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#### **APPENDICES**

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#### INTRODUCTION

#### **Background**

- 13.1 Roadplan Consulting was appointed by SLR Consulting Ireland to identify and assess the traffic and transportation impacts of a planning application to increase the permitted intake rate of construction and demolition (C&D) waste to its C&D waste recovery facility at the Huntstown Quarry Complex at North Road, Finglas, Dublin 11, from a maximum of 24,950 tonnes per annum at the present time to 95,000 tonnes per annum in future years.
- 13.2 No further C&D waste will be imported to the existing waste recovery facility, located on a 1.9 hectare site in the Central Quarry. The planning application provides for processing and off-site dispatch of C&D waste stockpiled at the existing facility in the near-term (2-3 years), following publication of End of Waste criteria for recycled aggregate. It also provides for
  - (i) relocation of C&D waste recovery activities to a dedicated new longterm recovery facility on a 5.2 hectare site in the north-eastern corner of the Huntstown Quarry Complex and
  - (ii) construction of a hardstanding area, waste processing shed, surface water management infrastructure and upgraded internal access road at the new waste recovery facility.
- 13.3 This chapter predicts the trips expected to be generated by the proposed development, and the impacts of those trips on the operational performance of the local road network and junctions, in particular the following:
  - R135 / N2 Slip Road Priority Junction
  - R135 / Elm Road Signalised Junction
  - R135 / L3125 Signalised Junction
  - R135 / N2 Roundabout Junction

# Existing Development &

- 13.4 Existing development at Huntstown Quarry is primarily tied to ongoing rock extraction and processing. In addition to established quarrying activities, several associated value-added activities are undertaken at the quarry, including production of concrete blocks and readymix concrete. A large soil recovery facility which is also operating within the quarry complex has a permitted soil waste intake of 1,500,000 tonnes per annum.
- The quarry and application site are located within the townlands of Huntstown and Kilshane, Co. Dublin, approximately 2.5km north-west of the Dublin suburb of Finglas and 2km north-west of the interchange between the N2 Dual Carriageway and the M50 Motorway. Positioned north of the M50 motorway, the quarry has two access points: the primary entrance located on the eastern boundary of the Roadstone property holding, located off the R135 Regional Road, also known as the North Road, and a secondary access (which has been closed in recent years and is no longer in use), located on the western boundary of the property, along the Kilshane Road. The location of the application site, and both existing accesses, are shown on Figure 13-1.
- 13.6 The existing site infrastructure at the quarry complex includes internal haul roads, offices and staff welfare facilities, plant storage and maintenance sheds, refuelling facilities and crushing, grading and processing plant used to process blasted rock.

Kilshane Road

Application Area

Existing Access Closed

Roadstone Quarry

Roadstone Quarry

Roadstone Quarry

Existing Roadstone Quarry

Application Area

Existing Roadstone Quarry Access

Cappagh Road

Cappagh Road

Figure 13-1
Site Location Map

### **Proposed Development**

13.7 This application relates to a proposal to increase the permitted rate of C&D waste intake/ recovery at the existing C&D recovery facility at Huntstown Quarry, from a maximum of 24,950 tonnes per annum at present to a maximum of 95,000 tonnes per annum in future years. It is also proposed to transfer the C&D waste recovery activities from its current location at the Central Quarry to a replacement site in the north-eastern corner of the quarry complex.

# **Existing Site Access**

13.8 Huntstown Quarry is currently accessed via the North Road (R135). The access road leading from North Road to the quarry complex is shared by quarry traffic and traffic going to and from the soil recovery facility and Huntstown Power Station. The access road is approximately 7.3m wide at the site entrance and divides as it runs towards the principal quarries and waste recovery facility. The widths of the inbound and outbound lanes are approximately 3.7m.

#### **Proposed Site Access**

13.9 This application is tied to a previous grant of planning permission and an established C&D waste recovery facility which has operated under a Local Authority waste permit for many years. All of the proposed increase in C&D waste intake and export of recycled aggregate will be carried via the existing entrance and access road leading off the R135 North Road, located on the eastern side of the Huntstown Quarry complex. The former access road from the Kilshane Road to the west of the quarry complex will not be used.

#### Information Reviewed

- 13.10 In preparing this assessment, Roadplan Consulting has made reference to:
  - the Fingal Development Plan 2011 2017,
  - The Institute of Highways and Transportation Guidelines on the Preparation of Traffic Impact Assessments,
  - the TII Transport Assessment Guidelines,
  - the TII National Traffic Model.

#### **Existing Road Network**

- 13.11 The existing road network within the vicinity of the application site is illustrated in Figure 13-1 and is described further below.
- 13.12 The existing road network around the recovery facility and application site is defined by:
  - The R135 regional road to the east, which previously served as the N2 National Primary Road (up to May 2006). This road is known locally as the North Road. It intersects with the N2 Dual carriageway at the Cherryhound Interchange to the north and forms a cul-de-sac to the south (severed by the re-aligned N2);
  - a local road, known as the Kilshane Road (or Cappagh Road) to the west and north of the Huntstown quarry complex; and
  - The M50 Motorway which lies south of the existing quarry.
- 13.13 The N2 Dual Carriageway between the M50 Motorway and Cherryhound Interchange runs immediately east of the R135 Regional Road. It continues northwards from the Cherryhound Interchange as the M2 Motorway to the north of Ashbourne Co. Meath. From there, it becomes the N2 National Primary Road and continues northwards as a single carriageway road through the counties of Meath, Louth and Monaghan to the border with Northern Ireland.
- 13.14 In relation to the local road network, the application site and the Huntstown Quarry complex in general, is located to the north of the M50 motorway, west of the R135 Regional Road (North Road) and the N2 Dual Carriageway and east and south of the Kilshane Road.
- 13.15 Much of the road network around the application site has been upgraded in recent years. The N2 dual carriageway / M2 motorway opened in May 2006 and led to a large and immediate reduction in traffic levels along the former N2 National Primary Road (now the R135 Regional Road) immediately east of Huntstown Quarry. Upgrading of the M50 to provide three lanes of traffic in both directions was also completed in 2010, as was the upgrading of its interchange with the N2 dual carriageway at Finglas to provide for a free-flow interchange.

ROADSTONE LIMITED 13-3 HUNTSTOWN C&D WASTE RECOVERY FACILITY, FINGLAS, DUBLIN 11 INTENSIFICATION OF ACTIVITY AND RE-LOCATION OF FACILITY

- 13.16 The existing R135 (North Road) comprises of a single carriageway road generally of about 7.5m width with hard shoulders of varying width. The alignment essentially runs straight from the existing quarry entrance northwards up to the N2 / M2 motorway at the Cherryhound interchange and southwards to the point at which it is severed by the M50 motorway at Finglas.
- 13.17 A speed limit of 50kph applies along the existing R135 regional road. This speed limit applies to traffic which travels between the R135 / N2 roundabout junction and the existing entrance to the quarry complex at Huntstown.

#### Methodology

- 13.18 HGV traffic travelling to the recovery facility via Dublin City and the N2 National Primary Road and/or M50 motorway to the south will access it via the R135 / N2 Slip Road priority junction at Coldwinters. HGV traffic travelling to the facility from the N2 or N3 to the north and north-west will travel via the R135 / N2 Roundabout junction at the Cherryhound Interchange.
- 13.19 HGV traffic departing the recovery facility with recycled aggregates and travelling toward the city and M50 motorway will initially travel via the R135 / Elm Road signalised junction and turn back onto the southbound carriageway of the N2 dual carriageway. HGV traffic departing the facility and travelling towards the N2 Dual Carriageway northbound or the N3 will travel via the R135 / N2 Roundabout junction.
- 13.20 Having regard to the established / future pattern of traffic movements, the methodology adopted for this assessment is summarised as follows:
  - A 12-hour Manual Classified Traffic Counts was undertaken by Tracsis Traffic and Data Services of the 22<sup>nd</sup> of June 2016. Count information was obtained at the following junctions (shown on Figure 13-1):
    - 1. R135 / N2 Slip Road Priority Junction at Coldwinters
    - 2. R135 / Elm Road Signalised Junction at Newtown
    - 3. R135 / L3125 Kilshane Cross Signalised Junction
    - 4. R135 / N2 Roundabout Junction (link to Cherryhound Interchange)
  - Existing Traffic Assessment A spreadsheet model was created which contains the base year do-nothing traffic count data described above. The traffic count data was used to develop a PICADY model of the R135 / N2 Slip Road priority junction, an ARCADY model of the R135 / N2 roundabout junction and an OSCADY PRO model of the R135 / Elm Road signalised junction and the R135 / L3125 signalised junction.
  - Future Year Assessment The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic and additional development related traffic was used to assess the future operational performance of the junctions at the year of opening (2017), five years after (2022) and fifteen years after opening (2032).

#### THE EXISTING ENVIRONMENT

### **Existing Traffic Flows**

13.21 The 12-hour traffic flows for each junction are provided in Appendix 13-A – Traffic Count Data. Traffic flows along the R135 were recorded for the four junctions identified previously. The daily profile of traffic flow at each junction along the R135 is shown in the figures below, as is the percentage of each vehicle class. The traffic flows during the busiest AM and PM peak hours were also abstracted from the surveyed data and are shown in the tables below:

Figure 13-2
R135 / N2 Slip Road Priority Junction Traffic Profile

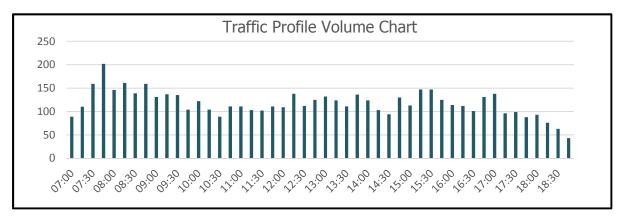


Figure 13-3
R135 / N2 Slip Road Priority Junction Vehicle Percentages

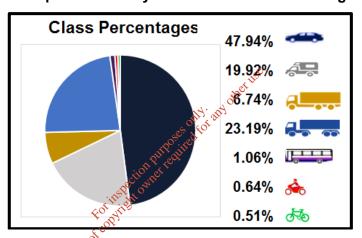


Table 13-1 2016 AM Peak Existing (07:30 – 08:30)

From / To	R135 (North)	N2 Slip Rd	R135 (South)	Totals
R135 (North)		0	58	58
N2 Slip Rd	396		128	524
R135 (South)	86	0		86
Totals	482	0	186	668

Table 13-2 2016 PM Peak Existing (16:45 – 17:45) –

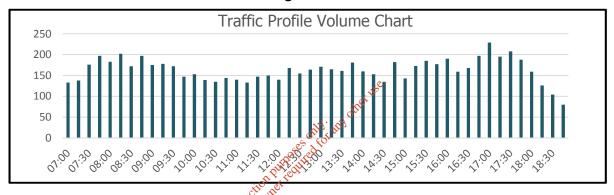
From / To	R135 (North)	N2 Slip Rd	R135 (South)	Totals
R135 (North)		0	20	20
N2 Slip Rd	308		20	328
R135 (South)	116	0		116
Totals	424	0	40	464

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Principal features of the existing traffic flows at the R135 / N2 Slip Road priority junction are as follows:

- Overall flows are higher in the am peak compared to the pm peak, with the main traffic flows travelling along the N2 Slip Road;
- The N2 slip is one-way only with turning from the R135 Regional Road prohibited;
- The percentage of HGV movement is high with HGVs comprising approximately 30% of traffic travelling through the junction.
- 13.22 The daily profile of traffic flow at for the R135 / Elm Road signalised junction is shown in the figures below, as is the percentage of each vehicle class. The traffic flows during the busiest AM and PM peak hours were abstracted from the surveyed data and are shown in the tables below:

Figure 13-4 R135 / Elm Road Signalised Junction



R135 / Elm Road Signalised Junction Vehicle Percentages

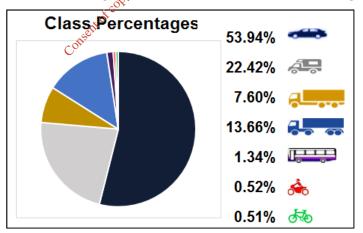


Table 13-3 2016 AM Peak Existing (07:30 – 08:30)

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)		230	63	293
Elm Road	21		3	24
R135 (South)	319	122		441
Totals	340	352	66	758

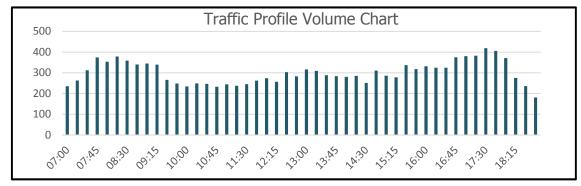
Table 13-4 2016 PM Peak Existing (16:45 – 17:45)

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)		313	21	334
Elm Road	29		2	31
R135 (South)	320	144		464
Totals	349	457	<sub>15</sub> ©· 23	829

Principal features of the existing traffic flows at the R135 / Elm Road Signalised junction are as follows:

- Overall flows are slightly higher in the pm peak compared to the am peak;
- Traffic volumes turning from Elm Road are low in both the am and pm peak;
- The R135 / Elm Recipinations provides access to the N2 for vehicles travelling southbound only;
- The percentage of HGV movement is high with HGVs comprising approximately 21% of traffic travelling through the junction.
- 13.23 The daily profile of traffic flow at for the R135 / L3125 Kilshane crossroads signalised junction is shown in the figures below, as is the percentage of each vehicle class. The traffic flows during the busiest AM and PM peak hours were abstracted from the surveyed data and are shown in the tables below:

Figure 13-6 R135 / L3125 Signalised Junction Traffic Profile



ROADSTONE LIMITED 13-7 HUNTSTOWN C&D WASTE RECOVERY FACILITY, FINGLAS, DUBLIN 11 INTENSIFICATION OF ACTIVITY AND RE-LOCATION OF FACILITY

Figure 13-7
R135 / L3125 Signalised Junction Vehicle Percentages

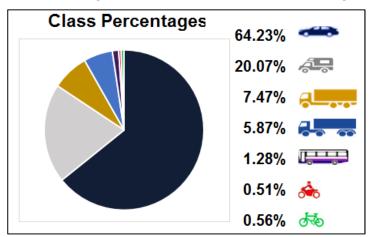


Table 13-5 2016 AM Peak Existing (07:30 – 08:30)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)		219	1,17	29	365
L3125 (East)	82	, d	114. str. 30	320	492
R135 (South)	59	73 110 see 3		205	337
L3125 (West)	9	134, red	81		224
Totals	150	115 Po 426	288	554	1418

Table 13-6 2016 PM Peak Existing (16:45 – 17:45)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)		168	86	16	270
L3125 (East)	204		85	199	488
R135 (South)	111	120		110	341
L3125 (West)	22	273	163		458
Totals	337	561	334	325	1557

Principal features of the existing traffic flows at the existing R135 / L3125 Signalised junction are as follows;

- Overall flows are slightly higher in the pm peak compared to the am peak;
- The traffic flow travelling along the L3125 local road is higher than that along the R135 Regional Road;
- The L3125 provides access to Ballycoolin Industrial estate to the west and Dublin airport to the east.

13.24 The daily profile of traffic flow at for the R135 / N2 roundabout junction is shown in the figures below, as is the percentage of each vehicle class. The traffic flows during the busiest AM and PM peak hours were abstracted from the surveyed data and are shown in the tables below:

Figure 13-8
R135 / N2 Roundabout Junction Traffic Profile

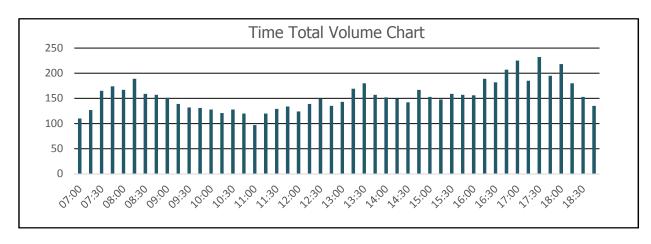


Figure 13-9
R135 / L3125 Signalised Junction Vehicle Percentages

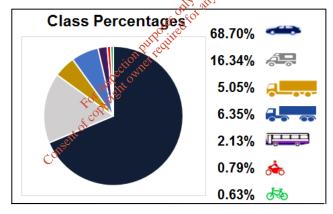


Table 13-7 2016 AM Peak Existing (07:30 – 08:30)

From / To	R135 (North)	R135 (South)	N2 Slip Rd	Totals
R135 (North)		170	139	309
R135 (South)	48		88	136
N2 Slip Rd	63	186		249
Totals	111	356	229	694

Table 13-8 2016 PM Peak Existing (16:45 – 17:45)

From / To	R135 (North)	R135 (South)	N2 Slip Rd	Totals
R135 (North)		111	86	197
R135 (South)	185		175	360
N2 Slip Rd	127	160		278
Totals	312	271	261	844

Principal features of the existing traffic flows at the R135 / N2 Roundabout junction are as follows:

- Overall flows are slightly higher in the pm peak compared to the am peak;
- The flows along the N2 Slip Road are low.

#### **Non-Car Access / Transport**

- 13.25 To ascertain opportunities for sustainability, consideration has been given to non-car accessibility for the application site.
- 13.26 Although operation of the facility will be very dependent on road based haulage, staff will require transport means to get to and from work. Non-car accessibility will help reduce traffic impact and also promote social inclusion by providing means of transport to the application site to those who do not have access to a private car.
- 13.27 Access to the application site of foot is by way of the existing pedestrian footway situated to the eastern side of North Road. At approximately 1.5m in width, this footway extends along North Road northwards until reaching the northbound N2 Slip Road / North Road priority junction where it terminates. Pedestrians can then prilise the footpath situated to the western side of the R135 which extends for a short distance in the direction of Cherryhound interchange before terminating at a bus stop. For employees wishing to access this bus stop on foot, it is an approximate distance of 1.8 kilometres away or a 25 minute walk (based upon an average walking distance of 1.2m per second.)
- 13.28 A large number of residential dwellings can be reached within a 5 kilometre cycle from the recovery facility which, assuming an average speed of 15kmh, equates to a 20 minute cycle ride. This includes the northern suburbs of Santry, Finglas, Charlestown, Dunsink and Castlenock and settlements to the north of the M50 Blanchardstown, Mulhuddart and Tyrellstown.
- 13.29 Adequate provision has already been made for pedestrians and cyclists within the visitor area with internal pedestrian walkways segregated from vehicles and cycle parking provided for those members of staff (or visitors) wishing to travel via bicycle. Whilst the Applicant is limited by what can realistically be undertaken to further improve non-car accessibility within the quarry complex, should the development proposal give rise to an increase in members of staff / visitors wishing to travel via bicycle then additional bicycle parking can be provided.

- 13.30 The closest bus stop to the application site is situated on the North Road (R135), to the north of the N2 off-slip. The bus stop is a simple flag-post stop which is served by the Number 103 and 107 services operated by Bus Eireann. Both of the routes that service the bus stop run from Dublin to surrounding towns and villages.
- 13.31 The Number 103 service runs between Dublin City and Ashbourne / Ratoath. The service operates 7 days a week and begins at 06:30 in the morning and runs at approximately 20 minute intervals throughout the day until approximately midnight.
- 13.32 The Number 107 service runs between Dublin City and Navan, Nobber and Kells. The service operates 7 days a week and begins at 09:00 in the morning and runs at least four services in either direction throughout the day.
- 13.33 As identified above the local bus service is limited; however there are regular 20 minute services available from central Dublin throughout the day, seven days per week. Individual travel by bus to the application site is therefore a realistic alternative to the car.

#### Site Access Sightlines

- 13.34 The requirements for sightlines are stated in the TII Design Manual for Urban Roads and Streets. Sightlines are measured along the mainline from a driver's viewing position on the access road, 3.0m back from the mainline edge.
- 13.35 Access to the development is from the existing Roadstone Quarry Access onto the R135. The posted speed limit of the R135 at the existing access to the quarry is 50kph. The existing access provides a sightline in excess of 200m in each direction when assessed in accordance with the DMURS.

# **Accident History**

- 13.36 Accident data has been obtained from the Road Safety Authority website <a href="https://www.rsa.ie">www.rsa.ie</a>. The website provides an interactive online mapping tool which has been navigated to the area of interest in order to determine the local accident history.
- 13.37 Accident data covering a nine year period 2005 to 2013 is provided. The information is rudimentary and only provides the number of collisions and the seriousness of the collisions, along with basic details of each incident. The definitions of the severities are given below:
  - Fatal (a crash resulting in death)
  - Serious (detention in hospital: includes paralysis, fractures and severe lacerations)
  - Minor (includes whiplash, strains and minor lacerations)
- 13.38 No accidents were recorded at the existing access to the quarry. Two minor accidents were recorded south of the existing access and one minor accident was recorded north of the existing access. At the existing R135 / Elm Road signalised junction one minor accident was recorded.
- 13.39 At the existing R135 / L3125 signalised junction (Kilshane Cross), one fatal accident, one serious accident and eight minor accidents were recorded. A summary of the collision history broken down into vehicle type is provided in Table 13.9 below:

Table 13-9
Road Collision History

Vehicle Type	Fatal Collision	Serious Collision	Minor Collision	All Collision
Bus	0	0	0	0
Goods Vehicle	0	1	2	3
Car	0	0	6	6
Motorcycle	1	0	4	5
Bicycle	0	0	0	0
Pedestrian	0	0	0	0
Other	0	0	0	0
Total	1	1	12	14

13.40 The location of each collision is shown in Figure 13.10 below

Figure 13-10 Road Collisions Ireland road collisions The Ward Help Collisions Broughan Fatal O Serious O Minor 吕 All 2013 2012 2011 2010 2009 Piperstown ○ 2008 ○ 2007 ○ 2006 ○ 2005 ● All Туре ○ Bicycle ○ Motorcycle ○ Car ○ Goods vehicle ○ Bus ○ Other Dublin Airport Logistics Park Collision information Single click on a collision icon at the local level to see details of that collision. 0 Application Site

#### **Proposed Road Network Improvements**

- 13.41 Fingal County Council has future proposals to provide a western link from the R135 / N2 roundabout to Dublin Airport. This road scheme is set as a development objective in the Airport Local Area Plan.
- 13.42 It is envisaged that existing traffic flows at the R135 / L3125 Kilshane Crossroad signalised junction will significantly reduce pending the construction of the airport link road scheme due to re-distribution of traffic flows.

#### IMPACT OF THE PROPOSED DEVELOPMENT

#### **Future Trip Generation**

- 13.43 The proposed development will generate an increase in the rate of C&D waste recovery intake from 24,950 tonnes per annum to 95,000 tonnes per annum (an increase of 70,050 tonnes per annum).
- 13.44 The existing quarry and recovery facility operate between 08:00 to 19:00 on Monday to Friday and between 08:00 hours and 13:00 hours on Saturdays. It will operate / open on approximately 300 days per annum (based on 6 days a week for 50 weeks).
- 13.45 It is anticipated that the waste material will arrive in 18 tonne consignments. Table 13.10 below provides a forecast of the average weekday traffic that is anticipated to be generated by the proposed increase of waste material intake.
- 13.46 In addition, it is expected that the recovery facility will produce up to 90,000 tonnes of recycled (secondary) aggregate per annum to be exported off-site from the C&D waste recovery facility.
- 13.47 It is anticipated that the secondary aggregate will be exported off-site in 18 tonne consignments. Table 13:10 below provides a forecast of the average weekday traffic that is anticipated to be generated by the proposed export of secondary aggregate from the C&D waste recovery facility.

Table 13-10 Future Trip Generation

	Volume (Tonnes)	Annual Loads (HGVs)	Average Daily Loads (HGVs)	Average Hourly Loads (HGVs)
OPERATION Waste Recovery Material Intake (18t)	70,050	3,900	13	1
OPERATION Export of Recycled Aggregate (18t)	95,000	5,300	18	2

# **Distribution and Assignment**

13.48 Table 13-10 above indicates that the average increase in daily trip generation of HGV traffic as a result of the increase in waste recovery material intake and the export of secondary aggregate is 31 HGV loads per day. This equates to a total of 62 HGV movements per day (two-way trips).

13.49 The proposed development will be operational for approximately 11 hours per day with a total of 31 additional trips per day. Therefore for a 1 hour period there will be approximately 3 trip per hour (31 trips / 11 hours) arriving and departing from the proposed development. The table below shows the expected AM and PM peak flows to and from the development.

#### Table 13-11 Peak hour Flows

	Trips to Development	Trips from Development
AM Peak	3	3
PM Peak	3	3

- 13.50 It is envisaged that all HGV's importing C&D waste material and exporting recycled (secondary) aggregate to/from the recovery facility at the Huntstown quarry complex will approach it along the M50 Motorway and / or the N2 Dual Carriageway and enter the site using the existing North Road entrance.
- 13.51 As such, all the proposed development traffic within the assessment have been distributed in line with the existing traffic patterns as surveyed.

#### **Other Planned Developments**

- 13.52 Planning permission was granted in November 2016 for an increase in the rate of soil and stone importation to the adjoining soil waste recovery facility at Huntstown from 750,000 tonnes per annum to 1,500,000 tonnes per annum (Fingal County Council Ref. No FW16A/0120). This activity will generate approximately 130 *additional* trips per day (based on working 6 days a week for 50 weeks, arriving and departing in 20 tonne consignments). If it operates at maximum capacity, the permitted soil recovery and restoration activities at the North Quarry and West Quarry would be completed in around 6 years.
- 13.53 Planning has previously been granted to Roadstone for a total aggregate and concrete output of up to 2 million tonnes per annum from the established quarry operations over a 20 year period from 2014 (Fingal County Council Ref. No FW12A-0022 and An Bord Pleanala Ref. No. 06F.241693). The proposed development will generate approximately 330 trips per day (based on working 6 days a week for 50 weeks, arriving and departing in 20 tonne consignments).
- 13.54 Planning permission has also been granted for a proposed Anaerobic Digestion (AD) Facility at Huntstown Quarry. (Planning Ref. FW13A/0089). The proposed development will generate approximately 60 trips per day. Access to the proposed AD facility will be via the existing R135 / Quarry Access priority junction.
- 13.55 Sensitivity testing of the above developments has been carried out to show the impact these development will have on the existing road network when the C&D waste recovery facility development is operational.

#### Traffic Increase

13.56 The TII issues a range of traffic growth factors to be applied to existing traffic flows which are broken down into three groups; low growth, medium growth and high growth. Due to the close proximity of the M50 motorway and the N2 dual carriageway it is assumed that medium growth is most likely for the R135 regional road.

13.57 The zone in which the site is located is numbered 821 in the TII National Traffic Model. The medium growth factors for each operational phase are as follows:

# Table 13-12 Future Year Traffic Growth

Road	2016 Existing	2017 Development Operational	2022 Development Operational	2032 Development Operational
All Roads	1.00	+ 0.71%	+ 4.36%	+ 8.59%

13.58 These percentages have been used to predict the increase in background traffic along the R135 that will occur in future years. It should be noted that these growth factors do not apply to predicted trips generated by the development. Full summary tables and predicted future traffic flows for 2017, 2022 and 2032 future years are included in Appendix 13B – Traffic Flow Sheets.

#### **Junction Capacity Assessment**

- 13.59 Capacity assessments using the computer programme PICADY for the existing R135 / N2 Slip Road priority junction and ARCADY for the existing R135 / N2 roundabout junction has been carried out. Full details and results of capacity assessments are contained in Appendix 13C PICADY Results and in Appendix 13D ARCADY Results
- 13.60 The parameters shown in the tables are defined as follows:
  - Ratio of Flow to Capacity (RFC) is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its reserve capacity.
  - Avg. Queue is the average number of vehicles queued over the time period on the junction approach.
  - Queue delay is the average number of seconds delay to each vehicle in the time period.
  - Total Delay is the total number of vehicle hours of delay to all vehicles at the junction over the time period.

#### R135 / N2 Slip Road Priority Junction

13.61 The following tables show the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the existing R135 / N2 Slip Road priority junction at Coldwinters.

Table 13-13
R135 / N2 Slip Road Priority Junction : AM Peak

	AM Pe	eak	2016	2017 No Dev	2017 With Dev	2022 No Dev	2022 With Dev	2022 Sens Flows	2032 No Dev	2032 With Dev	2032 Sens Flows
		RFC value	-	-	-	-	-	-	-	-	-
	R135	Average Queue (Vehicles)	-	-	-	-	-	-	-	-	-
	North	Average delay (sec / veh)	-	-	-	-	-	-	-	-	-
		Total Delay (veh / min)	ı	1	-	-	ı	-	1	1	-
		RFC value	0.87	0.87	0.88	0.90	0.91	0.96	0.95	0.95	0.98
R135 / N2 Slip Road	N2 Slip	Average Queue (Vehicles)	6	6	6	7	7	11	10	10	14
Priority Junction	Road	Average delay (sec / veh)	28	28	29	32	33	45	40	41	60
		Total Delay (veh / min)	5.12	5.29	5.39	6.36	6.51	9.60	8.53	8.82	11.89
		RFC value	-	-	-	-	-	-	-	-	-
	R135	Average Queue (Vehicles)	-	-	-	-	-	-	-	-	-
	South	Average delay (sec / veh)	-	1	-	-	Aller Use	-	-	-	-
		Total Delay (veh / min)	-	-	-	Egily's	017 -	-	-	-	-

Table 13/14
R135 / N2 Slip Road Priority Junction : PM Peak

	AM Pe	eak	2016		2017 With Dev	2022 No Dev	2022 With Dev	2022 Sen Flows	2032 No Dev	2032 With Dev	2032 Sen Flows
		RFC value	-	ont of t	-	1	-	-	1	-	-
	R135	Average Queue (Vehicles)	-	Courser	-	-	-	-	-	-	-
	North	Average delay (sec / veh)	-	-	-	1	-	-	1	-	-
		Total Delay (veh / min)	-	-	-	1	-	-	1	-	-
		RFC value	0.68	0.69	0.69	0.72	0.72	0.74	0.75	0.75	0.76
R135 / N2 Slip Road	N2 Slip	Average Queue (Vehicles)	2	2	2	2	2	2	3	3	3
Priority Junction	Road	Average delay (sec / veh)	17	18	18	19	19	19	20	20	21
		Total Delay (veh / min)	2.13	2.16	2.18	2.38	2.39	2.51	2.65	2.67	2.93
		RFC value	-	-	-	-	-	-	-	-	-
	R135	Average Queue (Vehicles)	-	-	-	-	-	-	-	-	-
	South	Average delay (sec / veh)	-	-	-	-	-	-	-	-	-
		Total Delay (veh / min)	-	-	-	-	-	-	-	-	-

13.62 Tables 13-13 and 13-14 above indicate that at present the R135 / N2 Slip Road priority junction operates at capacity with queues and delays during the AM peak hour. During the PM peak hour, the junction will operate within capacity with small queues and delays.

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- 13.63 Queues were noted at the junction and a maximum queue of 8 vehicles were noted at the junction during the counts which correlates with the junction assessment.
- 13.64 With the proposed development in place in 2017, 2022 and 2032, the junction will operate at capacity with queues and delays during the AM peak hour. During the PM peak hour the junction will operate within capacity with small queues and delays.
- 13.65 In 2032 during the AM peak hour the junction has a maximum queue of 10 vehicles. The slip road from the N2 is approximately 200m in length and it is unlikely that vehicles will queue back to the N2 dual carriageway.
- 13.66 Sensitivity testing on other committed and other planned development was carried out with the proposed development in place in 2017, 2022 and 2032. The junction will operate at capacity with queues and delays during the AM peak hour. During the PM peak hour the junction will operate within capacity with small queues and delays.

#### R135 / N2 Link Road Roundabout Junction

13.67 The following tables show the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the existing R135 / N2 Link Road priority junction.

Table 13-15
R135 / N2 Link Road Roundabout Junction : AM Peak

Δ	AM Peak				With Dev	2022 No Dev	2022 With Dev	2022 Sen Flows		2032 With Dev	2032 Sen Flows
		RFC value	0.22	0.22	tion 61 0.23	0.23	0.23	0.25	0.24	0.24	0.26
	R135	Average Queue (Vehicles)	0	Fig in a	0	0	0	0	0	0	0
	North	Average delay (sec / veh)	3	FO Pride	3	3	3	3	3	3	3
		Total Delay (veh / min)	0.33	0.34	0.35	0.36	0.36	0.39	0.37	0.38	0.40
		RFC value	0.09	0.10	0.10	0.10	0.10	0.12	0.10	0.10	0.12
R135 / N2 Link Road	R135	Average Queue (Vehicles)	0	0	0	0	0	0	0	0	0
Roundabout Junction	South	Average delay (sec / veh)	2	2	2	2	2	2	2	2	2
		Total Delay (veh / min)	0.12	0.13	0.13	0.13	0.13	0.16	0.14	0.14	0.16
		RFC value	0.18	0.18	0.19	0.19	0.19	0.19	0.19	0.20	0.20
	N2	Average Queue (Vehicles)	0	0	0	0	0	0	0	0	0
	Link Road	Average delay (sec / veh)	3	3	3	3	3	3	3	3	3
		Total Delay (veh / min)	0.26	0.26	0.27	0.27	0.27	0.27	0.29	0.29	0.29

Table 13-16
R135 / N2 Link Road Roundabout Junction : PM Peak

P	M Pea	ak	2016	2017 No Dev	2017 With Dev	2022 No Dev	2022 With Dev	2022 Sen Flows	2032 No Dev	2032 With Dev	2032 Sen Flows
		RFC value	0.13	0.14	0.14	0.14	0.14	0.16	0.15	0.15	0.16
	R135	Average Queue (Vehicles)	0	0	0	0	0	0	0	0	0
	North	Average delay (sec / veh)	2	2	2	2	2	2	2	2	2
		Total Delay (veh / min)	0.18	0.19	0.19	0.20	0.20	0.22	0.21	0.21	0.22
		RFC value	0.22	0.22	0.22	0.23	0.23	0.25	0.24	0.24	0.25
R135 / N2 Link Road	R135	Average Queue (Vehicles)	0	0	0	0	0	0	0	0	0
Roundabout Junction	South	Average delay (sec / veh)	2	2	2	2	2	2	2	2	2
		Total Delay (veh / min)	0.33	0.34	0.34	0.35	0.35	0.38	0.38	0.38	0.40
		RFC value	0.22	0.22	0.22	0.23	0.23	0.23	0.24	0.24	0.24
	N2 Link	Average Queue (Vehicles)	0	0	0	0	et 15°C.	0	0	0	0
	Road	Average delay (sec / veh)	3	3	3	only any or	3	3	3	3	3
		Total Delay (veh / min)	0.33	0.34	0.3420	0.35	0.35	0.36	0.38	0.38	0.38

- 13.68 Tables 13-15 and 13-16 above indicate that at present the R135 / N2 Link Road roundabout junction will operate within capacity, with no queues and minimal delays during the AM and PM peak hours.
- 13.69 With the proposed development in place in 2017, 2022 and 2032 the roundabout junction will operate within capacity with no queues and minimal delays during the AM and PM peak hours.
- 13.70 Sensitivity testing was undertaken to model the impact of other permitted development with the proposed development in place in 2022 and 2032. These analyses indicated that the roundabout junction will operate within capacity, with no queues and minimal delays during AM and PM peak hours.

#### Signalised Junctions

- 13.71 Capacity assessments using the computer programme OSCADY PRO have also been carried out on the following junctions:
  - R135 / Elm Road Signalised Junction
  - R135 / L3125 Signalised Junction
- 13.72 Full details of the capacity assessments are contained in Appendix 13E OSCADY PRO Results.
- 13.73 The parameters shown in the tables are defined as follows:
  - Max Degree of Saturation (%) is a ratio of demand to capacity on each
    approach to the junction, with a value of 100% meaning that demand
    and capacity are equal and no further traffic is able to progress through
    the junction. Values over 90% are typically regarded as suffering from
    traffic congestion, with queues of vehicles beginning to form.

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- Queue at end of Red is the number of vehicles queued on the approach arm at the end of red.
- Average Delay is the average number of seconds delay to each vehicle in the time period.
- Practical Reserve Capacity is the capacity available relative to a capacity of 90%. A positive PRC indicates that a junction has spare capacity and may be able to accept more traffic. A negative PRC indicates that the junction is over capacity and is suffering from traffic congestion.

#### R135 / Elm Road Signalised Junction

13.74 The following tables show the predicted degree of saturation, average queue lengths, average vehicle delay, total junction delays and practical reserve capacity for the existing R135 / Elm Road signalised junction.

Table 13-17
R135 / Elm Road Signalised Junction : AM Peak

	AM P	eak	2016	2017 No Dev	2017 With Dev	2022 No Dev	Dev	2022 With Sens Flows	2032 No Dev	2032 With Dev	2032 With Sens Flows
		Max DoS %	28%	29%	29%	30%	√√30%	31%	31%	31%	32%
	R135	Q red (pcu's)	5	5	5	5 offi	5	6	6	6	6
	North	Average delay (s)	24	25	25 ٍ وَ	il 25	25	28	25	25	27
		PRC %	219.81	213.13	212013	202.50	201.57	190.85	195.14	189.97	180.55
R135 /		Max DoS %	18%	18%	1218%	19%	19%	19%	20%	20%	20%
Elm Road	N2	Q red (pcu's)	1	~~~ × × ~	Will <sup>e</sup> 1	1	1	1	1	1	1
Signalised Junction	Slip Road	Average delay (s)	56	For 56 971	57	57	57	57	57	57	57
Junction		PRC %	396.98	<b>3</b> 96.98	396.98	377.11	377.11	377.11	358.75	358.75	358.75
		Max DoS %	29&ent	29%	29%	30%	30%	31%	32%	32%	32%
	R135	Q red (pcu's)	CA <sup>T</sup>	4	5	5	5	5	5	5	5
	South	Average delay (s)	29	28	28	28	28	28	29	29	29
		PRC %	218.59	218.11	216.46	206.92	205.38	191.82	188.42	193.64	181.15

Table 13-18
R135 / Elm Road Signalised Junction : PM Peak

	PM P	eak	2016	2017 No Dev	2017 With Dev	2022 No Dev	2022 With Dev	2022 With Sens Flows	2032 No Dev	2032 With Dev	2032 With Sens Flows
		Max DoS %	31%	31%	31%	33%	32%	34%	34%	34%	35%
	R135	Q red (pcu's)	5	5	5	6	6	6	6	6	6
	North	Average delay (s)	20	20	21	21	20	23	21	21	22
		PRC %	193.95	192.36	187.66	174.14	180.97	165.20	166.81	166.14	157.61
D405 /		Max DoS %	25%	25%	25%	26%	26%	26%	27%	27%	27%
R135 / Elm Road	N2	Q red (pcu's)	1	1	1	1	1	1	1	1	1
Signalised Junction	Slip Road	Average delay (s)	59	59	59	59	59	59	60	60	60
Junction		PRC %	261.44	261.44	261.44	250.81	250.81	250.81	231.32	231.32	231.32
		Max DoS %	31%	32%	32%	33%	33%	34%	34%	34%	35%
	R135	Q red (pcu's)	4	4	4	4	5	5	5	5	5
	South	Average delay (s)	33	33	33	33	34	32	34	34	32
		PRC %	189.15	185.94	191.94	173.79	175.23	164.92	166.68	165.30	162.20

- 13.75 Tables 13-17 and 13-18 above indicate that at present the R135 / Elm Road signalised junction operates within capacity with minimal queues and delays during the AM and PM peak hour
- 13.76 With the development in place in 2017, 2022 and 2032 the junction will continue to operate within capacity with minimal queues and delays during the AM and PM peak hour.
- 13.77 Sensitivity testing was undertaken to model the impact of other permitted development with the proposed development in place in 2022 and 2032. These analyses indicated that the signalised junction will operate within capacity, with no queees and minimal delays during the AM and PM peak hours.

13.78

#### R135 / L3125 Kilshane Crossroads Signalised Junction

13.79 The following tables show the predicted degree of saturation, average queue lengths, average vehicle delay, total junction delays and practical reserve capacity for the existing R135 / L3125 signalised junction at Kilshane Cross.

Table 13-19
R135 / L3125 Signalised Junction : AM Peak

	AM P	eak	2016	2017 No Dev	2017 With Dev	2022 No Dev	2022 With Dev	2022 With Sens Flows	2022 With Link Rd	2032 No Dev	2032 With Dev	2032 With Sens Flows	2032 With Link Rd
		Max DoS %	47%	47%	49%	49%	51%	50%	32%	53%	53%	54%	34%
	R135	Q red (pcu's)	12	12	12	12	12	13	8	13	13	14	9
	North	Average delay (s)	42	42	44	43	44	43	39	44	44	44	40
		PRC %	92.75	91.34	83.93	84.99	77.84	79.79	178.98	70.97	70.58	68.97	167.01
		Max DoS %	84%	85%	85%	90%	89%	90%	86%	92%	92%	94%	90%
	L3125	Q red (pcu's)	17	17	17	19	19	19	17	21	20	23	19
	East	Average delay (s)	51	51	54	59	59	59	55	61	61	79	65
R135 / L3125		PRC %	6.11	5.38	5.38	-0.38	1.86	-0.38	4.56	-2.21	-2.21	-4.36	0.33
Signalised junction		Max DoS %	84%	85%	88%	88%	90%	91%	84%	94%	94%	95%	87%
junionom	R135	Q red (pcu's)	12	12	13	13	14	15	12	15	15	18	14
	South	Average delay (s)	95	97	103	100	110	97	72	88	89	109	79
		PRC %	6.78	5.83	2.90	2.47	-0.39	15-0.94	7.12	-4.02	-4.29	-5.43	2.93
		Max DoS %	88%	89%	86%	89%	4 · 89%	93%	85%	93%	92%	93%	89%
	L3125		12	13	12	130	of 13	14	12	14	14	15	14
	West	Average delay (s)	82	83	81	DILL SAIL	89	89	39	88	89	102	87
		PRC %	1.30	0.66	4.9400	<b>1.09</b>	1.40	-2.74	5.54	-2.77	-2.77	-2.77	1.19

- 13.80 Table 13.19 above indicates that at present the R135 / L3125 signalised junction at Kilshane Cross is operating at capacity with queues and delays during the AM peak hour.
- 13.81 With the development in place in 2017 the signalised junction will continue to operate at capacity with queues and delays during the AM peak hour.
- 13.82 With the development in place in 2022 and 2032 the junction will reach its maximum capacity with queues and delays forming during the AM peak hour.
- 13.83 It should be noted that without the proposed development in place in 2022 and 2032, the junction will have reached its maximum capacity with queues and delays forming during the AM peak hour.
- 13.84 Sensitivity testing of granted planning applications within the area indicates that the signalised junction will have reached its maximum capacity in 2022 and 2032, with queues and delays forming during the AM peak hour.
- 13.85 With the opening of the Western (Airport) Link Road from the R135 / N2 roundabout to Dublin Airport, the impact on the R135 / L3125 signalised junction will be reduced. For the purposes of this assessment it was assumed that 50% of the traffic flows travelling from the R135 North direction to the L3125 East and from the L3125 East direction to the R135 North would now travel via the Western Link Road. As a result, the signalised junction will operate within capacity in 2022 and 2032, with queues and delays during the AM peak hour.

Table 13-20 R135 / L3125 Signalised Junction : PM Peak

	PM Peak		2016	2017 No Dev	2017 With Dev	2022 No Dev	2022 With Dev	2022 With Sens Flows	2022 With Link Rd	2032 No Dev	2032 With Dev	2032 With Sens Flows	2032 With Link Rd
		Max DoS %	44%	44%	43%	46%	45%	46%	29%	46%	46%	49%	29%
	R135	Q red (pcu's)	9	9	9	10	10	10	6	9	10	10	6
	North	Average delay (s)	47	47	46	53	53	54	42	46	46	47	42
		PRC %	102.77	101.43	110.10	92.53	103.41	96.21	211.73	95.33	97.14	85.67	213.29
		Max DoS %	91%	92%	92%	96%	96%	98%	87%	99%	99%	99%	91%
	L3125	Q red (pcu's)	19	20	20	23	23	25	16	30	26	26	18
	East	Average delay (s)	63	64	64	72	72	79	65	106	81	81	69
R135 / L3125		PRC %	-1.40	-2.41	-2.41	-6.26	-6.29	-8.46	3.22	-9.38	-9.38	-9.38	-1.35
Signalised junction		Max DoS %	93%	93%	92%	98%	96%	105%	90%	108%	99%	102%	90%
janotion	R135	Q red (pcu's)	13	13	13	15	14	11	9	16	10	18	13
	South	Average delay (s)	119	121	121	131	133	165	96	265	142	145	113
		PRC %	-3.47	-4.14	-4.93	-8.25	-6.90	14.13	-0.05	-17.33	-9.19	-12.11	-0.55
		Max DoS %	89%	90%	93%	94%	y . 97%	94%	88%	97%	100%	101%	91%
	L3125	Q red (pcu's)	15	15	17	185	o <sup>t</sup> 19	18	15	21	22	22	17
		Average delay (s)	73	74	82	Jul 8 site	92	82	42	113	100	100	73
		PRC %	0.37	-0.36	-3.63	er-4.52	-7.65	-4.52	1.74	-7.52	-10.56	-10.56	-1.46

- 13.86 Table 13-20 above indicates that at present the R135 / L3125 signalised junction at Kilshane Cross operates outside capacity with queues and delays during the PM peak hour.
- 13.87 In 2017, 2022 and 2032 without the proposed development in place, the R135 / L3125 signalised junction operates outside capacity with queues and delays during the PM peak hour.
- 13.88 With the development in place in 2017, 2022 and 2032, the junction will continue to operate outside capacity, with queues and delays during the PM peak hour.
- 13.89 Sensitivity testing of granted planning applications within the area indicates that the signalised junction will have reached its maximum capacity in 2022 and 2032, with queues and delays forming during the AM peak hour.
- 13.90 With the opening of the Western (Airport) Link Road from the R135 / N2 roundabout to Dublin Airport, the impact on the R135 / L3125 signalised junction will be reduced. For the purposes of this assessment it was assumed that 50% of the traffic flows travelling from the R135 North direction to the L3125 East and from the L3125 East direction to the R135 North would now travel via the Western Link Road. As a result the signalised junction will operate within capacity in 2022 and 2032, with queues and delays during the PM peak hour.

#### **Road Capacity Assessment**

- 13.91 A capacity assessment of the R135 has been undertaken to determine the impact the proposed development flows will have on the R135 Regional Road. The AM and PM peak hour traffic counts have been converted to AADT (Annual Average Daily Traffic) using the methodology in TII Project Appraisal Guidelines 'Unit 16.2 Expansion Factors for Short Period Traffic Counts'.
- 13.92 The vehicle flows (Annual Average Daily Traffic) given in Table 6/1 of TD 9/12 of the Design Manual for Roads and Bridges represent the approximate two-way flows which correspond to Level of Service D in reasonably level terrain. This is the level of service at which passing becomes extremely difficult and begins to affect the overall flow of the road.
- 13.93 Table 6/1 of the TII TD 9/12 indicates that the R135 would be considered as a Type 2 Single Carriageway, with a capacity of 8,600 AADT for a Level of Service D.
- 13.94 The following tables calculate the existing AADT for the R135 and the future AADT for the R135 when the development is operational in the years 2017, 2022 and 2032.

Table 13-21
2016 Existing Annual Average Daily Traffic

				<u> </u>					
STEP 1: Conversion of short period traffic counts to average daily traffic									
	Flows	PAG to factor of the state of t		aily flow PAG*factor)	Average Daily traffic for 22 <sup>nd</sup> June 2016				
AM peak (07:30 – 08:30)	633	₹Q:07	,	9,042	8,315				
PM peak (16:45 – 17:45)	683	0.09	•	7,588	0,010				
* Project Appraisal Guidelines	inspent	COT							
STEP 2: Conversion of ave	rage dai	ly traffic to w	eekly av	erage daily tr	affic				
Average Daily traffic for 22	June				WADT				
2016	Julie	PAG* fa	ctor	Weekly Average Daily Traffic					
2010				(Avg. Daily traffic * PAG factor					
8,315		0.97			8,065				
STEP 3: Conversion of wee	ekly aver	age daily traf	fic to an	nual average	daily traffic)				
AADT									
WADT		PAG* factor		Annually Av	erage Daily Traffic				
				(WADT	* PAG factor)				
8,065		0.96			7,742				

13.95 From Table 13-21 above, the existing AADT for the R135 is 7,742 AADT which is below the recommended 8,600 AADT for a Level of Service D for a Type 2 Single Carriageway.

# Table 13-22 2017 Proposed Annual Average Daily Traffic with Development Flows

STEP 1: Conversion of short period traffic counts to average daily traffic									
	Flows	PAG* factor		aily flow (PAG*factor)	Average Daily traffic for 22 <sup>nd</sup> June 2017				
AM peak (07:30 - 08:30)	639	0.07		9,128	8,402				
PM peak (16:45 – 17:45)	691	0.09		7,677	0,402				
* Project Appraisal Guidelines									
STEP 2: Conversion of ave	rage dai	ly traffic to w	eekly av	erage daily tr	affic				
Average Daily traffic for 22 <sup>r</sup> 2017	<sup>id</sup> June	PAG* fa	ctor	Weekly Ave	WADT erage Daily Traffic raffic * PAG factor)				
8,402		0.97			8,150				
STEP 3: Conversion of wee	ekly aver	age daily tra	fic to ar	nual average	daily traffic)				
WADT PAG* factor Annually Average Daily Traffic (WADT * PAG factor)									
8,150		0.96			7,824				

13.96 From Table 13-22 above, the AADT for the R135 in 2017 with the development fully operational is 7,824 AADT which is below the recommended 8,600 AADT for a Level of Service D for a Type 2 Single Sarriageway.

