0	0	11	11
09:15	2	0	22	3	0	2	29	29	34	0	69	20	10	3	136	122	0	0	7	1	1	0	9	10
H/TOT	14	0	118	8	1	10	151	151	48	0	257	66	29	6	406	403	0	0	28	5	1	0	34	35
P/TOT	17	0	237	17	4	18	153	301	85	0	576	152	53	16	882	883	0	0	52	8	2	0	62	64

	MOVEMENT 4								MOVEMENT 5								MOVEMENT 6							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
16:30	0	0	36	4	0	1	41	42	6	1	118	10	2	2	139	138	0	0	10	1	0	0	11	11
16:45	0	0	52	7	0	2	61	63	2	1	109	16	0	0	128	126	0	0	9	0	0	0	9	9
17:00	1	0	37	5	2	1	46	48	1	2	101	12	3	0	119	120	0	0	9	1	0	0	10	10
17:15	1	0	49	4	0	1	55	55	3	0	97	7	1	0	108	107	0	0	9	2	0	0	11	11
H/TOT	2	0	174	20	2	5	203	208	12	4	425	45	6	2	494	490	0	0	37	4	0	0	41	41
17:30	0	0	40	0	0	2	42	44	2	0	103	16	1	2	124	125	0	0	8	1	0	0	9	9
17:45	1	0	45	2	0	1	49	49	4	0	87	11	2	1	105	105	0	0	10	0	0	0	10	10
18:00	1	0	43	4	1	1	50	51	4	0	113	14	1	1	133	132	0	0	17	1	0	0	18	18
18:15	0	0	42	2	0	1	45	46	2	0	112	8	0	0	122	120	0	0	15	1	0	0	16	16
H/TOT	2	0	170	8	1	5	186	190	12	0	415	49	4	4	484	482	0	0	50	3	0	0	53	53
P/TOT	4	0	344	28	3	10	389	399	24	4	840	94	10	6	978	972	0	0	87	7	0	0	94	94

TRAFFINOMICS LIMITED

SCHOLARSTOWN HOUSE TRAFFIC COUNT **MAY 2022**

MANUAL CLASSIFIED JUNCTION TURNING COUNT **TRA/22/130**

SITE: 01 DATE: 11th May 2022

LOCATION: Scholarstown Road/Orlagh Grove Roundabout DAY: Wednesday

	MOVEMENT 7								MOVEMENT 8								MOVEMENT 9							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
07:30	0	0	19	3	0	0	22	22	0	0	8	1	0	0	9	9	0	0	5	0	0	0	5	5
07:45	0	0	15	2	0	0	17	17	0	0	11	2	0	0	13	13	1	0	9	1	1	0	12	12
08:00	2	0	10	1	0	0	13	11	0	0	5	1	0	0	6	6	0	0	5	1	1	0	7	8
08:15	1	0	21	0	0	0	22	21	0	0	9	1	0	0	10	10	0	0	3	1	0	0	4	4
H/TOT	3	0	65	6	0	0	74	72	0	0	33	5	0	0	38	38	1	0	22	3	2	0	28	29
08:30	0	0	15	1	0	0	16	16	0	0	8	1	0	0	9	9	2	0	6	1	0	0	9	7
08:45	0	0	13	0	0	0	13	13	0	0	6	1	0	0	7	7	1	0	7	1	0	0	9	8
09:00	0	0	14	0	0	0	14	14	0	0	8	0	0	0	8	8	0	0	9	2	0	0	11	11
09:15	1	0	19	1	0	0	21	20	1	0	3	0	0	0	4	3	4	0	14	0	0	0	18	15
H/TOT	1	0	61	2	0	0	64	63	1	0	25	2	0	0	28	27	7	0	36	4	0	0	47	41
P/TOT	4	0	126	8	0	0	138	135	1	0	58	7	0	0	66	65	8	0	58	7	2	0	75	71

	MOVEMENT 7								MOVEMENT 8								MOVEMENT 9							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
16:30	0	0	9	2	0	0	11	11	0	0	3	0	0	0	3	3	1	0	8	0	0	0	9	8
16:45	0	0	9	4	0	0	13	13	1	0	2	0	0	0	3	2	1	0	13	0	0	0	14	13
17:00	1	0	9	1	0	0	11	10	3	0	6	1	0	0	10	8	0	0	9	1	0	0	10	10
17:15	0	0	5	1	0	0	6	6	1	0	5	0	0	0	6	5	0	0	8	1	0	0	9	9
H/TOT	1	0	32	8	0	0	41	40	5	0	16	1	0	0	22	18	2	0	38	2	0	0	42	40
17:30	2	0	11	1	0	0	14	12	0	0	8	0	0	0	8	8	0	0	6	2	1	0	9	10
17:45	1	0	6	1	0	0	8	7	0	0	4	1	0	0	5	5	0	0	9	0	0	0	9	9
18:00	1	0	7	0	0	0	8	7	0	0	5	0	0	0	5	5	0	0	9	1	0	0	10	10
18:15	0	0	4	1	0	0	5	5	0	0	5	0	0	0	5	5	0	0	13	1	0	0	14	14
H/TOT	4	0	28	3	0	0	35	32	0	0	22	1	0	0	23	23	0	0	37	4	1	0	42	43
P/TOT	5	0	60	11	0	0	76	72	5	0	38	2	0	0	45	41	2	0	75	6	1	0	84	83

TRAFFINOMICS LIMITED

SCHOLARSTOWN HOUSE TRAFFIC COUNT **MAY 2022**

MANUAL CLASSIFIED JUNCTION TURNING COUNT **TRA/22/130**

SITE: 01 DATE: 11th May 2022

LOCATION: Scholarstown Road/Orlagh Grove Roundabout DAY: Wednesday

	MOVEMENT 10								MOVEMENT 11								MOVEMENT 12							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
07:30	1	0	6	0	0	0	7	6	1	1	128	18	1	1	150	151	0	0	4	1	0	0	5	5
07:45	0	0	2	0	0	0	2	2	0	1	143	11	0	1	156	156	0	0	12	0	0	0	12	12
08:00	0	0	4	0	0	0	4	4	0	0	133	10	5	0	148	153	0	0	5	1	0	0	6	6
08:15	0	0	2	1	0	0	3	3	2	0	118	4	1	0	125	124	0	0	8	1	1	0	10	11
H/TOT	1	0	14	1	0	0	16	15	3	2	522	43	7	2	579	584	0	0	29	3	1	0	33	34
08:30	0	0	0	1	0	0	1	1	4	1	77	7	5	0	94	95	0	0	7	0	0	0	7	7
08:45	0	0	3	1	0	0	4	4	0	0	80	5	4	0	89	93	0	0	3	1	0	0	4	4
09:00	0	0	12	0	0	0	12	12	1	0	88	9	4	0	102	105	0	0	8	0	0	0	8	8
09:15	1	0	5	1	0	0	7	6	0	1	91	11	1	3	107	110	0	0	13	0	0	0	13	13
H/TOT	1	0	20	3	0	0	24	23	5	2	336	32	14	3	392	404	0	0	31	1	0	0	32	32
P/TOT	2	0	34	4	0	0	40	38	8	4	858	75	21	5	971	988	0	0	60	4	1	0	65	66

	MOVEMENT 10								MOVEMENT 11								MOVEMENT 12							
TIME	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU	PCL	MCL	CAR	LGV	HGV	BUS	TOT	PCU
16:30	0	0	7	1	0	0	8	8	1	1	72	21	1	1	97	98	0	0	20	0	0	0	20	20
16:45	0	0	3	3	0	0	6	6	0	0	69	17	3	1	90	94	1	0	28	3	0	0	32	31
17:00	2	0	9	0	0	0	11	9	6	1	83	14	7	1	112	115	1	0	26	4	0	0	31	30
17:15	0	0	7	1	0	0	8	8	1	0	76	24	1	1	103	104	0	0	17	3	0	0	20	20
H/TOT	2	0	26	5	0	0	33	31	8	2	300	76	12	4	402	410	2	0	91	10	0	0	103	101
17:30	1	0	7	1	0	0	9	8	2	0	78	12	2	1	95	96	0	0	30	2	0	0	32	32
17:45	0	0	11	0	0	0	11	11	1	0	79	11	1	1	93	94	0	0	44	1	0	0	45	45
18:00	1	0	8	1	0	0	10	9	7	0	89	8	1	0	105	100	0	0	23	0	0	0	23	23
18:15	1	0	6	0	0	0	7	6	3	0	95	7	0	0	105	103	1	0	19	1	0	0	21	20
H/TOT	3	0	32	2	0	0	37	35	13	0	341	38	4	2	398	394	1	0	116	4	0	0	121	120
P/TOT	5	0	58	7	0	0	70	66	21	2	641	114	16	6	800	804	3	0	207	14	0	0	224	222

TRAFFINOMICS LIMITED

SCHOLARSTOWN HOUSE TRAFFIC COUNT **MAY 2022**

PEDESTRIAN CROSSING COUNTS **TRA/22/130**

SITE: 01 DATE: 11th May 2022

LOCATION: Scholarstown Road/Orlagh Grove Roundabout DAY: Wednesday

PCU's Through Junction			PEDESTRIAN CROSSING COUNTS								
			P1	P2	P3	P4	P5	P6	P7	P8	TOTAL
468		07:30	0	0	4	1	3	22	1	33	64
450		07:45	0	0	26	0	10	12	0	17	65
510		08:00	0	0	15	1	3	21	3	21	64
421		08:15	0	1	50	3	7	30	1	40	132
1849	1849	H/TOT	0	1	95	5	23	85	5	111	325
417	1799	08:30	0	0	156	5	35	7	6	49	258
387	1735	08:45	0	0	16	27	2	13	14	4	76
460	1685	09:00	0	0	11	29	6	19	4	4	73
408	1672	09:15	0	0	3	29	1	143	107	0	283
1672		H/TOT	0	0	186	90	44	182	131	57	690
3521		P/TOT	0	1	281	95	67	267	136	168	1015

PCU's Through Junction			PEDESTRIAN CROSSING COUNTS								
			P1	P2	P3	P4	P5	P6	P7	P8	TOTAL
399		16:30	0	0	4	1	2	6	5	2	20
415		16:45	0	0	7	2	4	1	2	5	21
424		17:00	0	0	4	6	18	6	13	2	49
405		17:15	0	0	4	1	5	8	1	1	20
1643	1643	H/TOT	0	0	19	10	29	21	21	10	110
397	1641	17:30	0	1	5	4	11	2	6	1	30
388	1614	17:45	0	0	5	4	18	3	10	4	44
415	1605	18:00	0	1	6	11	29	13	13	7	80
409	1609	18:15	0	0	1	6	7	6	3	5	28
1609		H/TOT	0	2	17	25	65	24	32	17	182
3252		P/TOT	0	2	36	35	94	45	53	27	292

14.0 Appendix B – Trics Data

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	8	116	0.045	**8**	**116**	**0.256**	**8**	**116**	**0.301**
08:00 - 09:00	8	116	0.046	8	116	0.254	8	116	0.300
09:00 - 10:00	8	116	0.055	8	116	0.101	8	116	0.156
10:00 - 11:00	8	116	0.030	8	116	0.057	8	116	0.087
11:00 - 12:00	8	116	0.044	8	116	0.045	8	116	0.089
12:00 - 13:00	8	116	0.069	8	116	0.080	8	116	0.149
13:00 - 14:00	8	116	0.084	8	116	0.073	8	116	0.157
14:00 - 15:00	8	116	0.078	8	116	0.067	8	116	0.145
15:00 - 16:00	8	116	0.113	8	116	0.061	8	116	0.174
16:00 - 17:00	8	116	0.141	8	116	0.057	8	116	0.198
17:00 - 18:00	**8**	**116**	**0.218**	8	116	0.043	8	116	0.261
18:00 - 19:00	8	116	0.192	8	116	0.055	8	116	0.247
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.115			1.149			2.264

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:	20 - 340 (units:)
Survey date date range:	01/01/11 - 22/11/16
Number of weekdays (Monday-Friday):	8
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.