Table 13-23
2022 Proposed Annual Average Daily Traffic with Development Flows

		CA CA			
STEP 1: Conversion of sho	rt period	traffic counts	s to ave	rage daily traf	fic
	Flows	PAG* factor		aily flow 'PAG*factor)	Average Daily traffic for 22 <sup>nd</sup> June 2032
AM peak (07:30 – 08:30)	659	0.07		9,414	8,674
PM peak (16:45 – 17:45)	714	0.09		7,933	0,074
* Project Appraisal Guidelines					
STEP 2: Conversion of ave	rage dai	ly traffic to w	eekly av	erage daily tr	affic
Average Daily traffic for 22 2016	<sup>nd</sup> June	PAG* fa	ctor	Weekly Ave	WADT erage Daily Traffic raffic * PAG factor)
8,674		0.97			8,414
STEP 3: Conversion of wee	ekly aver	age daily trat	fic to ar	nual average	daily traffic)
WADT		PAG* fa	ctor	Annually Av	AADT erage Daily Traffic * PAG factor)
8,414		0.98			8,246

13.97 From Table 13-23 above, the AADT for the R135 in 2022 with the development fully operational is 8,246 AADT which is below the recommended 8,600 AADT for a Level of Service D for a Type 2 Single Carriageway.

# Table 13-24 2032 Proposed Annual Average Daily Traffic with Development Flows

STEP 1: Conversion of sho	rt period	traffic counts	s to ave	rage daily traf	fic			
	Flows	PAG* factor		aily flow /PAG*factor)	Average Daily traffic for 22 <sup>nd</sup> June 2032			
AM peak (07:30 – 08:30)	688	0.07		9,828	9,036			
PM peak (16:45 – 17:45)	742	0.09		8,244	9,030			
* Project Appraisal Guidelines								
STEP 2: Conversion of ave	rage dai	ly traffic to w	eekly av	erage daily tr	affic			
Average Daily traffic for 22 2016	<sup>nd</sup> June	PAG* fa	ctor	Weekly Ave	WADT erage Daily Traffic raffic * PAG factor)			
9,036		0.97		8,765				
STEP 3: Conversion of wee	ekly aver	age daily tra	fic to ar	nual average	daily traffic)			
WADT		PAG* fa	ctor	Annually Av	AADT erage Daily Traffic * PAG factor)			
8,765		0.98			8,590			

13.98 From the table above the AADT for the R135 in 2032 with the development fully operational is 8,590 AADT which is below the recommended 8,600 AADT for a Level of Service D for a Type 2 Single Carriageway.

#### PROPOSED MITIGATION MEASURES

- 13.99 It has been demonstrated in this chapter that the proposed development, involving increased intake and output to / from the existing C&D waste recovery facility at Huntstown would generate an increase in HGV movements on the surrounding local network when compared to existing levels. HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse impacts:
  - Roadstone Ltd would adhere to a routing policy to ensure all movements are made via the strategic road network to avoid HGV's passing through residential areas as far as is practical.
  - Roadstone Ltd would employ a policy of safety and environmental awareness for all HGV drivers accessing the site.
  - It may be possible to reduce the number of additional traffic movements generated by the increased activity at the C&D waste recovery facility by encouraging "backloading", whereby trucks delivering aggregates / blocks from the adjoining facility will return with pre-sorted construction and demolition waste for the recovery facility. Recycled secondary aggregates may also be dispatched off-site in place of virgin aggregates from the adjoining quarry.
  - Efforts should be made to promote backloading practices as aside from reducing traffic impact, it can offer opportunities to significantly reduce haulage costs, enhance the viability of the recovery operation and contribute to a reduction in traffic related emissions generated by the construction and development sector.

#### CONCLUSIONS

- 13.100 This chapter assesses the traffic and transport implications of the proposed increase in the current rate of waste intake at its licensed construction & demolition recovery facility at Huntstown Quarry from a maximum of 24,950 tonnes per annum at present to a maximum of 95,000 tonnes per annum in future years
- 13.101 The principal objective of this assessment was to provide a detailed consideration of the proposed development in terms of highways and transportation planning. This includes details of all the traffic and movement activity associated with the proposed development and any resulting traffic and transport related impacts.
- 13.102 In accordance with the scale of development and location, realistic consideration has been given to the non-car accessibility of the site. This demonstrated that non-car accessibility is adequate for the type of development located in this area.
- 13.103 The application site is well located in terms of access to the strategic highway network and all HGV traffic would be routed on roads considered suitable to accommodate frequent HGV movement.
- 13.104 Junction capacity assessment was carried out to determine the impact the additional development trips would have on the existing junctions within the vicinity of the proposed development. The analysis showed that the existing R135 / Elm Road signalised junction and the R135 / N2 Slip Road roundabout junction will operate within capacity when the development is operational in 2017, 2022 and 2032.
- 13.105 The R135 / N2 Slip Road priority junction and the R135 / L3125 signalised junction at Kilshane Cross are currently operating at capacity. With the development operational in 2017, 2022 and 2032 both junctions will continue to operate at capacity with queues and delays during the AM and PM peak hours. It should be noted the development flows will have an insignificant impact on the operational performance of both junctions as the junctions are currently operating at capacity and will continue to do so with no development in place in 2017, 2022 and 2032 during the AM and PM peak hours.
- 13.106 Sensitivity testing was undertaken for other committed and other planned development with the proposed development in place in 2022 and 2032. These analyses showed that the existing R135 / Elm Road signalised junction and the R135 / N2 Slip Road roundabout junction will operate within capacity when the developments are operational 2022 and 2032. The R135 / N2 Slip Road priority junction and the R135 / L3125 signalised junction are currently operating at capacity. With all developments operational in 2022 and 2032 both junctions will continue to operate at capacity with queues and delays during the AM and PM peak hours.
- 13.107 With the future opening of the Western Link Road, traffic flows through the R135 / L3125 signalised junction at Kilshane Cross travelling to and from Dublin Airport will re-distribute onto the Western Link Road. As a result, the R135 / L3125 signalised junction will operate within capacity in 2022 and 2032 during the AM and PM peak hours with the proposed development in place.
- 13.108 A road capacity assessment of the R135 (North Road) was carried out to determine the impact the additional development flows would have on the R135 Regional Road. The AM and PM peak hour flows were converted to

- AADT using the methodology in TII Project Appraisal Guidelines. Table 6/1 of the TII TD 9/12 indicated that the R135 would be considered as a Type 2 Single Carriageway with a capacity of 8,600 AADT for a level of Service D.
- 13.109 The assessment showed that in 2016 the R135 operates within capacity for a level of service D with an existing AADT level 7,742 vehicles.
- 13.110 In 2017, 2022 and 2032 with the additional development trips and an increase in the background flows, the R135 will have a proposed AADT of 7,824 in 2017, a proposed AADT of 8,246 in 2022 and a proposed AADT of 8,590 in 2032 which is below the recommended AADT capacity for a Level of Service D for a Type 2 Single Carriageway.
- 13.111 A review of accident records on the surrounding highway network covering the period from 2006 to 2013 showed that no fatal or serious incidents were recorded at the North Road access to the Huntstown Quarry Complex. The one fatal incident and one serious incident recorded both occurred at Kilshane Cross.
- 13.112 Three minor incidents occurred in close proximity to the North Road quarry access. However it appears these took place prior to the N2 road realignment and upgrading. None are therefore specifically relevant to the development proposal, both in terms of location and incident detail. It is considered that the proposed development would not have a significant impact on road safety.
- 13.113 Overall it is considered that the development proposal would have a minimal impact in terms of highway and transportation. For the above reasons the proposed development of the site accords with the national, regional and county planning policies and is considered to be acceptable in traffic and transport terms.

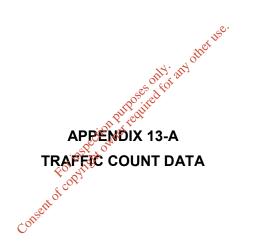
APPENDICES

APPENDICES

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Client: Job No: Survey Date: Survey Method: Weather AM: Weather PM Site No: Road: Roadplan Consulting 3082-RE Huntstown Quarry 22/06/2016 Video Observation Cloudy Site 1 N2 / R135 Roundabout

				ad:	142/11/00/	Roundabout		
Entry:	Arm A - R135 (N) Destination: Arm A - R135 (N)		Doctination:	Arm B - R135 (S)			Destination: Arm C - N2 On/ Off Slip Road	
	CAR LGV OGV1 OGV2	PSV MCL PCL Total		LGV OGV1 OGV2	PSV MCL	PCL Total	CAR LGV OGV1 OGV2 PSV	MCL PCL Total
07:00	0 0 0 0	0 0 0 0	15	5 1 0	0 0	1 22	18 8 2 1 0	0 0 29
07:15 07:30	0 0 0 0	0 0 0 0	17 24	6 3 3 10 0 1	2 0 2 1	0 31 0 38	15 6 4 1 1 17 6 6 1 1	0 0 27 0 0 31
07:45 1 Hr	0 0 0 0	0 0 0 0	34 90	6 1 1 27 5 5	3 0 7 1	2 47 3 138	23 3 1 1 0 73 23 13 4 2	1 0 29 1 0 116
08:00 08:15	0 0 0 0	0 0 0 0	37 31	8 0 0 4 1 0	2 0	1 48 0 37	22 7 2 3 0 28 8 3 1 3	0 0 34 2 0 45
08:30	0 0 0 0	0 0 0 0	19	4 1 0	1 0	0 25	20 5 3 1 0	0 0 29
08:45 1 Hr	0 0 0 0	0 0 0 0	19 106	3 1 1 19 3 1	2 0 5 1	0 26 1 136	23 5 1 1 2 93 25 9 6 5	1 0 33 3 0 141
09:00 09:15	0 0 0 0	0 0 0 0	20 25	3 1 1 4 1 0	1 0 2 0	1 27 0 32	20 3 1 0 0 15 2 0 3 0	0 0 20
09:30 09:45	0 0 0 0	0 0 0 0	28 30	6 0 0 5 0 0	0 0	0 34 0 36	14 4 2 1 0 11 8 2 3 0	0 0 21 0 0 24
1 Hr 10:00	0 0 0 0	0 0 0 0	103	18 2 1	4 0	1 129 1 20	60 17 5 7 0 13 10 3 3 0	0 0 89
10:15	0 0 0 0	0 0 0 0	13	4 1 3	0 0	0 21	13 5 1 0 0	0 0 19
10:30 10:45	0 0 0 0	0 0 0 0	22 9	5 1 0 2 1 2	1 0	0 29 0 16	9 1 1 0 0 15 3 2 2 0	2 0 13 0 0 22
1 Hr 11:00	0 0 0 0	0 0 0 0	55 16	15 4 6 7 0 1	4 1 2 0	1 86	50 19 7 5 0 3 1 3 0 0	
11:15 11:30	0 0 0 0	0 0 0 0	17 22	3 2 1 2 4 1	0 0	0 23	11 1 1 0 0 7 3 3 2 0	0 0 13 0 0 15
11:45 1 Hr	0 0 0 0	0 0 0 0	23 78	5 0 1 17 6 4	2 0	0 31	10 2 1 1 0 31 7 8 3 0	0 0 14
12:00	0 0 0 0	0 0 0 0	12	5 1 1	0 0	0 19	10 0 3 1 0	0 0 14
12:15 12:30	0 0 0 0 0 0 0 1 1 0	0 0 0 0 0 0 0 2	15 19	5 2 0 5 0 1	1 1	1 25 0 25	15 3 0 1 0 13 6 2 0 0	1 0 22
12:45 1 Hr	0 1 0 0	0 0 0 1	16 62	4 2 0 19 5 2	1 0	0 23 1 92	9 1 1 0 0 47 10 6 2 0	0 0 11 2 0 67
13:00 13:15	0 0 0 0 0 1 0 0	0 0 0 0 0 2 0 3	14 29	6 0 0 7 2 1	2 0 0	0 22 0 39	17 4 1 1 0 10 1 1 0 0	0 0 23 0 0 12
13:30	0 0 0 0	0 0 0 0	27 19	5 1 1 3 0 2	1 1	1 37 0 26	20 3 0 1 0 22 2 2 0 0	0 0 24
13:45 1 Hr	1 0 0 0	0 2 0 3	89	21 3 4	4 2	1 124	69 10 4 2 0	0 0 85
14:00 14:15	1 0 0 0 0	0 0 0 1	23 19	3 1 0	1 0	0 28 0 30	19 4 2 1 0 9 4 4 1 0	
14:30 14:45	0 0 0 0	0 0 0 0	26 26	7 0 0 7 0 0	1 0	0 34 2 37	11 5 1 1 0 16 6 2 0 0	0 0 18 0 0 24
1 Hr 15:00	1 0 0 0	0 0 0 1 0 0 0 0	94 16	26 2 0 3 0 0	4 1 2 0	2 129 0 21	55 19 9 3 0 23 2 2 0 0	0 0 86 0 0 27
15:15 15:30	0 0 0 0	0 0 0 0	20 19	1 0 0	0 0	0 21 0 28	18 3 3 0 0 12 5 1 0 0	0 0 24 0 0 18
15:45	0 0 0 0	0 0 0 0	18	3 1 1	1 0	1 25	11 3 2 1 0	1 0 18
1 Hr 16:00	0 0 0 0	0 0 0 0	73 17	13 1 3 4 3 0	2 0	1 95 0 26	64 13 8 1 0 12 5 0 0 0	0 0 17
16:15 16:30	0 0 0 0	0 0 0 0	18 16	2 0 0 1 0 0	0 4 1 0	0 24 0 18	19 5 0 0 1 16 4 1 0 0 0	1 0 26 0 0 21
16:45 1 Hr	0 0 0 0	0 0 0 0	28 79	3 1 0 10 4 0	1 0	0 33	16 7 0 0 0 63 21 1 0 1	0 0 23 1 0 87
17:00 17:15	0 0 0 0	0 0 0 0	23	4 0 1	1 0	3 32	10 6 1 7 0 0	
17:30	0 0 0 0	0 0 0 0	14	6 1 1	0 1	0 23	15 3 0 0 0	0 0 19
17:45 1 Hr	0 0 0 0	0 0 0 0	18 68	1 0 0 17 1 3	0 1 3 2	0 20 4 98	62 12 2 3 0	0 0 16 0 0 79
18:00 18:15	0 1 0 0 0 0 0	0 0 0 1 0 0	17 19	1 1 1 1	3 0 0 0	1 24 0 20	3 0 0 0 5 14 0 3 2 0 0	0 0 19
18:30 18:45	0 0 0 0	0 0 0 0	17 17	1 0 0	0 0	0 18 0 21	2 0 0 0	0 0 16 0 0 16
1 Hr	0 1 0 0	0 0 0 1	70	4 1 1	6 0	1 3	60 11 3 1 0	0 0 75
12 Hrs	2 3 1 0	0 2 0 8	967	206 37 30	52 13	17 01322	727 187 75 37 8	10 0 1044
Total	2 3 1 0	0 2 0 8	967	206 37 30	52 13	07 d322	727 187 75 37 8	10 0 1044
Check Entry:	Arm B - R135 (S)	8			<sub>2</sub> 60	WIT 1322		1044
	Destination: Arm A - R135 (N) CAR LGV OGV1 OGV2	PSV MCL PCL Total		Arm B - R135 (S) LGV OGV1 OGV2	PSV MC	PCL Total	Destination: Arm C - N2 On/ Off Slip Road  CAR LGV OGV1 OGV2 PSV	MCL PCL Total 1
07:00	9 2 0 0	0 0 0 11	0	0 0 0 0	08 108	0 0	3 0 2 1 0	
07:15 07:30	6 6 0 1	0 0 0 13	0	0 0 0	77.0			0 0 6
07:45	1 3 0 0 10 4 0 1					0 0	8 1 2 3 0	
1 Hr 08:00		3 0 0 7 0 0 0 15	0	0 0 0		0 0 0 0 0 0	12 4 0 3 1 11 3 0 7 0	0 0 14 0 0 20 0 0 21
08:15 08:30	26 15 0 2 7 2 0 1	3 0 0 7 0 0 0 15 3 0 0 46 1 0 1 12	0 0	0 0 0 0 0 0 0 0 0	0 0	0 0 0 0 0 0 0 0	12 4 0 3 1 11 3 0 7 0 34 8 4 14 1 12 5 0 3 0	0 0 14 0 0 20 0 0 21 0 0 61 0 0 20
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08:45	7 2 0 1 1 5 5 0 0 0 6 6 1 3 3 0 0 7 3 0 1 1 25 11 3 2 1 6 5 1 1 3 1 3 2 1 7 2 2 1 1 5 1 1 4 6 6 6 1 1 1 6 0 0 1 1 6 0 1 1 6 0 1 1 6 0 1 1 6 0 1 6 1 6	3 0 0 7 0 0 0 15 3 0 0 0 15 1 0 0 1 11 2 1 1 4 1 0 0 0 12 4 2 2 2 4 4 2 0 0 0 15 5 0 0 2 2 10 1 0 0 29 1 0 0 29 1 0 0 29 1 0 0 20 1 0 0 20 1 0 0 20 1 0 0 20 1 0 0 20 1 0 0 20 2 0 0 0 2 20 1 0 0 20 2 0 0 0 20 2 0 0 0 20 2 0 0 0 20 3 0 0 0 20 3 0 0 0 0 20 3 0 0 0 0 20 3 0 0 0 0 20 3 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 20 2 0 0 0 20 3 0 0 0 20 3 0 0 0 0 20 3 0 0 0 0 20 3 0 0 0 0 20 3 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 0 0 0 0 20 1 1 0 0 0 20 2 0 1 0 0 20 1 1 0 0 0 20 2 0 1 0 0 20 1 1 0 0 0 20 2 0 1 0 0 20 1 1 0 0 0 20 2 0 1 0 0 20 3 1 1 0 0 0 20 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12	0 0 14 0 0 0 20 0 0 21 0 0 0 21 0 0 0 27 1 0 0 29 1 0 0 29 1 0 0 29 1 0 0 29 1 1 0 26 0 0 0 26 0 0 15 0 0 0 15 0 0 0 24 0 0 0 25 0 0 0 15 0 0 0 25 0 0 15 0 0 0 25 0 0 15 0 0 0 25 0 0 0 25 0 0 15 0 0 0 25 0 0 0 24 0 0 0 25 0 0 0 25 0 0 0 25 0 0 0 25 0 0 0 27 0 0 0 25 0 0 0 25 0 0 0 25 0 0 0 23 0 0 0 24 0 0 0 25 0 0 0 26 0 0 0 26

Fig.	Entry:	Arm C - N Destination	2 On/ Off Slip on: Arm A - R LGV OG	135 (N)	PSV	MCL F	PCL Total	Destination CAR	on: Arm E	B - R135 (S) OGV1 OGV2	PSV	MCL	PCL	Total	Destinat CAR	ion: Arm	C - N2 (	On/ Off SI	ip Road 2 PSV	MCL	PCL	Total	Arm Totals
Second Property			2	3 2		0	0 10		6	2 1	0	0		32		0	) (	) (	0 0		0		42
The column   The	07:30		4		0		0 12	39	9		2	1	1 0	57	0			) (	0 0	0	0	1 0	69
Section   Sect	1 Hr		16	1 0	0	0	0 45	117	33		3	1	0 1	168	0	1	2 (	) (	0 0	0	0		215
The color of the	08:15	16	4	0 0	0	1	0 21	34		1 4	0	0	0	45	0	0	) (	) (	0 0	0	0	0	66
Second Property	08:45	13	4	0 1	0		0 19	34	_	2 3	0	0	0	45	0	0	) (	) (	0 0	0	0	0	64
Second Property	09:00	11	4		0		0 19	25	8	2 3	3	0	0	41	0	0	) (	) (	0 0	0	0	0	60
The color   The	09:30	16	3	2 2	0	0	0 23	11		0 6	1	0	0	22	0	0	) (	) (	0 0	0	0		45
Section   Sect	1 Hr	56	16	6 4	0	0	0 82	70		3 15	5	0	0	113	_	0	)	1 (	0 0	0	0	1	196
Section   Sect	10:15	9	3	2 1	0	0	0 15	17	1	2 1		0	0	21	1	0	) (	) (	0 0	0	0	1	37
1100   100	10:45	10	3	4 0	0	0	0 17	14	2	0 6	0	0	0	22		0	) (	) (	0 0	0	0		39
128	11:00	8	2	1 0	0	0	0 11	10	4	2 2		0	0	18	0	0	) (	) (	0 0	0	0		29
The color   The	11:30	14	3		0	1	0 19	11	5	1 2	1	0	0	20	1	0	) (		1 0	0	0		41
1.00	1 Hr	50	12	6 3	0		0 74	46	17	4 8	1 0	0		76	2	0	) (	) .	1 0	0		3	
1.   1.   1.   1.   1.   1.   1.   1.	12:15	9	2	1 1 4 2	0	0	0 13	18	3	1 2	1	0		25	0	0	) (	) (	0 0	0	0	0	38 52
1300   1300	12:45	14			0		0 23	14	2		<u>3</u>	0	0	25		0	) (		0 0	0	0		48
1.50																					0		44 48
1400   1400		27		2 0						1 1 0 2			0								0		66 48
14-86   11	14:00	15	5	0 1	1	0	0 22	10		2 4	0	0	1	20	0	0	) (	) (	0 0	0	0	0	206 42
Column   C	14:30	11	4	2 0	0	0	0 25 0 17	18	6	3 2	1	0	0	30	0	0	) (	) (	0 0	0	0	0	47
12-90   11	1 Hr	53	16	7 3	_	0	0 80	55	13	9 16	3	0	0	97	0		) (	) (	0 0	0	0		177
	15:15	21	4	2 0		0	0 27	15	5	1 3		0		24	0		) (	) (	0 0	0	0		49 51
	15:45	13	6	0 3	0	0	0 22	13	3	3 5		0	0	24	0	0	) (	) (	0 0	0	0	0	46
	16:00	17	9	3 1	0	0	1 31	12	2	0 1	0	0	0	15	- 1	0	) (	) (	0 0	0	0	1	192 47
	16:30	30	7		1	0	0 39	29	7	1 1	0	0	0	38	1	0	) (	) (	0 0	0	0	1	60
1719   1719	1 Hr	84	30		1		1 130	74	15			0		107	2	0	) (	) (	0 0	0	0		239
1746   26   3   2   1   1   0   0   0   30   10   10   10	17:15	18	8	2 0	0	0	0 28	35	4	2 1	0	0		42		0	) (	) (	0 0	0	0	0	70
1915   22	17:45	26	3	2 1	1		0 33	22	3	2 2	0	0	0	29	1	0	) (	) (	0 0	0	0	1	63
	18:00	26	3	3 1		1	0 34	20	4	2 4	0	1 1		31	0	0	) (	) (	0 0	0		0	65
The color   The	18:30	25	2		0		0 30	17	2	0 4	1		0	24	0	0	) (	) (	0.00	0	0	0	54
The color   The				6 5		4					2	2	1	85					0		0		207
The column   The	12 Hrs Check	746	201	80 40	4	12		940	195	52 139	23	3	3		14	5	5 0	The same	1 0	0	0	22	
Company   Comp	Check			80 40	4	12		940	195	52 139	23	3	3			3.5	M.	2 .	1 0	0	0		
Fig. 10	ORIGIN																						
184   185		Origin: An	m A - R135 (I	N)	Bev	MCI I	OCI Total				Dev	MCI	DCI		Origin: A	ign(O-N	V2 On/ O	ff Slip Ro	ad nev	MCI	DCI	Total	Origin
184   183   50   18   9   9   2   3   28   5   18   10   29   3   28   18   18   18   18   18   18   18		Origin: An	m A - R135 (I LGV OG	V1 OGV2				CAR	LGV	OGV1 OGV2				Total	Origin: A	LGV	N2 On/ O / OGV	1 OGV2	2 PSV				Totals
Section   Sect	07:00 07:15	Origin: An CAR 33 32	m A - R135 (I LGV OG 13 12	3 1 7 4	0 3	0	1 51 0 58	12 14	LGV 2 7	OGV1 OGV2 2 1 2 4	0	0		Total	Origin: A C CAR 2 CAR 27	LGV B	N2 On/ O / OGV	1 OGV2	2 PSV 3 0 2 1	0		42 42	110 127
Section   Sect	07:00 07:15 07:30 07:45	33 32 41 57	m A - R135 (I LGV OG 13 12 16 9	3 1 7 4 6 2 2 2	0 3 3 3	0	1 51 0 58 0 69 2 76	12 14 13 21	2 7 7	OGV1 OGV2  2 1 2 4 0 3 0 8	0	0 0 0		Total	Origin: A C CAR 26 27 27 47 39	8 10 13 20	N2 On/ O / OGV	1 OGV2	2 PSV 3 0 2 1 5 2 2 0	0 0 1 0		42 42 69 62	110 127 165 174
1   1   1   1   1   2   7   10   4   1   27   7   72   28   8   16   44   5   2   138   130   48   7   14   0   1   0   227   17   18   18   18   18   18   18   1	07:00 07:15 07:30 07:45 1 Hr 08:00	Origin: An CAR  33 32 41 57 163	m A - R135 (I LGV OG 13 12 16 9 50	3 1 7 4 6 2 2 18 9 2 3	0 3 3 3 9	0 0 1 1 2	1 51 0 58 0 69 2 76 3 254 1 82	12 14 13 21 60	2 7 7 7 23 7	OGV1 OGV2  2 1 2 4 0 3 0 8 4 16 0 4	0	0 0 0 0		Total 27 27 36 07 32	Origin: A 2 CAR 26 27 47 39 139	8 10 13 20 51	N2 On/ O / OGV	1 OGV2	2 PSV 3 0 2 1 5 2 2 0 2 3	0 0 1 0	0 1 0 0	42 42 69 62 215 53	110 127 165 174 576
0930   42   10   2   1   0   0   0   55   12   4   3   3   2   0   0   32   27   7   2   8   1   0   0   45   13   13   1   13   2   3   1   0   0   0   0   0   15   1   1   1   1   1   1   2   1   1   2   1   1	07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30	Origin: An CAR 33 32 41 57 163 59 59 39 42	M A - R135 (I LGV OG 13 12 16 9 50 15 12 9	3 1 7 4 6 2 2 18 9 2 3 4 1 4 1 2 2	0 3 3 3 9	0 0 1 1 2 0 3	1 51 0 58 0 69 2 76 3 254 1 82 0 82 0 54 0 59	12 14 13 21 60 19 18 21	2 7 7 7 23 7 11 3 7	OGV1 OGV2  2 1 2 4 0 3 0 8 4 16 0 4	0	0 0 0 0		Total 27 27 36 107 32 41 31 34	26 27 47 39 139 37 50 56 47	8 10 13 20 51 12 10	N2 On/ O O O O O O O O O O O O O O O O O O	1 OGV2	2 PSV 3 0 2 1 5 2 2 0 2 3 2 0 4 0 4 0	0 0 1 0 1 0	0 1 0 0	42 42 69 62 215 53 66 74 64	110 127 165 174 576 167 189 159
1	07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr	Origin: An CAR  33 32 41 57 163 59 59 39 42 199	M A - R135 (I LGV OG 13 12 16 9 50 15 12 9 8 44	3 1 7 4 6 2 2 2 18 9 2 3 4 1 4 1 2 2 12 7	0 3 3 3 9 2 3 1 4	0 0 1 1 2 0 3 0 1	1 51 0 58 0 69 2 76 3 254 1 82 0 82 0 54 0 59 1 277	12 14 13 21 60 19 19 18 21	2 7 7 7 23 7 11 3 7 28	2 1 2 4 0 3 0 8 4 16 0 4 3 4 4 4 4 4 1 4 8 16	0	0 0 0 0 0 0 0 0 0 0 0 0	000	Total 27 27 36 107 32 41 31 34 138	26 27 47 39 139 37 50 56 47	8 10 13 20 51 12 10 13 10	N2 On/ O O O O O O O O O O O O O O O O O O	1 OGV2	2 PSV 3 0 2 1 5 2 2 0 2 3 2 0 4 0 4 0 4 0	0 0 1 0 1 0 1 0 0	0 1 0 0 0 1 1 0 0 0	42 42 69 62 215 53 66 74 64 257	110 127 165 174 576 167 189 159 157 672
10.15	07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15	Origin: An CAR  33 32 41 57 163 59 39 42 199 40 40 42	M A - R135 (I LGV OG 13 12 16 9 50 15 12 9 8 44 6 10	3 1 7 4 6 2 2 2 2 18 9 2 3 4 1 4 1 2 2 12 7 2 1 1 3	0 3 3 3 9 2 3 1 4 10	0 0 1 1 2 0 3 0 1 1 4	1 51 0 58 0 69 2 76 3 254 1 82 0 82 0 54 0 59 1 277 1 51 0 52 0 55	12 14 13 21 60 19 19 18 21 77 22 16	2 7 7 7 23 7 11 3 7 28 4	OGV1 OGV2  2 1 2 4 0 3 0 8 4 16 0 4 3 4 4 4 1 1 8 16 5 7 3 12 3 3 3	0 0 4 0 4 1 1 1 1 1 4	O O O O O O O O O O O O O O O O O O O	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total 27 27 36 107 32 41 31 34 138 40 38 32	26 27 47 39 139 56 47 190 36 32 27	88 100 133 200 511 122 100 133 100 455 128 8	N2 On/ O O O O O O O O O O O O O O O O O O	1 OGV2	2 PSV 3 0 1 1 5 2 2 0 0 2 3 2 0 0 4 0 0 4 4 0 0 4 4 0 0 4 4 0 0 7 7 0 0 8 1 1	0 0 1 0 1 0 1 0 0 0 0	0 1 0 0 0 1 1 0 0 0	42 42 69 62 215 53 66 74 64 257 60 49	70tals  110 127 165 174 576 167 189 159 157 672 151 139 132
1045   24   5   3   4   1   1   0   38   32   5   2   2   0   0   45   24   5   4   6   0   0   0   39   120   110   115   35   34   111   4   3   1   169   107   34   34   18   7   0   0   1   153   34   34   111   34   34   115   34   34   34   34   34   34   34   3	07:00 07:15 07:35 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 1 Hr	Origin: An CAR  33 32 41 59 59 59 39 42 199 40 40 42 41 163	m A - R135 (l LGV OC 13 12 16 9 50 15 12 9 8 44 6 6 6 10 13 35	3 1 7 4 6 2 2 2 18 9 2 3 4 1 1 2 2 11 1 3 2 1 1 2 3 7 8	0 3 3 3 9 9 2 3 1 4 10 1 1 2 0 1	0 0 1 1 1 2 0 3 0 3 0 1 1 4 0 0 0	1 511 0 58 0 69 2 76 3 254 1 82 0 82 0 54 0 59 1 277 1 51 0 52 0 55 0 60 1 218	12 14 13 21 60 19 18 21 77 22 16 22 11	2 7 7 7 7 23 7 11 3 7 28 4 6 6 4 9	OGV1 OGV2  2 1 2 4 0 3 0 8 4 16 0 4 3 4 4 4 1 4 8 16 5 7 3 12 3 3 3 3	0 0 4 0 4 1 1 1 1 1 2 2 2 5	NA COLOR	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total 27 27 36 37 32 41 31 34 138 40 38 32 29 139	010in: A CAR 267 47 39 139 50 56 47 190 36 32 27 31 126	8 10 13 20 51 10 10 10 10 10 10 10 10 10 10 10 10 10	N2 On/ O OGV	1 OGV3	2 PSV 3 0 0 2 1 1 5 2 2 0 0 2 3 2 0 0 4 4 0 0 4 4 0 0 4 4 0 0 0 1 1 0 0 1 1 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 0 1 1 0	0 0 1 0 1 1 0 0 0 1 0 0 0	0 1 0 0 0 1 1 0 0 0	42 42 69 62 215 53 66 74 64 257 60 49 45 42	110 127 165 174 576 167 189 159 157 672 151 139 132 131 131
11:00   19	07:00 07:15 07:35 07:35 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 09:45 1 Hr	Origin: An CAR  33 32 41 57 163 59 39 42 199 40 40 40 41 163 244 26	m A - R135 (l LGV OG 13 12 16 9 50 15 12 9 8 44 6 6 6 10 13 35 14	3 1 1 7 4 6 2 2 2 2 18 9 2 3 4 1 1 2 2 1 1 1 2 3 7 8 8 4 4 4 4 2 3 3 4 4 4 2 3 3	0 3 3 3 3 9 2 2 3 1 1 4 4 10 1 1 2 0 0 1 1 1 4 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 1 1 1 2 0 3 0 1 1 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 511 0 58 0 69 2 76 3 254 1 82 0 82 0 54 0 59 1 277 1 511 0 52 0 60 1 218 1 49 0 40	12 14 13 21 60 19 18 21 77 77 22 16 22 11 71 21 21 22 22 21 21 22 21 21 21 21 21 21	2 7 7 7 23 7 11 3 7 28 4 6 4 4 9 9 23 8 9	OGV1 OGV2  2 1 2 4 0 3 0 8 4 16 0 4 3 4 1 4 1 4 8 16 5 7 3 12 3 3 3 4 14 14 26 11 3	0 0 4 4 1 1 1 1 1 2 2 5	000000000000000000000000000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total 27 27 36 107 32 41 31 34 138 40 38 32 29 139 35 44	Origin: A 2 CAR 2 CAR 2 CAR 2 CAR 2 CAR 2 CAR 4 7 5 0 5 6 4 7 190 3 6 3 2 2 3 1 126 2 2 7	8 10 13 20 51 12 10 13 13 13 14 15 12 18 12 12 14 14 15 12 14 14 15 14 15 15 15 15 15 15 15 15 15 15 15 15 15	N2 On/ O OGV	1 OGV:	2 PSV 3 0 2 1 5 2 2 0 2 2 3 2 2 3 2 2 0 4 4 0 0 4 4 0 0 4 4 0 0 8 1 1 9 5 5 0 0 2 2 0 0 6 0 0 0 0 0 6 0 0 0 0 0 6 0 0 0 0 0	0 0 1 1 0 1 1 0 0 0 1 1 0 0 0 0 0 0 0 0	0 1 0 0 0 1 1 0 0 0	42 42 69 62 215 53 66 74 257 60 49 45 42 196 44 37	110 127 165 174 576 167 189 159 157 672 151 132 131 553 128
11:30   29   5   7   3   1   0   0   45   22   9   6   5   1   0   0   43   26   8   2   3   1   1   0   41   129   11:46   139   133   167   10   10   14   129   11:46   139   13   167   10   12   1   3   3   0   153   14   11   12   1   13   14   12   1   13   14   12   1   14   12   1   14   12   1   14   12   1   14   12   1   14   12   1   14   14	07:00 07:15 07:35 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 09:45 1 Hr 10:00 10:15	Origin: An CAR  33 32 41 57 163 59 59 39 42 199 40 40 42 41 163 24 26 31	m A - R135 (l LGV OG 13 12 16 9 50 15 12 9 8 44 6 6 6 10 13 35 14	3 1 1 7 4 6 2 2 2 2 18 9 2 3 4 1 1 2 2 1 1 1 2 3 7 8 8 4 4 4 4 2 3 3 4 4 4 2 3 3	0 3 3 3 3 9 2 2 3 1 1 4 4 10 1 1 2 0 0 1 1 1 4 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0 1 1 1 2 0 3 0 1 1 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1 511 0 58 0 69 2 76 3 254 1 82 0 82 0 54 0 59 1 277 1 51 0 52 0 60 0 60 1 218 1 40 0 40 0 40	12 14 13 3 21 60 19 18 21 77 22 26 22 21 17 11 21 21 22 25 29	2 7 7 7 23 7 11 3 7 28 4 6 4 4 9 9 23 8 9	OGV1 OGV2  2 1 2 4 0 3 0 8 4 16 0 4 3 4 1 4 1 4 8 16 5 7 3 12 3 3 3 4 14 14 26 11 3	0 0 4 4 1 1 1 1 1 2 2 5	000000000000000000000000000000000000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Total 27 27 27 30 30 41 31 34 138 40 38 40 38 32 29 139 35 44 53	26 27 39 37 50 47 190 36 47 190 36 22 27 22 24	8 10 13 20 51 12 10 13 13 13 14 15 12 18 12 12 14 14 15 12 14 14 15 14 15 15 15 15 15 15 15 15 15 15 15 15 15	N2 On/ O OGV	1 OGV:	2 PSV 3 0 2 1 5 2 2 0 2 2 3 2 2 3 2 2 0 4 4 0 0 4 4 0 0 4 4 0 0 8 1 1 9 5 5 0 0 2 2 0 0 6 0 0 0 0 0 6 0 0 0 0 0 6 0 0 0 0 0	0 0 1 1 0 1 1 0 0 0 1 1 0 0 0 0 0 0 0 0	0 1 0 0 0 1 1 0 0 0	42 42 69 62 215 53 66 74 64 257 60 49 45 42 196 44 37	Totals  110 127 165 174 576 167 189 159 151 139 132 131 553 128 121 128 121 128
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Roadplan Consulting 3082-IRE Huntstown Quarry 22/06/2016 Video Observation Cloudy Cloudy Site 2

Entry:		n: Arm A	A - R135 (N								- Elm Road					tion: Arm							Arm
	CAR	LGV		OGV2	PSV	MCL	PCL	Total	CAR		OGV1 OGV2	PSV MC		Total	CAF					MCL		Total	Totals
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07:45 1 Hr	0	0	0	0	0	0	0	0	25 35 120	12 11 39	10 7 6 2 27 19	3	1 1 0 0	58 57 217	11	1 7	7 (	0 : 0	3 0 1 0	0	0	19 58	81 76 275
08:00 08:15	0	0	0	0	0	0	0	0	26 34	17 13	4 7 10 1	1	0 0	55 60		7 :	3 (	0 (	0 0	0	3	13	68 68
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09:45 1 Hr	0	0	0	0	0	0	0	0	21 109	15 69	10 6 32 14		0 0	52 228	1	6 3 7 8	3 (	0 :	2 <u>0</u>	0	0	11 42	63 270
10:00 10:15	0	0	0	0	0	0	0	0	19 27	16 19	4 3 2 8		0 0	43 57		2 4			2 0 2 0	0	1 0	10 9	53 66
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1 Hr 13:00	0	0	0	0	0	0	0	0	109	10	24 20 3 2	1	0 1	217 44		9 2		1 (	4 0 6 0	0	0	40 18	257 62
13:15 13:30	0	0	0	0	0	0	0	0	31 29	12 18	1 6 4 4	1	1 0	52 57		6 2 2 2	2 (	0 !	5 0 5 0	0	0	13 9	65 66
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12 Hrs	0	0	0	0	0	0	0	0	1614	652	227 181	43 1	17 7	2741 2	19	4 70	0 10	0 12	1 2	0	15	412	3153
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Entry:			A - R135 (N	) OGV2	PSV	MCL	PCL	Total	Destination CAR		- Elm Road OGV1 OGV2	PSV MC	SCAL ST	Total	Destina	tion: Arm			2 PSV	MCL	PCL	Total	Arm Totals
07:00	Destination CAR	n: Arm A LGV	A - R135 (N OGV1	OGV2	0	0	0	1	CAR 0	LGV 0	OGV1 OGV2	200 10	8 0	Total 0	CAF	R LG\	V OGV	1 OGV	0 0	0	PCL 0 0	Total 0	Arm
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Entry:	Arm C - R1 Destination CAR	: Arm A	- R135 (N) OGV1 OGV	/2 PSV	MCL	PCL To		Destination CAR				SV MC	L PCL	Total	Destination CAR	on: Arm C	- R135 OGV1	(S) OGV2	PSV	MCL	PCL	Total	Arm Totals
07:00	29	LGV 13		2 0	0		50	CAH 8	LGV 11	0	3	0 MC			0	LGV 0	0001		0	0	0	1 otal	1 otals
07:15 07:30	28 31	9	5	4 1	0	0	47 64	8	12	1	7	0	0 0	28	0	0	0	0	0	0	0	0	75 90
07:45 1 Hr	52 140	26 61	2	10 1 26 5	0	0	91 52	9	6 37	1 2	8 27	0		24	0	0	0	0	0	0	0	0	115 352
08:00 08:15	46 62	14 20	5 2	6 0 5 1	0 2		72 92	10 21	5 3	0 1	21 11		0 0		0	0	0		0	0	0	0	108 128
08:30 08:45	50 57	22 15	3	2 0	1 1	0	78 96	27 20	4 1	0 1	7 15	0	0 0	37	0	0	0		0	0	0	0	116 133
1 Hr 09:00	215 47	71 15		25 3 12 1	0	0	83	78 20	13	1	54 5		0 0	27	0	0	0		0	0	0	0	485 110
09:15 09:30	44 33	14 18		8 2 9 3	1 0	0	72 68	11 8	4 5	1 0	11 15		0 0	28	0	0	0		0	0	0	0	99 96
09:45 1 Hr	23 147	23 70		5 0 34 6	1	0 2	57 80	7 46	4 14	3	14 45		0 0	108	0	0	0	0	0	0	0	0	83 388
10:00 10:15	30 25	17 12	9 6	7 1 6 2	1 0	0	65 51	8	2	3 1	18 10	0	0 0	21	0	0	0	0	0	0	0	1	97 72
10:30 10:45	26 22	17	3 5	4 2 7 1	0	0	57 52	8 11	5	0	8 12	0		26	0	0	0	0	0	0	0	0	78 78
1 Hr 11:00	103 27	68 14	8	4 1	1	0	55 55	35 9	12	2	48 14	0	0 0	28	0	0	0	0	0	0	0	0	325 83
11:15 11:30	17 17	22		9 0		0	56 53	9	1	1 2	14 12	0	0 0	21	0	0	0	0	0	0	0	0	84 74
11:45 1 Hr 12:00	27 88	17 74		5 2 8 3 5 1	1	0 2	58 22 56	32 4	10	6	17 57		0 0	105	0	0	0	0	0	0	0	0	86 327
12:00 12:15 12:30	26 40 42	15 23 17	3	5 1 10 2 5 2	0 0 0	0	78 74	15 4	2 4 4	0 1 0	10 10 10	0	D 0	30	0	0	0	0	0	0 0 0	0	0	72 108 92
12:45 1 Hr	34 142	10 65	10	6 0	0	0	60	10	12	2	9	0		23	0	0	0	0	0	0	0	0	83 355
13:00 13:15	34 39	19 16	10 4	7 1 4 1	0	0	71 64	15 15	5 4	0	11	0	0 0	31	0	0	0	0	0	0	0	0	102 95
13:30	37 44	11 21	8	6 0		0	62 84	8 16	5	1	12		0 0	26	0	0	0	0	0	0	0	0	88 113
1 Hr 14:00	154	67 15	29 2	9 1	0	0 2	181 56	54 16	16	4	42 14	1	0 0	117	0	0	0	0	0	0	0	0	398 89
14:15 14:30	27 27	20	8	4 1	0	0	60 51	8	4 2	1	10	0	0 0	23	0	0	0	0	0	0	0	0	83 69
14:45 1 Hr	38	22	11	8 1 31 4	1 2	0	81	16 48	10	2	10	0		29	0	0	0	0	0	0	0	0	110 351
15:00 15:15	27 38	11 18	9	7 1 2 2	0		55 78	16 22	4 3	2 1	12 9	0	1 0		0	0	0		0	0	0	0	90 113
15:30 15:45	37 29	26 19		9 2 6 1		0	82 67	19 14	3 11	1	10 12		0 0	33	0	0	0	0	0	0	0	0	115 105
1 Hr 16:00	131 21	74 24	7	34 6 12 1	1 0	2 2	82 65	71 16	21 13	5 2	43 8	0	1 0	39	0	0	0		0	0	0	0	423 104
16:15 16:30	36 32	12 13		8 1 4 0		1	62 64	11 16	12 6	5 0	4	0	D 0	32	0	0	0	0	0	0	0	0	94 90
16:45 1 Hr	49 138	14 63	21 4	0 2 14 4	2	1 2	82 !73	21 64	39	11	4 20	0	1 C	135	0	0	0	0	0	0	0	0	120 408
17:00 17:15	56 47	17 12	8 2	7 1 7 2	1 2	0	91 72	35 23	7 6	4	1	0		32	0	0	0	0	0	0	0	0	140 104
17:30 17:45	49 42	11 6	7 7	4 1 4 2	1	1	75 63	13 11	8 9	1	3 2	0		23	0	0	0	0	0	0	0	0	100 86
1 Hr 18:00	194 33	46 4	4	2 2	1	2	48	82 15	30 7	1	7 0		2 C	23	0	0	0	0	0	0	0	0	430 71
18:15 18:30	34 28	6		5 2	1	1	51 43	12 7	5	1	0	0	0 0	10	0	0	0	0	و٠٠٥	0	0	0	72 53 44
18:45 1 Hr	16 111	5 21	13	0 1	4		27 69	11 45	5 19	2	5	0	0 0	17	0	0	0	250	0	0	0	0	240
12 Hrs	1680	746	291 33	31 58	20		39	622	233	53	429	1	4 C	1342	1	0	0	1200	0	0	0	1	4482 4482
Total	1680	746	291 3	31 58	20	13 31	39	622	233	53	429	1	4 C		1	17.0	340	0	0	0	0	1	4482
ORIGIN	SUMMARY																						
Ornani	Origin: Arm	n A - R13						Origin: Arr							Origin: Ar								Origin
	Origin: Arm CAR	n A - R13 LGV	OGV1 OGV	/2 PSV	MCL		otal	CAR	n B - Elr LGV	OGV1	OGV2 F	SV MC	L PCL	Total	Origin: Ar	LGV	5 (S) OGV1	OGV2	PSV	MCL	PCL	Total	Origin Totals
07:00 07:15	Origin: Arm CAR 36 31	n A - R13 LGV 8 11	0GV1 OG\ 5 6	7 0 6 3	2 0	2	otal 60 58	CAR 0 2	LGV 1 0	0 3	0	0	0 0	Total	Origin: Ar	LGV 24 21	6 (S)	11	PSV 0 1	0	PCL 0 0	72 75	Origin Totals
07:00 07:15 07:30 07:45	36 31 41 46	8 11 14 18	5 6 10 6	6 3 10 2 3 3	2 0 1 0	2 1 3 0	60 58 81 76	0 2 2 4	1 0 3 2	OGV1	0 0 0	0 0 0	0 0	Total	Origin: Ar CCAR 36 40 61	24 21 21 32	6 6 7 3	11 19 18	1 3 1	0 0 0	0	72 75 90 115	Origin Totals 133 138 176 197
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07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45	Origin: Arm CAR  36 31 41 46 154 33 37 20 27	8 11 14 18 51 20 14 15 14	0GV1 OGV  5 6 10 6 27 4 10 9 6 29 9	6 3 10 2 3 3 26 8 7 1 5 0 5 1 9 1	2 0 1 0 3 0 1 0	2 1 3 0 6 2 3 1 1 0 5 2	60 58 81 76 75 68 68 51	0 2 2 4 8 2 3 2 5	1 0 3 2 6 5 1 1 2	0 3 0 0 3	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Total	Origin: Ar CCAR 87 36 40 61 174 56 83 77 77	24 21 21 32 98 19 23 26 16	6 6 6 7 3 22 5 3 3 10	11 19 18 18 27 16 16 9 17 79 17 17 19	1 3 1 5 0 1 0 2	0 0 0 0 0 0 0 2 1	0	72 75 90 115 352 108 128 116 133	Origin Totals 133 138 176 197 644 183 202 172 197
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07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:15	Origin: Arm CAR  36 31 41 41 43 33 37 20 27 117 25 39 35 27	8 11 14 18 51 20 14 15 14 15 14 15 17 21 18	OGV1 OGV  5 6 10 27 4 10 9 6 29 1 9 6 8 10 33 2	6 3 10 2 3 3 3 26 8 7 1 5 0 5 1 9 1 26 3 4 1 8 1 9 1 8 0	2 0 1 0 3 0 1 0 0 0 1	2 1 3 0 6 6 2 3 3 1 1 1 0 5 2 2 0 0 0 0 0 0	151 160 160 161 161 161 161 161 161 161 16	0 2 2 4 8 2 3 3 2 5 12 2 1 1 0 0	1 0 3 2 6 5 1 1 2 9 2 3 0 1 1	0GV1 0 3 0 0 1 1 0 2 1 1 0 3 3	0 0 0 0 0 0 1 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0			Total  1	Origin: Ar CARN 36 40 61 174 56 83 77 77 293 67 55 41	24 21 21 32 98 19 23 26 16 84 16 18 23 27	5 (S) 0GV1 6 6 7 3 22 5 3 10 21 9 4 5 7	11 19 19 18 18 53 27 19 19 17 79 19 19 79 19 25 25	1 3 1 5 0 1 0 2 3 1 2 3 0	0 0 0 0 0 0 2 1 1 1 4 0 0	0	72 75 90 115 352 108 128 116 133 485 110 99	Origin Totals 133 138 176 197 644 183 202 172 197 754 175 178 177 672 147
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14:45 1 Hr	39 129	22 68	11 28	9 32	1 4	1 2	0 83 0 263	42 167	18 72	10 27	14 57	0 4	0	0	84 328	6 20	3 7	0	6 11	0	0	0	15 39	182 630
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1 Hr 18:00	219 35	48 5	25 4	22	6	4	6 330 4 53	351 79	74 13	16 2	20	3	5 1	1	470 97	9	3 0	0	6 5	0	0	2	20 9	820 159
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Roadplan Consulting 3082-IRE Huntstown Quarry 22/06/2016 Video Observation Cloudy Cloudy Site 3

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Entry:	Arm A - R	135 (N)																
-	Destinatio	n: Arm A - R13	5 (N)				Destination: A		Offslip			Destination		35 (S)				Arm
	CAR	LGV OGV	1 OGV2	PSV	MCL PO	CL Total	CAR L	.GV OGV	1 OGV2 PS	SV MCL PC	L Total	CAR	LGV OG	V1 OGV2	PSV N	MCL PC	L Total	Totals
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14:00 14:15	49 33	15 22	4 9	24 13	1	1	0 94 0 79	0	0	0	0	0	0	0 0		3 2	1	15 11	0	0	0	30 24	124 103
14:30	38	14	4	18	1	0	0 75	0	0	0	0	0	0	0 0	4	0	1	13	0	1	0	19	94
14:45 1 Hr	45 165	28 79	12 29	16 71	4	3	0 103 0 351	0	0	0	0	0	0	0 0	33	3 8	4	14 53	0	2	0	27 100	130 451
15:00	44	13	11	20	1	1	0 90	0	0	0	0	0	0	0 0	5	1	0	17	0	0	0	23	113
15:15 15:30	66 62	20 30	7 9	22 20	1 2	0	0 116 0 123	0	0	0	0	0	0	0 0	11 7	1	1	18 14	0	0	0	31 24	147 147
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1 Hr 16:00	218 34	94 35	38	78 20	5 1	0	2 437 0 98	0	0	0	0	0	0	0 0	25 1	6 3	3 1	61 11	0	0	0	95 16	125 532 114
16:15 16:30	46 47	26 18	10	18 14	1	1	0 102 1 85	0	0	0	0	0	0	0 0	4	1	1	4 8	0	0	0	10 16	112 101
16:45	71	21	4 9	13	2	1	0 117	0	0	0	0	0	0	0 0	3	1	1	9	0	0	0	14	131
1 Hr 17:00	198 80	100 24	31 12	65 8	4	3	1 402 1 129	0	0	0	0	0	0	0 0	14	6	3	32 2	0	1 0	0	56 9	458 138
17:15	45	22	5	7	2	2	2 85	0	0	0	0	0	0	0 0	3	3	Ö	4	0	0	i	11	96
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1 Hr	226	81	33	29	6	6	5 386	0	0	Ů.	ō	0	ō	0 0	13	7	1	12	0	0	2	35 16	421 93
18:00 18:15	49 40	14 12	5 3	4 8	2	1	2 77 0 66	0	0	0	0	0	0	0 0	6 2	0	0	8 5	1	0	1	16 10	93 76
18:30	38	7	4	4	2	1	1 57	0						21 21			_		0.0	0	0	6	63 43
18:45 1 Hr	26 153	10 43	14	17	6	4	1 41 4 241	0	0	0	0	0	0	0 0	13	0	2	16	<u>0</u> 1	0	2	34	43 275
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Traffic and Data Services

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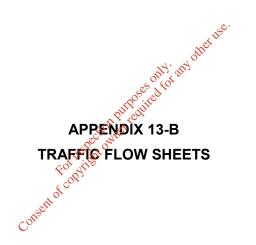
Roadplan Consulting 3082-IRE Huntstown Quarry 22/06/2016 Video Observation Cloudy Cloudy Site 6

		Road: Kilshane Cr	iross		
Entry:	Arm A - R135 (N) Destination: Arm A - R135 (N)	Destination: Arm B - Kilshane Way (E)		Destination: Arm C - R135 (S)	Destination: Arm D - Kilshane Way (W)
	CAR LGV OGV1 OGV2 PSV MCL PCL Total	CAR LGV OGV1 OGV2 PSV MCL	PCL Total	CAR LGV OGV1 OGV2 PSV MCL PCL Total	CAR LGV OGV1 OGV2 PSV MCL PCL Total Totals
07:00 07:15	0 0 0 0 0 0 0 0 0	20 8 2 1 1 0 22 7 2 1 1 0	0 32 1 34	12 3 1 1 0 0 1 18 5 4 3 2 2 0 0 16	8 0 0 0 0 0 0 0 0 0 50 3 2 1 1 0 0 0 7 57
07:30	0 0 0 0 0 0 0	45 12 0 2 3 1 30 15 1 3 0 0	0 63 0 49	19 5 4 3 1 0 2 34 19 8 0 1 3 0 1 32	2 1 0 0 0 0 0 3 100
07:45 1 Hr	0 0 0 0 0 0 0 0	117 42 5 7 5 1	1 178	55 20 8 7 6 0 4 100	10 4 1 1 0 0 0 16 294
08:00 08:15	0 0 0 0 0 0 0 0	36 4 0 2 1 0 53 8 2 1 0 0	0 43 0 64	14 9 0 2 1 0 4 30 11 3 1 4 0 1 1 21	7 2 1 0 0 0 0 10 95
08:30 08:45	0 0 0 0 0 0 0 0	49 9 1 0 0 0 31 7 1 3 0 0	0 59 0 42	7 8 0 1 1 0 1 18 12 2 0 3 2 0 0 19	9 1 1 0 0 1 0 12 73
1 Hr 09:00	0 0 0 0 0 0 0 0	169 28 4 6 1 0 27 6 0 1 3 0	0 208 0 37	9 5 3 1 0 0 1 19	8 2 0 0 1 0 0 11 67
09:15 09:30	0 0 0 0 0 0 0 0	25 4 2 1 0 0 19 3 1 1 1 0	0 32 0 25	19 2 1 3 1 0 1 27 14 7 3 6 1 0 0 31	5 3 0 0 0 0 0 8 67 3 1 0 0 0 0 0 4 60
09:45 1 Hr	0 0 0 0 0 0 0 0	24 7 0 0 1 0 95 20 3 3 5 0	0 32 0 126	13 7 1 2 0 0 0 23 55 21 8 12 2 0 2 100	8
10:00 10:15	0 0 0 0 0 0 0 0	17 3 1 2 1 0 19 3 2 0 0 0	0 24 0 24	5 5 0 2 1 0 1 14 9 5 0 1 1 0 0 16	1 2 2 0 0 0 0 5 43
10:30	0 0 0 0 0 0 0	23 3 3 1 1 0	0 31	7 4 0 1 1 0 0 13	4 1 0 1 0 0 0 6 50
1 Hr 11:00	0 0 0 0 0 0 0 0	64 11 8 4 2 1 19 6 2 1 1 0	0 90	25 19 0 10 4 0 1 59 11 4 0 1 0 0 1 17	8 4 2 2 0 0 0 16 165
11:15 11:30	0 0 0 0 0 0 0	19 4 5 0 0 0 19 2 1 1 1 0	0 28 0 24	6 7 0 3 1 0 0 17	1 1 1 0 0 0 0 3 48
11:45	0 0 0 0 0 0 0	20 6 0 0 0 0	0 26	12 3 2 4 0 0 0 21	4 2 2 0 0 0 0 8 55
1 Hr 12:00	0 0 0 0 0 0 0 0	77 18 8 2 2 0 18 0 0 1 1 0	0 107 0 20	37 16 5 8 2 0 1 69 8 3 1 2 1 0 0 15	4 2 0 0 0 0 0 6 41
12:15 12:30	0 0 0 0 0 0 0 0	20 5 1 2 1 0 31 5 2 0 1 0	0 29 0 39	10 4 0 1 1 0 1 17 12 4 4 0 0 0 0 0 20	0 3 2 0 0 0 0 0 5 64
12:45 1 Hr	0 0 0 0 0 0 0 0	22 4 0 1 1 0 91 14 3 4 4 0	0 28 0 116	10 4 0 0 1 0 0 15 40 15 5 3 3 0 1 67	13 7 2 0 0 1 0 23 206
13:00 13:15	0 0 0 0 0 0 0 0	21 3 2 0 2 0 35 4 2 0 0 0	0 28 0 41	16 5 1 7 1 0 0 30 17 6 1 5 1 0 0 30	
13:30 13:45	0 0 0 0 0 0 0 0	20 3 2 0 0 0 28 3 0 0 0 0	1 26 0 31	13 9 0 5 1 1 0 29 12 4 0 3 0 0 0 19	6 3 0 0 0 0 9 64
1 Hr 14:00	0 0 0 0 0 0 0 0 0	104 13 6 0 2 0 21 3 3 2 2 0	1 126 1 32	58 24 2 20 3 1 0 108 16 5 0 2 1 0 0 24	23 4 1 0 0 0 0 28 262
14:15 14:30		30 8 1 4 1 0 28 8 2 0 1 0	0 44	15 3 2 1 1 1 0 0 24 14 9 1 2 1 0 0 27	3 0 0 0 0 0 0 3 70
14:45 1 Hr	0 0 0 0 0 0 0	18 7 2 3 0 0	2 32	12 3 0 5 0 1 0 21	1 4 1 0 0 0 0 0 5 5 58
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15:15 15:30	0 0 0 0 0 0 0 0	21 1 1 1 0 0 28 5 0 4 0 0	0 24 0 37	16 2 0 4 0 0 0 22 19 7 0 1 1 0 0 28	5 1 2 0 0 0 0 8 73
15:45 1 Hr	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	19 5 1 1 0 1 99 19 2 7 1 1	1 28 1 130	11 3 2 1 1 0 0 18 53 16 2 8 4 0 0 83	14 5 5 0 0 0 0 24 237
16:00 16:15	0 0 0 0 0 0 0 0 0	18 3 1 1 1 0 21 5 3 2 1 1	0 24 0 33	11 6 1 4 1 0 0 23 10 1 1 2 0 0 0 14	3 1 0 0 0 0 0 4 51 2 2 1 1 0 0 0 6 53
16:30 16:45	0 0 0 0 0 0 0 0 0	31 6 0 0 0 0 37 3 0 0 1 0	0 37 0 41	7 5 0 2 1 3 0 18 19 3 1 3 0 0 1 27	
1 Hr 17:00	0 0 0 0 0 0 0 0 0	107 17 4 3 3 1 28 5 0 3 1 0	0 135 1 38	47 15 3 11 2 3 1 82 9 5 0 1 0 0 1 16	10 5 2 2 0 0 0 19 236
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17:45 1 Hr	0 0 0 0 0 0 0 0 0	34 2 0 1 1 0 140 14 1 7 2 0	0 38 1 165	19 2 2 3 0 0 1 27 52 17 4 6 2 1 4 86	'll 1 0 0 1 0 0 0 21 671
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18:30	0 0 0 0 0 0 0 0 0	27 4 0 2 1 0	0 29 0 34	15 0 0 0 0 17	4 0 0 0 0 0 0 4 55
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12 Hrs	0 0 0 0 0 0 0	1256 230 52 56 34 6	8 1642	\$66 <b>2</b> 14 44 112 39 8 21 1004	
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Total Check	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Destination: Arm B - Kilshane Way (E)  CAR LGV OGV1 OGV2 PSV MCL	8 1642 POC Total	568 214 44 112 39 8 21 1004	254 2000  Destination: Arm D - Kilshane Way (W) Arm
Check Total Check Entry:	Destination: Arm A - R135 (N)   CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Total     9   3   1   3   0   0   0   16	Destination: Arm B - Kilshane Way (E)  CAR LGV OGV1 OGV2 PSV MCL	8 1642 POC Total	0 588 214 44 112 39 8 21 1004  100  100  CAR LGV OGV1 OGV2 PSV MCL PCL Total  24 2 0 0 0 2 0 28	Destination: Arm D - Kilshane Way (W)
Check Total Check Entry:  07:00 07:15 07:30	Destination: Arm A - F135 (N)   CAR LGV OGV1 OGV2 PSV MCL PCL Total   9 3 1 3 0 0 0 16   13 2 0 1 1 0 0 0 16   16 0 0 3 1 0 0 0 16   16 0 0 0 3 1 0 0 0 16	Destination: Arm B - Kilshane Way (E)  CAR LGV OGV1 OGV2 PSV MCL	8 1642 POC Total	00   00   00   00   00   00   00   0	Destination: Arm D - Kilshane Way (W)
Check Total Check Entry:  07:00 07:15 07:30 07:45 1 Hr	Destination Arm A. R135 (N)   CGVI   OGV2   PSV   MCL   PCL   Total	Destination: Arm B - Kilshane Way (E)	8 1642 POO Total	Destination: Arm C - F135 (S)	Destination: Arm D - Kilshane Way (W)   CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Total   Totals     42   3   2   1   0   0   0   71   117     56   8   1   1   0   0   1   67   114     66   15   2   1   0   0   1   85     220   39   6   4   0   0   2   271   449
O7:00 07:15 07:30 07:45 1 Hr 08:00 08:15	Destination Arm A. F135 (N)   CGVI   OGV2   PSV   MCL   PCL   Total	Destination: Arm B - Kilshane Way (E)	8 1642 POC TOWN 0 0 0 0	Destination: Arm C - R135 (S)	Destination: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Arm Totals     42 3 2 1 0 0 0 0 48 92   92   93   94   94   92     56 13 1 1 0 0 0 0 71   117     56 8 1 1 0 0 0 1 67   114     66 15 2 1 0 0 1 85   126     220 39 6 4 0 0 2 271   449     72 9 2 0 0 0 0 1 84   22     73 7 4 0 0 0 0 84   123
Or:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45	Destination Arm A. F135 (N)   CGAP   CGAP	Destination: Arm B - Kilshane Way (E)	8 1642 POE Total	Destination: Arm C - R135 [S]	Destination: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Arm Totals     42 3 2 1 0 0 0 0 48 192   56 13 1 1 0 0 0 0 71   114     56 8 1 1 1 0 0 0 1 67   114     68 15 2 1 0 0 1 85 126     220 39 6 4 0 0 2 271 449     72 9 2 0 0 0 0 1 84 123     73 7 4 0 0 0 0 84 123     81 8 6 0 0 0 0 95 122     72 11 5 2 0 1 0 91 120
07:00 07:15 07:30 07:45 1 Hr 08:30 08:45 1 Hr 09:00	Destination Arm A. F135 (N)   CGAP   CGAP	Destination: Arm B - Kilshane Way (E)   CAR   LGV   OGV1   OGV2   PSV   MCL	8 1642 POO Total	Destination: Arm C - R135 [S]	Destination: Arm D - Kilshane Way (W)
07:00 07:15 07:30 07:15 07:30 07:45 1 Hr 08:00 08:15 08:34 1 Hr	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 POC Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Destination: Arm C - R135 [S]	Destination: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Arm Totals   CAR
07:00 07:00 07:15 07:30 07:45 1 Hr 08:00 08:45 1 Hr 09:00 08:45 09:15	Destination Arm A. R135 (N)   CAR   LGV OGVI OGV2   PSV   MCL   PCL   Total	Destination: Arm B - Kilshane Way (E)	8 1642 POC Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Control   Cont	Destination: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total     42 3 2 1 0 0 0 48   192     56 13 1 1 0 0 0 71   114     66 8 15 2 1 0 0 1 85     220 39 6 4 0 0 2 271     72 9 2 2 0 0 0 1 84     12 3 2 2 1 0 0 1 85     12 3 3 2 1 1 0 0 1 71     114 65 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Oneck Total Check Entry:  07:00 07:15 07:30 07:45 08:30 08:45 1 Hr 09:00 09:45 1 Hr 10:00 09:45 1 Hr	Destination Arm A. R135 (N)   CAR   LOV OGV) OGV2   PSV   MCL   PCL   Total	Destination: Arm B - Kilishane Way (E)	8 1642 POC TOWN 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Destination: Arm C - R135 (S)	Desination: Arm D - Kilehane Way (W)
Onsch Total Total Check Entry:  07:00 07:15 07:30 07:45 1 Hr 08:00 08:45 09:00 09:45 10:00 10:15	Destination Arm A. R135 (N)   CAR   LGV OGVI OGV2   PSV   MCL   PCL   Total	Destination: Arm B - Kilshane Way (E)	FOC TOWN  0	Destination: Arm C - R135 (S)	Desination: Am D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   CA
Oneck Total Check Entry:  07:00 07:15 07:30 07:45 08:30 08:45 1 Hr 09:00 09:45 1 Hr 10:00 09:45 1 Hr	Destination Arm A. R135 (N)   CAR   LGV CGVI CGV2   PSV   MCL   PCL   Total	Destination: Arm B - Kilishane Way (E)	FOC TOWN  0	Destination: Arm C - R135 (S)	DesSination: Arm D - Kilshane Way (W)   CAR LGV OGV1 OGV2 PSV MCL PCL Total   Total   Total   CAR LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR LGV OGV1 OGV2 PSV MCL PCL TOTAL   Total   CAR LGV OGV1 OGV1 OGV1 OGV1 OGV1 OGV1 OGV1 OG
7:00 7:00 07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:30 09:45 1 Hr 10:00 10:15 10:30 10:45 10:30 10:45	Destination Arm A. R135 (N)   CAR   LGV   CGV   CGV   PSV   MCL   PCL   Total	Destination: Arm B - Kilshane Way (E)	8 1642 PCG TON 0	Destination: Arm C - R135 [S]	Destination: Arm D - Kilshane Way (W)
Oreca   Oreca	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	B 1642  PO TOP  0 0 0 0  0 0 0	Destination: Arm C - R135 [S]	Destination: Arm D - Kilshane Way (W)
Orech Total Orech Check Total Orech Entry:  07:00 07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 09:45 1 Hr 10:00 10:15 10:30 10:45 1 Hr 11:00 11:15 11:30 11:15 11:15 11:30 11:15 1	Destination Arm A. R135 (N)   CAR   LGV OGV   OGV   PSV   MCL   PCL   Total	Destination: Arm B - Kilishane Way (E)	B 1642  PO TOWN  0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0	Destination: Arm C - R135 [S]	Desination: Arm D - Kilshane Way (W)
07:00 07:05 07:00 07:05 07:00 07:05 07:00 07:15 07:30 08:00 08:15 1 Hr 08:00 08:15 1 Hr 10:00 08:15 1 Hr 10:00 16:15 1 Hr 11:15 1 1 1:15 1 1:15 1 1 1:15 1 1 1:15 1 1 1:15 1 1 1:15 1 1 1:15 1 1 1:15 1 1 1 1	Destination, Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	B 1642  PO TOS  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0	Destination: Arm C - R135 [S]	Desination: Am D - Kilehane Way (W)
07:00 07:05 07:00 07:05 07:00 07:05 07:00 07:15 07:30 08:00 08:15 08:00 08:45 1 Hr 10:00 10:45 1 Hr 10:00 11:15 1 1:40 11:40 11:45 1 Hr 10:200 12:16 1 1:40 12:10 12:10 12	Destination Arm A. R1356   N	Destination: Arm B - Kilishane Way (E)	B 1642  PO TOST  O O O O  O O  O O O  O O  O O O  O O	Destination: Arm C - R135 [S]	Desination: Am D - Kilehane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   CAR   CAR
Total   Control   Contro	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	B 1642  PO TOM  0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0  0 0 0 0 0 0	Content	Desination: Am D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   CAR
Total   Control   Contro	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P C T C C C C C C C C C C C C C C C C C	Continuing	Designation: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   CAR   CA
Total   Oraco   Orac	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Continue	Designation: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   CAR   LGV OGV1 OGV2 PSV MCL PCL TOTAL   CAR   LGV OGV1 OGV2 PSV MCL PCL PCL PCL PCL PCL PCL PCL PCL PCL P
Total   Death   Property   Prop	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Destination: Arm C - R135   S    PSV   MCL   PCL   Total	Designation: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL   Total   Section   CAR   LGV OGV1   CAR   C
Total   Draw   Property   Prope	Destination Arm A. R1356   N	Destination: Arm B - Kilishane Way (E)	B 1642  P 0 109  0 0 0 0 0  0 0 0 0  0 0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0  0 0 0 0 0	Destination: Arm C - R135   S    PSV   MCL   PCL   Total	Designation: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Section   CAR   LGV OGV1 OGV2 PSV MCL PCL   Total   Section   CAR   LGV OGV1   CAR   C
Total   Death   Property   Prop	Destination Arm A. R135 (N)	Destination: Arm B - Kilishane Way (E)	8 1642 P 6 7 7 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Content	Desination: Am D - Kilehane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Total   CAR   CA
Total   Death   Process	Destination Arm A. R135 (N)	Destination: Arm B - Kilishane Way (E)	8 1642 P C T C C C C C C C C C C C C C C C C C	Continue	Desination: Am D - Kilehane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   CAR
Total   Death   Process	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 1 7 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Continue	Desination: Am D - Kilshane Way (W)   CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Total   Totals   Totals   CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Total   Totals   CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Total   Totals   CAR   CA
Total   Death   Process	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Destination: Arm C - F135 (S)	Designation: Arm D - Kilshane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   C
Company   Comp	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	B 1642  P 20 T 2 T 2 T 2 T 2 T 2 T 2 T 2 T 2 T 2	Destination: Arm C - F135   S    PSV   MCL   PCL   Total	Designation: Arm D - Kilishane Way (W)   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR   LGV OGV1 OGV2 PSV MCL PCL Total   Totals   CAR
Company   Comp	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 10 10 10 10 10 10 10 10 10 10 10 10 1	Destination: Arm C - R135   S    PSV   MCL   PCL   Total	Destination: Arm D - Kilehane Way (W)
Company   Comp	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P C T C C C C C C C C C C C C C C C C C	Destination: Arm C - R135   S    PSV   MCL   PCL   Total	Destination: Arm D - Kilishane Way (W)
Company   Comp	Destination Arm A. RT 135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 1642 0 0 0 0 0 0 0 0	Destination: Arm C - R135 [S]	Destination: Arm D - Kilshane Way (W)
Control   Cont	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P 0 1642 0 0 0 0 0 0 0 0	Content	Destination: Arm D - Kilshane Way (W)
Company   Comp	Destination Arm A. R135 (N)	Destination: Arm B - Kilshane Way (E)	B 1642  P 0 T 0 0  0 0 0 0  0	Content	Designation: Arm D - Kilshane Way (W)
Company   Comp	Destination Arm A. R1356   N	Destination: Arm B - Kilshane Way (E)	B 1642  P 0 1 7 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Destination: Arm C - F135   S    Destination: Arm C - F135   Destination: Arm C -	Designation: Arm D - Kilehane Way (W)
Company   Comp	Destination Arm A. RT 135 (N)	Destination: Arm B - Kilshane Way (E)	B 1642  P 0 T 0 0  0 0 0 0  0	Content	Destination: Arm D - Kilshane Way (W)
Company   Comp	Destination Arm A. RT 135 (N)	Destination: Arm B - Kilshane Way (E)	8 1642 P C T C C C C C C C C C C C C C C C C C	Destination: Arm C - R135   S    PC   Total	Destination: Arm D - Kilshane Way (W)

Entry:	Arm C - R135 (S)           Destination: Arm A - R135 (N)           CAR         LGV         OGV1         OGV2         PSV         MCL         PCL         Total	Destination: Arm B - Kilshane Way (E)  CAR LGV OGV1 OGV2 PSV MCL PCL Total	Destination: Arm C - R135 (S)	Destination: Arm D - Kilshane Way (W)   CAR LGV OGV1 OGV2 PSV MCL PCL Total	Arm Totals
07:00 07:15 07:30 07:45	3 3 1 1 0 0 0 8 3 3 1 1 1 0 0 9 0 2 0 3 2 0 0 7 10 3 0 5 0 0 1 19	9 4 1 1 0 0 0 15 9 1 2 2 0 0 0 14 8 4 1 4 1 0 0 15 11 6 0 5 0 0 0 0 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	16 9 4 0 0 0 0 29 18 5 4 1 0 0 0 28 18 10 5 2 0 0 0 35 39 25 2 0 0 0 0 66	52 51 60 107
1 Hr 08:00 08:15	16 11 2 10 3 0 1 43 1 10 0 2 1 0 1 15 8 3 0 4 1 2 0 18	37 15 4 12 1 0 0 65 9 0 2 2 0 0 0 13 18 2 0 0 0 0 0 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	91 49 15 3 0 0 0 158 33 9 2 3 0 0 0 47 39 13 3 2 0 0 0 57	270 75 95
08:30 08:45 1 Hr 09:00	7 2 2 1 0 0 0 12 7 1 1 4 2 0 0 15 23 16 3 11 4 2 1 60 7 4 2 3 1 0 0 17	8 7 0 0 0 0 0 15 6 2 1 4 0 0 0 15 41 11 3 6 0 0 0 61 10 3 3 2 0 0 0 18	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	40 21 2 2 0 1 0 66 47 13 5 4 0 1 0 70 159 56 12 11 0 2 0 240 32 10 4 2 0 0 0 48	93 98 361 83
09:15 09:30 09:45	2 5 3 8 1 0 0 19 12 3 1 3 0 0 0 19 5 5 1 3 2 0 0 16	4 5 0 3 0 1 0 13 3 6 0 3 0 0 0 12 8 2 1 3 0 0 0 14	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	35 7 3 3 1 0 0 49 21 14 4 2 1 0 0 42 11 15 4 0 0 0 0 30	81 73 60
1 Hr 10:00 10:15 10:30	26         17         7         17         4         0         0         71           7         8         1         3         1         0         0         20           11         2         1         4         1         0         0         19           8         6         1         2         1         0         0         18	25 16 4 11 0 1 0 5 7 3 2 1 0 1 0 14 6 2 1 2 0 0 0 11 4 2 3 1 0 0 0 11	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 46 15 7 2 0 0 169 17 10 5 1 0 0 0 33 11 8 7 1 1 0 0 28 13 15 0 1 1 0 0 30	297 67 58 58
10:45 1 Hr 11:00 11:15	4         4         0         2         1         0         0         11           30         20         3         11         4         0         0         68           3         4         1         0         1         0         0         9           4         3         2         2         0         0         2         13	9 2 1 2 0 0 0 14 26 9 7 6 0 1 0 45 5 3 2 3 0 0 0 1 4 6 0 3 0 0 0 15	0 0	13 9 4 2 0 0 0 28 54 42 16 5 2 0 0 119 15 9 5 1 0 1 0 31 15 10 4 5 0 0 0 34	53 236 53 60
11:30 11:45 1 Hr	3 5 1 3 0 0 0 12 13 4 1 3 2 0 0 23 23 16 5 8 3 0 2 57	3 3 3 1 0 0 0 10 4 6 2 4 0 0 0 16 16 18 7 11 0 0 0 52	0 0	7 12 2 2 0 0 1 24 13 11 3 2 0 0 0 29 50 42 14 10 0 1 1 118	46 68 227
12:00 12:15 12:30 12:45	10 4 0 4 1 0 0 19 18 6 1 5 0 0 0 0 30 22 7 1 3 2 0 0 35 14 6 2 2 1 0 0 25	8 3 3 1 0 0 0 15 9 4 1 4 0 0 0 16 10 7 4 1 0 0 0 22 8 3 2 3 0 0 0 16	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12 9 6 2 0 0 0 29 11 12 2 1 1 0 0 27 13 11 3 0 0 0 0 27 16 3 4 1 0 0 0 24	63 75 84 65
1 Hr 13:00 13:15	64 23 4 14 4 0 0 109 15 3 2 3 1 0 0 24 15 4 0 1 1 0 0 21	35 17 10 9 0 0 0 71 8 6 1 3 0 0 0 18 14 4 8 2 1 0 0 25 10 1 1 0 0 0 0 11	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	52 35 15 4 1 0 0 107 12 10 10 2 0 0 0 34 11 13 0 0 0 0 0 24 10 10 7 2 0 0 0 29	287 76 74
13:30 13:45 1 Hr 14:00	22 1 2 4 0 0 0 29 13 3 3 4 2 0 0 25 65 11 7 12 4 0 0 99 12 4 1 4 1 0 0 22	10 1 1 0 0 0 0 0 12 14 5 1 3 0 0 0 0 22 46 16 11 8 1 0 0 82 6 1 0 4 0 0 0 1	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13 7 4 3 0 0 0 27 46 40 21 7 0 0 0 114 11 10 5 2 0 1 0 29	70 75 295 62
14:15 14:30 14:45 1 Hr	14 7 2 1 1 1 0 26 8 3 1 7 1 0 0 20 111 3 0 5 1 1 0 21 45 17 4 17 4 2 0 89	7 3 3 2 0 0 0 15 5 4 2 1 0 0 0 12 16 5 0 1 0 0 0 22 34 13 5 8 0 0 0 6	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14 11 3 0 0 0 0 28 10 6 1 3 0 0 0 20 6 12 6 1 0 0 0 25 41 39 15 6 0 1 0 102	69 52 68
15:00 15:15 15:30	11 3 3 4 1 0 0 22 14 2 0 5 1 0 0 22 7 5 2 7 1 0 0 22	7 4 3 3 0 0 0 17 10 6 1 3 0 0 0 20 15 7 1 1 0 0 0 24	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13 11 8 2 0 0 0 34 14 7 4 4 1 0 0 30 21 11 6 3 0 0 0 41	251 73 72 87
15:45 1 Hr 16:00 16:15	10 4 1 4 1 0 2 22 42 14 6 20 4 0 2 88 7 7 2 8 1 1 0 26 13 6 0 5 1 0 0 25	11 6 5 1 0 0 0 2 43 23 10 8 0 0 0 8 10 6 1 2 0 0 0 0 8 15 5 1 4 0 0 0 2	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 12 1 0 1 0 0 21 55 41 19 9 2 0 0 126 11 11 7 2 0 0 1 32 8 8 4 1 0 0 0 21	66 298 77 71
16:30 16:45 1 Hr 17:00	10 4 1 6 0 1 1 23 19 6 0 4 2 0 0 31 49 23 3 23 4 2 1 105 17 4 1 1 1 1 1 26	16 4 1 5 0 1 0 2; 15 2 1 2 0 0 0 2; 56 17 4 13 0 1 0 9; 26 2 2 3 0 0 0 0 3	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 7 1 2 0 0 0 17 17 9 5 3 0 0 0 34 43 35 17 8 0 0 1 104 18 10 4 4 0 0 0 36	67 85 300 95
17:15 17:30 17:45	15 5 1 3 0 0 1 25 17 6 1 1 1 0 3 29 24 0 4 2 2 1 1 34	22 5 0 1 1 2 0 31 25 5 3 3 0 0 0 36 15 2 2 0 0 0 0 18	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10 6 3 1 0 0 0 20 12 3 3 2 0 0 0 20 10 6 3 3 0 0 0 22	76 85 75
1 Hr 18:00 18:15 18:30	73 15 7 7 4 2 6 114 16 1 0 1 3 1 3 25 18 6 0 1 2 0 0 27 12 1 0 2 1 0 1 17	88 14 7 7 1 2 0 119 16 2 3 0 0 0 0 2 13 3 0 1 0 1 0 18 13 3 0 2 0 1 0 19	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	50 25 13 10 0 0 0 98 3 3 2 0 0 0 0 8 2 2 3 3 0 0 1 11 2 3 3 0 0 0 8	331 54 56 44
18:45 1 Hr 12 Hrs	4         2         1         1         1         1         11         11         1	8         4         1         0         0         0         0         13           50         12         4         3         0         2         0         71	0 0 0 0 0 0 0 0 0	7 0 0 0 0 0 0 0 7 14 8 8 3 0 0 1 34 754 458 180 83 7 4 3 1489	31 185 3338
Total Check	963 506 193 52 155 49 10 18 983		<b>100</b>	1489	3338 3338 3338
Entry:	Arm D - Kilshane Way (W)				
	Destination: Arm A - R135 (N)  CAR LGV OGV1 OGV2 PSV MCL PCL Total	Destination: Arm B - Kilshane Way (E)  CAR LGV OGV1 OGV2 PSV MCL PCL Total	Destination: Arm & RY35 (8)  CAR LGIV GGV GGV2 PSV MCL PCL Total	Destination: Arm D - Kilshane Way (W)   CAR LGV OGV1 OGV2 PSV MCL PCL Total	Arm Totals
07:00 07:15 07:30 07:45	Destination: Arm A - R135 (N)	CAR LGV OGV1 OGV2 PSV MCL PCL Total  16 1 4 0 1 0 0 2  16 4 3 0 1 0 0 2  7 5 6 0 5 0 0 2	1 2 7 3 0 0 1 14 5 2 1 0 1 13 6 3 3 1 0 0 13		41 38 38
07:15 07:30 07:45 1 Hr 08:00 08:15	Destination: Arm A: F135 (N)   CAR   LGV OGV1 OGV2   PSV   MCL   PCL   Total	CAR LGV OGV1 OGV2 PSV MCL PCL Total   16	1 2 7 3 0 0 1 1 14 5 5 2 1 0 1 13 12 5 5 2 0 0 0 12 30 16 5 0 0 0 0 22 10 10 2 0 2 64 10 10 2 0 0 0 13 10 10 2 0 0 0 13 10 10 2 0 0 0 13 10 10 8 7 1 0 0 0 18	CAR LGV OGVI OGV2 PSV MCL PCL Total    0	70tals 41 38 38 54 171 66 66
07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr	Destination	CAR LGV OGV1 OGV2 PSV MCL PCL Tolar  16 1 4 0 1 0 0 2  7 5 6 0 5 0 0 2  20 6 3 1 0 0 0 0 3  59 16 16 1 7 7 0 0 0 3  59 16 16 1 7 7 0 0 0 2  33 3 9 0 0 0 0 2  18 11 3 3 0 0 0 0 0  85 30 20 6 0 0 0 2  85 30 0 0 6 0 0 0 2	1 2 7 3 0 0 1 1 14 5 2 7 3 0 0 0 1 1 14 5 3 3 1 0 0 13 12 5 5 2 0 0 0 0 22 18 16 20 10 2 0 2 64 5 5 7 1 0 0 0 12 5 7 7 0 0 0 0 12 24 28 27 6 0 0 0 22 24 28 27 6 0 0 0 18 3 1 1 4 1 0 0 19	CAR LGV OGVI OGVZ PSV MCL PCL Total    0	70tals  41 38 38 54 171 66 66 62 49 243 53
07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30	Destination	CAR LGV OGV1 OGV2 PSV MCL PCL Total   16	1 2 7 3 0 0 1 1 14 5 2 7 3 0 0 0 1 1 14 6 3 3 1 0 0 0 13 12 5 5 2 0 0 0 2 24 13 16 20 10 2 0 2 64 15 5 7 1 0 0 0 18 16 20 10 0 0 28 17 7 0 0 0 0 28 24 28 27 6 0 0 0 28 24 28 27 6 0 0 0 28 24 28 27 6 0 0 0 28 25 2 2 2 3 0 0 0 28 26 3 3 11 4 1 0 0 0 0 18 27 3 11 4 0 0 0 0 28 28 3 2 3 0 0 0 0 28 29 3 11 0 0 0 0 28 20 3 11 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CAR LGV OGVI OGVZ PSV MCL PCL Total    0	10 Totals  411 38 38 54 171 66 66 62 49 243 53 63 58 58
07:15 07:30 07:35 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 09:45 1 Hr 10:00 10:15	Destination: Arm A: F135 (N)   CAR   LGV   CGV1   GGV2   PSV   MCL   PCL   Total	CAR LGV OGV1 OGV2 PSV MCL PCL Tda   16	1 0 2 7 3 0 0 1 1 14 5 2 7 3 0 0 0 1 1 14 6 3 3 1 0 0 0 13 12 5 5 2 0 0 0 2 24 13 16 20 10 2 0 2 64 15 5 7 1 0 0 0 0 18 5 7 7 0 0 0 0 0 0 0 22 24 28 27 6 0 0 0 0 22 8 13 2 3 0 0 0 22 8 13 2 3 0 0 0 22 8 13 2 3 0 0 0 22 22 43 19 6 0 0 0 0 22 22 43 19 6 0 0 0 0 22 22 43 19 6 0 0 0 0 22 21 21 3 3 0 0 0 22 22 43 19 6 0 0 0 0 22 21 21 3 3 0 0 0 22 22 43 19 6 0 0 0 0 22 23 25 45 10 2 0 0 0 22 24 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CAR LGV OGVI OGVZ PSV MCL PCL Total    0	Totals  411 38 38 38 54 1771 66 66 62 49 243 53 63 58 232 51 63 57
07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 09:45 1 Hr 10:00 10:15 10:30 10:45 1 Hr	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total	Totals  411 38 38 38 54 1711 66 62 243 53 63 58 58 58 232 51 63 57 60 2311 61 62
07:15 07:30 07:35 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 09:45 1 Hr 10:00 10:15 10:30 10:45 1 Hr	Destination: Arm A: F135 (N)   CAR   LGIV   CGV1   GGV2   PSV   MCL   PCL   Total	CAR LGV OGV1 OGV2 PSV MCL PCL Tolar   16	10 2 7 3 0 0 1 1 14 10 2 7 3 0 0 0 1 1 14 11 5 3 3 2 1 0 0 1 0 13 12 15 5 2 1 0 0 1 1 14 15 5 7 1 0 0 0 2 12 15 6 7 1 0 0 0 0 19 16 8 7 1 0 0 0 0 19 4 8 6 4 0 0 0 0 22 24 28 27 6 0 0 0 0 85 3 11 4 1 0 0 0 0 18 6 10 5 1 0 0 0 0 22 8 13 2 3 0 0 0 0 2 8 13 3 3 0 0 0 2 12 10 3 3 0 0 0 2 12 10 3 3 0 0 0 2 12 11 3 1 3 0 0 0 0 2 13 14 3 0 0 0 0 2 14 8 8 4 0 0 0 0 2 16 8 1 3 1 0 0 0 0 2 17 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41 38 38 54 171 66 66 62 49 243 53 63 58 58 232 51 61 62 59 60 231 61 62 59 63 63 88
07:15 07:30 07:35 1 Hr 08:00 08:15 08:30 08:45 1 Hr 09:00 09:15 09:30 10:15 10:30 10:15 10:30 11:15 11:30 11:35 11:45 11:34 11:45 11:45 11:23 12:45 12:30 12:45	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  411 38 38 54 171 66 68 62 49 243 53 63 63 58 58 59 60 231 61 62 59 63 245 88 89 82 81
07:15 07:30 07:45 1 Hr 08:00 08:15 08:30 08:35 1 Hr 10:00 09:45 1 Hr 10:00 10:15 10:45 1 Hr 11:30 11:45 11:30 11:45 11:30 11:45 11:45 11:30 12:45 11:47 12:30 12:45 14:47 13:30 13:31 13:30	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1 0 2 7 3 0 0 1 1 14	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  411 38 38 54 171 66 66 62 49 243 53 58 58 232 51 63 57 60 231 61 62 59 63 245 88 58 88 58 82 81 310
07:15 (7:30 to 0.00 to	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  411 38 38 54 171 66 66 62 49 243 53 58 58 232 51 63 57 60 231 61 62 59 63 245 88 58 88 58 82 81 310
07:15   07:30	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41 43 38 38 38 54 47 171 66 66 62 49 49 49 53 58 58 58 232 61 63 65 62 244 63 63 68 88 88 88 88 88 88 88 88 88 88 88 88
07:15   1 Hr   08:00   07:46   1 Hr   08:00   07:46   1 Hr   08:00   08:15   08:30   08:45   1 Hr   08:00   08:15   1 Hr   10:00   08:15   1 Hr   10:00   10:15   1 Hr   10:00   10:15   1 Hr   10:00   10:15   1 Hr   10:00   10:45   1 Hr   10:515   15:515   15:515   15:545   10:545   1 Hr   10:500   10:45   1 Hr   10:515   15:545   15:545   1 Hr   15:515   15:545   15:545   1 Hr   15:545   1 Hr   15:545   15:545   1 Hr   1 Hr	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41  41  43  38  38  38  45  41  117  66  66  66  62  49  49  243  63  63  63  63  63  63  63  63  63
07:15 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41  41  438  389  389  389  491  491  491  491  491  491  491  4
07:15 (7:30 d) (7:40	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41  43  38  38  38  41  124  131  141  152  66  68  68  68  69  69  69  69  69  69
07:15 (17:30	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tabel   Tabel	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41  41  43  38  38  38  45  41  117  66  66  66  66  67  49  49  243  36  63  63  63  63  63  63  63  63
07:15 07:30 07:30 07:30 07:30 07:30 07:30 08:30	Destination   Arm A F 1935 (N)	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tela	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41  41  38  38  38  54  117  117  66  66  66  66  69  24  49  243  58  63  63  63  63  63  63  63  63  63  6
07:15 (7:30 d) (7:40	Destination	CAR   LGV   OGV1   OGV2   PSV   MCL   PCL   Tolar	1	CAR LGV OGVI OGVZ PSV MCL PCL Total  0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Totals  41  43  48  38  38  38  38  41  171  171  171  171  171  171  171

		rm A - R135	(N)					Origin: An	m B - Kilshan	e Way (E)				Origin: Ar	n C - R135 (S	)				Origin: An	m D - Kilsh	hane Way (W	ŋ			Origin
	CAR	LGV O	GV1 OGV	2 PSV	MCL	PCL	Total	CAR	LGV OG	V1 OGV2	PSV	MCL PCL		CAR	LGV OGV	1 OGV2	PSV M	CL PCL		CAR	LGV (	OGV1 OGV	2 PSV	MCL	PCL Total	Totals
07:00 07:15	32 30	11 13	3 6	2 1 4 3	0	1	50 57	75 93	8 19	3 4 2 3	0	0 0	92	28 30	16 9	6 2 7 4	0 1	0 0	52 51	19 16	3 9	13 8	4 1 2 2	0	1 41 1 38	235 263
07:30 07:45	66 54	18 24	4	5 4 4 3	1	2	100 87	91 92	11 26	3 6 3	1	1 1	114 126	26 60	16 34	6 9 2 10	3 0	0 0	60 107	9 32	11 11	9 8	3 6	0	0 38 0 54	312 374
1 Hr 08:00	182 54	66 19	14 1	5 11 4 2	0	5 4	294 83	351 104	64 15	11 17 5 3	0	3 2 0 2	449 129	144 43	75 2 19	1 25 4 7	1	0 1	270 75	76 37	34 9	38 1 16	2 9 4 0	0	2 171 0 66	1184 353
08:15 08:30	71 60	13 18	4	5 0 1 1	1 0	1	95 82	103 97	12 12	6 2 8 4	0	0 (	123	65 55	18 30	3 6	1	2 0	95 93	33 27	19 21		2 0	0	2 66 0 62	379 359
08:45 1 Hr	52 237	10 60	2 7 1	6 2	1 2	0	73 333	90 394	19	6 4 25 13	0	1 (	120	60 223	16 83 1	7 12 8 28	2	1 0	98 361	17 114	16 65	11 48 1	5 0	0	0 49 2 243	340 1431
09:00 09:15	44 49	13		2 4	0	1	67 67	101 85	20	12 6 6 8	1	0 2	142	49 41	17	9 7	1 2	0 0	83 81	22 31	22	7 8	1 0	1 0	0 53 0 63	345 339
09:30 09:45	36 39	11 14	4	7 2	0	0	60 57	48 46	17 13	7 2	1	0 0	75	36 24	23 22	5 8	1	0 0	73 60	26 19	17 25	11 12	4 0	0	0 58 0 58	266 248
1 Hr 10:00	168 23	47		5 8	0	2	251 43	280 45	77 ;	33 21 10 4	3	1 3	418 73	150 31	79 2 21	6 35 8 5	6	1 0	297 67	98 25	87 16	38	8 0 4 0	1 0	0 232 0 51	1198
10:15	28 34		2	2 1 3 2	0	0	42 50	60 46	10 22	7 8	1	0 0	86	28 25	12 23	9 7	2	0 0	58 58	31 20	22 25	6	4 0	0	0 63 1 57	249 247
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	CAR	LGV O	GV1 OGV	2 PSV	MCL	PCL	Total	CAR	LGV OGV	V1 OGV2	PSV	MCL PCL	Total	CAR	LGV OGV	UGV2	PSV M	CL PCL	Total	CAR	LGV (	OGV1 OGV	2 PSV	MCL	PCL Total	Totals
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# **TRAFFIC AND TRANSPORTATION 13**



## R135 / N2 Slip Road Priority Junction - AM Peak Hour

2016 Existing AM Peak

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	58	58
N2 Slip Road	396	0	128	524
R135 (South)	86	0	0	86
Totals	482	0	186	668

2017 AM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	58	58
N2 Slip Road	399	0	129	528
R135 (South)	87	0	0	87
Totals	485	0	187	673

2017 AM Peak Development Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	1	1
N2 Slip Road	0	0	2	2
R135 (South)	3	0	0	3
Totals	3	0	3	6

2017 AM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	59	59
N2 Slip Road	399	0	131	530
R135 (South)	90	0	0	90
Totals	488	0	190	679

2022 AM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	
R135 (North)	0	0	61	61	
N2 Slip Road	413	0	134	547	
R135 (South)	90	0	0	90	115e.
Totals	503	0	194	697	therit
2022 AM Peak Wit	h Development		•		. vot
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	all
R135 (North)	0	0	62	625 \$	0,
N2 Slip Road	413	0	136	549.0	

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	62	625
N2 Slip Road	413	0	136	549,00
R135 (South)	93	0	0	211/93/1
Totals	506	0	197	703

2022 AM Peak Sensitivity Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	A 62 100	22
N2 Slip Road	0	0	220	22
R135 (South)	44	0	× 00	44
Totals	44	0	X <sup>0</sup> 44	88

2022 AM Peak With Development Flows + Sensitivity Flows					
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	
R135 (North)	0	0	84	84	
N2 Slip Road	413	0	158	571	
R135 (South)	137	0	0	137	
Totals	550	0	241	791	

2032 AM Peak No Development (Existing + TII Growth Factors)

2032 AM Feak No Development (Existing + Til Growth Factors)					
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	
R135 (North)	0	0	63	63	
N2 Slip Road	430	0	139	569	
R135 (South)	93	0	0	93	
Totale	523	0	202	725	

2032 AM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	64	64
N2 Slip Road	430	0	141	571
R135 (South)	96	0	0	96
Totals	526	0	205	731

2032 AM Peak Sensitivity Flows

2002 Aim I can ochisitivity I lows					
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	
R135 (North)	0	0	16	16	
N2 Slip Road	0	0	16	16	
R135 (South)	32	0	0	32	
Totals	32	0	32	64	

2032 AM Peak With Development Flows + Sensitivity Flows

2002 Aill Feak With Development Hows + Sensitivity Hows					
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	
R135 (North)	0	0	80	80	
N2 Slip Road	430	0	157	587	
R135 (South)	128	0	0	128	
Totals	558	0	237	795	

## R135 / N2 Slip Road Priority Junction - PM Peak Hour

2016 Existing PM Peak

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	20	20
N2 Slip Road	308	0	20	328
R135 (South)	116	0	0	116
Totals	424	0	40	464

2017 PM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	20	20
N2 Slip Road	310	0	20	330
R135 (South)	117	0	0	117
Totals	427	0	40	467

2017 PM Peak Development Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	1	1
N2 Slip Road	0	0	1	1
R135 (South)	3	0	0	3
Totals	3	0	2	5

2017 PM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	21	21
N2 Slip Road	310	0	21	331
R135 (South)	120	0	0	120
Totals	430	0	42	472

2022 PM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	21	21
N2 Slip Road	321	0	21	342
R135 (South)	121	0	0	121
Totals	442	0	42	484

2022 PM Peak With Development

· · · · · · · · · · · · · · · · ·				
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals, N
R135 (North)	0	0	22	225°
N2 Slip Road	321	0	22	<sub>2</sub> 05°, 3843
R135 (South)	124	0	0 💉	124
Totals	445	0	44	<b>489</b>

2022 PM Peak Sensitivity Flows

LULL I III I CUIT OCITO	SEET IN FOUR CONSTITUTE					
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals		
R135 (North)	0	0	60 Jago	22		
N2 Slip Road	0	0	\$ 22	22		
R135 (South)	44	0	ς <sup>ω</sup> 0	44		
Totals	44	0	44	88		

2022 PM Peak With Development Flows + Sensitivity Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	44	44
N2 Slip Road	321	0	44	365
R135 (South)	168	0	0	168
Totals	489	0	88	577

2032 PM Peak No Development (Existing + TII Growth Factors)

2032 FW Feak NO Development (Existing + Til Growth Lactors)					
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals	
R135 (North)	0	0	22	22	
N2 Slip Road	334	0	22	356	
R135 (South)	126	0	0	126	
Totale	460	0	12	504	

2032 PM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals
R135 (North)	0	0	23	23
N2 Slip Road	334	0	23	357
R135 (South)	129	0	0	129
Totals	463	0	45	509

2032 PM Peak Sensitivity Flows

2002 I WIT CUR OCII	2002 I WIT car ochishivity Hows						
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals			
R135 (North)	0	0	16	16			
N2 Slip Road	0	0	16	16			
R135 (South)	32	0	0	32			
Totals	32	0	32	64			

2032 PM Peak With Development Flows + Sensitivity Flows

2002 I WIT CAR WITH DEVElopHicht Flows + Ochsitivity Flows						
From / To	R135 (North)	N2 Slip Road	R135 (South)	Totals		
R135 (North)	0	0	39	39		
N2 Slip Road	334	0	39	373		
R135 (South)	161	0	0	161		
Totals	495	0	77	573		

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## R135 / Elm Road Signalised Junction - AM Peak Hour

2016 Existing AM Peak

From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	230	63	293	
Elm Road	21	0	3	24	
R135 (South)	319	122	0	441	
Totals	340	352	66	758	

2016	$\Delta M$	Dook	DCII	Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	283	71	354	
Elm Road	22	0	4	26	
R135 (South)	371	173	0	544	
Totals	393	456	75	924	

2017 AM Peak No Development (PCU Flows + TII Growth Factors)

2011 7 mm 1 can 110 201010 pmont (1 00 1 10 10 1 1 1 1 ano 11 1 1 actors)					
From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	285	72	357	
Elm Road	22	0	4	26	
R135 (South)	374	174	0	548	
Totals	396	459	76	931	

2017 AM Peak Development Flows

2017 AM I CUR Development I lows					
From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	0	1	1	
Elm Road	0	0	0	0	
R135 (South)	1	2	0	3	
Totals	1	2	1	4	

2017 AM Peak With Development

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	285	73	358
Elm Road	22	0	4	26
R135 (South)	375	176	0	551
Totals	397	461	77	935

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	295	74	369
Elm Road	23	0	4	27
R135 (South)	387	181	0	568
Totals	410	476	78	964

22	O	7	20	
375	176	0	551	
397	461	77	935	
evelopment (Existin	g + TII Growth Fa	actors)		્ર•
R135 (North)	Elm Road	R135 (South)	Totals	* 118
0	295	74	369	West.
23	0	4	27	Oli
387	181	0	568	Enr. Er
410	476	78	964	Office de
				es 250'
Development			_	03. 40G
R135 (North)	Elm Road	R135 (South)	Totals	R WILL
0	295	75	370	ex-
23	0	4	\$27° O	
388	183	0	571	
411	478	79	968	
	375 397  evelopment (Existin R135 (North) 0 23 387 410  Development R135 (North) 0 23 388	375 176 397 461  evelopment (Existing + TII Growth Fa R135 (North) Elm Road 0 295 23 0 387 181 410 476  Development R135 (North) Elm Road 0 295 23 0 387 181 388 183	375         176         0           397         461         77           evelopment (Existing + TII Growth Factors)           R135 (North)         Elm Road         R135 (South)           0         295         74           23         0         4           387         181         0           410         476         78           Development           R135 (North)         Elm Road         R135 (South)           0         295         75           23         0         4           388         183         0	375