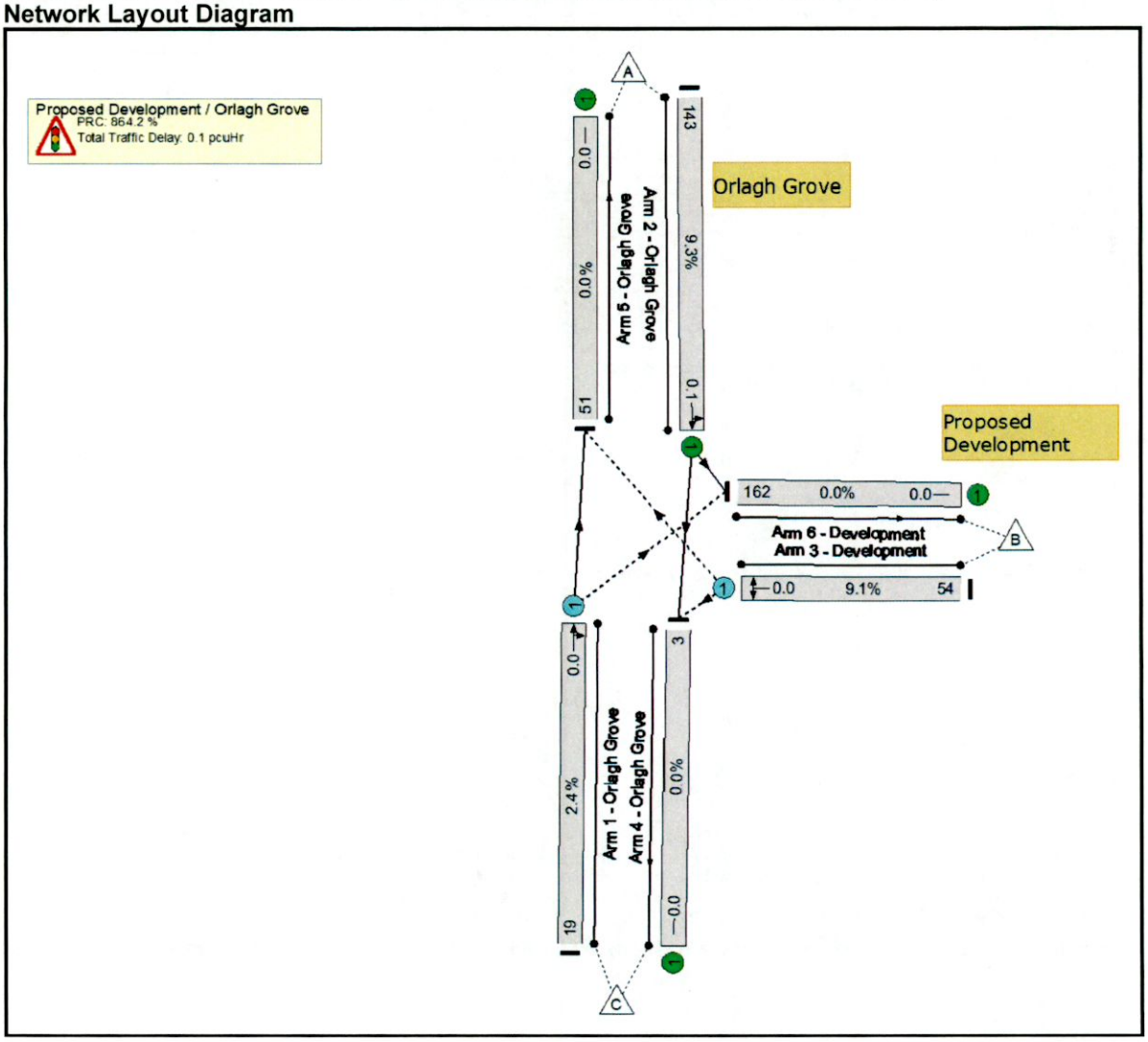
15.0 Appendix C – Linsig Output Data

Basic Results Summary

User and Project Details

Project:	
Title:	
Location:	
Additional detail:	
File name:	Scholarstown Entrance.lsg3x
Author:	
Company:	
Address:	

Scenario 1: 'Scenario 1 AM 2024' (FG1: 'AM 2024', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

Network Results

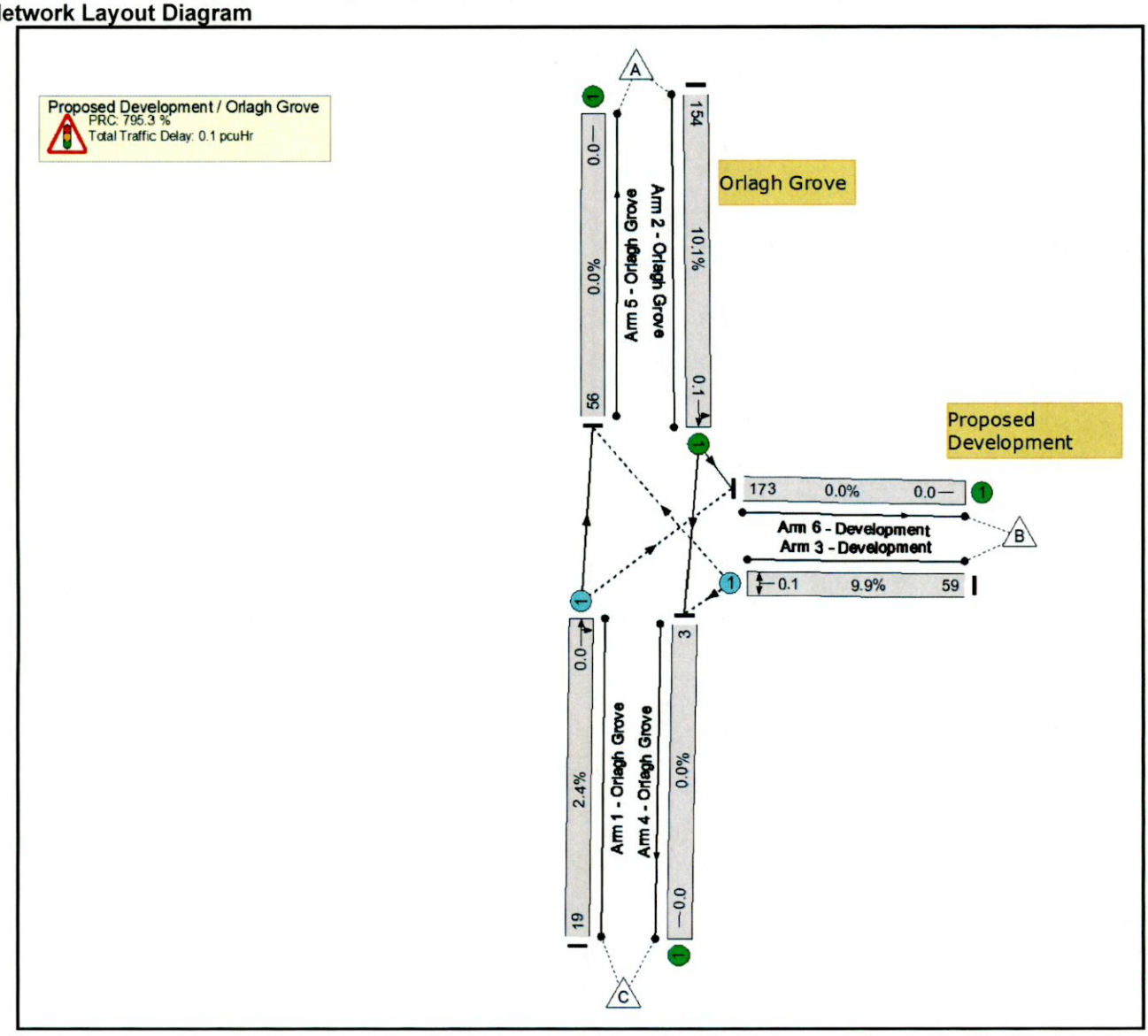
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**9.3%**	**73**	**0**	**0**	**0.1**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**9.3%**	**73**	**0**	**0**	**0.1**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	19	1741	800	2.4%	19	0	0	0.0	2.3	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	143	1532	1532	9.3%	-	-	-	0.1	1.3	0.1
3/1	Development Left Right	O	-		-	-	-	54	1728	595	9.1%	54	0	0	0.0	3.3	0.0

C1

PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90

PRC Over All Lanes (%): 864.2 Total Delay Over All Lanes(pcuHr): 0.11

Basic Results Summary
Scenario 2: 'Scenario 2 AM 2029' (FG2: 'AM 2029', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

Network Results

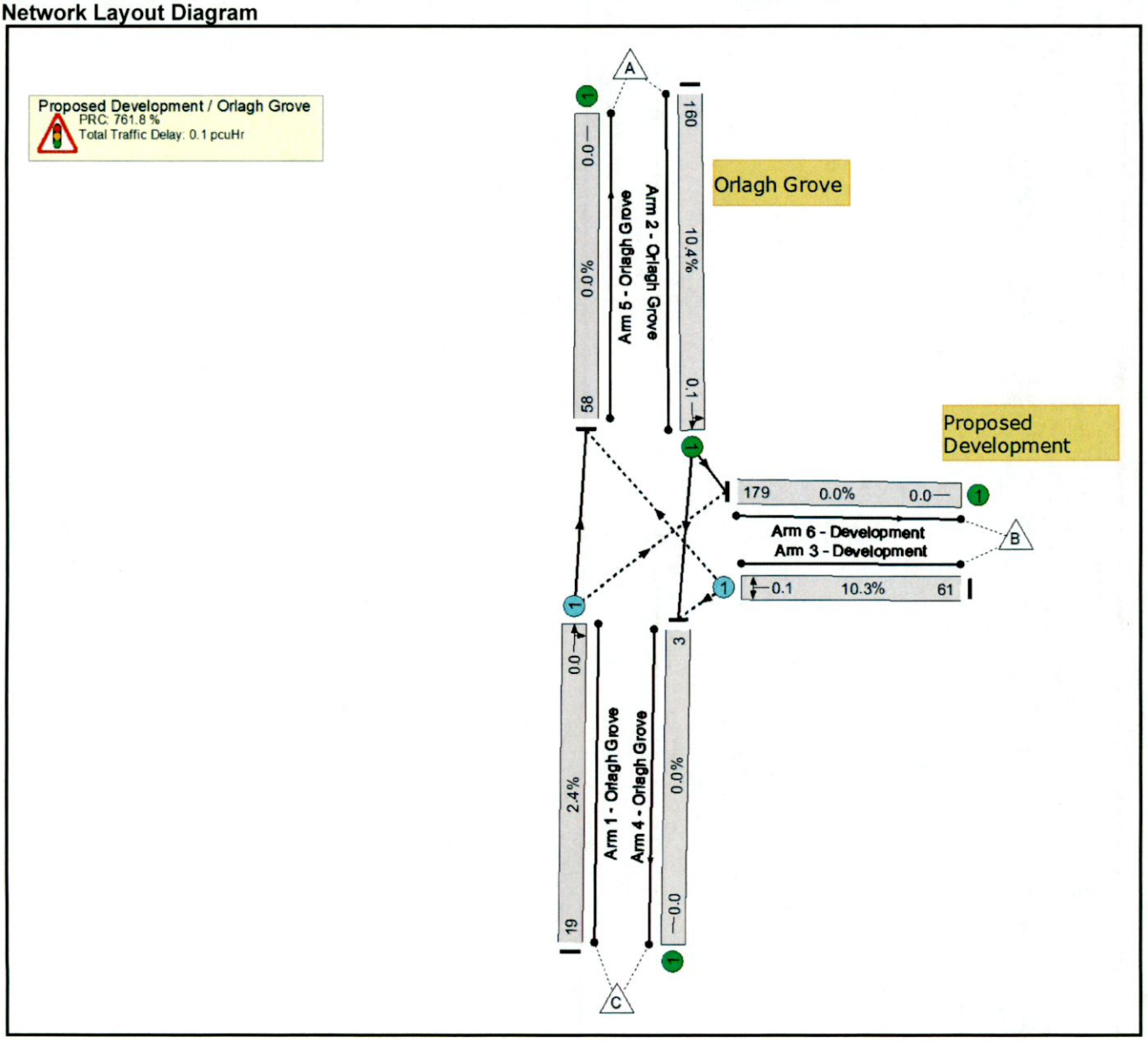
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**10.1%**	**78**	**0**	**0**	**0.1**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**10.1%**	**78**	**0**	**0**	**0.1**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	19	1741	796	2.4%	19	0	0	0.0	2.3	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	154	1532	1532	10.1%	-	-	-	0.1	1.3	0.1
3/1	Development Left Right	O	-		-	-	-	59	1729	595	9.9%	59	0	0	0.1	3.4	0.1

C1

PRC for Signalled Lanes (%): 0.0 | Total Delay for Signalled Lanes (pcuHr): 0.00 | Cycle Time (s): 90

PRC Over All Lanes (%): 795.3 | Total Delay Over All Lanes(pcuHr): 0.12

Basic Results Summary
Scenario 3: ' Scenario 3 AM 2039' (FG3: 'AM 2039', Plan 1: 'Network Control Plan 1')
Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**10.4%**	**80**	**0**	**0**	**0.1**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**10.4%**	**80**	**0**	**0**	**0.1**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	19	1741	794	2.4%	19	0	0	0.0	2.3	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	160	1532	1532	10.4%	-	-	-	0.1	1.3	0.1
3/1	Development Left Right	O	-		-	-	-	61	1729	595	10.3%	61	0	0	0.1	3.4	0.1

C1

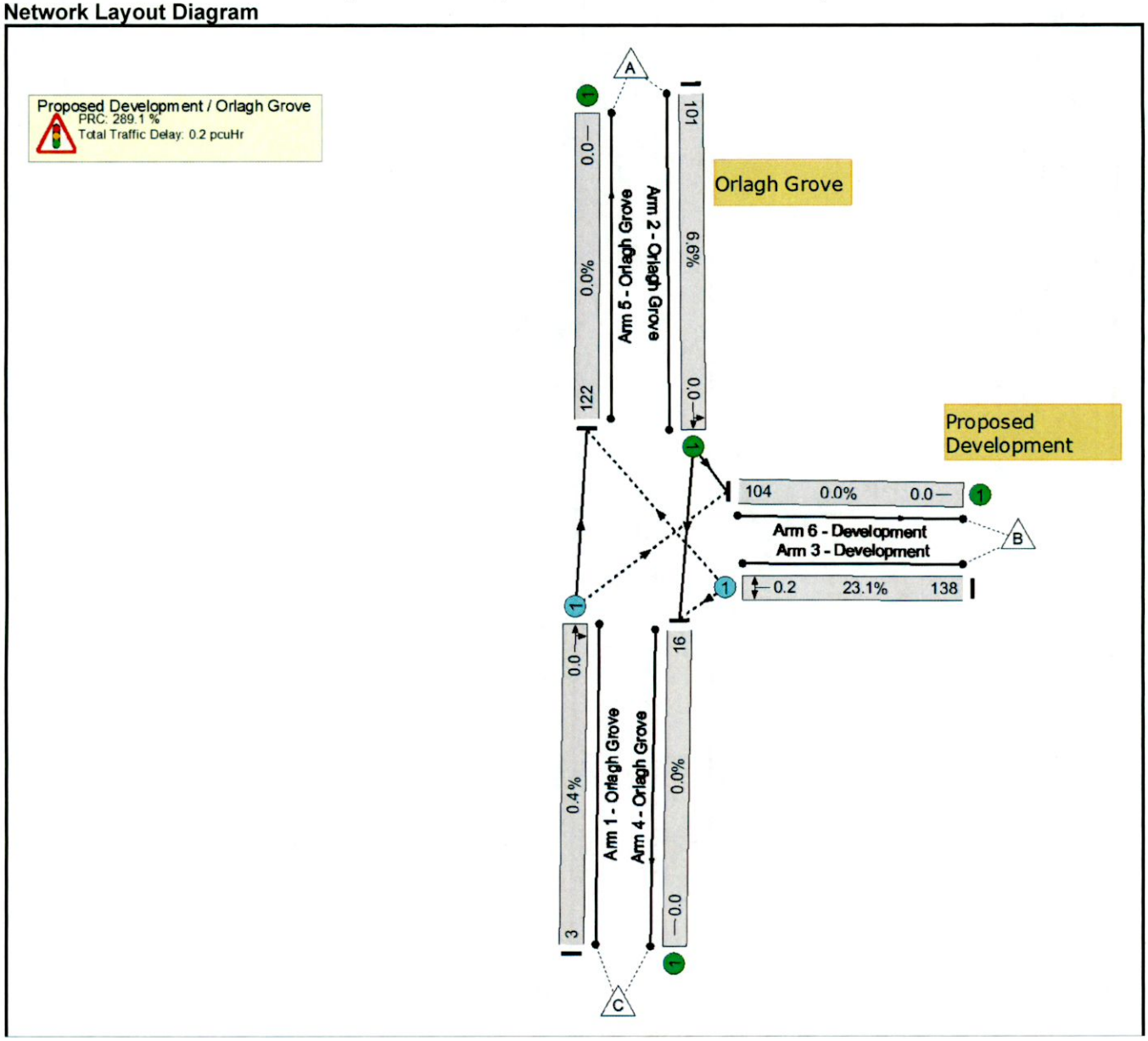
PRC for Signalled Lanes (%): 0.0 | Total Delay for Signalled Lanes (pcuHr): 0.00 | Cycle Time (s): 90

PRC Over All Lanes (%): 761.8 | Total Delay Over All Lanes(pcuHr): 0.13

Basic Results Summary

Scenario 4: 'Scenario 4 PM 2024' (FG4: 'PM 2024', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**23.1%**	**141**	**0**	**0**	**0.2**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**23.1%**	**141**	**0**	**0**	**0.2**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	3	1741	815	0.4%	3	0	0	0.0	2.2	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	101	1532	1532	6.6%	-	-	-	0.0	1.3	0.0
3/1	Development Left Right	O	-		-	-	-	138	1714	597	23.1%	138	0	0	0.2	3.9	0.2