2022 AM Peak Sensitivity Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	0	22	22
Elm Road	0	0	0%	0
R135 (South)	22	22	50	44
Totals	22	22	CON 22	66

2022 AM Peak With Development Flows + Sensitivity Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	295	97	392
Elm Road	23	0	4	27
R135 (South)	410	205	0	615
Totals	433	500	101	1034

2032 AM Peak No Development (Existing + TII Growth Factors)

2002 Am I cak No Bevelopment (Existing + III Growth I actors)					
From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	307	77	384	
Elm Road	24	0	4	28	
R135 (South)	403	188	0	591	
Totals	427	495	81	1003	

2032 AM Peak With Development

2032 AM Peak With Development					
From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	307	78	385	
Elm Road	24	0	4	28	
R135 (South)	404	190	0	594	
Totals	428	497	82	1007	

2032 AM Peak Sensitivity Flo

2032 AM Peak Sensitivity Flows					
From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	0	16	16	
Elm Road	0	0	0	0	
R135 (South)	16	16	0	32	
T - 4 - 1 -	10	4.0	10	40	

2032 AM Feak With Development Flows + Sensitivity Flows					
From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	307	94	401	
Elm Road	24	0	4	28	
R135 (South)	420	206	0	626	
Totals	444	513	98	1055	

## R135 / Elm Road Signalised Junction - PM Peak Hour

2016 Existing PM Peak

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	313	21	334
Elm Road	29	0	2	31
R135 (South)	320	144	0	464
Totals	349	457	23	829

#### 2016 PM Peak PCU Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	337	28	365
Elm Road	30	0	2	32
R135 (South)	378	164	0	542
Totals	408	501	30	939

2017 PM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	339	28	368
Elm Road	30	0	2	32
R135 (South)	381	165	0	546
Totals	411	505	30	946

2017 PM Peak Development Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	0	1	1	
Elm Road	0	0	0	0	
R135 (South)	1	2	0	3	
Totals	1	2	1	4	

2017 PM Peak With Development

From / To	R135 (North)	Elm Road	R135 (South)	Totals	
R135 (North)	0	339	29	369	
Elm Road	30	0	2	32	
R135 (South)	382	167	0	549	
Totals	412	507	31	950	

2022 PM Peak No Development (Existing + TII Growth Factors)

2022 FW Feak NO Development (Existing + Til Glowth Factors)						
From / To	R135 (North)	Elm Road	R135 (South)	Totals		
R135 (North)	0	352	29	381		
Elm Road	31	0	2	33		
R135 (South)	394	171	0	566		
Totals	426	523	31	980		

2022 PM Peak With Development					
From / To	R135 (North)	Elm Road	R135 (South)	Totals 🚫	
R135 (North)	0	352	30	382	
Elm Road	31	0	2	33	
R135 (South)	395	173	0 &	<b>₹</b> 569	
Totals	427	525	32	984	

2022 PM Peak Sensitivity Flows				
From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	0	22	22
Elm Road	0	0	<b>₹</b> 0	0
R135 (South)	22	22	20° 0	44
Totals	22	22	22	66

2022 PM Peak With Development Flows + Sensitivity Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	352	52	404
Elm Road	31	0	2	33
R135 (South)	417	195	0	613
Totals	449	547	54	1050

2032 PM Peak No Development (Existing + TII Growth Factors)

	ooz i m i oak no zorolopiioni (zaloting i in alontini actoro)					
From / To	R135 (North)	Elm Road	R135 (South)	Totals		
R135 (North)	0	366	30	396		
Elm Road	33	0	2	35		
R135 (South)	410	178	0	589		
Totals	443	544	33	1020		

2032 PM Peak With Development

2032 PM Peak With Development						
From / To	R135 (North)	Elm Road	R135 (South)	Totals		
R135 (North)	0	366	31	397		
Elm Road	33	0	2	35		
R135 (South)	411	180	0	592		
Totale	444	546	34	1024		

2032 PM Peak Sensitivity Flows

From / To	R135 (North)	Elm Road	R135 (South)	Totals
R135 (North)	0	0	16	16
Elm Road	0	0	0	0
R135 (South)	16	16	0	32
Totals	16	16	16	48

2032 PM Peak With Development Flows + Sensitivity Flows

2032 PM Peak With Development Flows + Sensitivity Flows						
From / To	R135 (North)	Elm Road	R135 (South)	Totals		
R135 (North)	0	366	47	413		
Elm Road	33	0	2	35		
R135 (South)	427	196	0	624		
Totals	460	562	50	1072		

## R135 / L3125 Signalised Junction - AM Peak Hour

2016 Existing AM Peak

LOTO Existing Am I	cun				
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	219	117	29	365
L3125 (East)	82	0	90	320	492
R135 (South)	59	73	0	205	337
L3125 (West)	9	134	81	0	224
Totals	150	426	288	554	1418

2016	ΔM	Peak	PCII	Flows

2010 AMIT CURT OF HOWS								
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals			
R135 (North)	0	234	137	30	401			
L3125 (East)	93	0	101	331	525			
R135 (South)	77	88	0	224	389			
L3125 (West)	11	163	111	0	285			
Totals	181	485	349	585	1600			

2017 AM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	236	138	30	404		
L3125 (East)	94	0	102	333	529		
R135 (South)	78	89	0	226	392		
L3125 (West)	11	164	112	0	287		
Totals	182	488	351	589	1611		

2017 AM Peak Development Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	1	0	1
L3125 (East)	0	0	0	0	0
R135 (South)	1	0	0	0	1
L3125 (West)	0	0	0	0	0
Totals	1	0	1	0	2

2017 AM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	236	139	30	405
L3125 (East)	94	0	102	333	529
R135 (South)	79	89	0	226	393
L3125 (West)	11	164	112	0	287
Totals	183	488	352	589	1613

2022 AM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	244	143	31	418
L3125 (East)	97	0	105	345	548
R135 (South)	80	92	0	234	406
L3125 (West)	11	170	116	0	297
Totals	189	506	364	611	1670

2022 AM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	244	144	31	409 3
L3125 (East)	97	0	105	345	548
R135 (South)	81	92	0	234	407
L3125 (West)	11	170	116	0	297
Totals	190	506	365	611	1672

2022 AM Peak Sensitivity Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	22	100	22
L3125 (East)	0	0	0	- 608	0
R135 (South)	22	0	0	0	22
L3125 (West)	0	0	0	0	0
Totals	22	0	22 😢	0	44
2022 AM Peak Wit	th Development + Se	nsitivity Flows	Cons		
From / To	R135 (North)	N2 Slin Road	R135 (South)	1 3125 (Most)	Totale

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	244	166	31	441
L3125 (East)	97	0	105	345	548
R135 (South)	103	92	0	234	429
L3125 (West)	11	170	116	0	297
Totals	212	506	387	611	1716

2032 AM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	254	149	33	435
L3125 (East)	101	0	110	359	570
R135 (South)	84	96	0	243	422
L3125 (West)	12	177	121	0	309
Totals	197	527	379	635	1737

2032 AM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	254	150	33	436
L3125 (East)	101	0	110	359	570
R135 (South)	85	96	0	243	423
L3125 (West)	12	177	121	0	309
Totals	198	527	380	635	1739

2032 AM Peak Sensitivity Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	16	0	16
L3125 (East)	0	0	0	0	0
R135 (South)	16	0	0	0	16
L3125 (West)	0	0	0	0	0
Totals	16	0	16	0	32

2032 AM Peak With Development									
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals				
R135 (North)	0	254	166	33	452				
L3125 (East)	101	0	110	359	570				
R135 (South)	101	96	0	243	439				
L3125 (West)	12	177	121	0	309				
Totals	214	527	396	635	1771				

## R135 / L3125 Signalised Junction - PM Peak Hour

2016 Existing PM Peak

LOTO Existing 1 mile	Jun				
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	168	86	16	270
N2 Slip Road	204	0	85	199	488
R135 (South)	111	120	0	110	341
L3125 (West)	22	273	163	0	458
Totals	337	561	334	325	1557

2016 PM Peak PCU Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	177	97	18	292
N2 Slip Road	216	0	91	221	528
R135 (South)	127	136	0	135	398
L3125 (West)	24	179	175	0	378
Totals	367	492	363	374	1596

2017 PM Peak No Development (PCU Flows + Til Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals			
R135 (North)	0	178	98	18	294			
N2 Slip Road	218	0	92	223	532			
R135 (South)	128	137	0	136	401			
L3125 (West)	24	180	176	0	381			
Totals	370	495	366	377	1607			

2017 PM Peak Development Flows

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	1	0	1
N2 Slip Road	0	0	0	0	0
R135 (South)	1	0	0	0	1
L3125 (West)	0	0	0	0	0
Totals	1	0	1	0	2

2017 PM Peak With Development

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals
R135 (North)	0	178	99	18	295
N2 Slip Road	218	0	92	223	532
R135 (South)	129	137	0	136	402
L3125 (West)	24	180	176	0	381
Totals	371	495	367	377	1609

2022 PM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	186	102	19	307		
N2 Slip Road	227	0	96	232	555		
R135 (South)	133	143	0	142	418		
L3125 (West)	25	188	184	0	397		
Totals	386	517	382	393	1677		

2022 PM Peak With Development

LULL I WIT CUR WITH	Developinent				Ø₽ ∧ 3
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals,
R135 (North)	0	186	103	19	308
N2 Slip Road	227	0	96	232	555
R135 (South)	134	143	0	142	419
L3125 (West)	25	188	184	0 10	397
Totals	387	517	383	393	1679
				25,0	
2022 PM Peak Sensitivity Flows				Mr. Mr.	

2022 PM Peak Sensitivity Flo

2022 PM Peak Sen	ISITIVITY FIOWS			. 15 20	
From / To	R135 (North)	N2 Slip Road	R135 (South)	23125 (West)	Totals
R135 (North)	0	0	22	000	22
N2 Slip Road	0	0	0	0	0
R135 (South)	22	0	0	0	22
L3125 (West)	0	0	0	0	0
Totals	22	0	22	0	44

2022 PM Peak With Development + Sensitivity Flows								
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals			
R135 (North)	0	186	125	19	330			
N2 Slip Road	227	0	96	232	555			
R135 (South)	156	143	0	142	441			
L3125 (West)	25	188	184	0	397			
Totals	409	517	405	393	1723			

2032 PM Peak No Development (PCO Flows + Til Growth Factors)									
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals				
R135 (North)	0	192	105	20	317				
N2 Slip Road	235	0	99	240	573				
R135 (South)	138	148	0	147	432				
L3125 (West)	26	194	190	0	410				
Totale	300	534	394	406	1733				

2032 PM Peak With Development

2032 FM Feak With Development								
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals			
R135 (North)	0	192	106	20	318			
N2 Slip Road	235	0	99	240	573			
R135 (South)	139	148	0	147	433			
L3125 (West)	26	194	190	0	410			
Totalo	400	E24	205	406	1725			

2032 FW Feak NO Development (FCO Flows + Til Glowth Factors)									
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals				
R135 (North)	0	0	16	0	16				
N2 Slip Road	0	0	0	0	0				
R135 (South)	16	0	0	0	16				
L3125 (West)	0	0	0	0	0				
Tetale	16		16		20				

2032 PM Peak With Development						
From / To	R135 (North)	N2 Slip Road	R135 (South)	L3125 (West)	Totals	
R135 (North)	0	192	122	20	334	
N2 Slip Road	235	0	99	240	573	
R135 (South)	155	148	0	147	449	
L3125 (West)	26	194	190	0	410	
Totals	416	534	411	406	1767	

## R135 / N2 Roundabout Junction - AM Peak Hour

2016 Existing AM Peak

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	170	139	309
R135 (South)	48	0	88	136
N2 Slip Road	63	186	0	249
Totals	111	356	227	694

2017 AM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	171	140	311
R135 (South)	48	0	89	137
N2 Slip Road	63	187	0	251
Totals	112	359	229	699

2017 AM Peak Development Flows

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	0	1	1
R135 (South)	0	0	1	1
N2 Slip Road	0	0	0	0
Totals	0	0	2	2

2017 AM Peak With Development

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	171	141	312
R135 (South)	48	0	90	138
N2 Slip Road	63	187	0	251
Totals	112	359	231	701

2022 AM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	
R135 (North)	0	177	145	322	
R135 (South)	50	0	92	142	
N2 Slip Road	66	194	0	260	
Totals	116	372	237	724	

TTTOO (INOILII)	U	177	170	322	
R135 (South)	50	0	92	142	
N2 Slip Road	66	194	0	260	115e.
Totals	116	372	237	724	
	•	•	•	•	other
2022 AM Peak Wit	h Development				· 4
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	300
R135 (North)	0	177	146	323	<b>9</b> *
R135 (South)	50	0	93	d43,00	
N2 Slip Road	66	194	0	260	
Totals	116	372	239	₹26	

2022 AM Peak Sensitivity Flows

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	0	A 2 100	22
R135 (South)	0	0	220	22
N2 Slip Road	0	0	ξ <sup>0</sup>	0
Totals	0	0	X <sup>0</sup> 44	44

2022 AM Peak With Development + Sensitivity Flows					
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	
R135 (North)	0	177	168	345	
R135 (South)	50	0	115	165	
N2 Slip Road	66	194	0	260	
Totals	116	372	283	770	

2032 Aili Feak No Development (Existing + Til Growth Lactors)					
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	
R135 (North)	0	185	151	336	
R135 (South)	52	0	96	148	
N2 Slip Road	68	202	0	270	
Totale	101	207	246	754	

2032 AM Peak With Development

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	185	152	337
R135 (South)	52	0	97	149
N2 Slip Road	68	202	0	270
Totals	121	387	248	756

2032 AM Peak Sensitivity Flows

2002 Aun i Can Constituty i long						
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals		
R135 (North)	0	0	16	16		
R135 (South)	0	0	16	16		
N2 Slip Road	0	0	0	0		
Totals	0	0	32	32		

2032 AM Peak With Development + Sensitivity Flows

2002 Ail Feak With Development + Sensitivity Flows						
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals		
R135 (North)	0	185	168	353		
R135 (South)	52	0	113	165		
N2 Slip Road	68	202	0	270		
Totals	121	387	280	788		

## R135 / N2 Roundabout Junction - PM Peak Hour

2016 Existing PM Peak

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	111	86	197
R135 (South)	185	0	175	360
N2 Slip Road	127	160	0	287
Totals	312	271	261	844

2017 PM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	112	87	198
R135 (South)	186	0	176	363
N2 Slip Road	128	161	0	289
Totals	314	273	263	850

2017 PM Peak Development Flows

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	0	1	1
R135 (South)	0	0	1	1
N2 Slip Road	0	0	0	0
Totals	0	0	2	2

2017 PM Peak With Development

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	112	88	199
R135 (South)	186	0	177	364
N2 Slip Road	128	161	0	289
Totals	314	273	265	852

2022 PM Peak No Development (Existing + TII Growth Factors)

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	
R135 (North)	0	116	90	206	
R135 (South)	193	0	183	376	
N2 Slip Road	133	167	0	300	
Totals	326	283	272	881	

2022 PM Peak With Development

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals, V
R135 (North)	0	116	91	2010°
R135 (South)	193	0	184	S 377
N2 Slip Road	133	167	0 💉	300
Totals	326	283	274	883

2022 PM Peak Sensitivity Flows

	,		A) ()	
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	0	CO 1820	22
R135 (South)	0	0	22	22
N2 Slip Road	0	0	0 ئى	0
Totals	0	0	44	44

2022 PM Peak With Development + Sensitivity Flows

2022 PM Peak With Development + Sensitivity Flows						
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals		
R135 (North)	0	116	113	229		
R135 (South)	193	0	206	399		
N2 Slip Road	133	167	0	300		
Totals	326	283	318	927		

2022 PM Peak No Development (Existing + TII Growth Factors)

2022 FM Feak No Development (Existing + Til Glowth Lactors)					
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	
R135 (North)	0	121	93	214	
R135 (South)	201	0	190	391	
N2 Slip Road	138	174	0	312	
Totale	330	20/	202	016	

2022 PM Peak With Development

From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals
R135 (North)	0	121	94	215
R135 (South)	201	0	191	392
N2 Slip Road	138	174	0	312
Totals	339	294	285	918

2022 PM Peak Sensitivity Flows

2022 FINI FEAR SELISITIVITY I IOWS					
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals	
R135 (North)	0	0	16	16	
R135 (South)	0	0	16	16	
N2 Slip Road	0	0	0	0	
Totals	0	0	32	32	

2022 PM Peak With Development + Sensitivity Flows

2022 FW Feak With Development + Sensitivity Flows								
From / To	R135 (North)	R135 (South)	N2 Slip Road	Totals				
R135 (North)	0	121	110	231				
R135 (South)	201	0	207	408				
N2 Slip Road	138	174	0	312				
Totals	339	294	317	950				

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## R135 / L3125 Signalised Junction - AM Peak Hour

2016 Existing AM Peak

ZUTU EXISTING AWIT	can				
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	219	117	29	365
L3125 (East)	82	0	90	320	492
R135 (South)	59	73	0	205	337
L3125 (West)	9	134	81	0	224
Totals	150	426	288	554	1418

2016 AM Peak PC	U Flows + Re-	distributed Flows
-----------------	---------------	-------------------

LOTO AIN I CUR I GO I IOWS + IIC GISTIDUCG I IOWS							
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	117	137	30	284		
L3125 (East)	46	0	101	331	478		
R135 (South)	77	88	0	224	389		
L3125 (West)	11	163	111	0	285		
Totals	134	368	349	585	1436		

2017 AM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	118	138	30	286		
L3125 (East)	46	0	102	333	481		
R135 (South)	78	89	0	226	392		
L3125 (West)	11	164	112	0	287		
Totals	135	371	351	589	1446		

2017 AM Peak Development Flows

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	1	0	1
L3125 (East)	0	0	0	0	0
R135 (South)	1	0	0	0	1
L3125 (West)	0	0	0	0	0
Totals	1	0	1	0	2

2017 AM Peak With Development

LUIT AMI I CUR TIII	2017 AM I Cuk With Development							
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals			
R135 (North)	0	118	139	30	287			
L3125 (East)	46	0	102	333	481			
R135 (South)	79	89	0	226	393			
L3125 (West)	11	164	112	0	287			
Totals	136	371	352	589	1448			

2022 AM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	122	143	31	296		
L3125 (East)	48	0	105	345	499		
R135 (South)	80	92	0	234	406		
L3125 (West)	11	170	116	0	297		
Totals	140	384	364	611	1499		

2022 AM Peak With Development + Opening of Aiport Link Road

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	122	144	31	297
L3125 (East)	48	0	105	345	3499
R135 (South)	81	92	0	234	407
L3125 (West)	11	170	116	0 💉	297
Totals	141	384	365	611	1501
				- 42.	5
2022 AM Peak Se	2022 AM Peak Sensitivity Flows			100 101	

2022 AM Peak Sensitivity Flo

2022 AM Peak Ser	isitivity Flows			. Ar all	
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	22	100	22
L3125 (East)	0	0	0	500	0
R135 (South)	22	0	0	0	22
L3125 (West)	0	0	0	0	0
Totals	22	0	22 .0	0	44

2022 AM Peak With Development Flows + Sensitivity Flows								
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals			
R135 (North)	0	122	166	31	319			
L3125 (East)	48	0	105	345	499			
R135 (South)	103	92	0	234	429			
L3125 (West)	11	170	116	0	297			
Totals	163	384	387	611	1545			

2032 AM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	127	149	33	308
L3125 (East)	50	0	110	359	519
R135 (South)	84	96	0	243	422
L3125 (West)	12	177	121	0	309
Totals	146	400	379	635	1559

2032 AW Feak With Development + Opening of Alport Link hoad							
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	127	150	33	309		
L3125 (East)	50	0	110	359	519		
R135 (South)	85	96	0	243	423		
L3125 (West)	12	177	121	0	309		
Totalo	1/17	400	200	625	1561		

2032 AM Peak Sensitivity Flows

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	16	0	16
L3125 (East)	0	0	0	0	0
R135 (South)	16	0	0	0	16
L3125 (West)	0	0	0	0	0
Totals	16	0	16	0	32

2032 AM Peak With Development Flows + Sensitivity Flows									
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals				
R135 (North)	0	127	166	33	325				
L3125 (East)	50	0	110	359	519				
R135 (South)	101	96	0	243	439				
L3125 (West)	12	177	121	0	309				
Totals	163	400	396	635	1593				

## R135 / L3125 Signalised Junction - PM Peak Hour

2016 Existing PM Peak

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	168	86	16	270
L3125 (East)	204	0	85	199	488
R135 (South)	111	120	0	110	341
L3125 (West)	22	273	163	0	458
Totals	337	561	334	325	1557

2016 PM Peak PCU Flows + Re-distributed Flows

LOTO I MIT CURT GO I IOWS + TIC distributed I IOWS							
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	88	97	18	203		
L3125 (East)	108	0	91	221	420		
R135 (South)	127	136	0	135	398		
L3125 (West)	24	179	175	0	378		
Totals	259	403	363	374	1399		

2017 PM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals	
R135 (North)	0	89	98	18	204	
L3125 (East)	109	0	92	223	423	
R135 (South)	128	137	0	136	401	
L3125 (West)	24	180	176	0	381	
Totals	261	406	366	377	1409	

2017 PM Peak Development Flows

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	1	0	1
L3125 (East)	0	0	0	0	0
R135 (South)	1	0	0	0	1
L3125 (West)	0	0	0	0	0
Totals	1	0	1	0	2

2017 PM Peak With Development

2017 I MIT CUR WILL DEVELOPMENT							
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals		
R135 (North)	0	89	99	18	205		
L3125 (East)	109	0	92	223	423		
R135 (South)	129	137	0	136	402		
L3125 (West)	24	180	176	0	381		
Totals	262	406	367	377	1411		

2022 PM Peak No Development (PCU Flows + TII Growth Factors)

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	92	102	19	213
L3125 (East)	114	0	96	232	441
R135 (South)	133	143	0	142	418
L3125 (West)	25	188	184	0	397
Totals	272	424	382	393	1470 💉

2022 PM Peak With Development + Opeing of Airport Link Road

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals,
R135 (North)	0	92	103	19	214
L3125 (East)	114	0	96	232	Q 491
R135 (South)	134	143	0	142	419
L3125 (West)	25	188	184	0 10	397
Totals	273	424	383	393	1472
				-50°0	
2022 PM Peak Sensitivity Flows				The thi	

2022 PM Peak Sensitivity Flows

2022 PW Peak Sensitivity Flows			. V . V		
From / To	R135 (North)	L3125 (East)	R135 (South)	23125 (West)	Totals
R135 (North)	0	0	22	0 O	22
L3125 (East)	0	0	0	0	0
R135 (South)	22	0	0	0	22
L3125 (West)	0	0	0 🔉	0	0
Totals	22	0	22 . 2	0	44

2022 PM Peak With Development Flows + Sensitivity Flows

From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	92	125	19	236
L3125 (East)	114	0	96	232	441
R135 (South)	156	143	0	142	441
L3125 (West)	25	188	184	0	397
Totals	295	424	405	393	1516

2032 PM Peak No L	evelopment (PCU FI	ows + I II Growth	i Factors)		
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	96	105	20	220
L3125 (East)	117	0	99	240	456
R135 (South)	138	148	0	147	432
L3125 (West)	26	194	190	0	410
Totals	281	438	394	406	1519

2032 FINI FEAR WILL	Development + Ope	Illing of All port L	IIIK NUAU		
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	96	106	20	221
L3125 (East)	117	0	99	240	456
R135 (South)	139	148	0	147	433
L3125 (West)	26	194	190	0	410
Totalo	202	120	205	406	1501

2032 FINI FEAR SEIN	SILIVILY FIOWS				
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	0	16	0	16
L3125 (East)	0	0	0	0	0
R135 (South)	16	0	0	0	16
L3125 (West)	0	0	0	0	0
Totalo	16	•	16	•	5

2032 PIVI Peak Will	i Developilient Flows	+ Sensitivity Fit	ws		
From / To	R135 (North)	L3125 (East)	R135 (South)	L3125 (West)	Totals
R135 (North)	0	96	122	20	237
L3125 (East)	117	0	99	240	456
R135 (South)	155	148	0	147	449
L3125 (West)	26	194	190	0	410
Totala	200	420	411	406	1552

# **TRAFFIC AND TRANSPORTATION 13**



TRL LIMITED

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CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS
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Run with file:-

"C:\PICADY\2016\16047-04\R135 - N2 Slip Road Priority Junction.vpi" (drive-on-the-left ) at 11:50:34 on Friday, 2 December 2016

.RUN INFORMATION

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 02/12/16

CLIENT: Roadstone ENUMERATOR: Roadplan Consulting

JOB NUMBER: 16047-04

STATUS: TIA

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

I I the period of the first of MAJOR ROAD (ARM C) -----

MINOR ROAD (ARM B)

ARM A IS R135 North ARM B IS N2 Slip Road ARM C IS R135 South

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C ETC.

## .GEOMETRIC DATA

I	DATA ITEM	Ι	MINO	R ROAD	В	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I	( W )	7.20	М.	I
I	CENTRAL RESERVE WIDTH	Ι	(WCR )	0.00	Μ.	I
I		Ι				Ι
Ι	MAJOR ROAD RIGHT TURN - WIDTH	Ι	(WC-B)	2.20	Μ.	Ι
I	- VISIBILITY	Ι	(VC-B)	200.0	Μ.	Ι
I	- BLOCKS TRAFFIC	Ι		NO		Ι
I		Ι				Ι
I	MINOR ROAD - VISIBILITY TO LEFT	Ι	(VB-C)	50.0	Μ.	Ι
I	- VISIBILITY TO RIGHT	Ι	(VB-A)	50.0	Μ.	Ι
I	- LANE 1 WIDTH	Ι	(WB-C)	-		Ι
I	- LANE 2 WIDTH	I	(WB-A)	-		Ι
I	- WIDTH AT 0 M FROM JUNC.	Ι		6.00	Μ.	Ι
I	- WIDTH AT 5 M FROM JUNC.	Ι		6.00	Μ.	Ι
I	- WIDTH AT 10 M FROM JUNC.	Ι		6.00	Μ.	Ι
I	- WIDTH AT 15 M FROM JUNC.	Ι		6.00	Μ.	Ι
I	- WIDTH AT 20 M FROM JUNC.	Ι		6.00	Μ.	Ι
I	- LENGTH OF FLARED SECTION	Ι		10 7	VEHS	Ι

## .SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted )

	Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	ι Ι
Ι	602.92	0.22	0.09	I

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Inte	ercept For	Slope For Opposing	Slope For Opposing	Ι
I Stre	eam C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

	LOW SCALE(%)	I											
I A I	100	I										115°.	
I B I	100	I										Mer	
I C I	100	I								. د.	A	200	
	t: 2016 AM P			-		ws		nspection of the state of the s	et te	ses only	arr		
LENGTH OF	TIME PERIOD TIME SEGMEN	T - ARE S	15 YNTHE	MINUT ESISED	ES.	OM TURNIN	જે ફુઇ	HSPECT ON DE STRIP	ATA				
ENGTH OF	TIME SEGMEN	T - ARE S	15 YNTHE	MINUT ESISED	ES.	OM TURNING	ું કુર્લ 	RATE	ATA  OF	 FLOW	 (VE	 CH/MIN)	_
ENGTH OF  EMAND FLO  I	TIME SEGMEN  OW PROFILES  NUMBER OF	T - ARE S  MINU	15 YNTHE  TES E	MINUT ESISED  FROM S	ES. FRO	T WHEN	I	RATE	OF	FLOW	(VE	H/MIN)	_
ENGTH OF  EMAND FLO   I  ARM I	TIME SEGMEN	T -  ARE S'  MINU'  I TO	YNTHE TES F P OF	MINUT ESISED FROM S PEAK	ES. FRO TAR I F	T WHEN OF S	I I	RATE BEFORE	OF I	FLOW AT TOE	(VE	H/MIN) AFTER	
ENGTH OF  EMAND FLC  I  ARM I  I	TIME SEGMEN  OW PROFILES .  NUMBER OF  FLOW STARTS  TO RISE	ARE S MINU I TO I I	YNTHE TES F P OF S REF	MINUT ESISED FROM S PEAK ACHED	CES.  FROM  TAR  I FI  I I	T WHEN TOPS LOW STOPS FAILLING	I I I	RATE BEFORE PEAK	OF I I	FLOW AT TOP OF PE	VK I	H/MIN) AFTER PEAK	_
ENGTH OF  EMAND FLO  I ARM I ARM I ARM I ARM I	TIME SEGMEN  OW PROFILES  NUMBER OF FLOW STARTS	T -  ARE S'  MINU'  I TO:  I I  I I	YNTHE TES E P OF S REF 45.	MINUT ESISED FROM S PEAK ACHED	TES.  FROM TAR  IF  I	T WHEN TOPS LOW STOPS FAILLING 75.00	I I I I	RATE BEFORE PEAK	OF I I	FLOW AT TOP OF PER	(VE AK I	H/MIN) AFTER PEAK 0.73	_

I		Ι		ΤU	JRNING PRO	OPORTIONS	I
Ι		Ι		ΤĮ	JRNING COU	JNTS (VEH/	/HR) I
Ι		Ι		(PE	ERCENTAGE	OF H.V.S)	I
I				· 			
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
I	07.15 - 08.45	Ι		Ι	I	I	I
I		Ι	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		Ι		Ι	0.0 I	0.0 I	58.0 I
I		Ι		Ι	(0.0)I	( 0.0)I	( 14.0)I
Ι		Ι		Ι	I	I	I
Ι		Ι	ARM B	Ι	0.756 I	0.000 I	0.244 I
Ι		Ι		Ι	396.0 I	0.0 I	128.0 I
Ι		Ι		Ι	( 10.0)I	( 0.0)I	( 33.0)I
Ι		Ι		Ι	I	I	I
Ι		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
Т		Т		Т	86.0 I	0.0 I	0.0 T
Т		Т		Т		( 0.0)I	
T		Т		T	T	( 0.0,1	T
_		_			_	_	_

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

## QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2016 AM Peak - Existing Flows AND FOR TIME PERIOD 1

I TIME I I		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 07.15-0	07.30		(1110)	(1 22 3 / 11111)	, )	, , _ 110 /	-1112 CDOLLENI)		. 2.1.1.0.2.2. (11.111)
I B-C	1.61	5.84	0.275		0.00	0.37	5.2		0.23
I B-A	4.97	8.61	0.577		0.00	1.31	17.9		0.26
I C-A	1.08	***-							**-*
I C-B	0.00	10.26	0.000		0.00	0.00	0.0		0.00
I A-B	0.00	10.20	0.000		0.00	0.00	0.0		0.00
I A-C	0.73								
I									
I TIME		CAPACITY		PEDESTRIAN		END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
	(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE		(VEH.MIN/	PER ARRIVING
I I 07.30-0	77 45		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	TIME SEGMENT)	VEHICLE (MIN)
I 07.30-0	1.92	5.55	0.345		0.37	0.51	7.4		0.27
I B-A	5.93	8.52	0.696		1.31	2.13	29.3		0.27
I C-A	1.29	0.32	0.090		T. OT	2.13	۷.3		0.37
I C-B	0.00	10.22	0.000		0.00	0.00	0.0		0.00
I A-B	0.00	⊥∪.∠∠	0.000		0.00	0.00	0.0		0.00
I A-C	0.87								
I	0.07								
							~O-		
I TIME		CAPACITY		PEDESTRIAN		END	D <b>&amp;</b> LAY		AVERAGE DELAY
	(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	ÉH.MIN/		
I = 07.45.6	20.00		(RFC)	(PEDS/MIN)				TIME SEGMENT)	VEHICLE (MIN)
I 07.45-0		4 70	0 500		0 51	0595joi	12.1		0.40
I B-C	2.35	4.70	0.500		0.51	0,5950	13.1		0.42
I B-A	7.27	8.40	0.865		2.13	604 11.08	60.4		0.68
I C-A I C-B	1.58	10.17	0.000		0 000	(e) 00	0.0		0.00
I A-B	0.00	10.17	0.000		rionset	. 0.00	0.0		0.00
I A-C	1.06				Decr Mile				
I no	1.00			·10	Spr C				
				<del>ç</del> 01 <sub>-4</sub>	100				
I TIME	DEMAND	CAPACITY	DEMAND/	PEDE <b>S</b> RIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I		(VEH/MIN)		LOW	QUEUE	QUEUE		(VEH.MIN/	
I	( V 1117 11111 )	( V 111 / 1111 / )	(RFC)	(PEDS/MIN)		(VEHS)		TIME SEGMENT)	
I 08.00-0	08.15		(111 0)	,, ,,	,	,,	020111111/	020111111/	(11111)
I B-C	2.35	4.47	0.526		0.95	1.06	15.4		0.47
I B-A	7.27	8.40	0.865		4.88	5.44	78.0		0.80
I C-A	1.58						- <del></del>		
I C-B	0.00	10.17	0.000		0.00	0.00	0.0		0.00
I A-B	0.00								
I A-C	1.06								
I									
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
	(VEH/MIN)							(VEH.MIN/	
I		,						TIME SEGMENT)	
I 08.15-0	08.30		* *	,	. ,	•	,	,	. ,
I B-C	1.92	5.47	0.351		1.06	0.56	8.9		0.29
I B-A	5.93		0.696		5.44		42.7		0.45
I C-A	1.29								
I C-B	0.00	10.22	0.000		0.00	0.00	0.0		0.00
	0.00								
I A-C	0.87								
I									

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.30-0	8.45									I
I	B-C	1.61	5.80	0.277		0.56	0.39	6.1		0.24	I
I	B-A	4.97	8.61	0.577		2.47	1.42	23.0		0.29	I
I	C-A	1.08									I
I	C-B	0.00	10.26	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.73									I
I											I

07.30 07.45 08.00 08.15	NO. OF VEHICLES IN QUEUE 0.4 0.5 0.9	*	
08.45 OUEUE FOR STR	0.4 EAM B-A		
TIME SEGMENT ENDING 07.30 07.45 08.00 08.15 08.30 08.45	VEHICLES IN QUEUE 1.3 2.1 4.9 5.4 2.5 1.4	** ****	Consent of copyright owner required for any other use.
07.30 07.45 08.00 08.15 08.30	VEHICLES IN QUEUE 0.0 0.0 0.0		Consent of copyright own

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I I T	STREAM	I I I	TOTAL	. [	EMAND	I I	* QUEUE:	*	I	* INCLUSIV * DE	LAY	<i>*</i>	I I I
I		I	(VEH)	(	(VEH/H)	Ι	(MIN)	(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	I
Ι	В-С	Ι	176.2	Ι	117.5	Ι	56.1 I	0.32	I	56.1	I	0.32	Ι
Ι	B-A	Ι	545.1	Ι	363.4	Ι	251.3 I	0.46	Ι	251.4	Ι	0.46	Ι
I	C-A	Ι	118.4	Ι	78.9	Ι	I		I		Ι		I
Ι	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	Ι	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		Ι		I
I	A-C	Ι	79.8	Ι	53.2	I	I		I		I		I
Ι	ALL	Ι	919.5	Ι	613.0	Ι	307.4 I	0.33	Ι	307.5	Ι	0.33	Ι

END OF JOB

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

## .SLOPES AND INTERCEPT

(NB:Streams may be combined, in which case capacity will be adjusted )

	-	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	j I I
Ι	602.92	0.22	0.09	Ι

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Inte	ercept For	Slope For Opposing	Slope For Opposing	Ι
I Stre	eam C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I
Demand set: 2017 AM Peak - No Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA
I B I 100 I I C I 100 I Demand set: 2017 AM Peak - No Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA
Demand set: 2017 AM Peak - No Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA
Demand set: 2017 AM Peak - No Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA
I I NUMBER OF MINUTES FROM START WHEN ? I RATE OF FLC
I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT I
I I TO RISE I IS REACHED I FAILUING I PEAK I OF F
I ARM A I 15.00 I 45.00 I 75.00 I 0.73 I 1.
I ARM B I 15.00 I 45.00 I 75.00 I 6.60 I 9.

I		Ι		ΤŲ	JRNING PRO	OPORTIONS	I
I		Ι		ΤŲ	JRNING COU	JNTS (VEH/	/HR) I
I		Ι		(PE	ERCENTAGE	OF H.V.S)	I
I							
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
Ι	07.15 - 08.45	Ι		Ι	I	I	I
Ι		Ι	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		I		I	0.0 I	0.0 I	58.0 I
I		Ι		I	( 0.0)I	( 0.0)I	( 14.0)I
I		Ι		I	I	I	I
I		I	ARM B	I	0.756 I	0.000 I	0.244 I
I		Ι		Ι	399.0 I	0.0 I	129.0 I
I		Ι		Ι	( 10.0)I	( 0.0)I	( 33.0)I
I		Ι		Ι	I	I	I
I		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
I		Ι		Ι	87.0 I	0.0 I	0.0 I
I		Ι		Ι	( 60.0)I	( 0.0)I	( 0.0)I
I		Ι		Ι	I	I	I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

## QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2017 AM Peak - No Development AND FOR TIME PERIOD 1

		AND I	FOR TIME P	ERIOD :	1						
I I I	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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
Ι	07.15-0	07.30									I
Ι	B-C	1.62	5.83	0.278		0.00	0.38	5.3		0.23	Ι
I		5.01	8.61	0.582		0.00	1.33	18.2		0.27	I
I		1.09	10.26	0.000		0.00	0.00	0.0		0.00	I
I		0.00	10.20	0.000		0.00	0.00	0.0		0.00	I
I	A-C	0.73									I
I											Ι
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/			Ι
I	07.30-0	77 45		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I		1.93	5.54	0.349		0.38	0.52	7.5		0.28	I
I		5.98	8.52	0.702		1.33	2.19	29.9		0.38	I
I	C-A	1.30									Ι
I		0.00	10.22	0.000		0.00	0.00	0.0		0.00	I
I		0.00 0.87									I
I	A-C	0.07									I
								<u>&amp;</u>			
_								<del>ije</del> ilise			
·I	TIME	DEMAND			DEDECTRIAN	START	END	O DELYA	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUENE	(VEH.MIN/	(VEH.MIN/		I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	07.45-0		4 62	0 511		0 50 4	2005 rea	12.6		0.42	I
I		2.37 7.32	4.63 8.39	0.511 0.872		2 1/9	65 08	13.6 62.5		0.43 0.70	I I
I	C-A	1.60	0.33	0.072		ctioner	3.00	02.5		0.70	I
I		0.00	10.17	0.000	٠	20.00	0.00	0.0		0.00	I
I		0.00			arid	ghi					I
I	A-C	1.06			400						I I
					FLOW (PEDS/MIN)						
_					asent of						
·I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I	00 00	20.15		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	08.00-0		4.37	0.542		0 00	1 10	16.2		0.49	I
I	B-C B-A	2.37 7.32		0.542		0.99 5.08	1.13 5.70	16.2 81.5		0.49	
I		1.60	0.33	0.012		J.00	J. / U	01.5		0.04	I
I	C-B	0.00	10.17	0.000		0.00	0.00	0.0		0.00	Ι
	A-B	0.00									Ι
I		1.06									I
·-	TIME	Овмуир	CAPACITY	DEMAND /	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	 т
I		(VEH/MIN)							(VEH.MIN/		
I		. , , , , ,		(RFC)					TIME SEGMENT)		
	08.15-0										I
I		1.93	5.45			1.13	0.57	9.1			I
I		5.98 1.30	8.52	0.702		5.70	2.55	44.3		0.46	I
I		0.00	10.22	0.000		0.00	0.00	0.0		0.00	I
I		0.00	,,								I
I		0.87									I
I											Ι

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.30-0	8.45									I
I	B-C	1.62	5.79	0.279		0.57	0.40	6.2		0.24	I
I	B-A	5.01	8.61	0.582		2.55	1.45	23.5		0.29	I
I	C-A	1.09									I
I	C-B	0.00	10.26	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.73									I
I											I

07.30 07.45 08.00 08.15 08.30	VEHICLES IN QUEUE 0.4 0.5 1.0 1.1 0.6 0.4	*	
TIME SEGMENT ENDING 07.30 07.45 08.00 08.15	NO. OF VEHICLES IN QUEUE 1.3 2.2 5.1 5.7 2.5 1.4	* * * * * * * * * * * *	Consent of copyright owner required for any other use.
TIME SEGMENT ENDING  07.30 07.45 08.00 08.15 08.30 08.45			Consent of copyright owner

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I I T	STREAM	I I I	TOTAI		EMAND	I I	* QUEUE]	*	I	* DE	LAY	QUEUEING *	I
I		I	(VEH)	(	(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	В-С	I	177.6	Ι	118.4	Ι	58.0 I	0.33	I	58.0	I	0.33	Ι
I	B-A	Ι	549.2	Ι	366.1	Ι	260.0 I	0.47	I	260.1	I	0.47	Ι
I	C-A	Ι	119.7	I	79.8	I	I		I		I		Ι
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	Ι
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		Ι
I	A-C	Ι	79.8	Ι	53.2	Ι	I		I		I		Ι
Ι	ALL	Ι	926.3	Ι	617.6	Ι	317.9 I	0.34	Ι	318.1	Ι	0.34	Ι

END OF JOB

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

## .SLOPES AND INTERCEPT

(NB:Streams	may be	combined,	, in	which	case	capacity	will	be	adjusted	)
-------------	--------	-----------	------	-------	------	----------	------	----	----------	---

-				_	
	I Intercept For Stream B-C		Slope For Opposing Stream A-B		
I -	602.92	0.22	0.09	I -	
	I Intercept For Stream B-A	1 11 2	1 11 3	Slope For Opposing Stream C-A	
	476.98	0.21	0.08	0.13	0.30 I
	I Intercept For Stream C-B		Slope For Opposing Stream A-B	- I I	
1	689.79	0.25	0.25	Ī	

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I  I A I 100 I I B I 100 I I C I 100 I  Demand set: 2017 AM Peak - With Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN OF I RATE OF FLOW (VEH/MIN) I ARM I FLOW STARTS I TOP OF PEAK I FLOW STAPS I BEFORE I AT TOP I AFTER I TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74 I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63 I ARM C I 15.00 I 45.00 I 75.00 I 1.13 I 1.69 I 1.13	T 131(I)	I FLOW	SCALE(%)	I										
Demand set: 2017 AM Peak - With Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN OF I RATE OF FLOW (VEH/MIN)  I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER  I TO RISE I IS REACHED I FALLENG I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 0.74 I 9.94 I 6.63	IA :	 І т	100	I T									nerise.	
Demand set: 2017 AM Peak - With Development  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN OF I RATE OF FLOW (VEH/MIN)  I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER  I TO RISE I IS REACHED I FALLENG I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 0.74 I 9.94 I 6.63	I C	I	100	I							44. V	99		
TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN OF RATE OF FLOW (VEH/MIN)  I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOR'S I BEFORE I AT TOP I AFTER  I TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 0.663 I 9.94 I 6.63	Demand	set: 2	2017 AM P	 eak -	With Dev	zeloj	oment				es dioi a	,,,		
LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN OF I RATE OF FLOW (VEH/MIN)  I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER  I I TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	TIME P	ERIOD E	BEGINS 07	.15 AN	ID ENDS	08.4	5		Ó	1120	Hitot			
LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN OF I RATE OF FLOW (VEH/MIN) I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I I TO RISE I IS REACHED I FALLENG I PEAK I OF PEAK I PEAK I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74 I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	LENGTH	OF TIM	ME PERIOD	- 9	0 MINU	JTES			chon,	st to				
DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA  I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I ARM I FLOW STARTS I TOP OF PEAK I FLOW STARS I BEFORE I AT TOP I AFTER I I TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74 I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	LENGTH	OF TIM	ME SEGMEN	г – 1	5 MINU	JTES	•		aspert own					
I NUMBER OF MINUTES FROM START WHEN SI RATE OF FLOW (VEH/MIN)  I ARM I FLOW STARTS I TOP OF PEAK I FLOW STARTS I BEFORE I AT TOP I AFTER  I TO RISE I IS REACHED I FALLENG I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	DEMAND							-5.	100					
I ARM I FLOW STARTS I TOP OF PEAK I FLOW STAPS I BEFORE I AT TOP I AFTER  I TO RISE I IS REACHED I FALLENG I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	DEMAND	F. TOM F	PROFILES A	ARE SY	NTHESISI	ED FI	ROM TURNIN	9'(g	OUNT DA	ATA				
I TO RISE I IS REACHED I FALLENG I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74  I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	 I	I I	PROFILES A  NUMBER OF	ARE SY  MINUT	NTHESISI  'ES FROM	ED FI  STAI	ROM TURNIK  RT WHEN &	9'0 '0 'I	RATE	ATA  OF	FLOW (	 VEI	 H/MIN)	 I
I ARM A I 15.00 I 45.00 I 75.00 I 0.74 I 1.11 I 0.74 I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	I ARM	FLOW F  I N I FLO	PROFILES A  NUMBER OF DW STARTS	ARE SY  MINUT I TOP	TOTHESISH TES FROM OF PEAR	ED FI  STAI K I I	ROM TURNING  RT WHEN S FLOW STOPS	I I	RATE BEFORE	ATA  OF I	FLOW (V	VEI	 H/MIN) AFTER	 I I
I ARM B I 15.00 I 45.00 I 75.00 I 6.63 I 9.94 I 6.63	I ARM	FLOW F  I N I FLO I T	PROFILES A NUMBER OF DW STARTS TO RISE	ARE SY  MINUT I TOP I IS	THESISI ES FROM OF PEAR REACHER	ED FI  STAI K I I	ROM TURNING TOWNS RT WHEN FLOW STOPS FALLING	I I I	RATE BEFORE PEAK	OF I	FLOW (V AT TOP OF PEAK	VEI I I	H/MIN) AFTER PEAK	I I I
	I ARM I I ARM	FLOW F I N I FLO I T A I	PROFILES A	ARE SY MINUT I TOP I IS	ES FROM OF PEAR REACHER	ED FI STAI K I I D I I	ROM TURNING RT WHEN S FLOW STOPS FALLING 75.00	I I I I	RATE BEFORE PEAK 0.74	ATA OF I I	FLOW (VAT TOPOF PEAK	VEI	H/MIN) AFTER PEAK 	I I I
I ARM C I 15.00 I 45.00 I 75.00 I 1.13 I 1.69 I 1.13	I ARM I I ARM I I ARM I I ARM I	FLOW F I N I FLO I T A I B I	PROFILES A	ARE SY MINUT I TOP I IS I	ES FROM OF PEAR REACHER 45.00	ED FI STAI K I I D I I	ROM TURNING FLOW STOR'S FALLING 75.00 75.00	I I I I I	RATE BEFORE PEAK 0.74 6.63	ATA OF I I I I	FLOW (VAT TOP OF PEAK	VEI I I I	H/MIN) AFTER PEAK 0.74 6.63	I I I
T TURNING PROPORTIONS I	I ARM I ARM I ARM I ARM I ARM I	I N I FLO I T I T I I T I I T I I I I I I I I I I	PROFILES A	ARE SY MINUT I TOP I IS I I	ES FROM OF PEAI REACHEI 45.00 45.00	STAI STAI STAI STAI STAI	ROM TURNING RT WHEN STATES FALLING 75.00 75.00 75.00		RATE BEFORE PEAK  0.74 6.63 1.13	OF I I I I I	FLOW (VAT TOP OF PEAK 1.11 9.94 1.69	VEI I I I I I	H/MIN) AFTER PEAK 0.74 6.63 1.13	 I I  I I

I I I		I I I		ΤŢ	JRNING PRO JRNING COU ERCENTAGE	JNTS (VEH,	,
I	TIME	·	 FDOM/TO		ARM A I		7 DM C T
1	TIME		FROM/ 10		ARM A I	ARM D I	ARM C I
I	07.15 - 08.45	I		Ι	I	I	I
I		I	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		I		Ι	0.0 I	0.0 I	59.0 I
I		I		Ι	( 0.0)I	( 0.0)I	( 14.0)I
I		I		Ι	I	I	I
I		I	ARM B	Ι	0.753 I	0.000 I	0.247 I
I		I		Ι	399.0 I	0.0 I	131.0 I
I		I		Ι	( 10.0)I	( 0.0)I	( 33.0)I
I		I		Ι	I	I	I
I		I	ARM C	Ι	1.000 I	0.000 I	0.000 I
I		I		Ι	90.0 I	0.0 I	0.0 I
I		I		Ι	( 60.0)I	( 0.0)I	( 0.0)I
I		Ι		Ι	I	I	I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

## QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2017 AM Peak - With Development AND FOR TIME PERIOD 1

		AND E	FOR TIME P	ERIOD :	1						
I I I	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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
Ι	07.15-0	07.30		, ,		,	, ,	,	,	, ,	Ι
I	в-А	1.64 5.01	5.83 8.58	0.282 0.583		0.00	0.38 1.34	5.4 18.3		0.24 0.27	I
I		1.13									Ι
I		0.00	10.26	0.000		0.00	0.00	0.0		0.00	I
I		0.00 0.74									I
I		0.74									I
. —	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/			Ι
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	07.30-0			0 054						0.00	Ι
I		1.96	5.54	0.354		0.38	0.53	7.6		0.28	I
I		5.98 1.35	8.49	0.704		1.34	2.21	30.2		0.38	I
I		0.00	10.22	0.000		0.00	0.00	0.0		0.00	I
I		0.00	10.22	0.000		0.00	0.00	0.0		0.00	I
I		0.88									Ι
I											Ι
• -								<del>ije</del> ilise			
Ι	TIME	DEMAND			PEDESTRIAN	START	END.	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUE	WEH.MIN/	(VEH.MIN/		I
I	07 45 (	00 00		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
I	07.45-0 B-C	2.40	4.61	0.522		0 53 🔨	21163	14.1		0.44	I
I		7.32	8.36	0.876		2.21	5.17	63.4		0.71	I
I	C-A	1.65	0.30	0.070		dioner	, 3.17	00.1		0.71	I
Ι	C-B	0.00	10.17	0.000		20.00	0.00	0.0		0.00	Ι
I	A-B	0.00			(in	dhi					Ι
I	A-C	1.08			\$000	C. C.					I
. –					FLOW (PEDS/MIN)						I 
					asent 0.						
	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	 I
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/		PER ARRIVING	
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
	08.00-0						_			_	Ι
I		2.40	4.33	0.555		1.03	1.18	17.0		0.51	I
	B-A		8.36	0.876		5.17	5.82	83.2		0.86	
I	C-A C-B	1.65 0.00	10.17	0 000		0.00	0 00	0.0		0.00	I
	A-B	0.00	10.1/	0.000		0.00	0.00	0.0		0.00	I
I		1.08									I
Ι											Ι
•											
	TIME		CAPACITY		PEDESTRIAN		END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)						(VEH.MIN/		
I		no 30		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
I	08.15-0 B-C		5.44	0 360		1.18	0.58	9.3		0.29	I
I		1.96 5.98		0.360		5.82		9.3 45.0		0.29	I
I		1.35	0.49	0.704		J. UZ	2.50	10.0		0.1	I
I		0.00	10.22	0.000		0.00	0.00	0.0		0.00	I
I		0.00									I
I		0.88									I
I											Ι

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	/ I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.30-0	8.45									I
I	B-C	1.64	5.80	0.284		0.58	0.40	6.3		0.24	I
I	B-A	5.01	8.58	0.583		2.58	1.46	23.6		0.29	I
I	C-A	1.13									I
I	C-B	0.00	10.26	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.74									I
I											I

07.30 07.45 08.00 08.15 08.30	NO. OF VEHICLES IN QUEUE 0.4 0.5 1.0 1.2 0.6 0.4	*	
TIME SEGMENT ENDING  07.30  07.45  08.00  08.15  08.30  08.45   QUEUE FOR STR	VEHICLES IN QUEUE 1.3 2.2 5.2 5.8 2.6 1.5	**  ***  ***  ***	Consent of copyright owner required for any other use.
TIME SEGMENT ENDING 07.30 07.45 08.00 08.15 08.30 08.45			Consent of copyright owner

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I I T	STREAM	I I I	TOTA		EMAND	I I	* QUEUE:	<i>(</i> *	I * I	* DE	LA:	~	I I I
I		I	(VEH)		(VEH/H)	I		(MIN/VEH)		(MIN)		(MIN/VEH)	_
I	в-с	I	180.3	Ι	120.2	Ι	59.9 I	0.33	Ι	59.9	Ι	0.33	Ι
I	B-A	Ι	549.2	Ι	366.1	Ι	263.8 I	0.48	I	263.9	Ι	0.48	Ι
I	C-A	Ι	123.9	Ι	82.6	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
I	A-C	Ι	81.2	Ι	54.1	I	I		I		I		I
I	ALL	I	934.6	I	623.1	I	323.7 I	0.35	I	323.8		0.35	 I

END OF JOB

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

## .SLOPES AND INTERCEPT

(NB:Streams	may	be	combined,	in	which	case	capacity	y will	be	adjusted	)
-------------	-----	----	-----------	----	-------	------	----------	--------	----	----------	---

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	I

-	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream C-B	Stream A-C	Stream A-B	I
Ι	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM	I FLOW	SCALE(%)	Ι												
 I A	I	100	 I											115°.	
ΙB	I	100	I											Her	
I C	I	100	Ι									.43. 6	40	,	
Demand FIME F LENGTH LENGTH	d set: PERIOD H OF TI H OF TI OF TI	2022 AM POBEGINS 07 ME PERIOD ME SEGMENT PROFILES 2	eak .15 - T - ARE	ANI 90	No De D END D M 5 M	velop S 08 INUTI INUTI	ome .45 ES. ES.	ROM TURNING TOWNSTOPS FAILUING 75.00 75.00 75.00	خ خ	negection for the strict of th	ATA	second for the second s			
 [	I	 NUMBER OF	 MI	NUTE	 ES FR	 OM S:	 ГАF	RT WHEN	 I	RATE	OF	F FLOW (	VEI	 H/MIN)	
I ARN	4 I FL	OW STARTS	Ι	TOP	OF P	EAK :	ΙF	LOW STOPS	Ι	BEFORE	Ι	AT TOP	Ι	AFTER	
[	I	TO RISE	I	IS	REAC	HED :	Ι	FALLING	Ι	PEAK	Ι	OF PEAK	Ι	PEAK	
ARM	 А I	15.00			45.0	0 :	 I	75.00	 I	0.76		1.14	 I	0.76	-
I ARM	ВІ	15.00	Ι		45.0	0 :	Ι	75.00	Ι	6.84	Ι	10.26	Ι	6.84	
I ARM	CI	15.00	Ι		45.0	0 :	Ι	75.00	Ι	1.13	Ι	1.69	Ι	1.13	
I			Ι		T	URNII	NG	PROPORTION	NS		Ι				
Т			Т		Т	IIRNTI	NG	COUNTS (VI	ЕΗ	/HR)	Т				

I		Ι		ΤĮ	JRNING PRO	OPORTIONS	I
I		Ι		ΤU	JRNING COU	JNTS (VEH,	/HR) I
I		Ι		(PE	ERCENTAGE	OF H.V.S)	Í
Т				` 			
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
	07.15 - 08.45	 I			I	I	I
I		Ι	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		Ι		Ι	0.0 I	0.0 I	61.0 I
I		Ι		Ι	( 0.0)I	( 0.0)I	( 14.0)I
I		Ι		Ι	·	·	I
I		Ι	ARM B	Ι	0.755 I	0.000 I	0.245 I
I		Ι		Ι	413.0 I	0.0 I	134.0 I
I		Ι		Ι	( 10.0)I	( 0.0)I	( 33.0)I
I		Ι		Ι	I	I	I
I		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
I		Ι		Ι	90.0 I	0.0 I	0.0 I
I		Ι		Ι	( 60.0)I	( 0.0)I	( 0.0)I
I		Ι		Ι	I	· I	I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

## QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2022 AM Peak - No Development AND FOR TIME PERIOD 1

		AND I	FOR TIME P	ERIOD :	1						
I I I		, , ,	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY 1 PER ARRIVING 1 VEHICLE (MIN) 1	I I
I	B-A	1.68 5.18	5.78 8.58	0.291 0.604		0.00	0.40 1.45	5.6 19.7		0.24 0.28	I I I
I I I I	C-B A-B A-C	1.13 0.00 0.00 0.77	10.25	0.000		0.00	0.00	0.0		0.00	I I I I
 I I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY DER ARRIVING DER ARRIVING DER VEHICLE (MIN)	Ι
I	B-C	2.01 6.19	5.46 8.49	0.368 0.729		0.40 1.45	0.57 2.46	8.1 33.4		0.29 0.41	I I
I I I	C-B A-B	1.35 0.00 0.00 0.91	10.21	0.000		0.00	0.00	0.0		0.00	I I I
								<del>g.</del>			I -
I I I			CAPACITY (VEH/MIN)	DE143.15D /	PEDESTRIAN FLOW (PEDS/MIN)		END QUENE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY DER ARRIVING DER VEHICLE (MIN)	I I
	07.45-0		4 00	0 506		0 57 4	20stred	17.4			I
I		2.46 7.58	4.20 8.36	0.586 0.906		2.46	6.21	17.4 74.0			I I
I	C-A	1.65				ctioner				1	Ι
I		0.00	10.16	0.000	:100	20.00	0.00	0.0			I I
I	A-C	1.12			FLOW (PEDS/MIN)	 169				1	I I
•					sento						
I I I			CAPACITY (VEH/MIN)	DEMAND/	PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE	OELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY 1 PER ARRIVING 1 VEHICLE (MIN) 1	Ι
Ι		2.46	3.70	0.665		1.30	1.77	24.4			I
I	B-A C-A	7.58 1.65	8.36	0.906		6.21	7.26	102.0		1.03	I I
I	C-B	0.00	10.16	0.000		0.00	0.00	0.0		0.00	Ι
I I 	A-C	0.00 1.12								ם ב	I I I
											_
I I		(VEH/MIN)		CAPACITY		QUEUE		(VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)		I I
I I I		2.01 6.19		0.378 0.729		1.77 7.26		10.4 54.1		0.32	I I I
I I I	C-A C-B A-B	1.35 0.00 0.00 0.91		0.000		0.00		0.0		0.00	I I I
										]	I –

 I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW	START OUEUE	END OUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELA PER ARRIVING	
		(VET/MIN)	(VEH/MIN)			~	~		•		
Τ				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN	) 1
Ι	08.30-0	8.45									Ι
I	B-C	1.68	5.74	0.293		0.63	0.42	6.7		0.25	I
I	B-A	5.18	8.58	0.604		2.95	1.59	26.0		0.31	I
I	C-A	1.13									I
I	C-B	0.00	10.25	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.77									I
I											I

07.30 07.45 08.00 08.15 08.30	NO. OF VEHICLES IN QUEUE 0.4 0.6 1.3 1.8 0.6 0.4	* * *	
TIME SEGMENT ENDING 07.30 07.45 08.00 08.15 08.30 08.45	NO. OF VEHICLES IN QUEUE 1.5 2.5 6.2 7.3 3.0 1.6	* ** ****  ****  **  **  **	Consent of convident owner leading of out of other use.
07.30 07.45 08.00 08.15 08.30	VEHICLES IN QUEUE		Consent of copyright own

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I I T	STREAM	I I I	TOTAL	 D	EMAND	I I	* QUEUE:	*	I	* INCLUSIV	LAY	<i>7</i> *	I I I
I		I	(VEH)	(	VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	184.4	 I	123.0	I	72.6 I	0.39	I	72.6		0.39	I
Ι	B-A	Ι	568.5	Ι	379.0	Ι	309.1 I	0.54	Ι	309.2	Ι	0.54	Ι
I	C-A	Ι	123.9	Ι	82.6	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	Ι	0.0	Ι	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
Ι	A-C	Ι	84.0	Ι	56.0	Ι	I		Ι		Ι		Ι
I	ALL	I	960.7	I	640.5	I	381.7 I	0.40	Ι	381.9	Ι	0.40	I

END OF JOB

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

## .SLOPES AND INTERCEPT

(NB:Streams	may	be	combined,	in	which	case	capacity	y will	be	adjusted	)
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I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	Ι

I Intercept For Slope For Op		Slope For Opposing	Slope For OpposingI
I Stream B-A Stream A-C		Stream C-A	Stream C-B I
I 476.98 0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	ream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

T 7 D 7 6													
1 ARM	I FLOW	SCALE(%)	I										
 I A	I	100	I									115°.	
ΙB	I	100	I								á	Her	
I C	I	100	I							ند ۱۰۰۰	40	,0	
Demano TIME I LENGTI LENGTI DEMANI	d set: 2 PERIOD 1 H OF TIM H OF TIM D FLOW 1	2022 AM Pe BEGINS 07 ME PERIOD ME SEGMENT	eak15 Al .15 Al	With Dends  90 MIN 15 MIN YNTHESIS	evelo 08.4 NUTES NUTES	opment  15  CROM TURNING  RT WHENEN  FLOW STOPS  FAILING  75.00  75.00  75.00	इ.स	negection of the state of the s	arpe er re	ses of for a			
						X							
 I	I 1	 NUMBER OF	MINU'	 IES FRON	1 STA	ART WHEN	 I	RATE	OF	FLOW (	VEI	 H/MIN)	
i I Ari	I 1 M I FL	 NUMBER OF OW STARTS	MINU' I TO	TES FRON P OF PEA	ISTA KI	ART WHEN	I I	RATE BEFORE	OF I	FLOW (V	VEI	H/MIN) AFTER	
 I I Ari	I I M I FLO	NUMBER OF OW STARTS TO RISE	MINU' I TO	TES FROM P OF PEA S REACHE	I STA AK I ED I	ART WHEN TOPS FAILING	I I I	RATE BEFORE PEAK	OF I	FLOW ('AT TOP OF PEAK	VEI I	H/MIN) AFTER PEAK	
I ARI I ARI I	I 1 M I FL	NUMBER OF OW STARTS TO RISE	MINU' I TO	TES FROM POF PEA S REACHE	M STA AK I ED I	RT WHEN TOPS FAILING 75.00	I I I	RATE BEFORE PEAK	OF I I	FLOW (VAT TOP OF PEAK	VEI I I I	H/MIN) AFTER PEAK	
I ARI I ARI I ARM I ARM	I 1 M I FLO I 1 A I B I	NUMBER OF OW STARTS TO RISE 15.00 15.00	MINU' I TOI I II I	FES FROM FOR PER FOR REACHE 45.00 45.00	M STA AK I ED I I I	RT WHEN TOPS FALLING  75.00  75.00	I I I I	RATE BEFORE PEAK 0.77 6.86	OF I I I	FLOW (VAT TOP OF PEAK	VEI I I I	H/MIN) AFTER PEAK 0.77 6.86	
I I ARI I I I I ARM I ARM I ARM	I I M I FLO I A I B I C I	NUMBER OF OW STARTS TO RISE 15.00 15.00 15.00	MINU' I TOI I I: I I	FES FROM P OF PEAS REACHE 45.00 45.00 45.00	M STA AK I ED I I I I	FLOW STOPS FAILLING 75.00 75.00 75.00	I I I I I I	RATE BEFORE PEAK 0.77 6.86 1.16	OF I I I I I	FLOW (VAT TOP OF PEAK 1.16 10.29 1.74	VEI I I I I I	H/MIN) AFTER PEAK 0.77 6.86	

I TURNING COUNTS (VEH/HR) I I (PERCENTAGE OF H.V.S) I I (PERCENTAGE OF H.V.S) I I I TIME I FROM/TO I ARM A I ARM B I ARM C I I I I I I I I I I I I I I I I I I								
I 07.15 - 08.45 I I I I I I I I I I I I I I I I I I I	I I I		I		ΤŪ	JRNING COU	JNTS (VEH/	,
I ARM A I 0.000 I 0.000 I 1.000 I I I I I 0.0 I 0.0 I 62.0 I I I I I (0.0) I (0.0) I (14.0) I I I I I I I I I I I ARM B I 0.752 I 0.000 I 0.248 I I I I 413.0 I 0.0 I 136.0 I I I I I (10.0) I (0.0) I (33.0) I	I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
		07.15 - 08.45	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	ARM B		0.000 I 0.0 I ( 0.0) I 0.752 I 413.0 I ( 10.0) I I 1.000 I 93.0 I	I 000.0 I (0.0 ) I	62.0 I ( 14.0) I I 0.248 I 136.0 I ( 33.0) I I 0.000 I 0.0 I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

## QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2022 AM Peak - With Development AND FOR TIME PERIOD 1

	AND E	FOR TIME P	ERIOD	1					
TIME 07.15-0	, , ,			FLOW	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C B-A	1.71 5.18	5.79 8.56	0.295 0.605		0.00	0.41 1.46	5.7 19.8		0.24 0.28
C-A C-B A-B A-C	0.00 0.00 0.78	10.25	0.000		0.00	0.00	0.0		0.00
TIME				FLOW	QUEUE	END QUEUE (VEHS)			AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C B-A	2.04	5.46 8.46	0.373 0.731		0.41 1.46	0.58 2.49	8.3 33.7		0.29 0.41
C-A C-B A-B A-C	0.00 0.00 0.93	10.21	0.000		0.00	0.00	0.0		0.00
							~		
TIME	DEMAND (VEH/MIN)	CAPACITY	DEMAND/	DEDECTRIAN	CTADT	END QUENE (VERS)	ONDELYA	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C B-A	2.50 7.58	4.17 8.33	0.599 0.910		0.58 yr 2.49 7 ct	1030 red 1137 106.33	18.2 75.1		0.56 0.83
C-B A-B A-C	0.00 0.00 1.14	10.15	0.000	For in	ight.og	0.00	0.0		0.00
				of cert					
TIME	,			PEDESTRIAN FLOW	QUEUE		DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
B-C	2.50	3.63 8.33	0.687 0.910		1.37 6.33	1.93 7.43	26.3 104.3		0.82 1.06
C-B A-B A-C	0.00 0.00 1.14								0.00
TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN FLOW	START	END QUEUE	DELAY	GEOMETRIC DELAY	AVERAGE DELAY PER ARRIVING
B-C B-A	2.04 6.19		0.384		1.93	0.64	10.8	,	0.32
С-В А-В	1.39 0.00 0.00 0.93	10.21	0.000		0.00	0.00	0.0		0.00
	07.15-0 B-C B-A C-A C-B A-B A-C TIME  07.30-0 B-C B-A C-A C-B A-B A-C TIME  07.45-0 B-C B-A C-A C-B A-B A-C TIME  08.00-0 TIME  08.00-0 TIME  08.00-0 TIME  08.00-0 TIME	TIME DEMAND (VEH/MIN)  07.15-07.30 B-C 1.71 B-A 5.18 C-A 1.17 C-B 0.00 A-B 0.00 A-C 0.78  TIME DEMAND (VEH/MIN)  07.30-07.45 B-C 2.04 B-A 6.19 C-A 1.39 C-B 0.00 A-C 0.93  TIME DEMAND (VEH/MIN)  07.45-08.00 B-C 2.50 B-A 7.58 C-A 1.71 C-B 0.00 A-B 0.00 A-C 1.14  TIME DEMAND (VEH/MIN)  08.00-08.15 B-C 2.50 B-A 7.58 C-A 1.71 C-B 0.00 A-B 0.00 A-C 1.14  TIME DEMAND (VEH/MIN)  08.00-08.15 B-C 2.50 B-A 7.58 C-A 1.71 C-B 0.00 A-B 0.00 A-C 1.14	TIME DEMAND CAPACITY (VEH/MIN)  07.15-07.30  B-C 1.71 5.79  B-A 5.18 8.56  C-A 1.17  C-B 0.00 10.25  A-B 0.00  A-C 0.78   TIME DEMAND CAPACITY (VEH/MIN)  07.30-07.45  B-C 2.04 5.46  B-A 6.19 8.46  C-A 1.39  C-B 0.00 10.21  A-B 0.00  A-C 0.93   TIME DEMAND CAPACITY (VEH/MIN)  07.45-08.00  B-C 2.50 4.17  B-A 7.58 8.33  C-A 1.71  C-B 0.00 10.15  A-B 0.00  A-C 1.14   TIME DEMAND CAPACITY (VEH/MIN)  08.00-08.15  B-C 2.50 3.63  B-A 7.58 8.33  C-A 1.71  C-B 0.00 10.15  A-B 0.00  A-C 1.14   TIME DEMAND CAPACITY (VEH/MIN)  08.00-08.15  B-C 1.14  TIME DEMAND CAPACITY (VEH/MIN)  08.00-08.15  B-C 1.14  TIME DEMAND CAPACITY (VEH/MIN)  08.00-08.15  B-C 1.14  TIME DEMAND CAPACITY (VEH/MIN)  08.00-08.15  B-C 1.14  TIME DEMAND CAPACITY (VEH/MIN)  08.15-08.30  B-C 1.14	TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  07.15-07.30  B-C 1.71 5.79 0.295  B-A 5.18 8.56 0.605  C-A 1.17 C-B 0.00 10.25 0.000  A-B 0.00 A-C 0.78   TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  07.30-07.45  B-C 2.04 5.46 0.373  B-A 6.19 8.46 0.731 C-A 1.39 C-B 0.00 10.21 0.000 A-C 0.93  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  07.45-08.00  B-C 2.50 4.17 0.599  B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  08.00-08.15  B-C 2.50 4.17 0.599  B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  08.00-08.15  B-C 2.50 3.63 0.687  B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-B 0.00 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  08.15-08.30  B-C 2.04 5.30 0.384 B-A 6.19 8.46 0.731 C-A 1.39 C-B 0.00 10.21 0.000 A-B 0.00 A-B 0.00 A-B 0.00 A-C 1.14	TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY (RFC)  07.15-07.30  B-C 1.71 5.79 0.295 B-A 5.18 8.56 0.605 C-A 1.17 C-B 0.00 10.25 0.000 A-B 0.00 A-C 0.78  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY (RFC)  07.30-07.45 B-C 2.04 5.46 0.373 C-A 1.39 C-B 0.00 10.21 0.000 A-C 0.93  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY (RFC)  07.45-08.00 B-C 2.50 4.17 0.599 B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-B 0.00 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY (RFC)  08.00-08.15 B-C 2.50 4.17 0.599 B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-B 0.00 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY (RFC)  08.00-08.15 B-C 2.50 3.63 0.687 B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-B 0.00 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY (RFC)  08.00-08.15 B-C 2.50 3.63 0.687 B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-B 0.00 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY (RFC)  08.01-08.15 B-C 2.50 3.63 0.687 B-A 7.58 8.33 0.910 C-A 1.71 C-B 0.00 10.15 0.000 A-B 0.00 A-C 1.14  TIME DEMAND CAPACITY DEMAND/ (VEDS/MIN)  TO TIME DEMAND CAPACITY DEMAND/ (VEDS/MIN)	TIME   DEMAND   CAPACITY   DEMAND   (VEH/MIN)   (VEH/MIN)   (VEH/MIN)   (VEH/MIN)   (VEHS)    07.15-07.30	TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) (VEH/MIN) CAPACITY PLOW (VEHS) (VEHS)  07.15-07.30 B-C 1.71 5.79 0.295 0.00 0.41 B-A 5.18 8.56 0.605 0.00 1.46 C-A 1.17 C-B 0.00 A-B 0.00 A-C 0.78  TIME DEMAND CAPACITY DEMAND/ (VEH/MIN)	TIME	Time

		DEMAND	CADACTEV	DEMAND /	DEDECTRIAN		END	DELAY	CEOMETRIC DELAY	AVEDACE DELAY	
Τ	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	i I
Ι		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	08.30-0	8.45									I
I	B-C	1.71	5.75	0.297		0.64	0.43	6.8		0.25	I
I	B-A	5.18	8.56	0.605		2.99	1.61	26.2		0.31	I
I	C-A	1.17									I
I	C-B	0.00	10.25	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.78									I
I											I

07.30 07.45 08.00 08.15 08.30	NO. OF VEHICLES IN QUEUE 0.4 0.6 1.4 1.9	* *	
QUEUE FOR STR			
TIME SEGMENT ENDING 07.30 07.45 08.00 08.15 08.30 08.45	VEHICLES IN QUEUE 1.5 2.5 6.3 7.4 3.0 1.6	*	Consent of contribution that required for any other use.
TIME SEGMENT ENDING 07.30 07.45	VEHICLES IN QUEUE 0.0		for in get out
08.00 08.15			Consento

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I STREAM I		I I I	TOTAL	. [	EMAND	I I	* QUEUE:	*	I	* INCLUSIV	LAY	<i>7</i> *	I I -T
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	187.2	I	124.8	I	76.1 I	0.41	I	76.1	I	0.41	I
Ι	B-A	Ι	568.5	Ι	379.0	Ι	314.3 I	0.55	Ι	314.4	Ι	0.55	I
I	C-A	Ι	128.0	Ι	85.3	Ι	I		Ι		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	Ι	0.0	I	0.00	I
Ι	A-B	Ι	0.0	Ι	0.0	Ι	I		Ι		I		I
Ι	A-C	Ι	85.3	Ι	56.9	Ι	I		Ι		Ι		Ι
I	ALL	I	969.0	I	646.0	Ι	390.4 I	0.40	I	390.5	I	0.40	I

END OF JOB

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

## .SLOPES AND INTERCEPT

(NB:Streams	may be	combined,	, in	which	case	capacity	will	be	adjusted	)
-------------	--------	-----------	------	-------	------	----------	------	----	----------	---

I Intercept For I Stream B-C	Slope For Opposing	Slope For Opposing	I
	Stream A-C	Stream A-B	I
I 602.92	0.22	0.09	 I 

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B
I 476.98	0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	ream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM	I FLOW	SCALE (%)	Ι											
 I A	I	100	 I										115°.	
ΙB	I	100	Ι										Her	
I C	I	100	Ι								.A. 6	40	,	
Demand TIME E LENGTH LENGTH	d set: PERIOD H OF TI H OF TI	2016 PM POBEGINS 16 ME PERIOD ME SEGMEN' PROFILES	eak .30 - I -	- FANI 90 15	Existin  DENDS  MIN  MIN  WTHESIS	g Fl 18.0 UTES UTES	FROM TURNING  ART WHEN FLOW STOPS FAIL/ING  75.00 75.00 75.00	3.01 3.01	nspection of the state of the s	ATA	ses of forth			
 т	т	NIIMBER OF							 RATE					
T ARN	т . И Т . Г.Т.	OW STARTS	Т	TOP	OF PEA	K T	FLOW STOPS	Т	BEFORE	T	AT TOP	Т	AFTER	
I	I	TO RISE	Ī	IS	REACHE	DI	FALLING	Ι	PEAK	I	OF PEAK	Ι	PEAK	
 [ ARM	 A I	15.00			45.00		75.00	 I	0.25	 I	0.38	 I	0.25	
I ARM	вІ	15.00	I		45.00	I	75.00	Ι	4.10	Ι	6.15	Ι	4.10	
I ARM	CI	15.00	Ι		45.00	I	75.00	Ι	1.45	Ι	2.18	Ι	1.45	
I			Ι		TUR	NINC	F PROPORTION	NS		Ι				
Т			Т		TUR	NTNO	COUNTS (VI	εн	/HR)	Т				

I		Ι		ΤŲ	JRNING PRO	OPORTIONS	I					
I		Ι		ΤŲ	JRNING COU	JNTS (VEH,	/HR) I					
I		Ι		(PE	ERCENTAGE	OF H.V.S)	I					
I												
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I					
Ι	16.30 - 18.00	Ι		Ι	I	I	I					
I		Ι	ARM A	I	0.000 I	0.000 I	1.000 I					
I		Ι		Ι	0.0 I	0.0 I	20.0 I					
I		Ι		I	(0.0)I	( 0.0)I	( 35.0)I					
I		Ι		I	I	I	I					
I		Ι	ARM B	Ι	0.939 I	0.000 I	0.061 I					
I		Ι		I	308.0 I	0.0 I	20.0 I					
I		Ι		Ι	( 19.0)I	( 0.0)I	(50.0)I					
I		Ι		Ι	I	I	I					
I		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I					
I		Ι		Ι	116.0 I	0.0 I	0.0 I					
I		Ι		Ι	( 15.0)I	( 0.0)I	( 0.0)I					
I		Ι		Ι	·	·	Ī					

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

FOR DEMAND SET 2016 PM Peak - Existing Flows AND FOR TIME PERIOD 2

Time		AND FOR TIME PERIOD 2												
1   1   1   1   2   2   3   5   4   5   5   5   1   2   0   0   0   0   0   0   0   0   0	I	TIME			CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING I			
Table   1.00		16 20 1	I 6 1 E		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	IIME SEGMENI)				
2   P-M   3.86				E 10	0 049		0 00	0 05	0.7					
1 C-S   0.00   10.37   0.000   0.00														
C-B				8.40	0.460		0.00	0.83	11.0					
1   A-C   0.25   0.26   0.25				10 27	0 000		0 00	0 00	0 0					
1   1   1   1   1   1   1   1   1   1				10.37	0.000		0.00	0.00	0.0					
TIME														
TIME		A-C	0.25											
T	Τ										1			
T	•													
T														
1   1-4   3-1	I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY I			
1   1   1   1   2   2   3   3   4   4   6   0   0   6   0   0   0   0   0   0	I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING I			
B	I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN) I			
	I	16.45-1	L7.00								I			
C-A	Ι	B-C	0.30	4.96	0.060		0.05	0.06	0.9		0.21 I			
C-B   0.00   10.36   0.00	Ι	B-A	4.61	8.34	0.554		0.83	1.20	17.0		0.27 I			
A-B	Ι	C-A	1.74											
Table	Ι	C-B	0.00	10.36	0.000		0.00	0.00	0.0		0.00 I			
TIME   DEMAND   CAPACITY   DEMAND   CAPACITY   DEMAND   CAPACITY   DEMAND   CAPACITY   PEDESTRIAN   START   END   DELAY   DELAY   DEMAND   CAPACITY   PEDESTRIAN   START   END   DELAY   DEMAND   CAPACITY   PEDESTRIAN   CAPACITY   PEDESTRIAN   CAPACITY   PEDESTRIAN   CAPACITY   PEDESTRIAN   CAPACITY   PEDESTRIAN   CAPACITY   CAPACITY   PEDESTRIAN   CAPACITY   C	Ι	A-B	0.00											
TIME	Ι	A-C	0.30								I			
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   UVER   MIN   (VEH.MIN)   (VEH.MIN)   PEDESTRIAN   START   END   UVER   MIN   (VEH.MIN)   PER ARRIVING   TIME SEGMENT   TIME SEGMENT   VEHICLE (MIN)   TIME   PER ARRIVING   TIME SEGMENT   TIME SEGMENT   TIME SEGMENT   TIME SEGMENT   VEHICLE (MIN)   TIME   PER ARRIVING   TIME SEGMENT   TIME SEGMENT   VEHICLE (MIN)   TIME   PER ARRIVING   TIME   PER ARRI	I										I			
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   UVER   MIN   (VEH.MIN)   (VEH.MIN)   PEDESTRIAN   START   END   UVER   MIN   (VEH.MIN)   PER ARRIVING   TIME SEGMENT   TIME SEGMENT   VEHICLE (MIN)   TIME   PER ARRIVING   TIME SEGMENT   TIME SEGMENT   TIME SEGMENT   TIME SEGMENT   VEHICLE (MIN)   TIME   PER ARRIVING   TIME SEGMENT   TIME SEGMENT   VEHICLE (MIN)   TIME   PER ARRIVING   TIME   PER ARRI									<del>```</del>					
1   1   1   1   1   1   1   1   1   1									2)*					
1   1   1   1   1   1   1   1   1   1	т	TIME	DEMAND	CAPACTTY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY T			
1   1   1   1   1   1   1   1   1   1						FLOW	OUEUE	OUE	(VEH.MIN/					
1   1   1   1   1   1   1   1   1   1			(	, , ,		(PEDS/MIN)	(VEHS)	(VEH SK)	TIME SEGMENT)	TIME SEGMENT)				
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (		17.00-1	7.15		(1110)	(1 DD D / FIIIN )	( * 1110)	1900 1900	TITL SHOPHINI)	TITE OFFICIAL)				
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (				4.71	0.078		0.06	S. Gillos	1.2					
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (							1.20	<sup>6</sup> 2.03	27.8					
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (				0.25	0.000		ioner	, 2.03	27.0					
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (				10 34	0 000		20 an	0 00	0 0					
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (				10.01	0.000	.10,	Stories of	0.00	0.0					
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (						tiot it	180							
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (						COP								
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I   (VEH/MIN) (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (VEH/MIN) (VEH/MIN)   (														
I (VEH/MIN) (VEH/MIN) CAPACITY (PEDS/MIN) (VEHS) (VEHS) (VEHS) (VEH.MIN/ (VEH.MIN/ PER ARRIVING I I 17.15-17.30						seni								
I (VEH/MIN) (VEH/MIN) CAPACITY (PEDS/MIN) (VEHS) (VEHS) (VEHS) (VEH.MIN/ (VEH.MIN/ PER ARRIVING I I 17.15-17.30	·I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY T			
I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY (VEH.MIN) (VEH.MIN														
I 17.15-17.30 I B-C 0.37 4.69 0.078 0.08 0.08 1.3 0.23 I I B-A 5.65 8.25 0.685 2.03 2.09 31.0 0.38 I I C-A 2.13 I C-B 0.00 10.34 0.000 0.00 0.00 0.0 0.0 0.0 0.00 I I A-B 0.00 I I A-C 0.37 I I (VEH/MIN) (VEH/MIN) CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-B 0.00 10.36 0.00 0.00 0.00 0.00 0.00 I I A-B 0.00 I A-C 0.30			, ,,	. ,/										
I B-C 0.37 4.69 0.078 0.08 0.08 1.3 0.23 I I B-A 5.65 8.25 0.685 2.03 2.09 31.0 0.38 I I C-A 2.13		17.15-1	17.30		/	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	/	/	/	/				
B-A   5.65   8.25   0.685   2.03   2.09   31.0   0.38   I   I   C-A   2.13   I   C-B   0.00   10.34   0.000   0.00   0.00   0.00   0.00   0.00   I   A-B   0.00   I   A-C   0.37   I   I   I   I   I   I   I   I   I				4.69	0.078		0.08	0.08	1.3					
I C-A 2.13 I C-B 0.00 10.34 0.000 0.00 0.00 0.00 0.0 0.0 0.00 I I A-B 0.00 I A-C 0.37 I I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.0 0.00 I I A-B 0.00 I A-B 0.00 10.36 0.000 I I A-B 0.00 I I A-C 0.30														
I C-B 0.00 10.34 0.000 0.00 0.00 0.00 0.0 0.0 0.00 I I A-B 0.00 I I A-B 0.00 I I A-C 0.37 I I I I I I I I I I I I I I I I I I I														
I A-B 0.00 I I A-C 0.37 I I I I I I I I I I I I I I I I I I I				10.34	0.000		0.00	0.00	0.0					
I A-C 0.37 I I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.00 0.00 0.00 I A-B 0.00 I A-B 0.00 I A-B 0.00 10.36 0.000 I I A-B 0.00 I I A-C 0.30														
I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45  I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I DELAY O.22 I DELAY I DEMAND O.22 I DELAY I DEMAND O.28 I DELAY I DEMAND O.28 I DELAY I DEMAND O.28 I DELAY I DEMAND O.29 I DELAY O.28 I DEMAND O.29 I DE														
I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.00 0.00 0.00 I A-B 0.00 I A-B 0.00 I A-B 0.00 I A-B 0.00 I I A-C 0.30	I										I			
I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/) PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.00 0.00 0.00 0.00	•													
I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/) PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.00 0.00 0.00 0.00														
I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/) PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.30-17.45 I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.00 0.00 0.00 0.00	Ι	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY I			
I														
I 17.30-17.45  I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I I C-B 0.00 10.36 0.000 0.00 0.00 0.0 0.0 I I A-B 0.00 I I A-C 0.30				, ,										
I B-C 0.30 4.94 0.061 0.08 0.07 1.0 0.22 I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.0 0.0 I A-B 0.00 I A-C 0.30		17.30-1	17.45		,	, -,	. = /	/	,	- /				
I B-A 4.61 8.34 0.554 2.09 1.29 20.7 0.28 I I C-A 1.74 I I C-B 0.00 10.36 0.000 0.00 0.00 0.0 0.00 I I A-B 0.00 I I A-C 0.30				4.94	0.061		0.08	0.07	1.0					
I C-A 1.74 I C-B 0.00 10.36 0.000 0.00 0.00 0.0 0.0 0.00 I I A-B 0.00 I A-C 0.30														
I C-B 0.00 10.36 0.000 0.00 0.00 0.0 0.00 I I A-B 0.00 I I A-C 0.30				01					= * * *					
I A-B 0.00 I I A-C 0.30 I				10.36	0.000		0.00	0.00	0.0					
I A-C 0.30									- • •					
		-												

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									I
I	B-C	0.25	5.10	0.049		0.07	0.05	0.8		0.21	I
I	B-A	3.86	8.40	0.460		1.29	0.87	13.8		0.22	I
I	C-A	1.46									I
I	C-B	0.00	10.37	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.25									I
I											I

. QUEUE FOR STRE	AM B-C		
TIME SEGMENT	NO. OF		
	VEHICLES		
	IN QUEUE		
16.45 17.00			
	0.1		
	0.1		
	0.1		
18.00	0.1		
QUEUE FOR STRE	AM B-A		
TIME SEGMENT			
ENDING	VEHICLES		
	IN QUEUE		<u> </u>
	0.8 1.2	*	of the
17.00 17.15	2.0	**	Office
17.30	2.1	* *	AH. SIIA
17.45		*	as of foil
18.00		*	to sited.
QUEUE FOR STRE	AM C-B		Consent of copyright owner required for any other use.
TIME SEGMENT	NO. OF		a Pect on the
ENDING	VEHICLES		at ith ight
	IN QUEUE		FO WILL
	0.0		£ 00x
17.00 17.15	0.0		at or
17.13	0.0		nsev .
17.45	0.0		Cor
18.00	0.0		

I I T	I STREAM I TOTAL DEMAND I I I I					I I	* QUEUE:		I I	* INCLUSIV * DE		~	I I I
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	27.5	I	18.4	I	5.9 I	0.22	I	5.9	I	0.22	I
I	B-A	Ι	423.9	Ι	282.6	Ι	121.8 I	0.29	I	121.8	Ι	0.29	Ι
I	C-A	I	159.7	Ι	106.4	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	Ι	0.00	I
I	A-B	I	0.0	Ι	0.0	Ι	I		I		I		I
I	A-C	Ι	27.5	Ι	18.4	Ι	I		I		Ι		Ι
I	ALL	I	638.7	I	425.8	Ι	127.7 I	0.20	I	127.8	I	0.20	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	may	be	combined,	in	which	case	capacity	y will	be	adjusted	)
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_				
	-	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
_				
Ι	602.92	0.22	0.09	Ι
_				

-	or Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	cream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM	I FLOW	SCALE (%)	Ι											
 I A	I	100	I										7 15°C.	
ΙB	I	100	I									- 6	Her	
I C	I	100	Ι								م ٠٨٠ م	40	,0	
Demand TIME E LENGTE LENGTE	d set: PERIOD H OF TI H OF TI OF TI	2017 PM PG BEGINS 16 ME PERIOD ME SEGMENT PROFILES	eak .30 - F -	- N AND 90 15	Deve	lopn 18.0 JTES JTES	FROM TURNING  FROM TURNING  FROM STOPS FAILING  75.00 75.00 75.00		nspection of the state of the s	ATA	Serifed for a			
 I		 NUMBER OF	 MII	 NUTE	S FROM	STA	ART WHEN	 I	RATE	OF	FLOW (	VEI	 H/MIN)	
I ARN	4 I FL	OW STARTS	I :	TOP	OF PEAL	ΚI	FLOW STOPS	Ι	BEFORE	Ι	AT TOP	Ι	AFTER	
Ι	I	TO RISE	I	IS	REACHE	) I	FALLING	Ι	PEAK	Ι	OF PEAK	Ι	PEAK	
 [ ARM	 A I	15.00	·		45.00		75.00	 I	0.25		0.38	 I	0.25	
I ARM	ВІ	15.00	I		45.00	I	75.00	Ι	4.13	Ι	6.19	Ι	4.13	-
I ARM	CI	15.00	Ι		45.00	I	75.00	Ι	1.46	Ι	2.19	Ι	1.46	
											 -			
I			Ι		TURI	NING	F PROPORTION	NS		I				
Т			Т		TURI	JTN0	COUNTS (VI	ЕΗ	/HR)	Т				

I I		I I T		ΤŪ		DPORTIONS JNTS (VEH, OF H.V.S)	,
T				(РГ	ERCENTAGE	OF n.v.s)	
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
I	16.30 - 18.00	Ι		Ι	I	I	I
I		Ι	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		Ι		Ι	0.0 I	0.0 I	20.0 I
I		Ι		I	( 0.0)I	( 0.0)I	( 35.0)I
I		Ι		Ι	I	I	I
I		Ι	ARM B	Ι	0.939 I	0.000 I	0.061 I
I		Ι		Ι	310.0 I	0.0 I	20.0 I
I		Ι		Ι	( 19.0)I	( 0.0)I	( 50.0)I
I		Ι		Ι	I	I	I
I		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
I		Ι		Ι	117.0 I	0.0 I	0.0 I
I		Ι		Ι	( 15.0)I	( 0.0)I	( 0.0)I
I		Ι		Ι	I	I	I

FOR DEMAND SET 2017 PM Peak - No Development AND FOR TIME PERIOD 2

	AND FOR TIME PERIOD 2												
I I I	TIME 16.30-1		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY I PER ARRIVING I VEHICLE (MIN) I			
I	B-C B-A	0.25	5.11 8.40	0.049		0.00	0.05	0.7 11.7		0.21 I 0.22 I			
I I I	C-B	1.47	10.37	0.000		0.00	0.00	0.0		0.00 I I			
I	A-B A-C	0.00 0.25								I I			
 I	TIME	DEMAND	CAPACITY	DEMAND/	 PEDESTRIAN	START	 END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY I			
I I	16 45 1		(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)		(VEH.MIN/ TIME SEGMENT)	PER ARRIVING I VEHICLE (MIN) I			
I	16.45-1 B-C	0.30	4.95	0.060		0.05	0.06	0.9		0.21 I			
I	B-A	4.64	8.33	0.557		0.84	1.21	17.2		0.27 I			
I I I		1.75 0.00 0.00	10.36	0.000		0.00	0.00	0.0		0.00 I I			
I	A-C	0.30								I			
								eilise.					
I I I	TIME		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUENE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY I PER ARRIVING I VEHICLE (MIN) I			
	17.00-1		4 70	0 070		0.065	20sted	1 0		I			
I		0.37 5.69	4.70 8.25	0.078 0.690		1.21	2.07	1.2 28.3		0.23 I 0.37 I			
I		2.15	10.24	0.000		ection net	0.00	0.0		I			
I	C-B A-B	0.00	10.34	0.000	, in	300.00	0.00	0.0		0.00 I			
I	A-C	0.37			E CODA	7.0				I			
					<del>1</del> 5ept ot								
I I I	TIME 17.15-1		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	~	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY I PER ARRIVING I VEHICLE (MIN) I			
Ι	B-C	0.37	4.68	0.078		0.08	0.08	1.3		0.23 I			
I	B-A C-A	5.69 2.15	8.25	0.690		2.07	2.14	31.6		0.39 I			
I	C-B	0.00	10.34	0.000		0.00	0.00	0.0		0.00 I			
I I I	A-C	0.00 0.37								I I			
I I	TIME		CAPACITY (VEH/MIN)	CAPACITY		QUEUE		(VEH.MIN/	(VEH.MIN/				
I	17.30-1	7 45		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN) I			
I	B-C	0.30		0.061		0.08	0.07	1.0		0.22 I			
I		4.64	8.33	0.557		2.14	1.31	21.0		0.28 I			
I		1.75 0.00	10.36	0.000		0.00	0.00	0.0		0.00 I			
I I I	A-B A-C	0.00								I I			

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									I
I	B-C	0.25	5.10	0.049		0.07	0.05	0.8		0.21	I
I	B-A	3.89	8.40	0.463		1.31	0.89	14.0		0.22	I
I	C-A	1.47									I
I	C-B	0.00	10.37	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.25									I
I											I

16.45 17.00 17.15 17.30 17.45	VEHICLES IN QUEUE 0.1 0.1 0.1		
Queue for str			
TIME SEGMENT ENDING			Consent of copyright owner required for any other use.
16.45	0.8	*	115°.
17.00	1.2		not to
17.15	2.1	**	otis
17.30		* *	AH. OH
17.45		*	~ 01 to
18.00	0.9	*	the ited i
QUEUE FOR STR	REAM C-B		igh pared
TIME SEGMENT	NO OF		Decr wife
ENDING			institu
	IN QUEUE		COT WITH
16.45			<i>y</i> 06,
17.00	0.0		8
17.15	0.0		ante
17.30	0.0		ALISE.
	0.0		Co,
	0.0		

I I T	I STREAM I TOTAL DEMAND I I I I I I I I I I I I I I I I I I I			I * QUEUEING * I * DELAY *				I * INCLUSIVE QUEUEING * I * DELAY *					
I		I	(VEH)		(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	27.5	I	18.4	I	6.0 I	0.22	I	6.0	I	0.22	I
I	B-A	Ι	426.7	Ι	284.5	Ι	123.9 I	0.29	I	123.9	Ι	0.29	Ι
I	C-A	Ι	161.0	I	107.4	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
Ι	A-C	Ι	27.5	Ι	18.4	Ι	I		Ι		I		Ι
I	ALL	I	642.8	I	428.5	I	129.8 I	0.20	I	129.9	I	0.20	 I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	may	be	combined,	in	which	case	capacity	will	be	adjusted	)

	Intercept For Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	ι Ι
Ι	602.92	0.22	0.09	I

I Intercept For Slope For Op		Slope For Opposing	Slope For OpposingI
I Stream B-A Stream A-C		Stream C-A	Stream C-B I
I 476.98 0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	tream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

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het use.
 !/MIN)
 I/MIN)
 !/MIN)
 H/MIN)
AFTER
PEAK
0.26
4.14
1.50
( 4 1

Ι		Ι		ΤŲ	JRNING PRO	OPORTIONS	I
Ι		Ι		ΤŲ	JRNING COU	JNTS (VEH/	/HR) I
Ι		I		(PE	ERCENTAGE	OF H.V.S)	I
I							
Ι	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
Ι	16.30 - 18.00	Ι		Ι	I	I	I
Ι		Ι	ARM A	Ι	0.000 I	0.000 I	1.000 I
Ι		I		Ι	0.0 I	0.0 I	21.0 I
Ι		I		Ι	( 0.0)I	( 0.0)I	( 35.0)I
Ι		Ι		Ι	I	I	I
I		Ι	ARM B	Ι	0.937 I	0.000 I	0.063 I
Ι		Ι		Ι	310.0 I	0.0 I	21.0 I
Т		Т		Т	( 19.0) T	( 0.0)I	(50.0)T
T		T		Т	T	I	Т
Т		Т	ARM C	T	_	0.000 I	0 000 T
т т		T	71101 0	Т		0.0 I	
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Τ		1		Ι	I	I	I

FOR DEMAND SET 2017 PM Peak - With Development AND FOR TIME PERIOD 2

		AND I	FOR TIME P	ERIOD :	2						
 I I	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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I I I	16.30-3 B-C B-A	0.26 3.89	5.11 8.39	0.052 0.464		0.00	0.05 0.84	0.8 11.8		0.21 0.22	I I I
I I I I	C-A C-B A-B A-C	1.51 0.00 0.00 0.26	10.37	0.000		0.00	0.00	0.0		0.00	I I I I
 I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I I I	16.45-1 B-C B-A	17.00 0.31 4.64	4.95 8.32	0.064 0.558		0.05	0.07	1.0 17.2		0.22 0.27	I I I
I	C-A C-B A-B	1.80 0.00 0.00	10.35	0.000		0.00	0.00	0.0		0.00	I I I
I	A-C	0.31									I
								<del>ije</del> ilise			
I I I	TIME			DEMAND/	DEDECTRIAN	START QUEUE (VEHS)	END QUENE (VEHS)	O DELYA	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I I I	17.00-3 B-C B-A C-A	0.39 5.69 2.20	4.69 8.23	0.082 0.691		0.071	20109 22.08	1.3 28.4		0.23 0.38	I I I
I I I	C-B A-B A-C	0.00 0.00 0.39	10.33	0.000	FLOW (PEDS/MIN)	16 .00 i	0.00	0.0		0.00	I I I
											I 
					<u>-</u>						
I I I	TIME 17.15-1		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I I I	B-C B-A C-A	0.39 5.69 2.20	4.67 8.23	0.082 0.691		0.09	0.09 2.15	1.3 31.8		0.23 0.39	I I I
I	C-B A-B	0.00 0.00 0.39	10.33	0.000		0.00	0.00	0.0		0.00	I I I
•											
I I I		(VEH/MIN)	CAPACITY (VEH/MIN)	CAPACITY		QUEUE			GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)		I I
I		0.31 4.64	4.93 8.32	0.064 0.558		0.09 2.15	0.07 1.31	1.1 21.1		0.22 0.28	I I I
I I I	C-A C-B A-B A-C	1.80 0.00 0.00 0.31	10.35	0.000		0.00	0.00	0.0		0.00	I I I
											_I 

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	NO. OF	
QUEUE FOR STR	REAM B-A	
16.45 17.00 17.15	VEHICLES IN QUEUE 0.8 1.2 2.1 2.1 1.3 0.9	Consent of copyright owner required for any other use.
TIME SEGMENT ENDING		Eof inspect own
16.45 17.00 17.15 17.30 17.45	0.0 0.0 0.0	Couseint of cob,

I I T	I STREAM I TOTAL DEMAND I I I I I I I I I I I I I I I I I I I			I * QUEUEING * I * DELAY *				I * INCLUSIVE QUEUEING * I * DELAY *					
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	28.9	I	19.3	I	6.3 I	0.22	I	6.3	I	0.22	I
I	B-A	Ι	426.7	Ι	284.5	Ι	124.3 I	0.29	I	124.4	Ι	0.29	Ι
I	C-A	Ι	165.2	I	110.1	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
I	A-C	Ι	28.9	Ι	19.3	Ι	I		I		Ι		Ι
I	ALL	I	649.7	I	433.1	I	130.6 I	0.20	I	130.7	I	0.20	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams may be combined, in which case capacity will be adjusted )

	-	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	j I I
Ι	602.92	0.22	0.09	Ι