C1

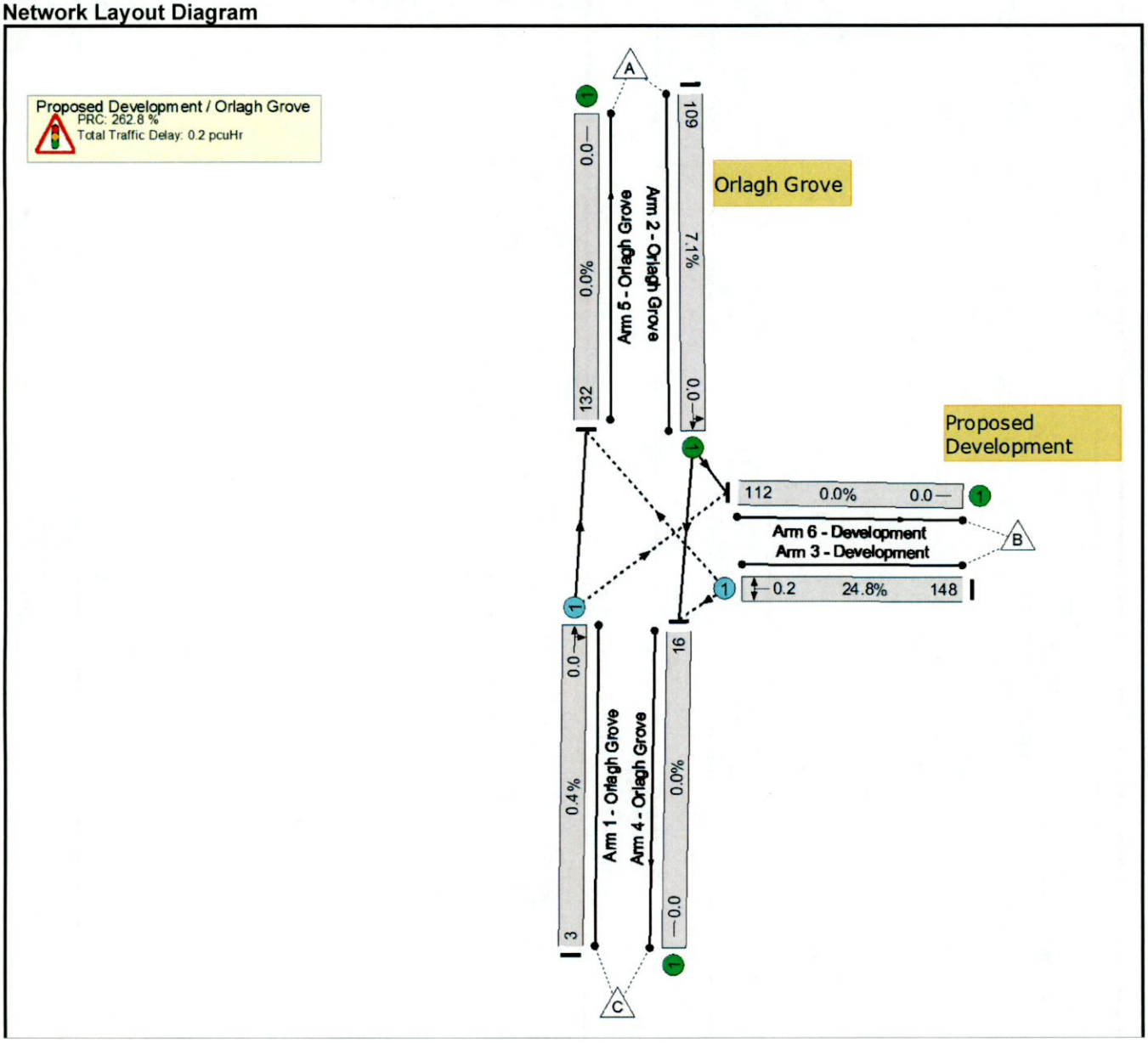
PRC for Signalled Lanes (%): 0.0 | Total Delay for Signalled Lanes (pcuHr): 0.00 | Cycle Time (s): 90

PRC Over All Lanes (%): 289.1 | Total Delay Over All Lanes(pcuHr): 0.19

Basic Results Summary

Scenario 5: 'Scenario 5 PM 2029' (FG5: 'PM 2029', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**24.8%**	**151**	**0**	**0**	**0.2**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**24.8%**	**151**	**0**	**0**	**0.2**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	3	1741	812	0.4%	3	0	0	0.0	2.2	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	109	1532	1532	7.1%	-	-	-	0.0	1.3	0.0
3/1	Development Left Right	O	-		-	-	-	148	1716	597	24.8%	148	0	0	0.2	4.0	0.2

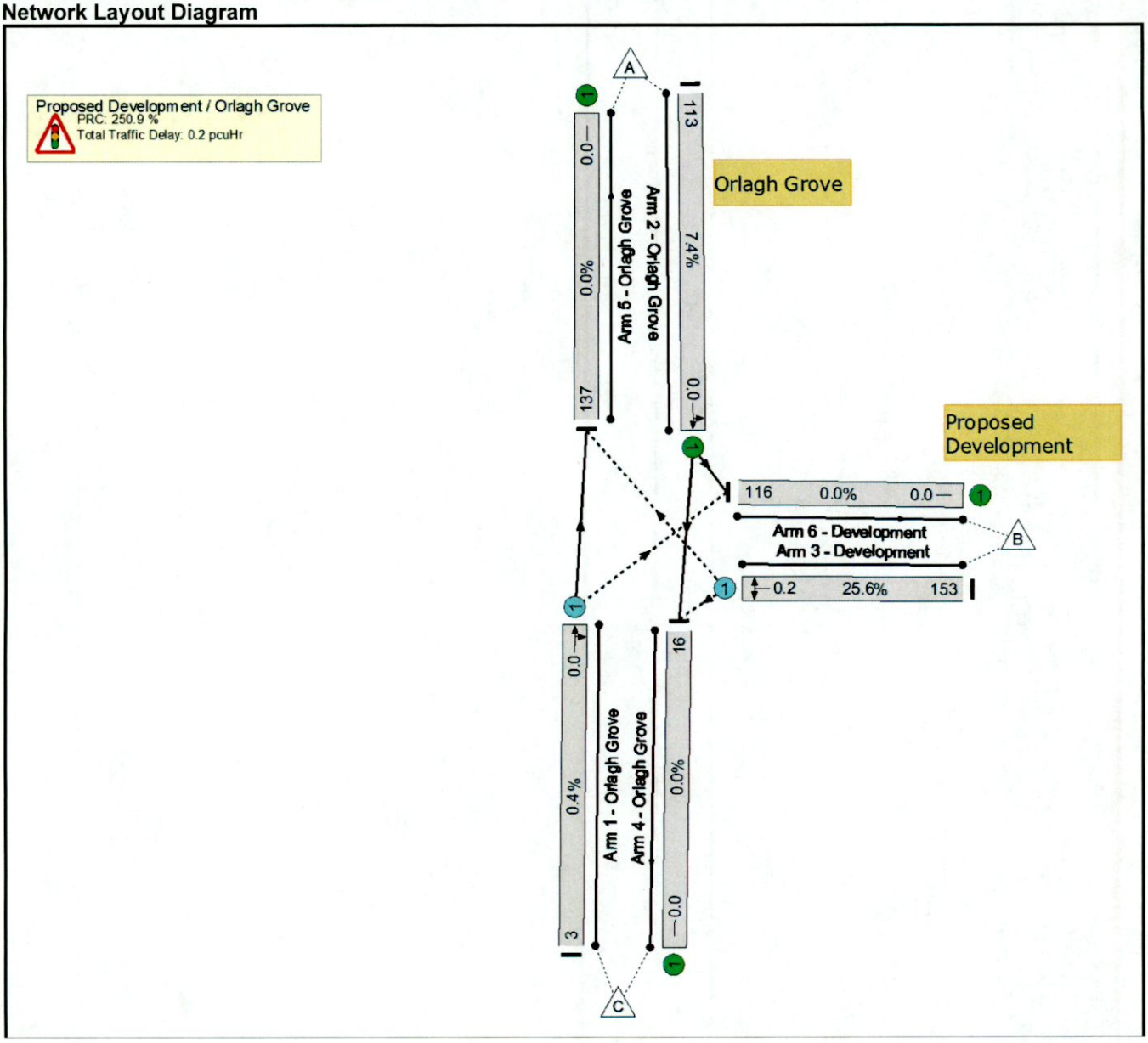
C1 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr): 0.00 Cycle Time (s): 90

PRC Over All Lanes (%): 262.8 Total Delay Over All Lanes(pcuHr): 0.21

Basic Results Summary

Scenario 6: 'Scenario 6 PM 2039' (FG6: 'PM 2039', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/ Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcu Hr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	**25.6 %**	**156**	**0**	**0**	**0.2**	-	-
Proposed Development / Orlagh Grove	-	-	-		-	-	-	-	-	-	**25.6 %**	**156**	**0**	**0**	**0.2**	-	-
1/1	Orlagh Grove Ahead Right	O	-		-	-	-	3	1741	810	0.4 %	3	0	0	0.0	2.2	0.0
2/1	Orlagh Grove Ahead Left	U	-		-	-	-	113	1532	1532	7.4 %	-	-	-	0.0	1.3	0.0
3/1	Development Left Right	O	-		-	-	-	153	1716	597	25.6 %	153	0	0	0.2	4.1	0.2

C1 PRC for Signalled Lanes (%): 0.0 Total Delay for Signalled Lanes (pcuHr):
0.00Cycle Time (s): 90
PRC Over All Lanes (%): 250.9 Total Delay Over All Lanes(pcuHr):
0.21

16.0 Appendix D – Roundabout Arcady Analysis Output Data

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\AM\Scholarstown Roundabout AM 2022.vai" at 16:22:16 on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY
****

.RUN TITLE
****
SCHOLARSTOWN ROUNDABOUT 07:30- 08:30 2022

.INPUT DATA
****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.50	6.80	23.00	15.00	40.00	60.0	0.598	27.729

V = approach half-width
E = entry width
L = effective flare length
R = entry radius
D = inscribed circle diameter
PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	ARM (DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	DISTANCE ENTRY TO CENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION				
FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the roundabout is non-circular or non-symetrical (AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.30 AND ENDS 08.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL		ARM A	ARM B	ARM C	ARM D
07.30 - 07.45					
	ENTRY	3.5	10.5	0.8	15.6
	EXIT	7.0	10.5	2.3	10.8
07.45 - 08.00					
	ENTRY	3.5	10.5	0.8	15.6
	EXIT	7.0	10.5	2.3	10.8
08.00 - 08.15					
	ENTRY	3.5	10.5	0.8	15.6
	EXIT	7.0	10.5	2.3	10.8
08.15 - 08.30					
	ENTRY	3.5	10.5	0.8	15.6
	EXIT	7.0	10.5	2.3	10.8

TIME	FROM/TO	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
07.30 - 08.30					
	ARM A	0.000	0.201	0.257	0.542
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.152	0.000	0.033	0.815
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM C	0.612	0.105	0.000	0.283
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM D	0.312	0.620	0.068	0.000
		(10.0)	(10.0)	(10.0)	(10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

.PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.30-07.45								
ARM A	3.55	11.17	0.318	0.0	0.0	0.5	6.6	5.2
ARM B	10.53	16.65	0.633	1.9	0.0	1.7	23.3	10.3
ARM C	0.83	12.97	0.064	1.8	0.0	0.1	1.0	0.6
ARM D	15.63	23.90	0.654	1.7	0.0	1.8	26.0	9.9

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00								
ARM A	3.55	11.13	0.319	0.0	0.5	0.5	6.9	5.2
ARM B	10.53	16.63	0.633	1.9	1.7	1.7	25.3	10.4
ARM C	0.83	12.91	0.064	1.8	0.1	0.1	1.0	0.6
ARM D	15.63	23.89	0.654	1.7	1.8	1.9	27.9	10.0

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
ARM A	3.55	11.13	0.319	0.0	0.5	0.5	7.0	5.2
ARM B	10.53	16.63	0.633	1.9	1.7	1.7	25.6	10.4
ARM C	0.83	12.91	0.064	1.8	0.1	0.1	1.0	0.6
ARM D	15.63	23.89	0.654	1.7	1.9	1.9	28.1	10.0

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
ARM A	3.55	11.13	0.319	0.0	0.5	0.5	7.0	5.2
ARM B	10.53	16.63	0.633	1.9	1.7	1.7	25.7	10.4
ARM C	0.83	12.91	0.064	1.8	0.1	0.1	1.0	0.6
ARM D	15.63	23.89	0.654	1.7	1.9	1.9	28.2	10.0

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	0.5	
08.00	0.5	
08.15	0.5	
08.30	0.5	

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	1.7	**
08.00	1.7	**
08.15	1.7	**
08.30	1.7	**

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	0.1	
08.00	0.1	
08.15	0.1	
08.30	0.1	

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	1.8	**
08.00	1.9	**
08.15	1.9	**
08.30	1.9	**

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	213.0	213.0	27.5	0.13	27.5	0.13
B	631.8	631.8	99.9	0.16	100.0	0.16
C	49.8	49.8	4.1	0.08	4.1	0.08
D	937.8	937.8	110.2	0.12	110.3	0.12
ALL	1832.4	1832.4	241.8	0.13	241.9	0.13

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC)) ARM A	ARM B	ARM C	ARM D	TOTAL GEOM. DELAY VEH MINI
A	213.0	213.0	0.0	0.0	2.8	18.0	20.9
			(15.4)	(0.0)	(3.1)	(9.2)	
B	631.8	631.8	15.0	0.0	0.0	26.6	41.6
			(9.2)	(15.4)	(0.0)	(3.1)	
C	49.8	49.8	1.6	0.8	0.0	0.0	2.4
			(3.1)	(9.2)	(15.4)	(0.0)	
D	937.8	937.8	0.0	30.1	10.0	0.0	40.1
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	1832.4	1832.4					105.0

****** ARCADY run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\AM\Scholarstown Roundabout AM 2024.vai" at 16:11:11
on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY

.RUN TITLE

SCHOLARSTOWN ROUNDABOUT 07:30- 08:30 2024

.INPUT DATA

ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.50	6.80	23.00	15.00	40.00	60.0	0.598	27.729

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	ARM (DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	DISTANCE ENTRY TO CENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION				
FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the
roundabout is non-circular or non-symetrical
(AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.30 AND ENDS 08.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL	ARM A	ARM B	ARM C	ARM D
07.30 - 07.45				
ENTRY	3.7	10.9	0.9	16.1
EXIT	7.2	10.8	2.5	11.1
07.45 - 08.00				
ENTRY	3.7	10.9	0.9	16.1
EXIT	7.2	10.8	2.5	11.1
08.00 - 08.15				
ENTRY	3.7	10.9	0.9	16.1
EXIT	7.2	10.8	2.5	11.1
08.15 - 08.30				
ENTRY	3.7	10.9	0.9	16.1
EXIT	7.2	10.8	2.5	11.1

TURNING PROPORTIONS
(PERCENTAGE OF H.V.S)

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
07.30 - 08.30	ARM A	0.000	0.202	0.267	0.530
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.154	0.000	0.035	0.811
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM C	0.615	0.106	0.000	0.279
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM D	0.309	0.620	0.071	0.000
		(10.0)	(10.0)	(10.0)	(10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

.PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.30-07.45								
ARM A	3.65	10.99	0.332	0.0	0.0	0.5	7.0	5.2
ARM B	10.94	16.59	0.660	1.9	0.0	1.9	26.0	10.7
ARM C	0.87	12.78	0.068	1.8	0.0	0.1	1.1	0.6
ARM D	16.09	23.84	0.675	1.7	0.0	2.0	28.4	10.3

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00								
ARM A	3.65	10.95	0.333	0.0	0.5	0.5	7.4	5.3
ARM B	10.94	16.57	0.660	1.9	1.9	1.9	28.4	10.8
ARM C	0.87	12.71	0.068	1.8	0.1	0.1	1.1	0.6
ARM D	16.09	23.82	0.675	1.7	2.0	2.1	30.6	10.4

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
ARM A	3.65	10.95	0.333	0.0	0.5	0.5	7.5	5.3
ARM B	10.94	16.57	0.660	1.9	1.9	1.9	28.7	10.8
ARM C	0.87	12.71	0.068	1.8	0.1	0.1	1.1	0.6
ARM D	16.09	23.82	0.675	1.7	2.1	2.1	30.9	10.4

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
ARM A	3.65	10.95	0.333	0.0	0.5	0.5	7.5	5.3
ARM B	10.94	16.57	0.660	1.9	1.9	1.9	28.9	10.8
ARM C	0.87	12.71	0.068	1.8	0.1	0.1	1.1	0.6
ARM D	16.09	23.82	0.675	1.7	2.1	2.1	31.0	10.4

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	0.5	
08.00	0.5	
08.15	0.5	
08.30	0.5	

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	1.9	**
08.00	1.9	**
08.15	1.9	**
08.30	1.9	**

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.45	0.1
08.00	0.1
08.15	0.1
08.30	0.1

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	2.0	**
08.00	2.1	**
08.15	2.1	**
08.30	2.1	**

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	219.0	219.0	29.4	0.13	29.4	0.13
B	656.4	656.4	112.0	0.17	112.1	0.17
C	52.2	52.2	4.4	0.08	4.4	0.08
D	965.4	965.4	120.9	0.13	121.0	0.13
ALL	1893.0	1893.0	266.6	0.14	266.8	0.14

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND		GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC))				TOTAL GEOM. DELAY VEH MIN
	(VEH)	(VEH/H)	ARM A	ARM B	ARM C	ARM D	
A	219.0	219.0	0.0	0.0	3.0	18.1	21.2
			(15.4)	(0.0)	(3.1)	(9.2)	
B	656.4	656.4	15.8	0.0	0.0	27.5	43.3
			(9.2)	(15.4)	(0.0)	(3.1)	
C	52.2	52.2	1.7	0.9	0.0	0.0	2.5
			(3.1)	(9.2)	(15.4)	(0.0)	
D	965.4	965.4	0.0	31.0	10.7	0.0	41.6
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	1893.0	1893.0					108.7

END OF JOB

****** ARCADY run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\AM\Scholarstown Roundabout AM 2029 .vai" at 16:12:59 on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY
****

.RUN TITLE
****
SCHOLARSTOWN ROUNDABOUT 07:30- 08:30 2029

.INPUT DATA
****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.50	6.80	23.00	15.00	40.00	60.0	0.598	27.729

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT ARM
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	(DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	DISTANCE ENTRY TO CENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION

FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the roundabout is non-circular or non-symetrical (AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.30 AND ENDS 08.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL		ARM A	ARM B	ARM C	ARM D
07.30 - 07.45					
	ENTRY	4.0	11.8	0.9	17.5
	EXIT	7.8	11.6	2.9	12.0
07.45 - 08.00					
	ENTRY	4.0	11.8	0.9	17.5
	EXIT	7.8	11.6	2.9	12.0
08.00 - 08.15					
	ENTRY	4.0	11.8	0.9	17.5
	EXIT	7.8	11.6	2.9	12.0
08.15 - 08.30					
	ENTRY	4.0	11.8	0.9	17.5
	EXIT	7.8	11.6	2.9	12.0

TIME	FROM/TO	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
07.30 - 08.30					
	ARM A	0.000	0.198	0.280	0.522
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.153	0.000	0.037	0.809
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM C	0.614	0.106	0.000	0.280
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM D	0.308	0.616	0.075	0.000
		(10.0)	(10.0)	(10.0)	(10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

.PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.30-07.45								
ARM A	4.04	10.52	0.384	0.0	0.0	0.6	8.7	5.8
ARM B	11.80	16.38	0.721	1.9	0.0	2.5	33.3	11.5
ARM C	0.94	12.31	0.076	1.8	0.0	0.1	1.2	0.7
ARM D	17.46	23.74	0.736	1.7	0.0	2.7	36.8	11.3

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00								
ARM A	4.04	10.46	0.386	0.0	0.6	0.6	9.3	5.8
ARM B	11.80	16.36	0.721	1.9	2.5	2.5	37.4	11.6
ARM C	0.94	12.22	0.077	1.8	0.1	0.1	1.2	0.7
ARM D	17.46	23.72	0.736	1.7	2.7	2.7	40.7	11.4

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
ARM A	4.04	10.45	0.386	0.0	0.6	0.6	9.4	5.8
ARM B	11.80	16.36	0.721	1.9	2.5	2.5	38.0	11.6
ARM C	0.94	12.22	0.077	1.8	0.1	0.1	1.2	0.7
ARM D	17.46	23.72	0.736	1.7	2.7	2.8	41.1	11.4

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY

	(VEH/MIN)	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)
08.15-08.30								
ARM A	4.04	10.45	0.386	0.0	0.6	0.6	9.4	5.8
ARM B	11.80	16.36	0.721	1.9	2.5	2.6	38.3	11.6
ARM C	0.94	12.22	0.077	1.8	0.1	0.1	1.2	0.7
ARM D	17.46	23.72	0.736	1.7	2.8	2.8	41.3	11.4

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	0.6	*
08.00	0.6	*
08.15	0.6	*
08.30	0.6	*

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	2.5	**
08.00	2.5	***
08.15	2.5	***
08.30	2.6	***

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	0.1	
08.00	0.1	
08.15	0.1	
08.30	0.1	

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	2.7	***
08.00	2.7	***
08.15	2.8	***
08.30	2.8	***

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	242.4	242.4	36.8	0.15	36.8	0.15
B	708.0	708.0	147.0	0.21	147.2	0.21
C	56.4	56.4	4.9	0.09	4.9	0.09
D	1047.6	1047.6	160.0	0.15	160.1	0.15
ALL	2054.4	2054.4	348.8	0.17	349.1	0.17

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC)) ARM A	ARM B	ARM C	ARM D	TOTAL GEOM. DELAY VEH MIN
A	242.4	242.4	0.0	0.0	3.5	19.8	23.3
			(15.4)	(0.0)	(3.1)	(9.2)	
B	708.0	708.0	16.9	0.0	0.0	29.7	46.6
			(9.2)	(15.4)	(0.0)	(3.1)	
C	56.4	56.4	1.8	0.9	0.0	0.0	2.7
			(3.1)	(9.2)	(15.4)	(0.0)	
D	1047.6	1047.6	0.0	33.4	12.3	0.0	45.7
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	2054.4	2054.4					118.3

END OF JOB

****** ARCADY 5 run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\AM\Scholarstown Roundabout AM 2039.vai" at 16:14:16
on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY
*****