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

Ι	Intercept For	Slope For Opposing	Slope For Opposing	Ι
Ι	Stream C-B	Stream A-C	Stream A-B	Ι
Ι	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/M	100 I																	
I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/M	NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK I  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 I 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28 I																	
I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/M	NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK I  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 I 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28 I	ΙA	I	100	I												115°.	
I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/M	NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I TO RISE I IS REACHED I FAIL ING I PEAK I OF PEAK I PEAK I  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 I 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28 I	ΙB	I	100	Ι												Her	
I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/M	NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I TO RISE I IS REACHED I FAILING I PEAK I OF PEAK I PEAK I  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 I 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28 I	I C	I	100	I										.4.	40	N.	
I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/M	NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I TO RISE I IS REACHED I FAILING I PEAK I OF PEAK I PEAK I  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 I 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28 I	TIME I LENGTI LENGTI	PERIOD :	BEGINS 16 ME PERIOD ME SEGMEN'	.30 - I -	AND 90	ENI N	OS 18 MINU: MINU:	3.0 TES	nent 0	oi	nsight out	arte er re	oses of the second	dford			
I I NUMBER OF MINUTES FROM START WHEN TO I RATE OF FLOW (VEH/M	FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER TO RISE I IS REACHED I FALLING I PEAK I OF PEAK I PEAK  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28	DEMANI	FLOW :	PROFILES A	ARE	SYN	THES	SISEI	) F	ROM TURNING	<u>ئ</u> چ	SOUNT DA	ATA					_
I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AF	TO RISE I IS REACHED I FAILURG I PEAK I OF PEAK I PEAK  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28	Ι	I I	NUMBER OF	ΜI	NUTE	S FF	ROM S	STA	RT WHEN	Ι	RATE	OF	FI	OW (	VEI	H/MIN)	
	TO RISE I IS REACHED I FAILURG I PEAK I OF PEAK I PEAK  15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28	I ARI	M I FL	OW STARTS	Ι	TOP	OF E	PEAK	Ι	FLOW STOPS	Ι	BEFORE	Ι	ΑT	TOP	Ι	AFTER	
I I TO RISE I IS REACHED I FAMEING I PEAK I OF PEAK I PE	15.00 I 45.00 I 75.00 I 0.26 I 0.39 I 0.26 15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28	Ι	I	TO RISE	Ι							PEAK	Ι	OF	PEAK	Ι	PEAK	
	15.00 I 45.00 I 75.00 I 4.28 I 6.41 I 4.28	ARM	A I	15.00	 I							0.26					0.26	_
		_ _																
I TURNING PROPORTIONS I		1			1		7	·URN.	LNG	COUNTS (VI	ΗЭ	/HR)	ſ					

I I I		I I		ΤŪ		OPORTIONS JNTS (VEH/ OF H.V.S)	,
I	TIME	I	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
I I I I I I I I I	16.30 - 18.00		ARM A  ARM B	I I I I	0.0 I ( 0.0)I I 0.939 I 321.0 I ( 19.0)I I 1.000 I 121.0 I	I (0.0) I I 0.000 I	21.0 I ( 35.0) I I 0.061 I 21.0 I ( 50.0) I I 0.000 I 0.0 I

FOR DEMAND SET 2022 PM Peak - No Development AND FOR TIME PERIOD 2

		AND I	FOR TIME P	ERIOD 2	2						
I I I	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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I I I	16.30-1 B-C B-A	0.26 4.03	5.08 8.38	0.052 0.480		0.00	0.05	0.8 12.5		0.21 0.22	I I I
I I I	C-A C-B A-B A-C	1.52 0.00 0.00 0.26	10.37	0.000		0.00	0.00	0.0		0.00	I I I
	A-C										I 
 I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.45-1 B-C	0.31	4.92	0.064		0.05	0.07	1.0		0.22	I I
I I I	B-A C-A C-B	4.81 1.81 0.00	8.32 10.35	0.578		0.90	0.00	18.6		0.28	I I I
I I I	A-B A-C	0.00	10.00			0.00	0.00			0.00	I I I
								<del></del>			
I I I	TIME			DEMAND/	PEDESTRIAN FLOW	START QUEUE (VEHS)	END QUENE (VEHS)	O DELYA	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I	17.00-1 B-C B-A	0.39 5.89	4.62 8.23	0.083 0.716		0.071	2.31	1.3 31.3		0.24	I I I
I I I	C-A C-B A-B	2.22 0.00 0.00	10.33	0.000	, in	20 . allie	0.00	0.0		0.00	I I I
I	A-C	0.39			top t	710					I
_					asent of						
I I I T	TIME 17.15-1	, ,	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	B-C B-A	0.39 5.89	4.60 8.23	0.084 0.716		0.09 2.31	0.09 2.40	1.4 35.5		0.24	I I
I	C-B A-B A-C	2.22 0.00 0.00 0.39	10.33	0.000		0.00	0.00	0.0		0.00	I I I
											I 
I		(VEH/MIN)	CAPACITY (VEH/MIN)	CAPACITY		QUEUE			GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)		I
I I I		0.31 4.81	4.90 8.32	0.064 0.578		0.09	0.07 1.43	1.1 23.1		0.22 0.30	I I
I I I	C-B A-B	1.81 0.00 0.00 0.31	10.35	0.000		0.00		0.0		0.00	I I I
I 	A-C	0.31									I 

	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	 Z I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									I
I	B-C	0.26	5.07	0.052		0.07	0.06	0.9		0.21	I
I	B-A	4.03	8.38	0.480		1.43	0.95	15.1		0.23	I
I	C-A	1.52									Ι
I	C-B	0.00	10.37	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									Ι
I	A-C	0.26									Ι
I											Ι

QUEUE FOR STR	EAM B-C		
TIME SEGMENT ENDING			
16.45	0.1		
17.00 17.15	0.1		
17.15	0.1 0.1		
17.45	0.1		
18.00	0.1		
QUEUE FOR STR	EAM B-A		
TIME SEGMENT	NO. OF	-	
ENDING	VEHICLES IN QUEUE		Consent of copyright owner required for any other use.
16.45	0.9	*	, 11 <sup>5</sup> 6.
17.00	1.3	*	their
17.15	2.3	* *	. 4. od oc
17.30			Off of all.
17.45 18.00			ases did
	1.0	^	nitro nite
QUEUE FOR STR	EAM C-B	_	tion of the state
TIME SEGMENT	NO. OF		Age Coult
ENDING			of illight
	IN QUEUE		FO DYLL
16.45 17.00			& cor
17.15			ant o
17.30			anger .
	0.0		Co.
18.00	0.0		

I I T	STREAM	I I I	TOTAL	. I	DEMAND	I I	* QUEUE:	*	I	* INCLUSIV: * DE:	LA	<i>.</i> *	I I I
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	В-С	I	28.9	I	19.3	I	6.3 I	0.22	I	6.3	I	0.22	I
I	B-A	Ι	441.8	Ι	294.6	Ι	136.1 I	0.31	Ι	136.1	Ι	0.31	I
I	C-A	Ι	166.5	Ι	111.0	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	Ι	0.0	Ι	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
I	A-C	I	28.9	Ι	19.3	Ι	I		I		I		I
Ι	ALL	Ι	666.2	Ι	444.1	Ι	142.4 I	0.21	Ι	142.5	Ι	0.21	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	may	be	combined,	in	which	case	capacity	will	be	adjusted	)

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	Ι

I Intercept For Slope For Op		Slope For Opposing	Slope For OpposingI
I Stream B-A Stream A-C		Stream C-A	Stream C-B I
I 476.98 0.21	0.08	0.13	0.30 I

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream C-B	Stream A-C	Stream A-B	I
Ι	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM	I FLOW	SCALE(%)	Ι											
I A	I	100	I										115°.	
ΙB	I	100	I									- 6	Her	
I C	I	100	Ι								ه ۱۸۰۰	40	, C	
Demandrine : LENGT: LENGT: DEMAN	d set: PERIOD  H OF TI H OF TI D FLOW	2022 PM PO BEGINS 16 ME PERIOD ME SEGMEN' PROFILES	eak .30 - T -	- W AND 90 15	With De Dith D	18.0 UTES UTES	ppment  5.  FROM TURNING  ART WHEN  FLOW STOPS  FAIL/ING  75.00  75.00  75.00	or Go	nspection of the straight of t	ATA	Ses of for			
т	т .	NIIMBED OF	 мт		'C FDOM			т	D7TF					
T ARI	M T FT.	NUMBER OF	T	TOP	OF DEY	K T	FIOM STOPS	T	REFORE	T	AT TOP	رظ v T	AFTFR	
Ι 2110	I	TO RISE	I	IS	REACHE	DI	FALLING	Ι	PEAK	I	OF PEAK	Ι	PEAK	
 I ARM	 А І	15.00	 I		45.00		75.00	 I	0.28	 I	0.41	 I	0.28	
I ARM	ВІ	15.00	I		45.00	I	75.00	I	4.29	I	6.43	I	4.29	
I ARM	CI	15.00	I		45.00	I	75.00	Ι	1.55	I	2.32	Ι	1.55	
I ARM I ARM I ARM	A I B I C I	15.00 15.00 15.00	I I I 	IS 	REACHE 45.00 45.00 45.00	I I	FAIRTING 75.00 75.00 75.00	I I I I	PEAK 0.28 4.29 1.55	I I I	OF PEAP 0.41 6.43 2.32		I I I I I I I I I I I I I I I I I I I	I 0.28 I 4.29 I 1.55
			Ι		TUR	NINC	F PROPORTION	NS		Ι				
T			Т		TUR	NTNO	COUNTS (VI	ЕΗ	/HR)	Т				

I TURNING PROPORTIONS I I TURNING COUNTS (VEH/HR) I I TURNING COUNTS (VEH/HR) I I (PERCENTAGE OF H.V.S) I I I TIME I FROM/TO I ARM A I ARM B I ARM C I I ARM A I O.000 I 0.000 I 1.000 I I I I I I I I I I I I I I I I I I								
I 16.30 - 18.00 I I I I I I I I I I I I I I I I I I	I I I		I		ΤŪ	JRNING COU	JNTS (VEH/	/HR) I
I ARM A I 0.000 I 0.000 I 1.000 I I I I I I I 0.01 I I I I I I I I I I I I I I I I I I I	I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
		16.30 - 18.00	I I I I I I I I I I	ARM B		0.000 I 0.0 I ( 0.0) I I 0.936 I 321.0 I ( 19.0) I 1.000 I 124.0 I ( 15.0) I	0.000 I 0.00 I I 0.00 I 0.00 I 0.00 I I 0.00 I I 0.00 I	22.0 I ( 35.0)I I 0.064 I 22.0 I ( 50.0)I I 0.000 I 0.0 I ( 0.0)I

FOR DEMAND SET 2022 PM Peak - With Development AND FOR TIME PERIOD 2

		AND I	FOR TIME P	ERIOD :	2						
I I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I	B-A	0.28 4.03	5.08 8.37	0.054 0.481		0.00	0.06	0.8 12.5		0.21 0.22	I I
I I I I	C-B A-B A-C	1.56 0.00 0.00 0.28	10.37	0.000		0.00	0.00	0.0		0.00	I I I
 I I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	B-C B-A	0.33 4.81	4.91 8.31	0.067 0.579		0.06 0.90	0.07 1.32	1.0 18.6		0.22 0.28	I I
I I I	C-B A-B	1.86 0.00 0.00 0.33	10.35	0.000		0.00	0.00	0.0		0.00	I I I
								<u>-</u>			Ι
I I I		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/	PEDESTRIAN FLOW (PEDS/MIN)	START	END QUE	DELAY	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
	17.00-1						oostied,				Ι
I		0.40 5.89	4.62 8.22	0.087 0.717		0.07	0.09	1.4 31.5			I I
I		2.28	0.22	0.717		citon net		31.3			I
I		0.00	10.33	0.000	~	200.000	0.00	0.0			Ι
I		0.00			COLID	digit					I I
I		0.40			COP						I
											-
I I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)		END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I		0.40	4.59	0.088		0.09	0.10	1.4		0.24	I
I	B-A C-A	5.89 2.28	8.22	0.717		2.33	2.42	35.7		0.43	I
	C-B	0.00	10.33	0.000		0.00	0.00	0.0			I
I I 	A-C	0.00									I I I
									GEOMETRIC DELAY		_ _
I I		(VEH/MIN)		CAPACITY		QUEUE		(VEH.MIN/			I
I	B-C B-A	0.33 4.81		0.067 0.579		0.10		1.1 23.2		0.22 0.30	I I
I I I I	C-B A-B A-C	1.86 0.00 0.00 0.33	10.35	0.000		0.00	0.00	0.0		0.00	I I I I
•											_

 I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	 [ I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									I
I	B-C	0.28	5.06	0.055		0.07	0.06	0.9		0.21	I
I	B-A	4.03	8.37	0.481		1.43	0.95	15.1		0.23	I
I	C-A	1.56									I
I	C-B	0.00	10.37	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									Ι
I	A-C	0.28									Ι
I											Ι

QUEUE FOR STR				
TIME SEGMENT ENDING				
	0.1 0.1 0.1			
17.30 17.45 18.00	0.1 0.1 0.1			
QUEUE FOR STR	EAM B-A			
TIME SEGMENT ENDING				Ø1*
16.45	0.9	*		7 150
17.00		*		die
17.15 17.30			19. mg	
17.45			z of kot w	
18.00			ito ited i	
QUEUE FOR STR	EAM C-B		ion of redu	
TIME SEGMENT ENDING			Consent of copyright owner required for any	
16.45			COS	
17.00			, of C	
17.15			geni	
17.30			Colle	
17.45 18.00	0.0		•	
10.00	0.0			

I STREAM I TOTAL DEMAND I I T I					I I	* QUEUE:		I I	* INCLUSIV * DE		~	I I I	
I		Ι	(VEH)	(	(VEH/H)	Ι	(MIN)		Ι	(MIN)		(MIN/VEH)	I
I	B-C	I	30.3	I	20.2	I	6.7 I	0.22	I	6.7	I	0.22	I
I	B-A	Ι	441.8	Ι	294.6	Ι	136.6 I	0.31	Ι	136.7	Ι	0.31	I
I	C-A	Ι	170.7	Ι	113.8	I	I		I		I		I
I	C-B	I	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	I
I	A-B	I	0.0	Ι	0.0	Ι	I		I		I		I
Ι	A-C	Ι	30.3	Ι	20.2	Ι	I		Ι		Ι		Ι
I	ALL	I	673.1	I	448.7	I	143.3 I	0.21	I	143.4	I	0.21	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams may be combined, in which case capacity will be adjusted )

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	g I
I 602.92	0.22	0.09	I

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Inte	ercept For	Slope For Opposing	Slope For Opposing	Ι
I Stre	eam C-B	Stream A-C	Stream A-B	Ι
I	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I

I ARM I FLOW SCALE(%) I  I A I 100 I I B I 100 I I C I 100 I I C I 100 I  THE PERIOD BEGINS 16.30 AND ENDS 18.00  LENGTH OF TIME PERIOD - 90 MINUTES.  LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING BOUNT DATA  I I NUMBER OF MINUTES FROM START WHEN, I RATE OF FLOW (VEH/MIN) I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I I TO RISE I IS REACHED I FAILUING I PEAK I OF PEAK I PEAK  I ARM A I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14 I ARM C I 15.00 I 45.00 I 75.00 I 1.71 I 2.57 I 1.71	I ARM	I FLO	W SCALE(%)	I										
I ARM B I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	ΙA	I	100	I									, 15 <sup>6</sup> .	
I ARM B I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	ΙB	I	100	I								á	her	
I ARM B I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	I C	I	100	I							A .	40	N.	
I ARM B I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	Deman	d set:	2022 AM PO	 eak - .30 AN	Developm	ent 8.0	Flows + Se	en:	sitivity	er ch	off of the state o	8.,		
I ARM A I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	LENGI	H OF T	'IME SEGMEN'	- 9 T - 1	.5 MINU	TES		or,	inspired o					
I ARM B I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	DEMAN	D FLOW	PROFILES	ARE SY	NTHESISE	D F	ROM TURNING	ڰڹ	OUNT DA	ATA	A			
I ARM B I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	I	I	NUMBER OF	MINUT	ES FROM	STA	RT WHEN	I	RATE	OF	F FLOW (	VEI	H/MIN)	Ι
I ARM A I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	I AR	M I F	LOW STARTS	I TOP	OF PEAK	I	FLOW STOPS	Ι	BEFORE	Ι	AT TOP	Ι	AFTER	Ι
I ARM A I 15.00 I 45.00 I 75.00 I 1.05 I 1.57 I 1.05 I ARM B I 15.00 I 45.00 I 75.00 I 7.14 I 10.71 I 7.14	I	I	TO RISE	I IS	REACHED	I	FALLING	Ι	PEAK	Ι	OF PEAK	Ι	PEAK	Ι
	I ARM	A I	15.00	I	45.00		75.00	Ι	1.05		1.57		1.05	I
I ARM C I 15.00 I 45.00 I 75.00 I 1.71 I 2.57 I 1.71	I ARM	BI	15.00	I	45.00	I	75.00	Ι	7.14	Ι	10.71	I	7.14	I
	I ARM	CI	15.00	I	45.00	Ι	75.00	Ι	1.71	Ι	2.57	Ι	1.71	Ι

I		Ι		ΤŲ	JRNING PRO	OPORTIONS	I
I		Ι		ΤŲ	JRNING COU	JNTS (VEH/	'HR) I
I		Ι		(PE	ERCENTAGE	OF H.V.S)	I
Ι				· 		<sup>'</sup>	
I	TIME	Ι	FROM/TO	I	ARM A I	ARM B I	ARM C I
т	16.30 - 18.00	т		т	 Т	т	т
	10.30 10.00	T	ARM A	_	_	0.000 I	1 000 T
		_	ARM A				
Τ		Ι		Ι		0.0 I	
I		Ι		Ι	(0.0)I	(0.0)I	( 14.0)I
I		Ι		Ι	I	I	I
Ι		Ι	ARM B	Ι	0.723 I	0.000 I	0.277 I
I		Ι		Ι	413.0 I	0.0 I	158.0 I
I		Ι		Ι	( 10.0)I	( 0.0)I	( 33.0)I
I		Ι		Ι	I	I	I
I		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
I		Ι		Ι	137.0 I	0.0 I	0.0 I
I		Ι		Ι	( 60.0)I	( 0.0)I	( 0.0)I
I		Ι		Ι	I	I	I

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FOR DEMAND SET 2022 AM Peak - Development Flows + Sensitivity Flows AND FOR TIME PERIOD  $\phantom{-}435$ 

_		AND 1	FOR TIME PI	ERIOD 435	) - <b></b> =						
I I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)		GEOMETRIC DELAY  (VEH.MIN/  TIME SEGMENT)		I
	16.30-1	16.45		( /	(,,	( /	( /	,			I
I	B-C	1.98	5.82	0.341		0.00	0.50	7.0		0.26	Ι
I	B-A	5.18	8.23	0.630		0.00	1.61	21.6		0.31	I
I	C-A	1.72									I
I	C-B	0.00	10.17	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									Ι
Ι	A-C	1.05									Ι
Ι											Ι
•											
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
	16.45-1										Ι
Ι		2.37	5.43	0.436		0.50	0.75	10.6		0.32	Ι
I		6.19	8.09	0.765		1.61	2.89	38.4		0.48	I
I		2.05	10 10	0 000		0 00	0 00	0 0		0.00	I
I		0.00	10.12	0.000		0.00	0.00	0.0		0.00	I
I		1.26									I
I	11 0	1.20									I
								······································			
								DELAY			
	TIME	DEMAND		DEMAND /	PEDESTRIAN	CTADT	END.	DELAY	GEOMETRIC DELAY		
I			(VEH/MIN)	CAPACTTY	FLOESIKIAN	OHEHE	ULIEND.	(VEH.MIN/			I
I		( V DII / I I I I V /	( V 111 / 1111 /	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)		VEHICLE (MIN)	
	17.00-1	17.15		(14.0)	(1 DDO/ 111N)	( * = 110 )	-05-194c	III ODOMUNI)	IIII ODOMINI)	· DIII (FIIII)	I
I		2.90	3.39	0.856		0.75	P31167	41.4		1.23	I
I	B-A	7.58	7.90	0.959		2.89	<del>(</del> 8.49	94.9		1.07	Ι
I		2.51				action net					I
I		0.00	10.05	0.000	~	00.00	0.00	0.0		0.00	I
I		0.00			ail	18/11					Ι
I	A-C	1.54			4000						I
					FLDESTRIAN FLOW (PEDS/MIN)						
					asent						
·	TIME	ДЕМДИГ 	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I			(VEH/MIN)		FLOW		QUEUE		(VEH.MIN/	PER ARRIVING	
I		,,,	,,	(RFC)						VEHICLE (MIN)	
I	17.15-1	17.30				,		,	,	, ,	I
I	B-C	2.90	3.05	0.951		3.67	6.16	76.0		2.18	I
I	B-A		7.90	0.959		8.49	10.88	146.8		1.52	
Ι		2.51									Ι
I		0.00	10.05	0.000		0.00	0.00	0.0		0.00	I
I		0.00									I
I		1.54									I
	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т
I				CAPACITY			QUEUE			PER ARRIVING	
I		. , .===-/	. ,/		(PEDS/MIN)					VEHICLE (MIN)	
	17.30-1	17.45		,		/		- ·-,	- /	,,	I
I	B-C	2.37	5.08	0.466		6.16	0.92	21.5		0.48	Ι
I	B-A	6.19	8.09	0.765		10.88	3.73	79.4		0.83	I
I		2.05									I
I		0.00	10.12	0.000		0.00	0.00	0.0		0.00	Ι
I		0.00									I
I	A-C	1.26									I
I											Ι

I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW	START OUEUE	END OUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELA PER ARRIVING	
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN	) I
I	17.45-1	8.00									I
I	B-C	1.98	5.76	0.344		0.92	0.54	8.6		0.27	I
I	B-A	5.18	8.23	0.630		3.73	1.80	29.9		0.36	I
I	C-A	1.72									I
I	C-B	0.00	10.17	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	1.05									I
I											I

QUEUE FOR STR	EAM B-C		
TIME SEGMENT ENDING			
16.45	1N QUEUE 0.5	*	
17.00	0.7		
17.15	3.7	***	
17.13	6.2	****	
17.45		*	
	0.5		
10.00	0.9		
QUEUE FOR STR	EAM B-A		
TIME SEGMENT	NO. OF	-	
ENDING			
	IN QUEUE		
16.45		* *	150
17.00	2.9	***	net
17.15			101
17.30	10.9	*****	and any
17.45	3.7	* * * *	as of soft
18.00	1.8	* *	2050 red
OUEUE FOR STR	EAM C D		Consent of copyright owner required for any other use.
QUEUE FOR SIR	.EAM C-B		riot net?
TIME SEGMENT	NO. OF		Dec Owit
ENDING			insoft
	IN QUEUE		FOT WITE
16.45	0.0		Cost,
17.00	0.0		" of "
17.15	0.0		ent
17.30	0.0		* Olis
17.45	0.0		$\mathcal{C}$
18.00	0.0		
_			

I I T	STREAM	I I				I I	* QUEUE:	<i>(</i> *	I * INCLUSIVE QUEUEING * I * DELAY *				
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	217.5	I	145.0	I	165.1 I	0.76	I	165.1	I	0.76	I
Ι	B-A	Ι	568.5	Ι	379.0	Ι	411.1 I	0.72	Ι	411.3	Ι	0.72	I
I	C-A	Ι	188.6	Ι	125.7	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	Ι	0.0	Ι	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		Ι		I
Ι	A-C	Ι	115.6	Ι	77.1	Ι	I		Ι		Ι		Ι
I	ALL	I	1090.1	I	726.8	I	576.2 I	0.53	I	576.4	I	0.53	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	mav be	combined.	in	which	case	capacity	will	be	adiusted	)

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	Ι

-	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Inte	ercept For	Slope For Opposing	Slope For Opposing	Ι
I Stre	eam C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I

I ARM	I FLOW	SCALE(%)	I										
ΙA	I	100	I									, 15 <sup>6</sup> .	
ΙB	I	100	I								á	her	
I C	I	100	I							A	40	N.	
										ses a for a	ÿ.,		
Deman	d set:	2022 PM P	eak - I	Developm	ent	Flows + Se	ens	sitivity	2	NOWS			
TIME 1	PERIOD :	BEGINS 16	.30 ANI	D ENDS 1	8.0	0		ction	21. Le				
LENGT:	H OF TI	ME PERIOD ME SEGMEN	– 91 Г – 1	0 MINU 5 MINU	TES TES	Flows + Se  O  ROM TURNING THE WHEN FLOW STOPS FALLING	ر. م	itight own					
DEMAN	D FLOW	PROFILES A	ARE SYI	NTHESISE	D F	ROM TURNING	්ර	OUNT DA	ATA				
I	I	NUMBER OF	MINUT	ES FROM	STA	RT WHEN	Ι	RATE	OF	F FLOW (	VEI	H/MIN)	Ι
I ARI	M I FL	OW STARTS	I TOP	OF PEAK	I	FLOW STOPS	Ι	BEFORE	Ι	AT TOP	Ι	AFTER	Ι
I	I	TO RISE	I IS	REACHED	I	FALLING	Ι	PEAK	Ι	OF PEAK	Ι	PEAK	Ι
I ARM	 А І	15.00	I	45.00		75.00	Ι	0.55		0.83		0.55	I
I ARM	вІ	15.00	I	45.00	I	75.00	Ι	4.15	Ι	6.23	Ι	4.15	Ι
I ARM	CI	15.00	I	45.00	I	75.00	Ι	2.10	Ι	3.15	Ι	2.10	Ι

I I I		I I I		ΤŲ		DPORTIONS JNTS (VEH, OF H.V.S)	,				
I	TIME	Ι	FROM/TO	I	ARM A I	ARM B I	ARM C I				
I I I I I I I I I I	16.30 - 18.00		ARM A  ARM B	I I I I I I I	0.0 I ( 0.0) I I 0.967 I 321.0 I ( 19.0) I I 1.000 I 168.0 I	I(0.0) I I 000.0 I 0.0 I (0.0) I I (0.0) I I 000.0	44.0 I ( 35.0) I I 0.033 I 11.0 I ( 50.0) I I 0.000 I 0.0 I				

FOR DEMAND SET 2022 PM Peak - Development Flows + Sensitivity Flows AND FOR TIME PERIOD 990

		AND I	FOR TIME P	ERIOD 990	1					
 I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
	16.30-1	16.45		(141.0)	(I DDS/ HIN)	( V 1110 )	( V 1110 )	IIII DEGILENI,	TITHE ODGITHINT)	VEHICLE (HIN)
I	B-C B-A	0.14	5.02 8.20	0.027 0.491		0.00	0.03 0.94	0.4 13.0		0.20 0.23
Ι	C-A	2.11								
Ι	C-B	0.00	10.28	0.000		0.00	0.00	0.0		0.00
Ι	A-B	0.00								
Ι	A-C	0.55								
Ι										
•										
I	TIME	DEMAND	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW	QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING
I		(VEH/MIN)	(VEH/MIN)	(RFC)	(PEDS/MIN)				TIME SEGMENT)	VEHICLE (MIN)
	16.45-1	17.00		(142 0)	(I LDD) IIIII)	( V E110 )	( 1110 )	TITIE ODGIDINI)	TITIE ODGIDIVITY	VEHICLE (HILL)
I	B-C	0.16	4.84	0.034		0.03	0.03	0.5		0.21
I	В-А	4.81	8.10	0.594		0.94	1.40	19.7		0.30
I	C-A	2.52								
Ι	C-B	0.00	10.25	0.000		0.00	0.00	0.0		0.00
I	A-B	0.00								
I	A-C	0.66								
I										
•								et lise.		
	TIME	DEMAND		DEMAND/	DEDECTRIAN	START	END QUE	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I	1 11111		(VEH/MIN)		FLOW	OUEUE	OUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I		( 1211, 11211,	( 1211, 11111,	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	17.00-1	17.15		, ,	, ,	, -,	200° red	,	,	
I	B-C	0.20	4.47	0.045		0.03	0105	0.7		0.23
I	B-A	5.89	7.96	0.740		1.40	<del>°</del> 2.57	34.4		0.45
Ι	C-A	3.08				cition ner				
I	C-B	0.00	10.20	0.000		00.00	0.00	0.0		0.00
I	A-B	0.00			COLI	16gr				
I	A-C	0.81			trough	<b>Y</b>				
					FLOW (PEDS/MIN)					
					nsent 0,					
Ī	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/		PER ARRIVING
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	17.15-1			0.6:-						
I	B-C	0.20	4.44	0.045		0.05	0.05	0.7		0.24
	B-A		7.96	0.740		2.57	2.69	39.7		0.48
I	C-A C-B	3.08 0.00	10.20	0 000		0 00	0 00	0.0		0.00
	С-в A-в	0.00	10.20	0.000		0.00	0.00	0.0		0.00
I	A-C	0.81								
I	-									
		D							GROWDED TO DETERMINE	
I	TIME		CAPACITY		PEDESTRIAN		END	DELAY	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY
I		(VEH/MIN)	(VEH/MIN)							
I	17.30-1	17 45		(RFC)	(LEDS/MIN)	(vhu2)	(AFH2)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
I	B-C	0.16	4.82	0.034		0.05	0.04	0.6		0.21
I		4.81		0.594		2.69		24.9		0.32
I		2.52	- 7 - 7	<del>-</del>						0.02
I	C-B	0.00	10.25	0.000		0.00	0.00	0.0		0.00
I	A-B	0.00								
Ι	A-C	0.66								
Ι										

		DEMAND	CAPACITY	DEMAND /	DEDECTRIAN		END	DELAY	CROMETRIC DELAY		
Τ.	TIME	DEMAND			PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELA	
Τ		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN	) I
I	17.45-1	8.00									I
I	B-C	0.14	5.01	0.028		0.04	0.03	0.4		0.21	I
I	B-A	4.03	8.20	0.491		1.53	0.99	15.8		0.24	I
I	C-A	2.11									I
I	C-B	0.00	10.28	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.55									I
I											I

QUEUE FOR STREAM	в-с	
TIME SEGMENT NO	). OF	
ENDING VEHI		
IN Ç		
16.45 17.00		
17.15		
17.30		
17.45		
18.00	0.0	
QUEUE FOR STREAM	В-А	
TIME SEGMENT NO		
ENDING VEHI	CLES	
IN Ç	QUEUE	age.
	0.9 * 1.4 *	- St. W.
17.15	2.6 **	**
17.30	2.7 **	**
	1.5 **	*
	1.0 *	red ited
QUEUE FOR STREAM	C-B	**  **  **  **  Consent of copyright owner required for involuterinse.  Consent of copyright owner required for involuterinse.
TIME SEGMENT NO	). OF	edect of the
ENDING VEHI	CLES	or illight
IN Ç	QUEUE	FO DYLL
16.45 17.00	0.0	& COY
	0.0	ant o'
	0.0	and the second s
	0.0	Co.
18.00	0.0	

I I I	I STREAM I TOTAL DEMAND I I I					I I	* QUEUEI * DELAY		I I		INCLUSIVE QUEUEING *  * DELAY *			
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I	
I	в-с	I	15.1	Ι	10.1	Ι	3.3 I	0.22	Ι	3.3	Ι	0.22	Ι	
Ι	B-A	Ι	441.8	Ι	294.6	Ι	147.5 I	0.33	Ι	147.5	Ι	0.33	Ι	
I	C-A	Ι	231.2	Ι	154.2	Ι	I		Ι		I		Ι	
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	Ι	0.0	Ι	0.00	Ι	
I	A-B	Ι	0.0	Ι	0.0	Ι	I		Ι		Ι		Ι	
Ι	A-C	Ι	60.6	Ι	40.4	Ι	I		Ι		Ι		Ι	
I	ALL	I	748.8	Ι	499.2	Ι	150.8 I	0.20	I	150.8	I	0.20	I	

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	may	be	combined,	in	which	case	capacity	y will	be	adjusted	)
-------------	-----	----	-----------	----	-------	------	----------	--------	----	----------	---

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	Ι

-	or Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	tream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

		SCALE(%)													
ΙA	I	100	Ι											7 15°C.	
ΙB	I	100	I										á	Her	
I C	I	100	I									٠4٠ ٥	40	N.	
TIME 1 LENGTI LENGTI DEMANI	PERIOD :	2032 AM POBEGINS 16 ME PERIOD ME SEGMENT PROFILES	.30 - I -	ANI 90	) ) 5	NDS 1 MINU MINU ESISE	8.0 TES TES	nent 00 5. CROM TURNIN	G. O.	nedection of the string of the	ATA	see outy. of some			
 I	I	 NUMBER OF	 MI		 ES E	 TROM	 STA	ART WHEN	 I	RATE	 OE	FLOW (	 VEI	 H/MIN)	 I
i Ari	M I FL	OW STARTS	Ι	TOP	OF	PEAK	I	FLOW STOPS	Ι	BEFORE	Ι	AT TOP	Ι	AFTER	-
								FALLING							
 [ ARM	 A I	15.00	 I		45.	.00	 I	75.00	 I	0.79	 I	1.18	 I	0.79	
								75.00							
								75.00							
  I								FROPORTION							
Ĩ.			Τ			TURN	TNO	COUNTS (VI	E.H.	/HR)	Т				

I I I		I I I		ΤŲ		DPORTIONS JNTS (VEH, OF H.V.S)	,
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
	16.30 - 18.00	I I I I I I I I I I I I I	ARM A  ARM B	I I I I I I I	0.0 I ( 0.0) I I 0.756 I 430.0 I ( 10.0) I I 1.000 I 90.0 I	I(0.0) I I 000.0 I 0.00 I (0.0) I (0.0) I I 000.0	63.0 I ( 14.0) I I 0.244 I 139.0 I ( 33.0) I I 0.000 I 0.0 I
		_		_	_	_	_

FOR DEMAND SET 2032 AM Peak - No Development AND FOR TIME PERIOD 990

		AND I	FOR TIME P	ERIOD 990	)						
I I I		, ,	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I I I		16.45 1.74 5.40	5.73 8.58	0.304 0.629		0.00	0.43 1.61	6.0 21.6		0.25	I I I
I I I	C-B A-B	1.13 0.00 0.00 0.79	10.24	0.000		0.00	0.00	0.0		0.00	I I I
											_ _
 I I		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
	16.45-										Ι
I		2.08	5.35	0.389		0.43 1.61	0.62	8.8			I
I		6.44 1.35	8.49	0.759		1.01	2.83	37.9			I I
I		0.00	10.20	0.000		0.00	0.00	0.0			I
I		0.00									Ι
I		0.94									I
								<del>-</del>		· 	Ι
								etise.			
·-	TIME	DEMAND	CAPACITY		DEDESTRIAN	START	END.	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	- I
I			(VEH/MIN)		FLOW	QUEUE	QUENE	WEH.MIN/	(VEH.MIN/	PER ARRIVING	
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHSO)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	17.00-		2 40	0.700		0.00	602 item	27.5			I
I		2.55 7.89	3.48 8.35	0.732 0.945		2 23	24	27.5 90.2			I I
I		1.65	0.33	0.940		ations of	<b>y</b> 1 • J⊥	JU • Z			I
I		0.00	10.15	0.000	٥	80° 09	0.00	0.0			I
I		0.00			at in	dil					Ι
I		1.16			£0,04	Y					I I
					FLOW (PEDS/MIN)						_
_					asentof						_
. – I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I		17 20		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
I	17.15-1 B-C	2.55	2.68	0.952		2.24	5.35	60.8			I I
	B-A			0.945		7.91		134.3		1.33	
I		1.65		-							I
I		0.00	10.15	0.000		0.00	0.00	0.0			I
I		0.00									I
I		1.16									I I
											_
	TIME				PEDESTRIAN		END		GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)						(VEH.MIN/	PER ARRIVING	
I		17 15		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)		
I	17.30-1 B-C	2.08	5.08	0.410		5.35	0.72	16.4			I I
I		6.44		0.759		9.82		71.7			I
I		1.35				-	-	•			I
I		0.00	10.20	0.000		0.00	0.00	0.0			Ι
I		0.00									I
I		0.94									I I
											_

I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELA PER ARRIVING	I
I	17.45-1	8.00		(RFC)	(PEDS/MIN)	(VEDS)	(VERS)	IIME SEGMENI)	TIME SEGMENT)	VEHICLE (MIN	) I
I	В-С	1.74	5.68	0.307		0.72	0.45	7.2		0.26	I
I	B-A	5.40	8.58	0.629		3.57	1.78	29.4		0.34	I
I	C-A	1.13									I
I	C-B	0.00	10.24	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.79									I
I											I
٠		OMDERNA I									

QUEUE FOR STR	EAM B-C	_	
TIME SEGMENT ENDING			
16.45	0.4		
17.00		*	
17.15	2.2	* *	
17.30	5.3	****	
17.45	0.7	*	
18.00	0.5		
QUEUE FOR STR	EAM B-A		
TIME SEGMENT	NO. OF	_	
ENDING	VEHICLES		
	IN QUEUE		<u>ي</u> و.
	1.6		A 100
17.00			ather .
17.15	7.9	*****	·A· A
		*****	oully air.
	3.6		CES 2501
18.00	1.8	**	at Postified
QUEUE FOR STR	EAM C-B		Consent of copyright owner required for any other use.
TIME SEGMENT	NO. OF		EREC ONT
ENDING	VEHICLES		in dh
	IN QUEUE		FOR Mile
16.45	0.0		e cox
17.00	0.0		x or
17.15	0.0		<u>centi</u>
17.30	0.0		CORE
17.45	0.0		
18.00	0.0		

QUEUEING	DELAY	INFORMATION	OVER	WHOLE	PERIOD

I	STREAM	I I	TOTA	LI	DEMAND	I I	* QUEU: * DEL			I I	* INCLUSIV * DE		~	I
I		I-												- I
I		Ι	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	Ι
I	B-C	I	191.3	Ι	127.5	Ι	126.7	Ι	0.66	I	126.7	I	0.66	Ι
I	B-A	Ι	591.9	Ι	394.6	Ι	385.1	Ι	0.65	Ι	385.3	Ι	0.65	Ι
I	C-A	I	123.9	Ι	82.6	Ι		Ι		Ι		Ι		Ι
I	C-B	I	0.0	Ι	0.0	Ι	0.0	Ι	0.00	Ι	0.0	Ι	0.00	Ι
I	A-B	I	0.0	Ι	0.0	Ι		Ι		Ι		Ι		Ι
I	A-C	I	86.7	Ι	57.8	Ι		Ι		I		I		I
Ι	ALL	I	993.8	Ι	662.5	Ι	511.8	Ι	0.52	Ι	512.0	I	0.52	Ι

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	mav be	combined.	in	which	case	capacity	will	be	adiusted	)

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	Ι

-	or Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	ream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM	I FLOW	SCALE(%)	Ι												
I A	I	100	I											115°.	
ΙB	I	100	Ι										- 6	Her	
I C	I	100	Ι									ه ۱۸۰۰	40	,0	
Demand TIME F LENGTF LENGTF DEMANI	d set: PERIOD H OF TI H OF TI	2032 AM PO BEGINS 07 ME PERIOD ME SEGMEN PROFILES	eak .15 - I -	- V - 90 - 15	With O EN O 5	Dev IDS 0 MINU MINU ESISE	elo 8.4 TES TES	POMENT  ROM TURNING  ROM TURNING  FLOW STOPS  FALLING  75.00  75.00  75.00	of Ed	nspecion of the state of the st	ATA	See of for			
 т	 Т	NUMBER OF	 мт	NUTI	 ES F	ROM	 STA	RT WHEN	т	RATE	 OF	FLOW (	 7E1	 H/MTN)	
T ARN	4 T FT	OW STARTS	Т	TOP	OF	PEAK	Т.	FLOW STOPS	T	BEFORE	T	AT TOP	T	AFTER	7
I	I	TO RISE	I	IS	REA	CHED	I	FALLING	I	PEAK	I	OF PEAK	I	PEAK	-
 I ARM	 A I	15.00	 I		45.	.00	 I	75.00	 I	0.80	 I	1.20	 I	0.80	
I ARM	ВІ	15.00	Ι		45.	0.0	Ι	75.00	Ι	7.14	Ι	10.71	Ι	7.14	1
I ARM	CI	15.00	Ι		45.	00	Ι	75.00	Ι	1.20	Ι	1.80	Ι	1.20	-
I								PROPORTION							
Т			T			TURN	TNG	COUNTS (VI	H.F	/HR)	Т				

I		I		ΤU	JRNING PRO	OPORTIONS	I		
Ι		Ι		ΤU	JRNING COU	JNTS (VEH	/HR) I		
I		Ι		(PE	ERCENTAGE	OF H.V.S)	I		
I				· 					
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I		
I	07.15 - 08.45	I		I	I	I	I		
I		I	ARM A	I	0.000 I	0.000 I	1.000 I		
I		Ι		Ι	0.0 I	0.0 I	64.0 I		
I		Ι		Ι	( 0.0)I	( 0.0)I	( 14.0)I		
I		Ι		Ι	·	·	Ī		
I		Ι	ARM B	Ι	0.753 I	0.000 I	0.247 I		
I		Ι		Ι	430.0 I	0.0 I	141.0 I		
I		Ι		Ι	( 10.0)I	( 0.0)I	( 33.0)I		
I		Ι		Ι	·	·	·		
Т		Т	ARM C	Т	1.000 T	0.000 I	0.000 T		
T		T		T		0.0 I			
T		T		T		( 0.0)I			
T		Т		T	T	T	( 0.0/±		
_				_	_	_	_		

FOR DEMAND SET 2032 AM Peak - With Development AND FOR TIME PERIOD 1

		AND I	FOR TIME P	ERIOD	1						
I I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	B-A	1.77 5.40	5.74 8.55	0.308 0.631		0.00	0.44	6.1 21.8		0.25 0.30	I I I
I I I I	C-B A-B A-C	1.20 0.00 0.00 0.80	10.24	0.000		0.00	0.00	0.0		0.00	I I I I
 I I I	TIME		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I I	B-A	2.11 6.44	5.35 8.45	0.395 0.763		0.44 1.62	0.63 2.87	9.0 38.4		0.31 0.46	I
I I I I	C-B A-B	1.44 0.00 0.00 0.96	10.20	0.000		0.00	0.00	0.0		0.00	I I I I
								<del>nei</del> use			
I I I	TIME 07.45-0	, , ,			DEDECTRIAN	START QUEUE (VEHS)	END QUENE (VEHS)	OF DELYA		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I I I	B-C B-A	2.59 7.89 1.76	3.39 8.31	0.764 0.949		0.63 vi	21152 18.15	30.3 92.3		0.98 0.99	I
I I I	C-B A-B	0.00 0.00 1.17	10.14	0.000	FLOW (PEDS/MIN)	ight of	0.00	0.0		0.00	I I I
					of						
I I I I	TIME		CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	B-C	2.59 7.89 1.76	2.71 8.31	0.953 0.950		2.52 8.15	5.50 10.21	63.6 139.1		1.38	I I I
I I I I	C-B A-B A-C	0.00 0.00 1.17	10.14					0.0		0.00	I I I I
I I I		(VEH/MIN)	CAPACITY (VEH/MIN)	CAPACITY	FLOW	QUEUE			GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)	I I
I I I	B-A	2.11 6.44 1.44		0.418 0.763		5.50 10.21	0.75 3.65	17.2 74.6		0.42 0.74	I I I
I I I	C-B A-B A-C	0.00 0.00 0.96	10.20	0.000		0.00	0.00	0.0		0.00	I I I
•					·				<b></b>		

I I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELA PER ARRIVING VEHICLE (MIN	ï
Ι	08.30-0	8.45		, ,	, , ,	, ,	,	•	,	,	Ī
I	B-C	1.77	5.68	0.312		0.75	0.46	7.3		0.26	I
I	B-A	5.40	8.55	0.631		3.65	1.80	29.9		0.34	I
I	C-A	1.20									I
I	C-B	0.00	10.24	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.80									I
I											I
•	EUE FOR		3-0								

07.30 07.45 08.00 08.15 08.30	VEHICLES IN QUEUE 0.4 0.6 2.5	* * * * * * *	
QUEUE FOR STR	EAM B-A		
TIME SEGMENT ENDING			Consent of copyright owner required for any other use.
07.30	1.6	**	Jise.
07.45	2.9		net "
08.00	8.1	*****	1 ofte
08.15	10.2	*****	भीते होत्र
08.30	3.6	***	as of for
08.45	1.8		to sold
QUEUE FOR STR	EAM C-B		ion priedu
TIME SEGMENT	NO. OF		Dect onthe
ENDING			sittle dist
	IN QUEUE		FOI WITE
07.30	0.0		CON.
07.45	0.0		, of -
08.00	0.0		<u> eeni</u>
	0.0		C OTIS
	0.0		
08.45	0.0		

I I T	STREAM	I I I	TOTAI		EMAND	I I	* QUEUE:	<i>(</i> *	I	* INCLUSIV * DE	LA:	~	I I I
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	в-с	Ι	194.1	Ι	129.4	Ι	133.6 I	0.69	Ι	133.6	I	0.69	Ι
I	B-A	Ι	591.9	Ι	394.6	Ι	396.1 I	0.67	I	396.3	Ι	0.67	Ι
I	C-A	Ι	132.1	Ι	88.1	I	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
I	A-C	Ι	88.1	Ι	58.7	Ι	I		I		I		Ι
 I	ALL	I	1006.2	I	670.8	I	529.7 I	0.53	I	529.9		0.53	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams may be combined, in which case capacity will be adjusted )

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	g I
I 602.92	0.22	0.09	I

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Inte	ercept For	Slope For Opposing	Slope For Opposing	Ι
I Stre	eam C-B	Stream A-C	Stream A-B	Ι
I	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I

I ARM I FLOW SCALE(%) I  I A I 100 I I B I 100 I I C I 100 I  TIME PERIOD BEGINS 07.15 AND ENDS 08.45  LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.  DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING WOUNT DATA  I I NUMBER OF MINUTES FROM START WHEN I RATE OF FLOW (VEH/MIN) I ARM I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER I I TO RISE I IS REACHED I FAILUING I PEAK I OF PEAK I PEAK I ARM I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I 1 ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I I ARM C I 15.00 I 45.00 I 75.00 I 1.60 I 2.40 I 1.60 I	I ARM	I FLOW	SCALE(%)	I										
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	ΙA	I	100	I									, 15°	
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	ΙB	I	100	I									her	
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	I C	I	100	I								3 C	N .	
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	 Deman TIME	d set:	2032 AM Pe	 eak - :	Developm D ENDS 0	ent 8.4	Flows + Se	en:	sitivity	y J	of only of	>,		
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	LENGT LENGT	H OF TI H OF TI	ME PERIOD ME SEGMEN	- 9 r - 1	0 MINU 5 MINU	TES TES		Ž,	insplication					
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	DEMAN	D FLOW	PROFILES A	ARE SY	NTHESISE	D F	ROM TURNING	o	SOUNT DA	ATA	A			
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	I	I	NUMBER OF	MINUT	ES FROM	STA	RT WHEN	Ι	RATE	OI	F FLOW (	VEI	H/MIN)	Ι
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	I AR	M I FI	OW STARTS	I TOP	OF PEAK	I	FLOW STOPS	Ι	BEFORE	Ι	AT TOP	Ι	AFTER	I
I ARM A I 15.00 I 45.00 I 75.00 I 1.00 I 1.50 I 1.00 I ARM B I 15.00 I 45.00 I 75.00 I 7.34 I 11.01 I 7.34 I	I	I	TO RISE	I IS	REACHED	Ι	FALLING	Ι	PEAK	Ι	OF PEAK	Ι	PEAK	Ι
	I ARM	 А I	15.00	I	45.00		75.00		1.00	I	1.50	I	1.00	I
I ARM C I 15.00 I 45.00 I 75.00 I 1.60 I 2.40 I 1.60 I	I ARM	ΒI	15.00	I	45.00	I	75.00	Ι	7.34	Ι	11.01	Ι	7.34	I

I		Ι		ΤŲ	JRNING PRO	OPORTIONS	I
I		Ι		JΤ	JRNING COU	JNTS (VEH/	'HR) I
I		I		(PE	ERCENTAGE	OF H.V.S)	I
I							
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
Ι	07.15 - 08.45	Ι		Ι	I	I	I
I		Ι	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		Ι		Ι	0.0 I	0.0 I	80.0 I
Ι		Ι		Ι	(0.0)I	(0.0)I	( 14.0)I
I		Ι		Ι	I	I	I
I		Ι	ARM B	Ι	0.733 I	0.000 I	0.267 I
I		Ι		Ι	430.0 I	0.0 I	157.0 I
I		Ι		Ι	( 10.0)I	( 0.0)I	( 33.0)I
I		Ι		Ι	·	·	Ī
I		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
Т		Т		Т	128.0 I	0.0 I	0.0 T
T		T		T		( 0.0)I	
± T				T	( 00.0)I	( 0.0)I	( 0.0)I
Τ		1		Τ	1	1	1

FOR DEMAND SET 2032 AM Peak - Development Flows + Sensitivity Flows AND FOR TIME PERIOD 1

		AND I	FOR TIME P	ERIOD :	1						
 I I I		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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
	07.15-0	07.30		, 2/	,,/					(/	I
I	B-C	1.97 5.40	5.75 8.31	0.342 0.650		0.00	0.51 1.74	7.1 23.3		0.26 0.32	I
I		1.61									Ι
Ι		0.00	10.19	0.000		0.00	0.00	0.0		0.00	Ι
I		0.00									I I
I		1.00									I
	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/			I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	07.30-0		F 20	0 444		0 51	0 77	10.0		0.24	I
I		2.35	5.30	0.444		0.51	0.77	10.9		0.34	I
I		6.44 1.92	8.18	0.788		1.74	3.23	42.5		0.52	I
I		0.00	10.14	0.000		0.00	0.00	0.0		0.00	I
I		0.00		- · · · · ·				Ŭ. Ŭ		J. J. J.	I
I		1.20									Ι
I											Ι
								<del></del>			
I		DEMAND			PEDESTRIAN	START	END.	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUE	(VEH.MIN/	(VEH.MIN/		I
I		00 00		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
I	07.45-0 B-C	2.88	2.89	0.982		0 77 💰	20 Helin	60.8		1.92	I
I		7.89	8.00	0.982		3.23	<b>2</b> 0.18	110.3		1.20	I
I		2.35	3.00	0.502		ctioner	,			1.20	I
Ι	C-B	0.00	10.07	0.000		20.00	0.00	0.0		0.00	I
I	A-B	0.00			(in	dil					Ι
I		1.47			Ford	S. C.					I
. I					FLOW (PEDS/MIN)						I 
					asent 02						
	TIME	DEMAND	CAPACITY	DEMAND/	COV	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	 I
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/			Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	08.00-0		2 2=	0 000				101 4		0.55	I
I		2.88	3.07	0.939		6.10	7.30	101.1		2.66	I
	B-A		8.00	0.987		10.18	13.80	181.6		1.81	
I	C-A C-B	2.35 0.00	10.07	0 000		0.00	0 00	0.0		0.00	I
	A-B	0.00	10.07	0.000		0.00	0.00	0.0		0.00	I
I		1.47									I
Ι											I
	TIME		CAPACITY		PEDESTRIAN		END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)						(VEH.MIN/		
I		U8 3U		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
I	08.15-0 B-C	2.35	4 69	0.501		7.30	1.07	28.1		0.62	I
I		6.44		0.788		13.80		105.7		1.07	I
I		1.92	3.10	0.700			1.10	200.		±•0 /	I
I		0.00	10.14	0.000		0.00	0.00	0.0		0.00	I
I		0.00									I
I		1.20									Ι
I											Ι

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ί
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	08.30-0	8.45									I
I	B-C	1.97	5.68	0.347		1.07	0.55	8.7		0.27	I
I	B-A	5.40	8.31	0.650		4.43	1.97	33.5		0.38	I
I	C-A	1.61									I
I	C-B	0.00	10.19	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	1.00									I
I											I
QU	EUE FOR	STREAM I	3-C								

· QUEUE FOR STR	REAM B-C		
TIME SEGMENT ENDING			
	IN QUEUE		
	0.5	*	
07.45	0.8	*	
08.00	6.1	* * * * * *	
08.15	7.3	*****	
08.30	1.1	*	
08.45	0.5	*	
QUEUE FOR STR	REAM B-A		
TIME SEGMENT	NO. OF		
ENDING	VEHICLES		
	IN QUEUE		.Ø•
07.30	1.7	* *	· USC
07.45	3.2	* * *	ther
08.00	10.2	*****	1. 400
08.15		******	anily and
	4.4	* * * *	op Char
08.45	2.0	* *	70° ited
QUEUE FOR STR	REAM C-B		Consent of conviring to make required for any other use.
TIME SEGMENT	NO. OF	_	edect with
ENDING	VEHICLES		r ith dist
	IN QUEUE		FOI WILE
07.30	0.0		CON,
07.45	0.0		, 8 <sup>2</sup>
08.00	0.0		cetil
08.15	0.0		COIL
08.30	0.0		C <sup>-</sup>
08.45	0.0		
•			

QUEUEING	DELAI	INFORMATION	OVER	MHOLE	PERIOD

I I T	STREAM	I I I	TOTAI	. I	DEMAND	I I	* QUEUE]	<i>*</i>	I	* INCLUSIV * DE	LA:	=	I I
I		I	(VEH)		(VEH/H)	Ι		(MIN/VEH)		(MIN)			I
I	в-с	Ι	216.1	Ι	144.1	Ι	216.7 I	1.00	Ι	216.7	I	1.00	Ι
Ι	B-A	Ι	591.9	Ι	394.6	Ι	496.8 I	0.84	I	497.0	Ι	0.84	Ι
I	C-A	Ι	176.2	Ι	117.5	Ι	I		I		I		Ι
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	Ι
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		Ι
I	A-C	Ι	110.1	Ι	73.4	I	I		I		I		Ι
I	ALL	Ι	1094.3	Ι	729.5	Ι	713.4 I	0.65	Ι	713.7	Ι	0.65	Ι

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	may	be	combined,	in	which	case	capacity	y will	be	adjusted	)
-------------	-----	----	-----------	----	-------	------	----------	--------	----	----------	---

I Intercept For I Stream B-C	Slope For Opposing	Slope For Opposing	I
	Stream A-C	Stream A-B	I
I 602.92	0.22	0.09	 I 

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	ream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

ARM	I	FLOW	SCALE(%)	 I
 А	Ι		100	 I
В	Ι		100	Ι
C	Ι		100	Ι
	 А В	A I B I	A I B I	B I 100

I ARM	I FLOW	SCALE(%)	Ι												
I A	I	100	I											115°.	
ΙB	I	100	Ι										- 6	Her	
I C	I	100	I									.A. 6	40	,0	
Demand TIME F LENGTF LENGTF DEMANI	d set: PERIOD H OF TI H OF TI	2032 PM POBEGINS 16 ME PERIOD ME SEGMENT PROFILES	eak .30 - I -	ANI 90	No De D END D M D M	velo S 18 HINUT HINUT	pm .0 ES ES	ent  ROM TURNING  RT WHEN,  FLOW STOPS  FAIL ING  75.00  75.00  75.00	٠. ٥٠ ٤.۵	nedection of the string of the	ATA	see officers.			
 т	 Т	NUMBER OF	 МТ	NUTF			TA	ð RT WHEN	т	RATE	 OF	FLOW (	 7E1	 H/MTN)	
T ARN	M T FT	OW STARTS	Т	TOP	OF P	EAK	T	FLOW STOPS	T	BEFORE	T	AT TOP	T	AFTER	7
I	I	TO RISE	Ι	IS	REAC	HED	I	FALLING	I	PEAK	I	OF PEAK	I	PEAK	-
 I ARM	 А I	15.00			45.0	0		75.00	 I	0.28		0.41	 I	0.28	
I ARM	ΒΙ	15.00	Ι		45.0	0	Ι	75.00	Ι	4.45	Ι	6.67	Ι	4.45	1
I ARM	CI	15.00	Ι		45.0	0	Ι	75.00	Ι	1.58	Ι	2.36	Ι	1.58	-
I			I		Τ	'URNI	NG	PROPORTION	NS		I				
T			Т		Т	'IIRNT	NG	COUNTS (VI	ΣН	/HR)	Т				

I		Ι		ΤU	JRNING PRO	OPORTIONS	I
I		Ι		ΤU	JRNING COU	JNTS (VEH	/HR) I
I		Ι		(PE	ERCENTAGE	OF H.V.S)	Í
I							
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
I	16.30 - 18.00	Ι		Ι	I	I	I
I		I	ARM A	Ι	0.000 I	0.000 I	1.000 I
I		Ι		Ι	0.0 I	0.0 I	22.0 I
I		Ι		Ι	( 0.0)I	( 0.0)I	( 35.0)I
I		Ι		Ι	·	·	·
I		Ι	ARM B	Ι	0.938 I	0.000 I	0.062 I
I		Ι		Ι		0.0 I	
I		Ι		Ι	(19.0)I	( 0.0)I	(50.0)I
I		Ι		Ι	, I	, i	, I
Т		Т	ARM C	Т	1.000 T	0.000 I	0.000 T
T		Т	111111 0	T		0.0 I	
T		T		_		( 0.0)I	
T		Т		T	( 13.0)I	( 0.0/I	( 0.0)I
_		1		1	1	1	Τ.