.RUN TITLE
*****
SCHOLARSTOWN ROUNDABOUT 07:30- 08:30 2039

.INPUT DATA
*****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.50	6.80	23.00	15.00	40.00	60.0	0.598	27.729

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	ARM (DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	DISTANCE ENTRY TO CENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION

FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the
roundabout is non-circular or non-symetrical
(AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.30 AND ENDS 08.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL		ARM A	ARM B	ARM C	ARM D
07.30 - 07.45					
	ENTRY	4.2	12.3	1.0	18.1
	EXIT	8.1	12.1	3.0	12.4
07.45 - 08.00					
	ENTRY	4.2	12.3	1.0	18.1
	EXIT	8.1	12.1	3.0	12.4
08.00 - 08.15					
	ENTRY	4.2	12.3	1.0	18.1
	EXIT	8.1	12.1	3.0	12.4
08.15 - 08.30					
	ENTRY	4.2	12.3	1.0	18.1
	EXIT	8.1	12.1	3.0	12.4

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
		TURNING PROPORTIONS (PERCENTAGE OF H.V.S)			
07.30 - 08.30					
	ARM A	0.000	0.198	0.279	0.523
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.153	0.000	0.037	0.810
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM C	0.614	0.106	0.000	0.280
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM D	0.308	0.617	0.075	0.000
		(10.0)	(10.0)	(10.0)	(10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

.PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION (VEHS) ENTRY	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.30-07.45								
ARM A	4.20	10.28	0.409	0.0	0.0	0.7	9.6	6.0
ARM B	12.26	16.30	0.752	1.9	0.0	2.9	38.1	11.9
ARM C	1.01	12.05	0.084	1.8	0.0	0.1	1.3	0.7
ARM D	18.14	23.67	0.766	1.7	0.0	3.1	42.4	11.7

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00								
ARM A	4.20	10.21	0.411	0.0	0.7	0.7	10.3	6.1
ARM B	12.26	16.28	0.753	1.9	2.9	2.9	43.6	12.1
ARM C	1.01	11.95	0.085	1.8	0.1	0.1	1.4	0.7
ARM D	18.14	23.65	0.767	1.7	3.1	3.2	47.6	11.9

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
ARM A	4.20	10.21	0.412	0.0	0.7	0.7	10.4	6.1
ARM B	12.26	16.28	0.753	1.9	2.9	3.0	44.5	12.1
ARM C	1.01	11.95	0.085	1.8	0.1	0.1	1.4	0.7
ARM D	18.14	23.65	0.767	1.7	3.2	3.2	48.4	11.9

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY

	(VEH/MIN)	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)
08.15-08.30								
ARM A	4.20	10.21	0.412	0.0	0.7	0.7	10.4	6.1
ARM B	12.26	16.28	0.753	1.9	3.0	3.0	44.8	12.1
ARM C	1.01	11.95	0.085	1.8	0.1	0.1	1.4	0.7
ARM D	18.14	23.65	0.767	1.7	3.2	3.2	48.7	11.9

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	0.7	*
08.00	0.7	*
08.15	0.7	*
08.30	0.7	*

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	2.9	***
08.00	2.9	***
08.15	3.0	***
08.30	3.0	***

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.45	0.1
08.00	0.1
08.15	0.1
08.30	0.1

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.45	3.1	***
08.00	3.2	***
08.15	3.2	***
08.30	3.2	***

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	252.0	252.0	40.7	0.16	40.8	0.16
B	735.6	735.6	171.1	0.23	171.3	0.23
C	60.6	60.6	5.5	0.09	5.5	0.09
D	1088.4	1088.4	187.1	0.17	187.3	0.17
ALL	2136.6	2136.6	404.3	0.19	404.9	0.19

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND		GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC))				TOTAL GEOM. DELAY VEH MIN
	(VEH)	(VEH/H)	ARM A	ARM B	ARM C	ARM D	
A	252.0	252.0	0.0	0.0	3.6	20.6	24.2
			(15.4)	(0.0)	(3.1)	(9.2)	
B	735.6	735.6	17.6	0.0	0.0	30.8	48.4
			(9.2)	(15.4)	(0.0)	(3.1)	
C	60.6	60.6	1.9	1.0	0.0	0.0	2.9
			(3.1)	(9.2)	(15.4)	(0.0)	
D	1088.4	1088.4	0.0	34.7	12.8	0.0	47.5
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	2136.6	2136.6					123.0

END OF JOB

****** ARCADY 5 run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\PM\Scholarstown Roundabout PM 2022.vai" at 19:15:37 on Monday, 30 May 2022

.ROUNDABOUT CAPACITY AND DELAY
****

.RUN TITLE
****
SCHOLARSTOWN ROUNDABOUT 16:30- 17:30 2022

.INPUT DATA
****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.00	5.00	23.00	15.00	40.00	60.0	0.526	21.667

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	ARM (DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	IDISTANCE ENTRY TO ICENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION				
FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the roundabout is non-circular or non-symetrical (AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.30 AND ENDS 17.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL	ARM A	ARM B	ARM C	ARM D
16.30 - 16.45				
ENTRY	5.5	10.8	2.0	9.1
EXIT	4.4	9.0	1.8	12.3
16.45 - 17.00				
ENTRY	5.5	10.8	2.0	9.1
EXIT	4.4	9.0	1.8	12.3
17.00 - 17.15				
ENTRY	5.5	10.8	2.0	9.1
EXIT	4.4	9.0	1.8	12.3
17.15 - 17.30				
ENTRY	5.5	10.8	2.0	9.1
EXIT	4.4	9.0	1.8	12.3

TIME	FROM/TO	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
16.30 - 17.30	ARM A	0.000 (10.0)	0.311 (10.0)	0.195 (10.0)	0.493 (10.0)
	ARM B	0.137 (10.0)	0.000 (10.0)	0.029 (10.0)	0.835 (10.0)
	ARM C	0.538 (10.0)	0.179 (10.0)	0.000 (10.0)	0.283 (10.0)
	ARM D	0.197 (10.0)	0.761 (10.0)	0.041 (10.0)	0.000 (10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.30-16.45								
ARM A	5.47	12.74	0.429	0.0	0.0	0.7	10.6	7.1
ARM B	10.80	18.03	0.599	0.5	0.0	1.5	20.6	10.4
ARM C	2.05	12.42	0.165	0.8	0.0	0.2	2.9	1.7
ARM D	9.07	18.16	0.499	0.5	0.0	1.0	14.1	6.2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-17.00								
ARM A	5.47	12.71	0.430	0.0	0.7	0.7	11.2	7.1
ARM B	10.80	18.01	0.600	0.5	1.5	1.5	22.1	10.5
ARM C	2.05	12.36	0.166	0.8	0.2	0.2	3.0	1.7
ARM D	9.07	18.15	0.500	0.5	1.0	1.0	14.8	6.2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.00-17.15								
ARM A	5.47	12.71	0.430	0.0	0.7	0.8	11.2	7.1
ARM B	10.80	18.01	0.600	0.5	1.5	1.5	22.3	10.5
ARM C	2.05	12.36	0.166	0.0	0.2	0.2	3.0	1.7
ARM D	9.07	18.15	0.500	0.5	1.0	1.0	14.9	6.2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.15-17.30								
ARM A	5.47	12.71	0.430	0.0	0.8	0.8	11.3	7.1
ARM B	10.80	18.01	0.600	0.5	1.5	1.5	22.3	10.5
ARM C	2.05	12.36	0.166	0.0	0.2	0.2	3.0	1.7
ARM D	9.07	18.15	0.500	0.5	1.0	1.0	14.9	6.2

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	0.7	*
17.00	0.7	*
17.15	0.8	*
17.30	0.8	*

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.5	*
17.00	1.5	*
17.15	1.5	*
17.30	1.5	*

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.45	0.2
17.00	0.2
17.15	0.2
17.30	0.2

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.0	*
17.00	1.0	*
17.15	1.0	*
17.30	1.0	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	328.2	328.2	44.3	0.13	44.3	0.13
B	648.0	648.0	87.3	0.13	87.3	0.13
C	123.0	123.0	11.8	0.10	11.8	0.10
D	544.2	544.2	58.7	0.11	58.8	0.11
ALL	1643.4	1643.4	202.0	0.12	202.1	0.12

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND		GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC))				TOTAL GEOM. DELAY VEH MINI
	(VEH)	(VEH/H)	ARM A	ARM B	ARM C	ARM D	
A	328.2	328.2	0.0	0.0	3.3	25.3	28.6
			(15.4)	(0.0)	(3.1)	(9.2)	
B	648.0	648.0	13.8	0.0	0.0	28.0	41.8
			(9.2)	(15.4)	(0.0)	(3.1)	
C	123.0	123.0	3.4	3.4	0.0	0.0	6.9
			(3.1)	(9.2)	(15.4)	(0.0)	
D	544.2	544.2	0.0	21.4	3.5	0.0	24.9
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	1643.4	1643.4					102.2

END OF JOB

****** ARCADY 5 run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\PM\Scholarstown Roundabout PM 2024.vai" at 15:07:25 on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY
****

.RUN TITLE
****
SCHOLARSTOWN ROUNDABOUT 16:30- 17:30 2024

.INPUT DATA
****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.00	5.00	23.00	15.00	40.00	60.0	0.526	21.667

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	ARM (DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	IDISTANCE ENTRY TO ICENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION				
FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the roundabout is non-circular or non-symetrical (AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.30 AND ENDS 17.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL		ARM A	ARM B	ARM C	ARM D
16.30 - 16.45					
	ENTRY	5.6	11.4	2.1	9.4
	EXIT	4.6	9.3	1.9	12.8
16.45 - 17.00					
	ENTRY	5.6	11.4	2.1	9.4
	EXIT	4.6	9.3	1.9	12.8
17.00 - 17.15					
	ENTRY	5.6	11.4	2.1	9.4
	EXIT	4.6	9.3	1.9	12.8
17.15 - 17.30					
	ENTRY	5.6	11.4	2.1	9.4
	EXIT	4.6	9.3	1.9	12.8

TIME	FROM/TO	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
16.30 - 17.30	ARM A	0.000 (10.0)	0.316 (10.0)	0.205 (10.0)	0.479 (10.0)
	ARM B	0.141 (10.0)	0.000 (10.0)	0.031 (10.0)	0.829 (10.0)
	ARM C	0.543 (10.0)	0.182 (10.0)	0.000 (10.0)	0.275 (10.0)
	ARM D	0.196 (10.0)	0.761 (10.0)	0.043 (10.0)	0.000 (10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.30-16.45								
ARM A	5.64	12.62	0.447	0.0	0.0	0.8	11.3	7.2
ARM B	11.42	17.97	0.636	0.5	0.0	1.7	23.7	11.0
ARM C	2.13	12.13	0.176	0.8	0.0	0.2	3.1	1.8
ARM D	9.35	18.05	0.518	0.5	0.0	1.1	15.1	6.4

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-17.00								
ARM A	5.64	12.59	0.448	0.0	0.8	0.8	12.0	7.2
ARM B	11.42	17.95	0.636	0.5	1.7	1.7	25.7	11.1
ARM C	2.13	12.06	0.177	0.8	0.2	0.2	3.2	1.8
ARM D	9.35	18.04	0.518	0.5	1.1	1.1	15.9	6.5

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.00-17.15								
ARM A	5.64	12.59	0.448	0.0	0.8	0.8	12.1	7.2
ARM B	11.42	17.95	0.636	0.5	1.7	1.7	25.9	11.1
ARM C	2.13	12.06	0.177	0.0	0.2	0.2	3.2	1.8
ARM D	9.35	18.04	0.518	0.5	1.1	1.1	16.0	6.5

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY

	(VEH/MIN)	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)
17.15-17.30								
ARM A	5.64	12.59	0.448	0.0	0.8	0.8	12.1	7.2
ARM B	11.42	17.95	0.636	0.5	1.7	1.7	26.0	11.1
ARM C	2.13	12.06	0.177	0.0	0.2	0.2	3.2	1.8
ARM D	9.35	18.04	0.518	0.5	1.1	1.1	16.1	6.5

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	0.8	*
17.00	0.8	*
17.15	0.8	*
17.30	0.8	*

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.7	**
17.00	1.7	**
17.15	1.7	**
17.30	1.7	**

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.45	0.2
17.00	0.2
17.15	0.2
17.30	0.2

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.1	*
17.00	1.1	*
17.15	1.1	*
17.30	1.1	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
A	338.4	338.4	47.5	0.14	47.5	0.14
B	685.2	685.2	101.4	0.15	101.5	0.15
C	127.8	127.8	12.7	0.10	12.7	0.10
D	561.0	561.0	63.2	0.11	63.2	0.11
ALL	1712.4	1712.4	224.7	0.13	224.9	0.13

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC)) ARM A	ARM B	ARM C	ARM D	TOTAL GEOM. DELAY VEH MIN
A	338.4	338.4	0.0	0.0	3.6	25.3	28.9
			(15.4)	(0.0)	(3.1)	(9.2)	
B	685.2	685.2	15.1	0.0	0.0	29.4	44.5
			(9.2)	(15.4)	(0.0)	(3.1)	
C	127.8	127.8	3.6	3.6	0.0	0.0	7.2
			(3.1)	(9.2)	(15.4)	(0.0)	
D	561.0	561.0	0.0	22.1	3.7	0.0	25.8
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	1712.4	1712.4					106.4

END OF JOB

****** ARCADY 5 run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\PM\Scholarstown Roundabout PM 2029.vai" at 15:13:19 on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY
****

.RUN TITLE
****
SCHOLARSTOWN ROUNDABOUT 16:30- 17:30 2029

.INPUT DATA
****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.00	5.00	23.00	15.00	40.00	60.0	0.526	21.667

V = approach half-width
E = entry width
L = effective flare length
R = entry radius
D = inscribed circle diameter
PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	ARM (DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	DISTANCE ENTRY TO CENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION

FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the roundabout is non-circular or non-symetrical (AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.30 AND ENDS 17.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL		ARM A	ARM B	ARM C	ARM D
16.30 - 16.45					
	ENTRY	6.1	12.3	2.3	10.1
	EXIT	4.9	10.0	2.0	13.8
16.45 - 17.00					
	ENTRY	6.1	12.3	2.3	10.1
	EXIT	4.9	10.0	2.0	13.8
17.00 - 17.15					
	ENTRY	6.1	12.3	2.3	10.1
	EXIT	4.9	10.0	2.0	13.8
17.15 - 17.30					
	ENTRY	6.1	12.3	2.3	10.1
	EXIT	4.9	10.0	2.0	13.8

TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
		TURNING PROPORTIONS (PERCENTAGE OF H.V.S)			
16.30 - 17.30					
	ARM A	0.000	0.316	0.204	0.481
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.141	0.000	0.030	0.829
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM C	0.543	0.181	0.000	0.276
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM D	0.196	0.761	0.042	0.000
		(10.0)	(10.0)	(10.0)	(10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

.PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.30-16.45								
ARM A	6.09	12.31	0.495	0.0	0.0	1.0	13.5	7.7
ARM B	12.30	17.80	0.691	0.5	0.0	2.2	29.7	11.8
ARM C	2.29	11.60	0.197	0.8	0.0	0.2	3.5	1.9
ARM D	10.09	17.93	0.563	0.5	0.0	1.3	17.9	6.9

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-17.00								
ARM A	6.09	12.28	0.496	0.0	1.0	1.0	14.5	7.8
ARM B	12.30	17.77	0.692	0.5	2.2	2.2	32.8	12.0
ARM C	2.29	11.52	0.199	0.8	0.2	0.2	3.7	1.9
ARM D	10.09	17.92	0.563	0.5	1.3	1.3	19.1	7.0

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.00-17.15								
ARM A	6.09	12.28	0.496	0.0	1.0	1.0	14.6	7.8
ARM B	12.30	17.77	0.692	0.5	2.2	2.2	33.2	12.0
ARM C	2.29	11.52	0.199	0.0	0.2	0.2	3.7	1.9
ARM D	10.09	17.92	0.563	0.5	1.3	1.3	19.2	7.0

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/

			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)
17.15-17.30								
ARM A	6.09	12.28	0.496	0.0	1.0	1.0	14.7	7.8
ARM B	12.30	17.77	0.692	0.5	2.2	2.2	33.3	12.0
ARM C	2.29	11.52	0.199	0.0	0.2	0.2	3.7	1.9
ARM D	10.09	17.92	0.563	0.5	1.3	1.3	19.2	7.0

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.0	*
17.00	1.0	*
17.15	1.0	*
17.30	1.0	*

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	2.2	**
17.00	2.2	**
17.15	2.2	**
17.30	2.2	**

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.45	0.2
17.00	0.2
17.15	0.2
17.30	0.2

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.3	*
17.00	1.3	*
17.15	1.3	*
17.30	1.3	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	365.4	365.4	57.3	0.16	57.4	0.16
B	738.0	738.0	128.9	0.17	129.0	0.17
C	137.4	137.4	14.6	0.11	14.6	0.11
D	605.4	605.4	75.4	0.12	75.4	0.12
ALL	1846.2	1846.2	276.3	0.15	276.5	0.15

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND		GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC))				TOTAL GEOM. DELAY
	(VEH)	(VEH/H)	ARM A	ARM B	ARM C	ARM D	VEH MINI
A	365.4	365.4	0.0	0.0	3.9	27.4	31.3
			(15.4)	(0.0)	(3.1)	(9.2)	
B	738.0	738.0	16.2	0.0	0.0	31.7	47.9
			(9.2)	(15.4)	(0.0)	(3.1)	
C	137.4	137.4	3.9	3.9	0.0	0.0	7.7
			(3.1)	(9.2)	(15.4)	(0.0)	
D	605.4	605.4	0.0	23.8	4.0	0.0	27.9
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	1846.2	1846.2					114.7

END OF JOB

****** ARCADY 5 run completed.

TRANSPORT RESEARCH LABORATORY

CAPACITIES, QUEUES AND DELAYS AT ROUNDABOUTS

ARCADY ANALYSIS PROGRAM

THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS
IN NO WAY RELIEVED OF HIS RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:- "d:\MH DATA\TTA\Scholarstown Residential Dublin\TTA\Arcardy\PM\Scholarstown Roundabout PM 2039.vai" at 15:23:29 on Monday, 25 July 2022

.ROUNDABOUT CAPACITY AND DELAY
****

.RUN TITLE
****
SCHOLARSTOWN ROUNDABOUT 16:30- 17:30 2039

.INPUT DATA
****
ARM A - TO SCHOLARSTOWN ROAD NORTH
ARM B - TO SCHOLARSTOWN ROAD EAST R113
ARM C - TO ORLAGH GROVE
ARM D - TO ST COLMCILLES WAY R113

.GEOMETRIC DATA

ARM A HAS A ZEBRA CROSSING

ARM B HAS A ZEBRA CROSSING

ARM C HAS A ZEBRA CROSSING

ARM D HAS A ZEBRA CROSSING

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	4.00	4.00	21.00	20.00	40.00	60.0	0.488	18.097
ARM B	4.00	5.30	18.00	15.00	40.00	60.0	0.535	22.458
ARM C	3.60	6.80	7.00	10.00	40.00	60.0	0.507	20.956
ARM D	4.00	5.00	23.00	15.00	40.00	60.0	0.526	21.667

V = approach half-width
E = entry width
L = effective flare length
R = entry radius
D = inscribed circle diameter
PHI = entry angle

.GEOMETRIC DELAY DATA

	ARM SPEED (KPH)		ENTRY ANGLE	EXIT ANGLE	ENTRY RADIUS	EXIT RADIUS	SIGHT DISTANCE	ANGLE BETWEEN CURRENT AND NEXT ARM
	ENTRY	EXIT	ENA(DEG)	EXA(DEG)	R(M)	EXR(M)	SD(M)	(DEG)
ARM A	30.0	30.0	60.0	60.0	20.0	30.0	50.0	90.0
ARM B	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0
ARM C	30.0	30.0	60.0	60.0	10.0	30.0	50.0	90.0
ARM D	30.0	30.0	60.0	60.0	15.0	30.0	50.0	90.0

	DISTANCE ENTRY TO CENTRE OF JUNCTION (METRES)	DISTANCE CENTRE OF JUNCTION TO EXIT (METRES)
ARM A	39.0	39.0
ARM B	39.0	39.0
ARM C	39.0	39.0
ARM D	39.0	39.0

DISTANCES THROUGH JUNCTION

FROM/TO	ARM A	ARM B	ARM C	ARM D
ARM A	200.0	50.0	100.0	150.0
ARM B	150.0	200.0	50.0	100.0
ARM C	100.0	150.0	200.0	50.0
ARM D	50.0	100.0	150.0	200.0

WARNING Geometric delays have been calculated and the roundabout is non-circular or non-symetrical (AG24 REF 8.4.2(v))

.TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.30 AND ENDS 17.30
.LENGTH OF TIME PERIOD - 60 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

FLOW DATA USED IN THE ESTIMATION OF TURNING PROPORTIONS (VEH/MIN) -

TIME INTERVAL		ARM A	ARM B	ARM C	ARM D
16.30 - 16.45					
	ENTRY	6.3	12.8	2.4	10.5
	EXIT	5.1	10.4	2.1	14.3
16.45 - 17.00					
	ENTRY	6.3	12.8	2.4	10.5
	EXIT	5.1	10.4	2.1	14.3
17.00 - 17.15					
	ENTRY	6.3	12.8	2.4	10.5
	EXIT	5.1	10.4	2.1	14.3
17.15 - 17.30					
	ENTRY	6.3	12.8	2.4	10.5
	EXIT	5.1	10.4	2.1	14.3

TIME	FROM/TO	TURNING PROPORTIONS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
16.30 - 17.30					
	ARM A	0.000	0.316	0.204	0.481
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM B	0.140	0.000	0.030	0.829
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM C	0.542	0.181	0.000	0.276
		(10.0)	(10.0)	(10.0)	(10.0)
	ARM D	0.196	0.761	0.042	0.000
		(10.0)	(10.0)	(10.0)	(10.0)

TURNING PROPORTIONS ARE CALCULATED FROM ENTRY AND EXIT FLOWS
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

.PEDESTRIAN CROSSING DATA

PEDESTRIAN CROSSING FLOW:

ARM A: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM B: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM C: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.
ARM D: PEDESTRIAN FLOWS ARE INPUT DIRECTLY.