FOR DEMAND SET 2032 PM Peak - No Development

		AND I	FOR TIME P	ERIOD	2	-				
I I I	TIME 16.30-1		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY I PER ARRIVING I VEHICLE (MIN) I
Ι	B-C	0.28	5.05	0.055		0.00	0.06	0.8		0.21 I
I	B-A C-A	4.19 1.58	8.37	0.501		0.00	0.97	13.5		0.23 I
I		0.00	10.37	0.000		0.00	0.00	0.0		0.00 I
I		0.00								I
I	A-C	0.28								I
 I	TIME	DEMAND	CAPACITY			START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUEUE (VEHS)	(VEH.MIN/	(VEH.MIN/ TIME SEGMENT)	PER ARRIVING I VEHICLE (MIN) I
	16.45-1	7.00		(141.0)	(LEDS) HIN)	( V LI I I I )	( V LI I I J	TIME SEGMENT)	TIME DEGRENT)	I I
I	B-C	0.33	4.88	0.068		0.06	0.07	1.0		0.22 I
I	B-A C-A	5.00 1.89	8.30	0.603		0.97	1.45	20.4		0.30 I
I	C-B	0.00	10.35	0.000		0.00	0.00	0.0		0.00 I
I	A-B A-C	0.00 0.33								I
I		••••								I
								et lise.		
	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	OTO DELAY	GEOMETRIC DELAY	AVERAGE DELAY I
I		, , ,	(VEH/MIN)	CAPACITY (RFC)	FLOW (PEDS/MIN)	QUEUE (VEHS)	QUENE (VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	PER ARRIVING I VEHICLE (MIN) I
I	17.00-1 B-C	.7.15	4.51	0.089		0 07.5	Posited	1.4		0.24 I
I		6.13	8.21	0.747		1.45	<b>€</b> 2.66	35.5		0.45 I
I	C-A	2.31	10 22	0 000		accid when	0.00	0 0		I
I	C-B A-B	0.00	10.33	0.000	· in	Spir.	0.00	0.0		0.00 I
I	A-C	0.40			Ford	7.6				I
I	TIME	DEMAND	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW	START	END OUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY I PER ARRIVING I
I		(VEII/PIIN)	(VEII/PILIN)	(RFC)	(PEDS/MIN)	~	~		TIME SEGMENT)	VEHICLE (MIN) I
	17.15-1		1 10	0 000		0 10	0 10	1 =		I
I	B-C B-A	0.40 6.13	4.48 8.21	0.090 0.747		0.10 2.66	0.10 2.78	1.5 41.0		0.25 I 0.47 I
I	C-A	2.31								I
I		0.00	10.33	0.000		0.00	0.00	0.0		0.00 I
I		0.40								I
										I
I	TIME		CAPACITY (VEH/MIN)		PEDESTRIAN FLOW				GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY I
I		( A TI 11 1 1 1 1 1 1 1 )	/ A TITY   1.1TIA						TIME SEGMENT)	
	17.30-1		4 05							I
I		0.33 5.00		0.068 0.603		0.10 2.78	0.07 1.59	1.1 25.8		0.22 I 0.32 I
I	C-A	1.89								I
I		0.00	10.35	0.000		0.00	0.00	0.0		0.00 I
I	A-D A-C	0.33								I
Ι										I
•										

	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	·
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									I
I	B-C	0.28	5.03	0.055		0.07	0.06	0.9		0.21	Ι
I	B-A	4.19	8.37	0.501		1.59	1.03	16.4		0.24	I
I	C-A	1.58									Ι
I	C-B	0.00	10.37	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									Ι
I	A-C	0.28									I
I											I

16.45 17.00 17.15 17.30 17.45	NO. OF VEHICLES IN QUEUE 0.1 0.1 0.1 0.1		
18.00 QUEUE FOR STR	0.1 EAM B-A		
16.45	VEHICLES IN QUEUE 1.0 1.5 2.7 2.8 1.6 1.0	* *** ***	Consent of copyright owner required for any other use.
TIME SEGMENT ENDING  16.45 17.00 17.15 17.30 17.45 18.00	VEHICLES IN QUEUE		Consent of copyright owner

I I T	STREAM	I I I	TOTAI		DEMAND	I I	* QUEUE:	Y *	Ι	* INCLUSIV * DE	LA:	Y *	Ι
I		I	(VEH)		(VEH/H)	Ι		(MIN/VEH)		(MIN)			I
I	В-С	I	30.3	I	20.2	I	6.8 I	0.22	I	6.8	I	0.22	I
I	B-A	Ι	459.7	Ι	306.5	Ι	152.6 I	0.33	Ι	152.7	Ι	0.33	Ι
I	C-A	Ι	173.4	Ι	115.6	Ι	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	Ι	0.0	Ι	0.00	Ι
I	A-B	Ι	0.0	Ι	0.0	Ι	I		Ι		Ι		Ι
I	A-C	Ι	30.3	Ι	20.2	Ι	I		Ι		Ι		Ι
I	ALL	I	693.7	I	462.5	I	159.4 I	0.23	I	159.5	I	0.23	I

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

(NB:Streams	may	be	combined,	in	which	case	capacity	will	be	adjusted	)

I Intercept For I Stream B-C	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	I
I 602.92	0.22	0.09	I

I Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
I Stream B-A	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I Ir	ntercept For	Slope For Opposing	Slope For Opposing	I
I St	tream C-B	Stream A-C	Stream A-B	I
I	689.79	0.25	0.25	I

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

		SCALE(%)														
ΙA	I	100	Ι												115°.	
ΙB	I	100	Ι												Her	
I C	I	100	Ι										٠٠.	40	N.	
TIME I LENGTI LENGTI	PERIOD H OF TI H OF TI	2032 PM Po BEGINS 16 ME PERIOD ME SEGMEN	.30 - T -	ANI 90	) 5	NDS 1 MINU MINU	8.0 TES	opment  00  5.	or.	nspection of the strict of the	erre	oses (	or for t			
DEMANI	D FLOW	PROFILES A	ARE	SYN	NTHE	ESISE	D F	FROM TURNING	<u>.</u>	OUNT DA	AT <i>P</i>	·				
Ι	I	NUMBER OF	ΜI	NUTE	ES E	ROM	STA	Ó ART WHEN <mark>ST</mark>	Ι	RATE	OF	FI	OW (	VEI	H/MIN)	
I ARI	M I FL	OW STARTS	Ι	TOP	OF	PEAK	Ι	FLOW STOPS	Ι	BEFORE	Ι	ΑT	TOP	Ι	AFTER	
			Ι	IS	REA	ACHED	Ι	FALLING	Ι							
ARM	 А І	15.00						75.00		0.29			0.43	 I	0.29	
								75.00								
								75.00								
 			 I			TURN	INC	PROPORTION			 I					_
Т			Т			TURN	TNO	COUNTS (VI	EН	/HR)	Т					

I		Ι		ΤŲ	JRNING PRO	OPORTIONS	I
I		Ι		ΤŲ	JRNING COU	JNTS (VEH/	/HR) I
I		Ι		(PE	ERCENTAGE	OF H.V.S)	I
I							
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
т	16.30 - 18.00	т		 Т	 Т	т	т
т	10.50 10.00	T	ARM A	_	_	0.000 I	_
± +		T	ANII A	T			
1		_		_		0.0 I	
Ι		Ι		Ι	(0.0)I	(0.0)I	(35.0)I
I		Ι		Ι	I	I	I
Ι		Ι	ARM B	Ι	0.936 I	0.000 I	0.064 I
I		Ι		Ι	334.0 I	0.0 I	23.0 I
Ι		Ι		Ι	( 19.0)I	( 0.0)I	(50.0)I
I		Ι		Ι	I	I	I
Ι		Ι	ARM C	Ι	1.000 I	0.000 I	0.000 I
I		Ι		Ι	129.0 I	0.0 I	0.0 I
Ι		Ι		Ι	( 15.0)I	( 0.0)I	( 0.0)I
Ι		Ι		Ι	, I	, i	I

FOR DEMAND SET 2032 PM Peak - With Development AND FOR TIME PERIOD 2

		AND I	FOR TIME P	ERIOD :	2						
 I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I I I		16.45 0.29 4.19	5.05 8.36	0.057 0.501		0.00	0.06	0.9 13.5		0.21	I I I
I I	C-A C-B	1.62 0.00	10.36	0.000		0.00	0.00	0.0		0.00	I I
I I 	A-B A-C	0.00 0.29									I I -
I I I			CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I	16.45-1 B-C	0.34	4.87	0.071		0.06	0.08	1.1			I I
I		5.00	8.29	0.604		0.97	1.46	20.4			I
I		1.93									Ι
I		0.00	10.34	0.000		0.00	0.00	0.0			I
I		0.00 0.34									I
I		0.01									I
•											-
											_
I I I		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUENE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
	17.00-1						oost red				Ι
I		0.42	4.51	0.094		0.08	10	1.5			I I
I		6.13 2.37	8.20	0.748		Tions of	2.07	35.7			I
I		0.00	10.32	0.000		80.00	0.00	0.0			I
I		0.00			ain	ghi					Ι
I	A-C	0.42			\$00 A	Şto					I I
											_
_											_
·	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)		FLOW		QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	
I	17.15-1	17 30		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I I
I		0.42	4.47	0.094		0.10	0.10	1.5			I
I	B-A	6.13	8.20	0.748		2.67	2.80	41.2		0.48	Ι
Ι		2.37									Ι
I	C-B A-B	0.00	10.32	0.000		0.00	0.00	0.0			I I
I		0.42									I
I											Ι
•											-
											_
	TIME				PEDESTRIAN		END		GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(AFH/MTN)						(VEH.MIN/ TIME SEGMENT)		
	17.30-1	17.45		(111 0)	(1 DDS/ 111N)	( * 1110 )	( , , , , , ,	III ODOMUNI)	IIII ODOMINI)		I
I	B-C	0.34		0.071		0.10		1.2		0.22	Ι
I		5.00	8.29	0.604		2.80	1.59	26.0			I
I		1.93	10.34	0.000		0.00	0.00	0.0			I I
I		0.00	10.04	0.000		0.00	0.00	•••			I
I	A-C	0.34									Ι
Ι											Ι
•											-

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									I
I	B-C	0.29	5.03	0.057		0.08	0.06	1.0		0.21	I
I	B-A	4.19	8.36	0.501		1.59	1.04	16.5		0.24	Ι
I	C-A	1.62									I
I	C-B	0.00	10.36	0.000		0.00	0.00	0.0		0.00	I
I	A-B	0.00									I
I	A-C	0.29									I
I											I

QUEUE FOR STR	REAM B-C		
TIME SEGMENT ENDING			
	IN QUEUE		
16.45			
17.00	0.1		
17.15	0.1		
17.30	0.1		
17.45	0.1		
18.00	0.1		
QUEUE FOR STR	REAM B-A		
TIME SEGMENT	NO. OF	-	
ENDING	VEHICLES		<i>`</i> €·
	IN QUEUE		T US
16.45			ather
17.00			24· 24°
	2.7		Other att.
17.30	2.8	* * *	ago ngo
17.45	1.6		rect interest
18.00	1.0	*	n Pilitelli
QUEUE FOR STR	REAM C-B		Consent of copyright owner required for any other use.
TIME SEGMENT	NO. OF		citis ditt
ENDING	VEHICLES		for white
	IN QUEUE		cov.
16.45			, of
17.00			eent een een een een een een een een een
	0.0		COLL
17.30	0.0		
17.45	0.0		
18.00	0.0		

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I I T	STREAM	I I I	TOTAL DEMAND			I * DELAY *			I	* INCLUSIVE QUEUEING * * DELAY *			
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	в-с	Ι	31.7	Ι	21.1	Ι	7.1 I	0.22	I	7.1	Ι	0.22	Ι
I	B-A	I	459.7	Ι	306.5	I	153.3 I	0.33	I	153.4	Ι	0.33	Ι
I	C-A	Ι	177.6	Ι	118.4	Ι	I		I		Ι		Ι
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	Ι	0.00	Ι
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		Ι		Ι
I	A-C	Ι	31.7	Ι	21.1	Ι	I		Ι		I		Ι
I	ALL	Ι	700.6	Ι	467.1	Ι	160.4 I	0.23	Ι	160.5	Ι	0.23	Ι

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

<sup>\*</sup> INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

<sup>\*</sup> THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

(NB:Streams may be combined, in which case capacity will be adjusted )

Ι	Intercept For	Slope For Opposing	Slope For Opposing	I
Ι	Stream B-C	Stream A-C	Stream A-B	Ι
Ι	602.92	0.22	0.09	Ι

-	or Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For OpposingI
	Stream A-C	Stream A-B	Stream C-A	Stream C-B I
I 476.98	0.21	0.08	0.13	0.30 I

I	Intercept For	Slope For Opposing	Slope For Opposing	Ι
I S	Stream C-B	Stream A-C	Stream A-B	Ι
I	689.79	0.25	0.25	Ι

NB These values do not allow for any site specific corrections

## .TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I

I ARM	I FLO	W SCALE(%)	I										
ΙA	I	100	I									, 15°	
ΙB	I	100	I								i	Her	
I C	I	100	I								40	,0	
										only	Mr.		
Deman	d sat.	2032 PM P	oak -	Derrelonm	_nt	· Flows + Sa	n	ei+iv/i+v	, T	of one for			
Deman	a sec.	2032 111 1	car	релетории	CIIC	. FIOWS   De	511.	SICIVIC:	30	111103			
TIME	PERIOD	BEGINS 16	.30 AN	ID ENDS 1	8.0	00		an S	3	201			
								action 17	<u> </u>				
LENGT	H OF T	IME PERIOD	- 9	0 MINU	TES	5.		250, 0x					
LENGT	H OF T	'IME SEGMEN'	T – 1	.5 MINU	TES	5.	Š	it office					
DEMAN	D FLOW	PROFILES	ARE SY	NTHESISE	D F	Flows + Se	ැර	OUNT DA	AΤ <i>I</i>	A			
I	I	NUMBER OF	MINUT	ES FROM	STA	ART WHEN	I	RATE	OE	F FLOW	(VE	 H/MIN)	I
I AR	M I F	LOW STARTS	I TOP	OF PEAK	Ι	FLOW STOPS	Ι	BEFORE	Ι	AT TOP	I	AFTER	Ι
I	I	TO RISE	I IS	REACHED	Ι	FALLING	Ι	PEAK	Ι	OF PEA	ΚI	PEAK	Ι
I ARM	 A I	15.00	 I	45.00		75.00	 I	0.49		0.73	: I	0.49	 I
						75.00							
I ARM						75.00							

I I I		I I I		ΤŲ		DPORTIONS JNTS (VEH, OF H.V.S)	,
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C I
	16.30 - 18.00		ARM A  ARM B  ARM C	I I I I	0.0 I ( 0.0) I I 0.895 I 334.0 I ( 19.0) I I 1.000 I 161.0 I	I 000.0 I I I I	39.0 I ( 35.0) I I 0.105 I 39.0 I ( 50.0) I I 0.000 I 0.0 I

#### QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET 2032 PM Peak - Development Flows + Sensitivity Flows AND FOR TIME PERIOD \*\*\*\*\*

		AND I	FOR TIME P	ERIOD ****	*						
I I I	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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I I I		16.45 0.49 4.19	5.01 8.23	0.098		0.00	0.11	1.5 13.9		0.22	I I
I I I	C-B A-B	2.02 0.00 0.00 0.49	10.30	0.000		0.00	0.00	0.0		0.00	I I I
											I 
 I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.45-	17.00									I
I		0.58 5.00	4.82 8.14	0.121 0.615		0.11	0.14 1.52	2.0 21.3		0.24 0.31	I
I	C-A C-B	2.41	10.27	0.000		0.00	0.00	0.0		0.00	I I
I I I		0.00 0.58									I I I
•								<del>jei</del> i <sup>ge</sup>			
I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/	DEDECTRIAN	START QUEUE	END QUE	O DELYA	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
	17.00-3 B-C	17.15 0.72	4.41	0.162	(I EDS/ HIN)	0 14 4	20 stred	2.7	TIPH SHOPHINT,	0.27	I
I	B-A	6.13	8.01	0.765		1.520	2.89	38.2		0.48	Ι
I		2.95	10.23	0.000	. న	26 .00 July	0.00	0.0		0.00	I
I I I		0.00 0.72			FLOW (PEDS/MIN)	i gli					I I I
•					of						
I I I			CAPACITY (VEH/MIN)		~ OX	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I I
I	17.15-1 B-C	0.72	4.36	0.164		0.19	0.19	2.9		0.27	I
I	C-A	6.13 2.95		0.765			3.05	44.8			I
		0.00 0.00 0.72	10.23			0.00		0.0			I I I
I I I		(VEH/MIN)	CAPACITY (VEH/MIN)	CAPACITY		QUEUE			GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)		I I
I	17.30-3 B-C	17.45 0.58	4.79	0.122		0.19	0.14	2.2		0.24	I
I	B-A	5.00 2.41		0.615		3.05		27.4		0.34	I I
I I I	C-B A-B A-C	0.00 0.00 0.58	10.27	0.000		0.00	0.00	0.0		0.00	I I I
. —											I 

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	17.45-1	8.00									Ι
I	B-C	0.49	4.99	0.098		0.14	0.11	1.7		0.22	Ι
I	B-A	4.19	8.23	0.509		1.68	1.07	17.1		0.25	Ι
I	C-A	2.02									Ι
I	C-B	0.00	10.30	0.000		0.00	0.00	0.0		0.00	Ι
I	A-B	0.00									Ι
I	A-C	0.49									Ι
I											I

16.45 17.00 17.15	NO. OF VEHICLES IN QUEUE 0.1 0.1 0.2		
17.30	0.2		
17.45 18.00	0.1		
18.00	0.1		
QUEUE FOR STR	REAM B-A		
TIME SEGMENT			
ENDING	IN QUEUE		.و،
16.45	1.0	*	A TISE
17.00	1.5	* *	ather
17.15	2.9	***	34. <sup>24</sup> 0°
17.30		* * *	Office all.
17.45 18.00			Sep. 940
10.00	1.1	.*	ut porting
QUEUE FOR STR	REAM C-B		ital et ieu
TIME SEGMENT ENDING			Consent of copyright owner required for any other use.
16.45			, of
17.00			a de la companya de
17.15	0.0		ent
17.30			C Otto
	0.0		O'
18.00	0.0		

I I T	STREAM	I I I	TOTA	 L [	EMAND	I I	* QUEUE:		I I	* INCLUSIV * DE		~	 I I
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	B-C	I	53.7	I	35.8	I	13.0 I	0.24	I	13.0	I	0.24	I
I	B-A	Ι	459.7	Ι	306.5	Ι	162.7 I	0.35	Ι	162.8	Ι	0.35	Ι
I	C-A	Ι	221.6	Ι	147.7	I	I		I		I		I
I	C-B	Ι	0.0	Ι	0.0	Ι	0.0 I	0.00	I	0.0	I	0.00	I
I	A-B	Ι	0.0	Ι	0.0	Ι	I		I		I		I
Ι	A-C	Ι	53.7	Ι	35.8	Ι	I		Ι		Ι		Ι
I	ALL	I	788.7	I	525.8	I	175.7 I	0.22	I	175.8	I	0.22	 I

END OF JOB

<sup>\*</sup> DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

\* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

## **TRAFFIC AND TRANSPORTATION 13**



ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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IN NO WAY RELIEVED OF THEIR RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2016 AM Peak - Existing Flows.vai" (drive-on-the-left ) at 15:08:17 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of convigit owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50 3.50 7.00	I	8.00 9.50 9.00	I	30.00	I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I		I I I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

1

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

	DEMAND	SET	TITLE:	2016	AM	Peak	-	Existing	Flows	
--	--------	-----	--------	------	----	------	---	----------	-------	--

I	I I	NUMBER OF	MINUT	ES FROM	START	T WHEN	Ι	RATE	OF	FLOW (	(VEH	/MIN)	Ι
I ARM	I FLO	OW STARTS	I TOP	OF PEAK	I FI	LOW STOPS	Ι	BEFORE	I Z	AT TOP	I	AFTER	Ι
I	I ?	O RISE	I IS	REACHED	IFAI	LLING I	P	EAK I	OF	PEAK I	PE	AK I	
I ARM A	I		I	45.00	I	75.00	Ι	3.86	I	5.79	I	3.86	Ι
I ARM B	I	15.00	I	45.00	I	75.00	Ι	1.70	I	2.55	I	1.70	Ι
I ARM C	I	15.00	I	45.00	I	75.00	Ι	3.11	Ι	4.67	I	3.11	Ι

DEMAND SET TITLE: 2016 AM Peak - Existing Flows

I		I			TU	JRNING PRO	OPORTIONS .	I	
I		I			TU	RNING COU	JNTS (VEH,	/HR) I	
Ι		I		(	ΡE	RCENTAGE	OF H.V.S	) . I	
Ι									
I	TIME	I	FROM/	TO	Ι	ARM A I	ARM B I	ARM C I	
I	07.15 - 08.45	I			Ι	I	I	I	
I		I	ARM	A	Ι	0.000 I	0.550 I		
I		I			Ι	0.0 I	170.0 I	139.0 I	.Ø1*
I		I			Ι	( 0.0)I	( 7.0)I	( 16.0)I	, USC
I		I			Ι	I	I	I	their
I		I	ARM	В	Ι	0.353 I	0.000 I	0.647 I	1. 400
I		I			Ι	48.0 I	0.0 I	88.0 I	ally all
I		I			Ι	( 15.0)I	( 0.0)I	( 24.0)I	oses any other use.
I		I			Ι	I	I	I_	os reg
I		I	ARM	С	Ι	0.253 I	0.747 I	0.000	Alli
I		I			Ι	63.0 I	186.0 I	0.000 K	,
I		I			Ι	( 2.0)I	( 10.0)I	( 60°, 00°)	
I		I			Ι	I	I	ZO ON I	
								AL JAL	
							~	A-V)	

. QUEUE AND DELAY INFORMATION FOR EACH 15 JOHN TIME SEGMENT

~		- 0	
		0′	

I I		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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
	07.15-0										Ι
	ARM A	3.86	26.28	0.147		0.0	0.2	2.5		0.04	Ι
	ARM B	1.70	26.95	0.063		0.0	0.1	1.0		0.04	Ι
I	ARM C	3.11	25.66	0.121		0.0	0.1	2.0		0.04	Ι
Ι											Ι
_											
·I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	07.30-0	7.45									Ι
I	ARM A	4.61	26.03	0.177		0.2	0.2	3.2		0.05	Ι
I	ARM B	2.03	26.76	0.076		0.1	0.1	1.2		0.04	I
I	ARM C	3.72	25.59	0.145		0.1	0.2	2.5		0.05	I
I											Ι
_											
·I	TIME	DEMAND	CAPACITY		PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
I	07.45-0	8.00									I
I	ARM A	5.65	25.68	0.220		0.2	0.3	4.2		0.05	I
I	ARM B	2.49	26.49	0.094		0.1	0.1	1.5		0.04	I
I	ARM C	4.55	25.50	0.179		0.2	0.2	3.2		0.05	I
I											I
-											

\_\_\_\_\_

<sup>.</sup>TIME PERIOD BEGINS 07.15 AND ENDS 08.45 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

### Appendix D – ARCADY Results

I TIME I	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	•	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)		Ι
I 08.00-0	8.15									Ι
I ARM A	5.65	25.68	0.220		0.3	0.3	4.2		0.05	Ι
I ARM B	2.49	26.49	0.094		0.1	0.1	1.6		0.04	Ι
I ARM C	4.55	25.50	0.179		0.2	0.2	3.3		0.05	I
I 										_ I
 T TIME	DEMAND		 DEMAND/			END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
T		(VEH/MIN)	,	FLOW	OUEUE	QUEUE		(VEH.MIN/		T
T	(VDII/IIIII)	(VDII/TILIN)	(RFC)		~ .	(VEHS)	•	TIME SEGMENT)		_
I 08.15-0	18.30		(112 0)	(1220) 11111)	(12110)	( 12110 )	111111 0110111111,	111111 011011111,	12111022 (11111)	T
	4.61	26.03	0.177		0.3	0.2	3.3		0.05	I
I ARM B	2.03	26.76	0.076		0.1		1.2		0.04	Ι
I ARM C	3.72	25.59	0.145		0.2	0.2	2.6		0.05	Ι
I										I 
T TIME	DEMAND		 DEMAND/		START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	 T
I		(VEH/MIN)		FLOW	OUEUE	OUEUE		(VEH.MIN/		T
T	( 1211/11211/	(1211/11111)	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)		TIME SEGMENT)		T
I 08.30-0	8.45		(111 0)	(1 22 0 / 11111)	(12110)	( . 2110 )	TITLE CHOILDINI,	111111 0001101111		I
I ARM A	3.86	26.28	0.147		0.2	0.2	2.6		0.04	I
	1.70	26.95	0.063		0.1	0.1	1.0		0.04	I
I ARM C	3.11	25.66	0.121		0.2	0.1	2.1		0.04	Ι
I										I

#### .QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.2
07.45	0.2
08.00	0.3
08.15	0.3
08.30	0.2
08.45	0.2

#### .QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30 07.45 08.00 08.15 08.30 08.45	0.1 0.1 0.1 0.1 0.1

#### .QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF
ENDING	
	IN QUEUE
07.30	0.1
07.45	0.2
08.00	0.2
08.15	0.2
08.30	0.2
08.45	0.1

I	ARM	I	TOTAL	DEMAND	Ι	* QU	JΕU	JEING *	I	* INCLUSI	VE	QUEUEING *	I
I		I			I	* D	EΙ	LAY *	Ι	*	DEI	AY *	I
I		I-											- I
Ι		Ι	(VEH)	(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	Ι
I	A	I	423.7	I 282.5	I	20.0	Ι	0.05	I	20.0	I	0.05	I
I	В	I	186.5	I 124.3	I	7.6	Ι	0.04	Ι	7.6	I	0.04	Ι
I	С	Ι	341.4	I 227.6	Ι	15.7	Ι	0.05	Ι	15.7	I	0.05	Ι
I	ALL	I	951.6	I 634.4	I	43.3	I	0.05	I	43.3	I	0.05	I

- $^{\star}$  Delay is that occurring only within the time period.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2017 AM Peak - No Development.vai" (drive-on-the-left ) at 15:08:54 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50	I	9.50	I		I	20.00	I	60.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I

V = approach half-width E = entry width

L = effective flare length
R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

I ARM I FLOW SCALE(%) I  I A I 100 I  I B I 100 I  I C I 100 I						
I B I 100 I	Ι	ARM	Ι	FLOW	SCALE(%)	Ι
	I	В	I		100	I I
	_	-	_			_

1

.TIME PERIOD BEGINS 07.15 AND ENDS 08.45 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2017	ΑM	Peak	_	No	Development
--------	-----	--------	------	----	------	---	----	-------------

I	I NUN	MBER OF	MINUT	ES FROM S	START	WHEN	I	RATE	OF :	FLOW (	JEH/	MIN)	Ι
I ARM	I FLOW	STARTS	I TOP	OF PEAK	I FLO	OW STOPS	I :	BEFORE	I A	T TOP	I P	AFTER	I
I	I TO	RISE	I IS	REACHED	IFAL1	LING I	P.	EAK I	OF :	PEAK I	PEA	AK I	
I ARM A	. I 1		_		I	75.00	I	3.89	I	5.83	I	3.89	Ι
I ARM E	3 I I	L5.00	I	45.00	I	75.00	Ι	1.71	Ι	2.57	Ι	1.71	I
I ARM C	: I 1	L5.00	I	45.00	I	75.00	Ι	3.13	I	4.69	Ι	3.13	Ι

#### DEMAND SET TITLE: 2017 AM Peak - No Development

I		I		T	JRNING PROP	ORTIONS	I	
I		I		T	JRNING COUN	TS (VEH/	HR) I	
I		I		(P)	ERCENTAGE O	F H.V.S)	I	
I								
I	TIME	I	FROM/TO	I	ARM A I	ARM B I	ARM C I	
т	07.15 - 08.45	т		т	т	т		
T	07.13 - 00.43	T	ADM A	_	0.000 I	0 550 T	0 450 T	
		_	ANN A				140 0 1	Jeg.
1		I		Ι		171.0 I	140.0 1	es W
Ι		Ι			( 0.0)I (	7.0)I	(16.0)I	Me
I		I		Ι	I	I	I	A. A
I		I	ARM B	Ι	0.350 I	0.000 I	0.650 I	ally all,
I		I		I	48.0 I	0.0 I	89.0 I	Poses of M. in A other rise.
I		I		I	( 15.0)I (	0.0)I	( 24.0)I	os red
I		I		I	I	I	N N	Kalin
I		I	ARM C	I	0.252 I	0.748 I	0.000	ćock
I		I		I	63.0 I	187.0 I	CO QCI	
I		I		I	( 2.0)I (	10.0)I	(6,000) I	
I		I		I	I	Ĭ	i dii I	
						\$0°	<del>3</del> 2~	

## QUEUE AND DELAY INFORMATION FOR EACH 18 MIN TIME SEGMENT

. –					Cousett						
Ī	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	1 210 1111111 1110	I
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
Ι	07.15-0	7.30									Ι
I	ARM A	3.89	26.27	0.148		0.0	0.2	2.6		0.04	Ι
Ι	ARM B	1.71	26.94	0.064		0.0	0.1	1.0		0.04	Ι
Ι	ARM C	3.13	25.66	0.122		0.0	0.1	2.0		0.04	Ι
Ι											Ι
. –											
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
Ι	07.30-0	7.45									Ι
Ι	ARM A	4.64	26.02	0.178		0.2	0.2	3.2		0.05	Ι
Ι	ARM B	2.04	26.74	0.076		0.1	0.1	1.2		0.04	Ι
Ι	ARM C	3.73	25.59	0.146		0.1	0.2	2.5		0.05	Ι
I											Ι
. –											
Ι	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	07.45-0	08.00									Ι
I	ARM A	5.69	25.67	0.221		0.2	0.3	4.2		0.05	Ι
Ι	ARM B	2.50	26.47	0.095		0.1	0.1	1.5		0.04	Ι
Ι	ARM C	4.57	25.49	0.179		0.2	0.2	3.2		0.05	Ι
_											-

										_
I TIME I I	DEMAND (VEH/MIN)		,		START QUEUE (VEHS)	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)		Ι
I 08.00-0	08.15		, ,	, , ,	, ,	, ,	,	•	, ,	Т
I ARM A	5.69	25.67	0.222		0.3	0.3	4.3		0.05	T
	2.50		0.095		0.1	0.1	1.6			I
	4.57	25.49	0.179		0.2	0.2	3.3			I
I										I
										-
T TIME	DEMAND					END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т Т
I		(VEH/MIN)	,		OUEUE	OUEUE		(VEH.MIN/		I
I	( - ===, -====,	( - = , = ,	(RFC)	(PEDS/MIN)	~ -	(VEHS)	,	TIME SEGMENT)		I
I 08.15-0	08.30		,	, -, ,	/	/	,	,	, ,	Ι
I ARM A	4.64	26.02	0.178		0.3	0.2	3.3		0.05	Ι
I ARM B	2.04	26.74	0.076		0.1	0.1	1.3		0.04	Ι
I ARM C	3.73	25.59	0.146		0.2	0.2	2.6		0.05	Ι
I										Ι
										_
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I 08.30-0	08.45									Ι
I ARM A	3.89	26.27	0.148		0.2	0.2	2.6		0.04	Ι
I ARM B	1.71	26.94	0.064		0.1	0.1	1.0		0.04	Ι
I ARM C	3.13	25.66	0.122		0.2	0.1	2.1		0.04	Ι
I							<u>.</u> ق.			Ι
							<del>s</del> e.			_

#### .QUEUE AT ARM A

TIME SEGMENT NO. OF VEHICLES IN QUEUE ENDING 07.30 0.2 07.45 0.2

08.00 0.3 08.15 0.3 08.30 0.2 08.45 0.2

.QUEUE AT ARM B

TIME SEGMENT NO. OF VEHICLES ENDING IN QUEUE 0.1 07.30 07.45 08.00 0.1 08.15 0.1 0.1 08.30 08.45 0.1

#### .QUEUE AT ARM C

TIME SEGMENT NO. OF ENDING VEHICLES IN QUEUE 07.30 07.45 0.2 08.00 0.2 08.15 0.2 08.30 0.2 08.45 0.1

I I	ARM	I I	TOTAL DEMAND I * QUEUEING * I * INCLUSIVE QUEUEING I * DELAY * I * DELAY *								~	I I	
I 		I 	(VEH)	(	VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	_I
I	A	Ι	426.4	Ι	284.3	Ι	20.2 I	0.05	Ι	20.2	Ι	0.05	Ι
I	В	I	187.9	Ι	125.2	Ι	7.6 I	0.04	Ι	7.6	I	0.04	I
I	С	Ι	342.8	Ι	228.5	Ι	15.8 I	0.05	Ι	15.8	I	0.05	I
 I	ALL		957 <b>.</b> 1	 I	638.1	 I	43.6 I	0.05	 I	43.6		0.05	 I

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.

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

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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RG40 3GA,UK

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IN NO WAY RELIEVED OF THEIR RESPONSIBILITY FOR THE CORRECTNESS OF THE SOLUTION

Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2017 AM Peak - With Development.vai" (drive-on-the-left ) at 15:09:30 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of convigit owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	 I
I ARM A I I ARM B I I ARM C I	3.50 3.50 7.00	I	8.00 9.50 9.00	I		I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I I I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
Ι	A	Ι		100	Ι
Ι	В	Ι		100	Ι
Ι	С	Ι		100	Ι

```
.TIME PERIOD BEGINS 07.15 AND ENDS 08.45
.LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
```

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2017	AΜ	Peak	_	With	Development
--------	-----	--------	------	----	------	---	------	-------------

I I	NUMBER OF M	1INUTE	S FROM S	START	WHEN	Ι	RATE	OF E	/ WOLT	/EH/	'MIN)	Ι
I ARM I FLO	OW STARTS I	TOP	OF PEAK	I FLO	OW STOPS	I	BEFORE	I Al	TOP	I P	FTER	I
I I	TO RISE I	IS	REACHED	IFALI	LING I	PΙ	EAK I	OF E	PEAK I	PEA	λK I	
I ARM A I	15.00 I		45.00	I	75.00	Ι	3.90	I	5.85	I	3.90	Ι
I ARM B I	15.00 I	-	45.00	I	75.00	Ι	2.91	Ι	4.37	Ι	2.91	I
I ARM C I	15.00 I	-	45.00	I	75.00	Ι	3.13	I	4.69	I	3.13	Ι

#### DEMAND SET TITLE: 2017 AM Peak - With Development

I I I I		I I I		T( (PI	JRNING PRO JRNING COU ERCENTAGE	JNTS (VEH,	/HR) ) 	I 
I	TIME	I	FROM/TO	Ι	ARM A I	ARM B I	ARM C	I
	07.15 - 08.45			 I	I	I		 I
I		I	ARM A	I	0.000 I	0.548 I	0.452	I
I		I		Ι	0.0 I	171.0 I	141.0	The country of the first of the
I		I		Ι	( 0.0)I	( 7.0)I	( 16.0)	I mei
I		I		Ι	I	I		I
I		I	ARM B	I	0.206 I	0.386 I	0.408	I ally ally
I		I		I	48.0 I	90.0 I	95.0	I 25 1 501
I		I		Ι	48.0 I ( 15.0) I I	( 0.0)I	( 24.0)	Los red
I		I		I	I	I	A	IP CILL
I		I	ARM C	I	0.252 I	0.748 I	0.000	K. K.
I		I		Ι	63.0 I	187.0 I	COO CO	Ĭ
I		I		I	( 2.0)I	( 10.0)I	(2,000)	I
I		I		I	I	Ĭ,	in ohi	I
						<del>\^</del> 0';	475	

# QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

					COII						_
I I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	07.15-0° ARM A	3.90	25.70	0.152		0.0	0.2	2.6		0.05	I
	ARM B ARM C	2.91 3.13	28.84 25.08	0.101 0.125		0.0	0.1	1.7 2.1		0.04 0.05	I
											_
I I I	TIME 07.30-0	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	ARM A ARM B ARM C	4.66 3.48 3.73	25.33 28.62 24.90	0.184 0.122 0.150		0.2 0.1 0.1	0.2 0.1 0.2	3.3 2.0 2.6			I I I
											_
III		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	ARM A ARM B ARM C	5.70 4.26 4.57	24.83 28.33 24.65	0.230 0.150 0.185		0.2 0.1 0.2	0.3 0.2 0.2	4.4 2.6 3.4		0.05 0.04 0.05	I I I

I	(VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
I 08.00-08									
I ARM A	5.70	24.83	0.230		0.3	0.3	4.5		0.05
I ARM B	4.26 4.57	28.33	0.150		0.2	0.2	2.6 3.4		0.04 0.05
	4.57	24.65	0.185		0.2	0.2	3.4		
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
		( V 111 / 1111 V )	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)
I 08.15-08									
							3.4		0.05
I ARM B	3.48 3.73	28.62	0.122		0.2	0.1	2.1 2.7		0.04
	3.73	24.90	0.150		0.2	0.2	2.7		0.05
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I								TIME SEGMENT)	
I 08.30-08	3.45								
	3.90				0.2		2.7		0.05
I ARM B	2.91	28.83	0.101		0.1	0.1	1.7		0.04
I ARM C	3.13	25.08	0.125		0.2	0.1	2.2		0.05
I 							<del>_e</del>		
QUEUE AT A	ARM A						therus		
						My.	anyou		
	MENT NO. VEHICI					ses of for			
BINDING	IN QUE				Á	Philip			
		-02			200	rear			
	0.	. 2			action pu	tegt			
07.45	0.	. 2			Spection pu	ied.			
07.45 08.00	0. 0. 0.	. 2 . 2 . 3		, in	Spection pu	jedi			
07.45 08.00 08.15	0. 0. 0.	. 2 . 2 . 3		Fol of	spection po	icut			
07.45 08.00 08.15 08.30	0. 0. 0.	. 2 . 2 . 3 . 3		For in	Section Portier	ion			
07.45 08.00 08.15	0. 0. 0.	. 2 . 2 . 3 . 3		For in	spection po right owner	ient			
07.45 08.00 08.15 08.30	0. 0. 0. 0. 0.	. 2 . 2 . 3 . 3		Consent of copy	specifor owner	i de la companya de			
07.45 08.00 08.15 08.30 08.45	0. 0. 0. 0. 0.	2 2 3 3 2 2		Consent of copy	Section Programmer	r <sup>k</sup> e <sub>err</sub>			
07.45 08.00 08.15 08.30 08.45	0. 0. 0. 0. 0. 0. ARM B	2 2 3 3 2 2		Consent of copy	Section Property Section of the Control of the Cont	r <sup>k</sup> e <sub>err</sub>			
07.45 08.00 08.15 08.30 08.45	0. 0. 0. 0. 0.	2 2 3 3 2 2 2		Consent of copy	spection of the state of the st	r <sup>k</sup> e <sub>err</sub>			
07.45 08.00 08.15 08.30 08.45	0. 0. 0. 0. 0. ARM B	2 2 3 3 2 2 2 2 OF LES		Consent of copy	spection of the state of the st	re <sub>ex</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A	O. O. O. O. ARM B MENT NO. VEHICI IN QUE	2 2 3 3 3 2 2 2		Consent of copy	spection of the state of the st	re <sub>cor</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING	O. O. O. O. O. ARM B VEHICI IN QUE	2 2 3 3 3 2 2 2 2 OF LES EUE		Consent of copy	spection of the state of the st	re <sub>cor</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGI ENDING 07.30 07.45 08.00	0. 0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE 0. 0.	2 2 3 3 3 2 2 2 2 OF LES EUE		Consent of copy	spection of the state of the st	r <sup>k</sup> e <sub>or</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING 07.30 07.45 08.00 08.15	0. 0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE 0. 0. 0.	2 2 3 3 3 2 2 2 2 OF LES EUE		Consent of copy	Section of the state of the sta	r <sup>k</sup> e <sub>or</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00	0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0	2 2 3 3 3 2 2 2 2 OF LES EUE		Gonsent of cons	spection of the state of the st	re <sub>cor</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING  07.30 07.45 08.00 08.15 08.30 08.45	O. O. O. O. O. ARM B VEHICI IN QUE O. O. O. ARM C	2 2 3 3 2 2 2 2 OF CES EUE 1 1 2 2 1		Gonsent of cons	spection of the state of the st	re <sub>cor</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45	O. O. O. O. O. ARM B VEHICI IN QUE O. O. O. ARM C	2 2 3 3 2 2 2 2 OF CES EUE 1 1 2 2 1		Gonsent of cons	spection of the state of the st	re <sub>cor</sub>			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45	O. O. O. O. O. ARM B VEHICI IN QUE O. O. O. O. O. VEHICI VEHICI VEHICI VEHICI	2 2 3 3 3 2 2 2 OF LES EUE 1 1 2 2 1 1		Gonsent of cons	specification of the state of t	, eex			
07.45 08.00 08.15 08.30 08.45  QUEUE AT A ENDING  07.30 07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGNENDING	O. O	2 2 3 3 3 2 2 2 2 OF LES EUE 1 1 1 2 2 1 1		Consent of cons	a specification of the state of	k <sub>err</sub>			
07.45 08.00 08.15 08.30 08.45  QUEUE AT A ENDING  07.30 07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGN ENDING	O. O	2 2 3 3 3 2 2 2 OF LES EUE 1 1 1 2 2 2 1 1		Consent of copy	a specification of the state of	ken.			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING 07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING	O. O	2 2 2 3 3 3 2 2 2 2 1 1 1 2 2 2 1 1		Gongent of conv	Rection of the state of the sta	, eex			
07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGNENDING  07.30 07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGNENDING	ARM B MENT NO. VEHICI IN QUE  O. O. ARM C MENT NO. VEHICI IN QUE  IN QUE	2 2 3 3 3 2 2 2 2 OF LES EUE 1 1 1 2 2 2 1 1		Gonzent of con V	specification of the state of t	, eex			
07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGNENDING  07.30 07.45 08.00 08.15 08.30 08.45  TIME SEGNENDING  07.30 07.45 08.00 08.15 08.31	O. O	2 2 2 3 3 3 2 2 2 2 1 1 1 2 2 2 1 1 1 2 2 2 1 1 1 2 2 2 2 1		Consent of cons	age ction of the state of the s	, eex			
07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGNENDING  07.30 07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGNENDING	ARM B MENT NO. VEHICI IN QUE  O. O. ARM C MENT NO. VEHICI IN QUE  IN QUE	2 2 3 3 3 2 2 2 2 0 F LES EUE 1 1 2 2 2 1 1 1 1 2 2 2 1 1		Consent of cons	age ction of the state of the s	, eex			

I	ARM	Ι	TOTA	LI	DEMAND	Ι	* QUE	ΞU	EING *	I	*	INCLUSI	VE	QUEUEING *	I
I		I				Ι	* DI	ΞL	AY *	Ι		*	DEL	AY *	Ι
I		I-													-I
I		Ι	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι		(MIN)		(MIN/VEH)	I
I	A	Ι	427.8	Ι	285.2	Ι	21.0	Ι	0.05	Ι		21.0	I	0.05	I
I	В	I	319.5	Ι	213.0	Ι	12.8	Ι	0.04	Ι		12.8	I	0.04	Ι
I	С	I	342.8	Ι	228.5	Ι	16.3	Ι	0.05	Ι		16.3	I	0.05	Ι
I	ALL	Ι	1090.1	Ι	726.7	Ι	50.1	Ι	0.05	Ι		50.1	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-