ARM	LENGTH OF CROSSING (M) (ENTRY)	(EXIT)	QUEUEING SPACE BETWEEN CROSSING AND JUNCTION ENTRY (VEHS)	QUEUEING SPACE WITHOUT BLOCKING BACK INTO JUNCTION (VEHS)
A	9.00		3.0	6.0
B	14.00	4.50	1.0	4.0
C	10.70		3.0	6.0
D	8.30		4.0	8.0

. QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.30-16.45								
ARM A	6.33	12.15	0.521	0.0	0.0	1.1	14.9	8.0
ARM B	12.76	17.71	0.721	0.5	0.0	2.5	33.6	12.3
ARM C	2.38	11.33	0.210	0.8	0.0	0.3	3.8	2.0
ARM D	10.48	17.87	0.586	0.5	0.0	1.4	19.6	7.2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-17.00								
ARM A	6.33	12.11	0.523	0.0	1.1	1.1	16.1	8.1
ARM B	12.76	17.68	0.722	0.5	2.5	2.5	37.6	12.4
ARM C	2.38	11.23	0.212	0.8	0.3	0.3	4.0	2.0
ARM D	10.48	17.85	0.587	0.5	1.4	1.4	21.0	7.2

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.00-17.15								
ARM A	6.33	12.11	0.523	0.0	1.1	1.1	16.2	8.1
ARM B	12.76	17.68	0.722	0.5	2.5	2.6	38.1	12.4
ARM C	2.38	11.23	0.212	0.0	0.3	0.3	4.0	2.0
ARM D	10.48	17.85	0.587	0.5	1.4	1.4	21.1	7.2

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY

	(VEH/MIN)	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)
17.15-17.30								
ARM A	6.33	12.11	0.523	0.0	1.1	1.1	16.3	8.1
ARM B	12.76	17.68	0.722	0.5	2.6	2.6	38.4	12.4
ARM C	2.38	11.23	0.212	0.0	0.3	0.3	4.0	2.0
ARM D	10.48	17.85	0.587	0.5	1.4	1.4	21.2	7.2

.QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.1	*
17.00	1.1	*
17.15	1.1	*
17.30	1.1	*

.QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	2.5	**
17.00	2.5	***
17.15	2.6	***
17.30	2.6	***

.QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.45	0.3
17.00	0.3
17.15	0.3
17.30	0.3

.QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.45	1.4	*
17.00	1.4	*
17.15	1.4	*
17.30	1.4	*

. QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	379.8	379.8	63.6	0.17	63.6	0.17
B	765.6	765.6	147.6	0.19	147.8	0.19
C	142.8	142.8	15.8	0.11	15.8	0.11
D	628.8	628.8	82.9	0.13	83.0	0.13
ALL	1917.0	1917.0	310.0	0.16	310.3	0.16

INCLUSIVE GEOMETRIC DELAY

ARM	TOTAL DEMAND		GEOMETRIC DELAY BY TURN (VEH MIN) (GEOMETRIC DELAY PER LIGHT VEHICLE (SEC))				TOTAL GEOM. DELAY VEH MINI
	(VEH)	(VEH/H)	ARM A	ARM B	ARM C	ARM D	
A	379.8	379.8	0.0	0.0	4.0	28.5	32.5
			(15.4)	(0.0)	(3.1)	(9.2)	
B	765.6	765.6	16.8	0.0	0.0	32.9	49.6
			(9.2)	(15.4)	(0.0)	(3.1)	
C	142.8	142.8	4.0	4.0	0.0	0.0	8.1
			(3.1)	(9.2)	(15.4)	(0.0)	
D	628.8	628.8	0.0	24.8	4.2	0.0	28.9
			(0.0)	(3.1)	(9.2)	(15.4)	
ALL	1917.0	1917.0					119.1

* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.
END OF JOB

****** ARCADY run completed.

17.0 Appendix E – Drawing

NOTES:

All dimensions in metres.
Do not scale from drawing.
For any discrepancies found please consult with design office.
This drawing should be read in conjunction with all contract drawings, documents and specifications.

Rev	By	Date	Description

Drawing Status: PLANNING
NOT CERTIFIED FOR CONSTRUCTION

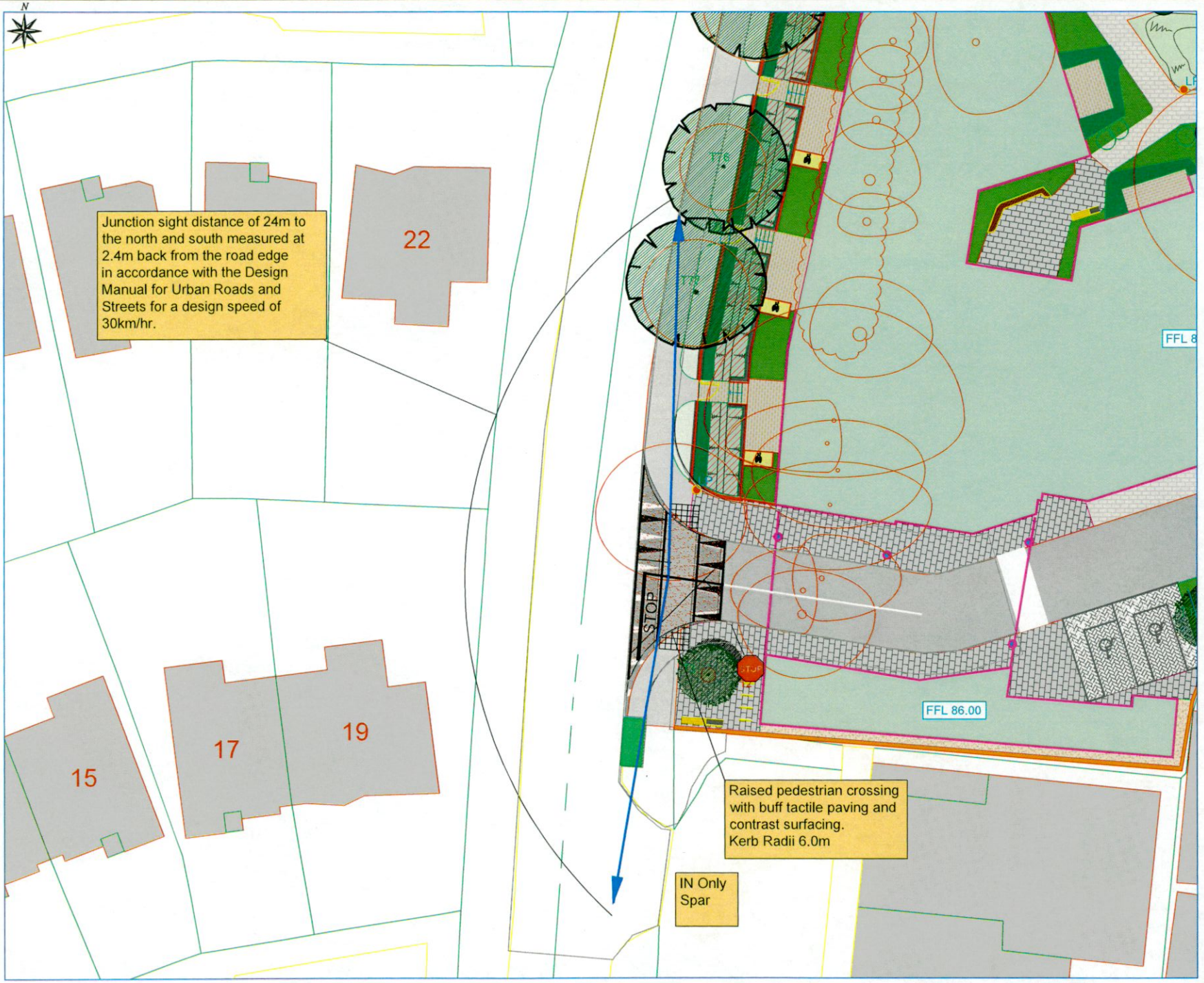
Project Title:
Apartment Development Scholarstown House Dublin 16.

Drawing Title:
Development Access.

Client:
Clancy Homes & Client Emmaville Ltd.

Martin Hanley
Traffic & Transportation Consulting Engineers.
70 Lisdoell, Marlyborough Hill, Douglas, Cork.
Tel: 0214857959
E-Mail:martinrhanley1@gmail.com

Designed: MH		
Scale: 1/500 at A3	**Date:** October 2022	
Job No: 22-05TT	**Drawing No:** SH-DA-P01	**Revision:**



NOTES:

All dimensions in metres.
Do not scale from drawing.
For any discrepancies found please consult with design office.
This drawing should be read in conjunction with all contract drawings, documents and specifications.

Rev	By	Date	Description

Drawing Status: PLANNING
NOT CERTIFIED FOR CONSTRUCTION

Project Title:
Apartment Development Scholarstown House Dublin 16.

Drawing Title:
Development Access.

Client:
Clancy Homes & Client Emmaville Ltd.

Martin Hanley
Traffic & Transportation Consulting Engineers.
70 Lissdeell, Marlyborough Hill, Douglas, Cork.
Tel: 021-4657959
E-Mail:martinhanley1@gmail.com

Designed:			
MH			
Scale: 1/250 at A3		**Date:** October 2022	
Job No: 22-05TT	**Drawing No:** SH-DA-P02	**Revision:**	