Consent of copyright owner required for any other use. "C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2022 AM Peak - No Development.vai" (drive-on-the-left ) at 15:10:19 on Thursday, 1 December 2016

## .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I .\_\_\_\_\_ I ARM A I I ARM A I 3.50 I 8.00 I 30.00 I I ARM B I 3.50 I 9.50 I 30.00 I I ARM C I 7.00 I 9.00 I 30.00 I 20.00 I 60.00 I 51.0 20.00 I 60.00 I 49.0 3.00 I 13.00 I 53.0 I 0.562 I I 0.596 I 30.623 Т 33.767 Ι 53.0 I 0.551 I 28.086 I

 $V = approach \ half-width \qquad \qquad L = effective \ flare \ length \ E = entry \ width \qquad \qquad R = entry \ radius$ 

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
Ι	A	Ι		100	Ι
Ι	В	Ι		100	Ι
Ι	С	Ι		100	Ι

1

.TIME PERIOD BEGINS 07.15 AND ENDS 08.45 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2022 AM Peak - No Development

I	I NUMBER	OF MINU	TES FROM	START	WHEN	Ι	RATE	OF	FLOW (	VEH	/MIN)	Ι
I ARM	I FLOW STA	RTS I TO	P OF PEAK	I FL	OW STOPS	Ι	BEFORE	I	AT TOP	I.	AFTER	Ι
I	I TO RIS	E I I	S REACHED	IFAL	LING I	Ρ	PEAK I	OF	PEAK I	PE.	AK I	
I ARM A	I 15.0	0 I	45.00	I	75.00	Ι	4.03	Ι	6.04	I	4.03	Ι
I ARM B	I 15.0	0 I	45.00	I	75.00	Ι	1.77	I	2.66	I	1.77	I
I ARM C	I 15.0	0 I	45.00	I	75.00	I	3.25	I	4.88	I	3.25	Ι

DEMAND SET TITLE: 2022 AM Peak - No Development

 I I I	TIME	I I I 	EDOM/		TU (PI	JRNING PF JRNING CC ERCENTAGE ARM A I	OUNTS (	VEH/ V.S)		I 
	T T LATE		F KOM/	10		L A Pina	ARM	D I	ANM C	
T 07	7.15 - 08.45	Т			Т			т		т
T 0 /	7.13 00.43	T	ARM	Α	_	0.000 I		0 T	0.450	-
T		T			T				145.0	T USO
I		I			I	( 0.0)				I set
I		Ι			Ι					_
I		I	ARM	В	Ι	0.352 I	0.00	0 I	0.648	I ose of the delay
I		I			Ι	50.0 I	0.	0 I	92.0	I softor
I		I			Ι	( 15.0) [	( 0.	0)I	(24.0)	I LOS LED
I		I				I		I	~	NE CHILL
I		I	ARM	С	I	0.254 I	0.74	6 I	0.000	Ker
I		I			Ι	66.0 I	194.	0 I	-cio. 00	Ī
I		I			Ι	( 2.0) I	( 10.	0)I	(8,000)	Ι
I		Ι			Ι	I		Ĭ	The ghi	I
								₹0°	452	

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
Ι		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/		Ι
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	07.15-0										Ι
	ARM A	4.03	26.23	0.153		0.0	0.2	2.7		0.04	Ι
	ARM B	1.77	26.91	0.066		0.0	0.1	1.0		0.04	Ι
	ARM C	3.25	25.65	0.127		0.0	0.1	2.1		0.04	Ι
Ι											Ι
·I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	07.30-0	7.45									Ι
I	ARM A	4.81	25.96	0.185		0.2	0.2	3.4		0.05	Ι
I	ARM B	2.12	26.70	0.079		0.1	0.1	1.3		0.04	Ι
I	ARM C	3.88	25.57	0.152		0.1	0.2	2.6		0.05	Ι
I											Ι
-											
. – ·	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т
T	1 11111	(VEH/MIN)	(VEH/MIN)	,	FLOW	OUEUE	OUEUE	(VEH.MIN/	(VEH.MIN/		T
т.		(VEII/PILIN)	(VEII/PIIN)	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	•	VEHICLE (MIN)	-
т.	07.45-0	8 00		(IXEC)	(IEDS/MIN)	( \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	( VEIIO )	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (FIIN)	T
	ARM A	5.89	25.60	0.230		0.2	0.3	4.4		0.05	T
	ARM B	2.60	26.42	0.098		0.1	0.1	1.6		0.03	T
	ARM C	4.75	25.48	0.038		0.1	0.1	3.4		0.05	T
	111111 C	4.75	23.40	0.107		0.2	0.2	J.4		0.05	T

Ī	(VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING
[			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
08.00-08	8.15								
	5.89				0.3		4.5		0.05
ARM B	2.60 4.75	26.42 25.48	0.098		0.1	0.1	1.6 3.4		0.04 0.05
ARM C	4.75	25.48	0.187		0.2	0.2	3.4		0.05
: 									
TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
[	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
[			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)
08.15-08	3.30								
ARM A	4.81	25.96	0.185		0.3	0.2	3.5		0.05
ARM B	2.12	26.70	0.079		0.1	0.1	1.3		0.04
ARM C	2.12 3.88	25.57	0.152		0.2	0.2	1.3 2.7		0.05
Ī									
TIME				PEDESTRIAN				GEOMETRIC DELAY	
	(VEH/MIN)							(VEH.MIN/	
•			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	8.45								
	4.03				0.2		2.8		0.05
ARM B	1.77 3.25	26.90	0.066		0.1	0.1	1.1		0.04
ARM C	3.25	25.65	0.127		0.2	0.1	2.2		0.04
OUEUE AT A	ARM A						neriuse		
						14.	ny otti		
TIME SEGN	MENT NO.	OF				e out,	Mr.		
	VEHICI					500 XX			
					,	00,760			
	IN QUE				n Pul	Collifer			
07.30	IN QUE	EUE			citon pur	requiree			
07.30 07.45	IN QUE  0. 0.	EUE . 2 . 2			dection pur	required			
07.45	IN QUE  0. 0.	EUE . 2 . 2		in	spection put	requiree			
07.45 08.00	IN QUE 0. 0.	EUE . 2 . 2 . 3		EQT IS	special purion purion	povities			
07.45 08.00 08.15	IN QUE 0. 0. 0.	EUE . 2 . 3 . 3		çoru Çoru	spection put tight owner	govitie			
07.45 08.00 08.15 08.30	IN QUE 0. 0. 0. 0. 0.	EUE . 2 . 2 . 3 . 3 . 2		Foliti K.cop	special purier	require			
07.45 08.00 08.15	IN QUE 0. 0. 0.	EUE . 2 . 2 . 3 . 3 . 2		Folia con d	specifor purishing the state of	Politie			
07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	EUE . 2 . 2 . 3 . 3 . 2		Gonsent of copy	specification of the state of t	go tire			
07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	2 2 2 3 3 3 2 2		Consent of copy	Rection aufer	Politice			
07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	2 2 2 3 3 3 2 2		Consent of copy	Section auter	go tiredities			
07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	2 2 2 3 3 3 2 2 2		Consent of cons	specification for the state of	go tire tredities			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A	IN QUE  O. O. O. O. O. ARM B VEHICL IN QUE	EUE  .2 2 .3 .3 .2 .2 .2 .2		Consent of copy	Rection auter	go tireditie			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O.	EUE  .2 2 .3 .3 .2 2 2  OF LES EUE 1		Consent of copy	specification for the state of	go tire treditie			
07.45 08.00 08.15 08.30 08.45 DUEUE AT A TIME SEGN ENDING	IN QUE  O. O. O. O. ARM B VEHICI IN QUE  O. O.	EUE  .2 .2 .3 .3 .3 .2 .2 .2  OF LES EUE .1 .1		Consent of cons	specification for the state of	go ite			
07.45 08.00 08.15 08.30 08.45 DUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00	IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O.	EUE  2 2 3 3 3 2 2 2  OF LES EUE  1 1 1		Consent of copy	Recitor Duret	Politice			
07.45 08.00 08.15 08.30 08.45 DUEUE AT A TIME SEGN ENDING	IN QUE  O. O. O. O. ARM B VEHICI IN QUE  O. O.	EUE  2 2 3 3 3 2 2 2  OF LES EUE  1 1 1		Consent of copy	Rection aufer	Politice			
07.45 08.00 08.15 08.30 08.45 DUEUE AT F 	IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O.	2 2 2 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Consent of copy	Rection autorities	go tire treditie			
07.45 08.00 08.15 08.30 08.45 DUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15	IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O.	2		Gonsent of copy	Recitor Duret	Politice			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  O. O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. O.	2		Consent of copy	Rection auf	go tire treditie			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A 	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. ARM C	2		Consent of copy	specification for the state of	go tire treditie			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. ARM C	OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of copy	Rection automorphists of the control	go tire tredities			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. ARM C	OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	Rection autorities	go tire tredities			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  O. O. O. O. ARM B VEHICI IN QUE  O. O. O. ARM C MENT NO.	OF LES		Gonsent of copy	Rection auf	go tire require			
07.45 08.00 08.15 08.30 08.45  DUEUE AT A ENDING  07.30 07.45 08.00 08.15 08.30 08.45  DUEUE AT A ENDING	IN QUE  O.	OF LES EUE		Consent of copy	Rection auf	go tire tredities			
07.45 08.00 08.15 08.30 08.45  DUEUE AT A ENDING  07.30 07.45 08.00 08.15 08.30 08.45  DUEUE AT A ENDING  TIME SEGN ENDING	IN QUE  O. O. O. O. O. ARM B  MENT NO. VEHICI IN QUE  O. O. VEHICI IN QUE IN QUE  IN QUE  O.	OF LES CUE  OF LES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	Rection automorphists of the contract of the c	go tire tredities			
07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGN ENDING  07.30 07.45 08.00 08.15 08.30 08.45  QUEUE AT A TIME SEGN ENDING	IN QUE  O. O. O. O. O. ARM B  MENT NO. VEHICI IN QUE  O. O. VEHICI IN QUE IN QUE  O.	OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of copy	Rection autorities	go tire tredities			
07.45 08.00 08.15 08.30 08.45 MUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45 MUEUE AT A TIME SEGN ENDING	IN QUE  O. O. O. O. O. ARM B  MENT NO. VEHICI IN QUE  O. O. VEHICI IN QUE IN QUE  MENT NO. O. O	OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	specification for the state of	go the tredities			
07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.45 QUEUE AT A TIME SEGN ENDING	IN QUE  O. O. O. O. ARM B  MENT NO. VEHICI IN QUE  O.	OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	Recitor Duret	go tire tredities			
07.45 08.00 08.15 08.30 08.45 MUEUE AT A TIME SEGN ENDING 07.30 07.45 08.00 08.15 08.30 08.45 MUEUE AT A TIME SEGN ENDING	IN QUE  O. O. O. O. O. ARM B  MENT NO. VEHICI IN QUE  O. O. VEHICI IN QUE IN QUE  MENT NO. O. O	OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of copy	Rection auf	go tire tredities			

I	ARM	Ι	TOTAL	DEMAND	I	* QU:	EUEING *	I	* INCLUSI	VE	QUEUEING *	I
I		Ι			I	* D	ELAY *	Ι	*	DEL	AY *	I
I		I-										-I
I		I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	Ι
I	A	Ι	441.5	I 294.4	I	21.1	I 0.05	I	21.1	I	0.05	I
I	В	Ι	194.7	I 129.8	Ι	7.9	I 0.04	Ι	7.9	I	0.04	Ι
I	С	I	356.5	I 237.7	I	16.5	I 0.05	I	16.5	I	0.05	I
I	ALL	I	992.8	I 661.8	I	45.6	I 0.05	I	45.6	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2022 AM Peak - With Development.vai" (drive-on-the-left ) at 15:11:06 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	 I
I ARM A I I ARM B I I ARM C I	3.50 3.50 7.00	I	8.00 9.50 9.00	I		I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I I I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

1

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.TIME PERIOD BEGINS 07.15 AND ENDS 08.45
.LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
```

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2022 AM Peak - With Development

I	I NUMBER	F MINU	TES FROM	START	C WHEN	Ι	RATE	OF	FLOW (	VEH	/MIN)	Ι
I ARM	I FLOW STAR	S I TOP	OF PEAK	I FI	LOW STOPS	Ι	BEFORE	I	AT TOP	I	AFTER	I
I	I TO RISE	I IS	REACHED	IFAI	LLING I	F	PEAK I	OF	PEAK I	PΕ	AK I	
I ARM A	I 15.00	I	45.00	I	75.00	Ι	4.03	I	6.04	I	4.03	I
I ARM B	I 15.00	I	45.00	I	75.00	Ι	1.77	I	2.66	I	1.77	I
I ARM C	I 15.00	I	45.00	I	75.00	Ι	3.25	Ι	4.88	Ι	3.25	Ι

DEMAND SET TITLE: 2022 AM Peak - With Development

 I I I		I I I		TU (PI	JRNING PRO JRNING COU ERCENTAGE	JNTS (VEH,	, 	I 
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C	I
I I	07.15 - 08.45	I I		_	0.000 I	I 0.550 I	0.450	ı I I
I		I		I	0.0 I ( 0.0) I	177.0 I ( 7.0) I	145.0 (16.0)	I ther is
I I		I	ARM B	I	0.352 I	0.000 I	0.648	I will still or
I I		I		I I	50.0 I ( 15.0) I	0.0 I ( 0.0) I	92.0 (24.0)	I I I I I I I I I I I I I I I I I I I
I T		I	ARM C	I	0.254 I	I 0.746 I	0.000	TE CHILL
Ī		I	111111 0	I	66.0 I	194.0 I	COO NO	£,
I		I		I	( 2.0)I	( 10.0)I	iligani (570)	I I
							342	-

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I
I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 07.15-07.30 I ARM A 4.03 26.23 0.153 I ARM B 1.77 26.91 0.066 I ARM C 3.25 25.65 0.127 0.04 0.0 0.2 2.7 0.0 0.1 0.0 0.1 0.04 I 0.04 I 1.0 2.1 DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I (VEH/MIN) (VEH/MIN) CAPACITY I 07.30-07.45 I ARM A 4.81 25.96 0.185 I ARM B 2.12 26.70 0.079 I ARM C 3.88 25.57 0.152 0.2 0.2 3.4 0.1 0.1 0.1 0.2 0.04 I 0.05 I 1.3 TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I 0.2 0.3 4.4 0.05 0.1 0.1 1.6 0.2 0.2 3.4 0.04 I 0.05

	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING
I 08.00-08	0 15		(RFC)	(PEDS/MIN)	(vEns)	(VERS)	TIME SEGMENT)	TIME SEGMENT)	VERICLE (MIN)
	5.89	25 60	0 230		0.3	0.3	4.5		0.05
I ARM B		26.42							
I ARM C	4.75	25.48	0.030		0.2	0.1	1.6 3.4		0.04 0.05
I	4.75	23.40	0.107		0.2	0.2	3.4		0.05
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)
I 08.15-08									
							3.5		0.05
I ARM B	2.12	26.70	0.079		0.1	0.1	1.3		0.04
I ARM C	2.12 3.88	25.57	0.152		0.2	0.2	1.3 2.7		0.04 0.05
I									
I TIME				PEDESTRIAN				GEOMETRIC DELAY	
	(VEH/MIN)							(VEH.MIN/	
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	
I 08.30-08		26.22	0 154		0.2	0 0	2 0		0 05
	4.03						2.8		0.05
I ARM B	1.77 3.25	20.90	0.000		0.1	0.1	1.1 2.2		0.04 0.04
I	3.23	23.03	0.127		0.2	0.1	2.2		0.04
	VEHICI IN QUI 0. 0. 0.	EUE .2 .2 .3 .3		For in	spection pur tight owner	ge diffe			
				on sent of					
QUEUE AT A				Consento					
~		LES		Consent o.					
TIME SEGNENDING	MENT NO. VEHICI IN QUE	LES EUE		Consent o					
TIME SEGNENDING	MENT NO. VEHICI IN QUE	LES EUE .1		Consent o					
TIME SEGNENDING  07.30 07.45	MENT NO. VEHICI IN QUI	LES EUE .1 .1		Consent o					
TIME SEGNENDING  07.30 07.45 08.00	MENT NO. VEHICI IN QUI	LES EUE .1 .1		Consent o					
TIME SEGNENDING  07.30 07.45	MENT NO. VEHICI IN QUI 0. 0.	LES EUE .1 .1		Consent o					
TIME SEGRENDING  07.30 07.45 08.00 08.15	MENT NO. VEHICI IN QUE  0. 0. 0. 0.	LES EUE .1 .1 .1		Consent o					
TIME SEGNENDING  07.30 07.45 08.00 08.15 08.30	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. 0. ARM C	LES SUE .1 .1 .1 .1		Consent o					
TIME SEGNENDING  07.30 07.45 08.00 08.15 08.30 08.45	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. 0. ARM C	LES SUE .1 .1 .1 .1		Consent o					

07.30 07.45 08.00 08.15 08.30 08.45 0.1 0.2 0.2 0.2 0.2 0.2

I	ARM	Ι	TOTA	LE	EMAND	Ι	* QU	ΕU	JEING *	Ι	* INCLUS	VE	QUEUEING *	I
I		I				Ι	* D	ΕI	AY *	Ι	*	DEL	AY *	Ι
I		I-												-I
I		I	(VEH)	(	(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	Ι
I	A	I	441.5	Ι	294.4	Ι	21.1	Ι	0.05	Ι	21.1	I	0.05	Ι
I	В	I	194.7	Ι	129.8	Ι	7.9	Ι	0.04	Ι	7.9	I	0.04	Ι
I	С	I	356.5	Ι	237.7	Ι	16.5	Ι	0.05	Ι	16.5	I	0.05	Ι
I	ALL	I	992.8	Ι	661.8	Ι	45.6	Ι	0.05	Ι	45.6	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2022 AM Peak - With Development + Sensitivity Flows.vai" (drive-on-the-left ) at 15:12:09 on Thursday, 1 December 2016

## .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 17/07/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-02 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	 I
I ARM A I I ARM B I I ARM C I	3.50 3.50 7.00	I	8.00 9.50 9.00	I		I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I I I

V = approach half-width E = entry width

L = effective flare length
R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

1

.TIME PERIOD BEGINS 07.15 AND ENDS 08.45 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET	TITLE:	2022	AΜ	Peak	_	With	Develo	noment	+	Sensitivity Flows

I I	NUMBER OF	MINUT	ES FROM	START	WHEN	Ι	RATE	OF	FLOW (	VEH,	/MIN)	Ι
I ARM I F	LOW STARTS	I TOP	OF PEAK	I FLO	OW STOPS	Ι	BEFORE	ΙA	T TOP	I Z	AFTER	I
I I	TO RISE	I IS	REACHED	IFAL:	LING I	Ρ	EAK I	OF	PEAK I	PE	λK I	
I ARM A I	15.00	I	45.00	I	75.00	Ι	4.31	I	6.47	I	4.31	Ι
I ARM B I	15.00	I	45.00	I	75.00	Ι	2.06	Ι	3.09	Ι	2.06	Ι
I ARM C I	15.00	I	45.00	I	75.00	Ι	3.25	I	4.88	Ι	3.25	Ι

DEMAND SET TITLE: 2022 AM Peak - With Development + Sensitivity Flows

I I I		I I I		ΤŪ	JRNING PRC JRNING COU ERCENTAGE	NTS (VEH	/HR)	I I I	
I	TIME	Ι	FROM/TO	Ι	ARM A I	ARM B I	ARM C	: I	
	07.15 - 08.45	I I I I I I I I I	ARM A	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	0.000 I 0.0 I ( 0.0) I I 0.303 I 50.0 I ( 15.0) I I 0.254 I 66.0 I ( 2.0) I	177.0 I ( 7.0) I	168.0 ( 16.0)	The Redired of the state of the	Š.
I 		I 		I 	I		Atight	I 	

QUEUE AND DELAY INFORMATION FOR EACH 18 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/		Ι
1	07 15 0	7 20		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	07.15-0		06.15	0 165		0 0	0 0	0 0		0.05	I
	ARM A	4.31	26.15	0.165		0.0	0.2	2.9		0.05	I
	ARM B	2.06	26.65	0.077		0.0	0.1	1.2		0.04	I
	ARM C	3.25	25.65	0.127		0.0	0.1	2.1		0.04	I
Ι											Τ
·	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	07.30-0	7.45									Ι
I	ARM A	5.15	25.88	0.199		0.2	0.2	3.7		0.05	Ι
I	ARM B	2.46	26.41	0.093		0.1	0.1	1.5		0.04	Ι
I	ARM C	3.88	25.57	0.152		0.1	0.2	2.6		0.05	Ι
I											Ι
·	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
T	1 11415	(VEH/MIN)	(VEH/MIN)		FLOW	OUEUE	OUEUE	(VEH.MIN/	(VEH.MIN/		T
		(ARU/MIN)	(VEH/MIN)	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)		VEHICLE (MIN)	_
	07.45-0	o nn		(RFC)	(FEDS/MIN)	(vens)	(VERS)	TIME SEGMENT)	IIME SEGMENI)	VEHICLE (MIN)	
	ARM A	6.31	25.53	0.247		0.2	0.3	4.8		0.05	T
	ARM B	3.02	26.09	0.247		0.2	0.3	1.9		0.03	T
	ARM C	4.75	25.48	0.110		0.1	0.1	3.4		0.05	T
т	AIVI C	4.75	23.40	0.107		0.2	0.2	J.4		0.05	T

I TIME	DEMAND (VEH/MIN)		DEMAND/	PEDESTRIAN FLOW	START		DELAY	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING
Т		,						TIME SEGMENT)	
I 08.00-0	08.15		(112 0)	(1250)11111)	(12110)	( 12110 )	11112 0201121111,	111111 0110111111	VEHICLE (HILL)
I ARM A	6.31	25.53	0.247		0.3	0.3	4.9		0.05
I ARM B		26.09	0.116		0.1	0.1	2.0		0.04
	4.75						3.4		0.05
I									
				PEDESTRIAN				GEOMETRIC DELAY	
	(VEH/MIN)	(VEH/MIN)	CAPACITY	F.TOM	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I	20		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	08.30	05.00	0 100		0 0	0 0	2 0		0.05
	5.15				0.3		3.8		0.05
I ARM B		26.41				0.1	1.6 2.7		0.04 0.05
I ARM C I	3.88	25.57	0.152		0.2	0.2	2.1		0.05
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	08.45								
	4.31				0.2		3.0		0.05
I ARM B	2.06 3.25	26.64	0.077		0.1	0.1	1.3		0.04 0.04
	3.25	25.65	0.127		0.2	0.1	2.2		
I							<del>_</del>		
QUEUE AT	ARM A						ederia		
						23.	any ou		
TIME SEG	GMENT NO.					es offici			
ENDING									
ENDTING	VEHICI IN QUE				- Dil	postified			
	IN QUE	EUE			ction put	required			
	IN QUE	EUE . 2			Dection Pur	postified			
07.30	IN QUE	EUE . 2 . 2		j Tr	spection put	postified			
07.30 07.45	IN QUE	EUE . 2 . 2 . 3		Fol A	Spection puriet	required			
07.30 07.45 08.00 08.15	IN QUE 0. 0. 0.	.2 .2 .3 .3		For in	Spection pur tight owner	required			
07.30 07.45 08.00	IN QUE 0. 0.	EUE . 2 . 3 . 3 . 2		Folia Folian	spection purification for the state of the s	positied			
07.30 07.45 08.00 08.15 08.30	IN QUE  0. 0. 0. 0. 0.	EUE . 2 . 3 . 3 . 2		For in	Specifor and Specification of the Specification of	positied			
07.30 07.45 08.00 08.15 08.30	IN QUE 0. 0. 0. 0. 0.	EUE . 2 . 3 . 3 . 2		Consent of conv	Specification Participation of the Control of the C	Postified required			
07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	2 2 2 3 3 3 2 2		Consent of conv	specifor purification of the second	dostred required			
07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	EUE 2 2 3 3 2 2 OF		Consent of copy	specifor purel	Postified ,			
07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B	EUE 2 2 3 3 2 2 2 OF		Consent of copy	specification for the state of	Postified Required			
07.30 07.45 08.00 08.15 08.30 08.45	IN QUE  0. 0. 0. 0. 0. ARM B GMENT NO. VEHICI	EUE  .2 2 .3 .3 .3 .2 2 2		Consent of cons	specifor purification of the control	Postified required			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT  TIME SEG ENDING	IN QUE  O. O. O. O. O. ARM B  GMENT NO. VEHICI IN QUE	EUE  2 2 3 3 2 2 2 OF LES EUE 1		Consent of cons	specification for the state of	Postified Required			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT TIME SEG ENDING	IN QUE  O. O. O. O. ARM B  GMENT NO. VEHICI IN QUE  O.	EUE  2 2 3 3 2 2 2  OF LES EUE 1 1		For in	specifor owner	Postified Required			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT TIME SEG ENDING	IN QUE  O. O. O. O. O.  ARM B  SMENT NO. VEHICI IN QUE  O. O.	2 2 2 3 3 3 2 2 2 2 OF LES EUE 1 1 1 1 1		Gonsent of conv	specifor purel	Postified Legitred			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O. O. O. O. O.  ARM B   SMENT NO. VEHICI IN QUE  O. O.	2 2 2 3 3 3 2 2 2 OF LES EUE 1 1		Gonsent of cons	specifor purel	Postified ,			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O. O. O. O. O. ARM B  SMENT NO. VEHICI IN QUE  O. O. O. O.	2 2 2 3 3 3 2 2 2 OF LES EUE 1 1		Consent of cons	specifor purification of the control	dostred required			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O. O. O. O. O.  ARM B  GMENT NO. VEHICI IN QUE  O. O. O. O.	2 2 2 3 3 3 2 2 2 2 OF LES EUE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Gonsent of conv	specifor purel	Postified Legitred			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O. O. O. O. O.  ARM B  GMENT NO. VEHICI IN QUE  O. O. O. O. ARM C	2 2 2 3 3 3 2 2 2 2 OF LES EUE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	specifor purel	Postified ,			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	OF LES CUE  1 1 1 1 1 1 1		Consent of cons	specifor purel	Postified Legitred			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT	IN QUE  O.	2 2 2 3 3 3 2 2 2 2 OF LES EUE 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	specifor purel	Postified Legitred			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	OF LES EUE  OF LES EUE  OF LES EUE		Consent of cons	Specifor Durel	Postified ,			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	OF LES CUE  OF LES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Consent of cons	specifor purel	Postified ,			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	OF LES EUE  1		Consent of cons	specifor purel	Postified Legitified			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	EUE  2 2 3 3 3 2 2 2  OF LES EUE  1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2		Consent of cons	specifor purel	Postified ,			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	EUE  2 2 3 3 3 2 2 2  OF LES EUE  1 1 1 1 1 1 2 2 2 2 2		Consent of cons	specifor purel	Postified to the second			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 	IN QUE  O.	EUE  2 2 3 3 3 2 2 2  OF LES EUE  1 1 1 1 1 1 2 2 2 2 2		For in	specifor purel	Postified to the second			

I	ARM	I	TOTA	LI	DEMAND	Ι	* QU	JΕU	JEING *	I	*	INCLUSI	VE	QUEUEING *	I
I		I				Ι	* D	EΙ	LAY *	Ι		*	DEI	LAY *	I
I		I-													- I
I		Ι	(VEH)		(VEH/H)	I	(MIN)		(MIN/VEH)	I		(MIN)		(MIN/VEH)	I
I	A	I	473.1	I	315.4	I	23.1	Ι	0.05	I		23.1	I	0.05	I
I	В	Ι	226.2	Ι	150.8	Ι	9.5	Ι	0.04	Ι		9.5	I	0.04	I
I	С	I	356.5	Ι	237.7	Ι	16.5	Ι	0.05	I		16.5	I	0.05	I
Ι	ALL	Ι	1055.8	Ι	703.9	Ι	49.1	Ι	0.05	Ι		49.1	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2032 AM Peak - No Development.vai" (drive-on-the-left ) at 15:14:59 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50	I	9.50	I		I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I I I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

	ARM	Ι	FLOW	SCALE (%)	 I
I	А В С	I I I		100 100 100	I I I

#### Appendix D - ARCADY Results

.TIME PERIOD BEGINS 07.15 AND ENDS 08.45 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2032 AM Peak - No Development

I I	NUMBER OF	MINUTES E	FROM START	WHEN I	RATE (	OF FLOW (	VEH/MIN) I
I ARM I	FLOW STARTS	I TOP OF	PEAK I FLO	OW STOPS I	BEFORE 1	AT TOP	I AFTER I
I I	TO RISE	I IS REA	ACHED IFAL:	LING I P	EAK I (	OF PEAK I	PEAK I
I ARM A I	15.00	I 45.	.00 I	75.00 I	4.20	6.30	I 4.20 I
I ARM B I	15.00	I 45.	.00 I	75.00 I	1.85	2.78	I 1.85 I
I ARM C I	15.00	I 45.	.00 I	75.00 I	3.38	5.06	I 3.38 I
I ARM C I	15.00	I 45.	.00 I	75.00 I	3.38	5.06	I 3.38 I

DEMAND SET TITLE: 2032 AM Peak - No Development

 I I		I I I		Т	TURNING PROPORTIONS I TURNING COUNTS (VEH/HR) I PERCENTAGE OF H.V.S) I
I T	TIME	—- т	FROM/T		I ARM A I ARM B I ARM C I
I	07.15 - 08.45	I		Ι	I I I I
I		I	ARM A	I	I 0.000 I 0.551 I 0.449 I
I		I		I	I 0.0 I 185.0 I 151.0 I
I		I		I	I 0.000 I 0.551 I 0.449 I
I		I		I	
I		I	ARM B	I	I I I I I I I I I I I I I I I I I I I
I		I		I	I 52.0 I 0.0 I 96.0 I
I		I		I	I ( 15.0)I ( 0.0)I ( 24.0)I
I		I		I	I I I JURI I
I		I	ARM C	I	
I		I		Ι	I 68.0 I 202.0 I 🚜 🐧
I		I			I ( 2.0)I ( 10.0)I (\$\frac{1}{2}\$ (\$\frac{1}{2}\$ (\$\frac{1}{2}\$)]I
I		Ι		Ι	I I IV. div I

QUEUE AND DELAY INFORMATION FOR EACH 18 MIN TIME SEGMENT

. –											
Ι	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
Ι	07.15-0	7.30									Ι
I	ARM A	4.20	26.17	0.160		0.0	0.2	2.8		0.05	Ι
I	ARM B	1.85	26.86	0.069		0.0	0.1	1.1		0.04	Ι
I	ARM C	3.38	25.63	0.132		0.0	0.2	2.2		0.04	Ι
Ι											Ι
-											
	TTME	DEMAND	CAPACITY		 PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)	,	FLOW	OUEUE		(VEH.MIN/	(VEH.MIN/		T
I		(VEH/MIN)	(VEH/MIN)	(RFC)	PEDS/MIN)	~ .	QUEUE (VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	_
	07.30-0	7 45		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	IIME SEGMENI)	VEHICLE (MIN)	T
	07.30-0 ARM A	5.02	25.90	0.194		0.2	0.2	3.5		0.05	
		2.21		0.194			0.2	1.3		0.03	T
	ARM B		26.65			0.1					_
T	ARM C	4.03	25.55	0.158		0.2	0.2	2.8		0.05	I
_											
. –											
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	07.45-0	8.00									Ι
Ι	ARM A	6.14	25.52	0.241		0.2	0.3	4.7		0.05	Ι
Ι	ARM B	2.71	26.37	0.103		0.1	0.1	1.7		0.04	Ι
Ι	ARM C	4.94	25.45	0.194		0.2	0.2	3.6		0.05	Ι
Ι											Ι
_											

### Appendix D – ARCADY Results

 I TIME I	DEMAND (VEH/MIN)		DEMAND/ CAPACITY	FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	8.15								
I ARM A	6.14	25.52	0.241		0.3	0.3	4.7		0.05
I ARM B		26.36				0.1	1.7		0.04
	4.94	25.45	0.194		0.2	0.2	3.6		0.05
I 									
			DEMAND/	PEDESTRIAN	START	END		GEOMETRIC DELAY (VEH.MIN/	
I		( , ,	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
I 08.15-0									
	5.02					0.2	3.7		0.05
I ARM B	2.21	26.65	0.083			0.1	1.4		0.04 0.05
	4.03	25.55	0.158		0.2	0.2	2.9		0.05
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I I	(VEH/MIN)			FLOW (PEDS/MIN)	(VEHS)	(VEHS)	(VEH.MIN/ TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	PER ARRIVING VEHICLE (MIN)
I 08.30-0	8.45		(112 0)	(1220)11111)	(12110)	(12110)	11112 020112111,	TITLE OLGINITY	VEHICLE (HILL)
I ARM A	4.20	26.17	0.161		0.2	0.2	2.9		0.05
I ARM B	1.85	26.86	0.069		0.1	0.1	1.1		0.04
	3.38	25.63	0.132		0.2	0.2	2.3		0.04
I 							<del></del>		
QUEUE AT A							otherin		
		0.7				only.	any		
	MENT NO.					-6 80			
ENDING	VEHICI IN QUE	JES			M	Possified 1			
07.30	VEHICI IN QUE	LES CUE			action put	required r			
	VEHICI IN QUE	LES CUE		, s	Spection put	pose required r			
07.30	VEHICI IN QUE	EES CUE 2 2		z in	gection pur ight owner	required 1			
07.30 07.45	VEHICI IN QUE 0. 0. 0.	LES CUE 2 2 3 3		Fo <sup>t</sup> ifi	spection put tight owner	pose redified i			
07.30 07.45 08.00	VEHICI IN QUE 0. 0.	LES CUE 2 2 3 3		For in	spection put ight owner	pose required r			
07.30 07.45 08.00 08.15	VEHICI IN QUE 0. 0. 0.	EES 2 2 3 3 2		For in	Rection pur right owner	postified t			
07.30 07.45 08.00 08.15 08.30	VEHICI IN QUE 0. 0. 0. 0.	EES 2 2 3 3 2		Consent of cons	specification of the state of t	possible of the second			
07.30 07.45 08.00 08.15 08.30 08.45	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	EES CUE 2 2 3 3 2 2		Consent of copy	Rection outer	positive di la constanti di la			
07.30 07.45 08.00 08.15 08.30 08.45	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	LES CUE 2 2 2 3 3 3 2 2 2		Consent of copy	specification for the state of	Postified t			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A	VEHICI IN QUE  0. 0. 0. 0. 0. 0. ARM B WENT NO. VEHICI IN QUE	LES CUE 2 2 2 3 3 3 2 2 2 2 OF LES CUE		For in	specification purification in the second sec	Postified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B VEHICI IN QUE  1N QUE	DES CUE 2 2 2 3 3 3 2 2 2 2 OF JES CUE		For in	specification for the state of	Postified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7	VEHICI IN QUE  0. 0. 0. 0. 0. 0. ARM B WENT NO. VEHICI IN QUE	DES CUE 2 2 2 3 3 2 2 2 2 OF LES CUE 1 1		Folia Consent of cons	specification for the state of	Postified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B VEHICI IN QUE  0. 0.	DES CUE 2 2 2 3 3 3 2 2 2 2 0 F DES CUE		For its	specificat put fight owner	posetified t			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE  0. 0.	DES CUE  2 2 2 3 3 3 2 2 2  OF DES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		For in	Rection outer	posetified t			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B WENT NO. VEHICI IN QUE  0. 0.	DES CUE  2 2 2 3 3 3 2 2 2  OF LES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Gonsent of conv	specification for the state of	Posetified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGIENDING  07.30 07.45 08.00 08.15 08.30	VEHICI IN QUE  O. O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O. O. O.	DES CUE  2 2 2 3 3 3 2 2 2  OF LES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		For in	specification for the state of	Posetified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGI ENDING 07.30 07.45 08.00 08.15 08.30 08.45	VEHICI IN QUE  O. O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O. O. O.	DES CUE  2 2 2 3 3 3 2 2 2  OF LES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		For in	specification purification in the second sec	Posetified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT A TIME SEGI ENDING 07.30 07.45 08.00 08.15 08.30 08.45	VEHICI IN QUE  O. O. O. O. ARM B VEHICI IN QUE  O. O. O. O. O. ARM C	DES CUE  2 2 2 3 3 2 2 2 2 0 0 F DES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		For in	specification for the state of	Posetified to			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING 07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING	VEHICI IN QUE  O. O. O. O. ARM B VEHICI IN QUE  O.	DES CUE 2 2 2 3 3 3 2 2 2 2 OF LES CUE 1 1 1 1 1 1		For the Consent of cons	Section and Section of the Section o	posetified the second s			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING 07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING	VEHICI IN QUE  O.	DES CUE  2 2 2 3 3 3 2 2 2 2 OF LES CUE  1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		For in	Section outer	posetified the second s			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING 07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING	VEHICI IN QUE  O.	DES CUE  2 2 2 3 3 3 2 2 2 2		For in	Section outer	posetified the second s			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGIENDING 07.30 07.45 08.00 08.15 08.45 QUEUE AT 7 TIME SEGIENDING	VEHICI IN QUE  O. O. O. O. O. O. ARM B  WENT NO. VEHICI IN QUE  O.	DES CUE  2 2 2 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2		For in	Specification of the state of t	posetified the second s			
07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING 07.30 07.45 08.00 08.15 08.30 08.45 QUEUE AT 7 TIME SEGI ENDING	VEHICI IN QUE  O.	DES CUE  2 2 2 3 3 3 2 2 2 2 2 2 2 2 2 2 2 2 2		For in	Specification of the state of t	posetified the second s			

#### Appendix D - ARCADY Results

## QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTA	LI	DEMAND	Ι	* QU	ΕU	JEING *	I	* INCLUS	IVE	QUEUEING *	I
I		I				Ι	* D	ΕI	LAY *	Ι	+	DEI	LAY *	Ι
I		I-												-I
I		I	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	A	I	460.7	I	307.2	Ι	22.3	Ι	0.05	I	22.3	I	0.05	I
I	В	I	202.9	Ι	135.3	Ι	8.3	Ι	0.04	Ι	8.3	I	0.04	Ι
I	С	I	370.2	Ι	246.8	Ι	17.3	Ι	0.05	Ι	17.3	I	0.05	Ι
I	ALL	I	1033.9	Ι	689.3	Ι	48.0	Ι	0.05	Ι	48.0	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2032 AM Peak - With Development.vai" (drive-on-the-left ) at 15:14:38 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50	I	8.00 9.50 9.00	I	30.00 30.00 30.00	I	20.00	I	60.00 60.00 13.00	I I I	51.0 49.0 53.0	I	0.562 0.596 0.551	I	30.623 33.767 28.086	I I I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

I	ARM	Ι	FLOW	SCALE(%)	Ι
I	A B C	I I I		100 100 100	I I I

.TIME PERIOD BEGINS 07.15 AND ENDS 08.45 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2032 AM Peak - With Development

I	I NUMBE	ER OF MINU	TES FROM	START	WHEN	I	RATE	OF I	FLOW (	VEH/	MIN)	I
I ARM	I FLOW ST	TARTS I TO	P OF PEAK	I FLO	OW STOPS	I :	BEFORE	I A	T TOP	I P	AFTER	Ι
I	I TO RI	ISE I I	S REACHED	IFAL:	LING I	P.	EAK I	OF I	PEAK I	PEA	AK I	
I ARM A	I 15.	.00 I	45.00	I	75.00	Ι	4.21	I	6.32	I	4.21	Ι
I ARM B	I 15.	.00 I	45.00	I	75.00	I	1.86	I	2.79	I	1.86	Ι
I ARM C	I 15.	.00 I	45.00	I	75.00	Ι	3.38	I	5.06	Ι	3.38	Ι

DEMAND SET TITLE: 2032 AM Peak - With Development

I		I		Т	URNING PRO	PORTIONS		I
I		I		Τ	URNING COL	NTS (VEH	/HR)	I
I		I		(P	ERCENTAGE	OF H.V.S)		I
I								-
I	TIME	I	FROM/I	O I	ARM A I	ARM B I	ARM C	I
								-
I	07.15 - 08.45	I		I	I	I		I
I		I	ARM A	ı I	0.000 I	0.549 I	0.451	I
I		I		I	0.0 I	185.0 I	152.0	I (V)
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I		I		I	52.0 I	0.0 I	97.0	I 25, 50
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I		I		I	I	I	á	Pull
I		I	ARM C	I	0.252 I	0.748 I	0.000	I I I I I I I I I I I I I I I I I I I
I		I		I	68.0 I	202.0 I	co <sup>O</sup> , Qe	Tose of the any
I		I			( 2.0)I		(000)	I
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						·	11/20	
						Y 3	2.3	

QUEUE AND DELAY INFORMATION FOR EACH 18 MIN TIME SEGMENT

				Cor						
I TIME I I	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)		PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I 07.15-0	7.30									Ι
I ARM A	4.21	26.17	0.161		0.0	0.2	2.8		0.05	Ι
I ARM B	1.86	26.85	0.069		0.0	0.1	1.1		0.04	Ι
I ARM C	3.38	25.63	0.132		0.0	0.2	2.2		0.04	Ι
I										Ι
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I 07.30-0	7.45									Ι
I ARM A	5.03	25.89	0.194		0.2	0.2	3.6		0.05	Ι
I ARM B	2.22	26.64	0.083		0.1	0.1	1.3		0.04	Ι
I ARM C	4.03	25.55	0.158		0.2	0.2	2.8		0.05	Ι
I										Ι
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I 07.45-0										Ι
I ARM A	6.16	25.52	0.241		0.2	0.3	4.7		0.05	Ι
I ARM B	2.72	26.35	0.103		0.1	0.1	1.7		0.04	Ι
I ARM C	4.94	25.45	0.194		0.2	0.2	3.6		0.05	Ι
I										Ι

				 PEDESTRIAN				GEOMETRIC DELAY		
	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	0-08.15 A 6.16	25 52	0 241		0.3	0.3	4.8		0.05	I
		26.35			0.1		1.7		0.04	I
I ARM (	C 4.94						3.6			I
I										I
· I TIME	E DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	· I
		(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE		(VEH.MIN/		
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
	5-08.30		0 101		0 0	0 0	2 7		0.05	I
	A 5.03						3.7		0.05 0.04	I
I ARM C	3 2.22 C 4.03						1.4 2.9			I
I										I
I TIME	E DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	I
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	I
	0-08.45									I
	A 4.21						2.9		0.05	I
	3 1.86		0.069		0.1	0.1	1.1 2.3		0.04	I
I ARM (	3.38	23.63	0.132		0.2	0.2	2.3		0.04	I
OHEHE 7	AT ARM A			For in			net it			
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	SEGMENT NO.					es y for	•			
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TTME C	SEGMENT NO.	OF								
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08.15		. 1								
08.30		. 1								
08.45	0	.1								
~ ~	AT ARM C									
TIME 9	SEGMENT NO.	OF								
ENDIN										
	IN QU	LOL								

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 07.45
 0.2

 08.00
 0.2

 08.15
 0.2

 08.30
 0.2

 08.45
 0.2

I	ARM	I	TOTA	LI	DEMAND	Ι	* QU	JΕŪ	JEING *	I	* INCLUS	VE	QUEUEING *	I
I		I				I	* D	ΕI	LAY *	Ι	* DELAY *			
I		I-												-I
I		Ι	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	Ι
I	A	I	462.1	Ι	308.1	I	22.4	Ι	0.05	I	22.4	I	0.05	I
I	В	Ι	204.3	Ι	136.2	Ι	8.4	Ι	0.04	Ι	8.4	I	0.04	Ι
I	С	Ι	370.2	Ι	246.8	Ι	17.3	Ι	0.05	Ι	17.3	I	0.05	Ι
I	ALL	Ι	1036.6	Ι	691.1	Ι	48.1	Ι	0.05	Ι	48.1	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\AM Peak\2032 AM Peak - With Development + Sensitivity Flows.vai" (drive-on-the-left ) at 15:15:39 on Thursday, 1 December 2016

## .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 17/07/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-02 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50 3.50 7.00	I	8.00 9.50 9.00	I		I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I I I

V = approach half-width E = entry width

L = effective flare length
R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

I	ARM	Ι	FLOW	SCALE(%)	Ι
I	A B C	I I I		100 100 100	I I I

1

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.TIME PERIOD BEGINS 07.15 AND ENDS 08.45
.LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.
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.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET	TITLE:	2032	AΜ	Peak	_	With	Develo	pment	+	Sensitivity Flows

I I	NUMBER OF M	MINUTES FROM S	START WHEN	I RATE	OF FLOW (	VEH/MIN) I
I ARM I I	LOW STARTS I	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER I
I I	TO RISE I	I IS REACHED	IFALLING I	PEAK I	OF PEAK I	PEAK I
I ARM A I	15.00 I	I 45.00	I 75.00	I 4.41	I 6.62	I 4.41 I
I ARM B I	15.00 I	I 45.00	I 75.00	I 2.06	I 3.09	I 2.06 I
I ARM C I	15.00 I	I 45.00	I 75.00	I 3.38	I 5.06	I 3.38 I

DEMAND SET TITLE: 2032 AM Peak - With Development + Sensitivity Flows

I I I I	TIME	I I 	FROM/	(P	URNII ERCEI	NG COU	PORTIONS INTS (VEH, OF H.V.S)	/HR) ) 	I I  I
I	07.15 - 08.45	I		I		I	I		I
I		I	ARM .	A I	0.	000 I	0.524 I	0.476	I or
I		I		I		0.0 I	185.0 I	168.0	I 188
I		I		I	(	0.0)I	( 7.0)I	(16.0)	I West
I		I		I		I	I		I 10th
I		I	ARM :	в І	0.	315 I	0.000 I	0.685	I ally ally
I		I		I	5:	2.0 I	0.0 I	113.0	I office of the state of the st
I		I		I	( 1	5.0)I	( 0.0)I	(24.0)	I'O'S 'SO'
I		I		I		I	I	3	Palite
I		I	ARM	C I	0.3	252 I	0.000 I 0.0 I ( 0.0)I I 0.748 I	0.000	Reck
I		I		I	6	8.0 I	202.0 I	CO. OS	ì
I		I		I	(	2.0)I	( 10.0)I	(0000)	I
Ι		I		I		I	\sqrt{\sq}}}}}}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}} \signignignightimes}}}} \end{\sqintitendanta}}}}} \sqrt{\	ing th	I
								22.	

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I I I		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	07.15-0	7.30									Ι
I	ARM A	4.41	26.12	0.169		0.0	0.2	3.0		0.05	Ι
	ARM B	2.06	26.67	0.077		0.0	0.1	1.2		0.04	Ι
I	ARM C	3.38	25.63	0.132		0.0	0.2	2.2		0.04	Ι
Ι											Ι
-											
	TIME	DEMAND	CAPACITY		PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т
T		(VEH/MIN)		CAPACITY	FLOW	OUEUE	OUEUE	(VEH.MIN/	(VEH.MIN/		T
Т		( V = 11/ 11111 )	( V 111 / 1111 /	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	,	VEHICLE (MIN)	_
T	07.30-0	7.45		(112 0)	(1220/1111)	(12110)	( 12110 )	111111 0110111111,	111111 0111111111	VEHILOED (HILL)	T
	ARM A	5.27	25.84	0.204		0.2	0.3	3.8		0.05	Т
Т	ARM B	2.46	26.43	0.093		0.1	0.1	1.5		0.04	Т
I	ARM C	4.03	25.55	0.158		0.2	0.2	2.8		0.05	I
I											I
-											
. –											
I	TIME	DEMAND		DEMAND/		START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	1 11 11 11 11 11 11 11 11 11 11 11 11 1	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
	07.45-0										Ι
	ARM A	6.45	25.47	0.253		0.3	0.3	5.0		0.05	Ι
	ARM B	3.02	26.12	0.115		0.1	0.1	1.9		0.04	Ι
Ι	ARM C	4.94	25.45	0.194		0.2	0.2	3.6		0.05	Ι
Ι											Ι
_											

I		CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY I PER ARRIVING I
I I 08.00-08	15		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	IIME SEGMENI)	VEHICLE (MIN) I
I ARM A		25 47	0 252		0.3	0.3	5.1		0.05 I
I ARM B		26.12					2.0		
		25.45	0.113		0.1	0.1	3.6		0.04 I 0.05 I
I ARM C	4.94	23.43	0.194		0.2	0.2	3.0		0.05 I
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY I
Ī	( 1211, 11111,	(1211/11111/	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN) I
I 08.15-08			, ,	, , ,	, ,	, ,	,	,	I
I ARM A	5.27	25.84	0.204		0.3	0.3	3.9		0.05 I
						0.1	1.6		0.04 I
I ARM B I ARM C	4.03	25.55	0.158		0.2	0.2	1.6 2.9		0.04 I 0.05 I
I									I
•									
I TIME				PEDESTRIAN				GEOMETRIC DELAY	
I								(VEH.MIN/	
I I 08.30-08			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	TIME SEGMENT)	
I ARM A		26 11	0 160		0.3	0.2	3.1		0.05 I
					0.3				
I ARM B I ARM C	3 38	25.63	0.077		0.2	0.1	1.3 2.3		0.04 I 0.04 I
I	0.00	20.00	0.102		0.2	0.2	2.0		I
ENDING	ENT NO. VEHIC: IN QUI  0 0 0 0 0 0	LES EUE .2 .3 .3 .3		Consent of cons	spection outer	Poses of for	·		
TIME SEGM ENDING	ENT NO. VEHIC: IN QUI	LES							
07.30	Ω	.1							
07.45		.1							
08.00		.1							
08.15		. 1							
08.30		.1							
08.45		.1							
.QUEUE AT A									
TIME SEGM ENDING	ENT NO. VEHIC								
TIADTIAG	IN QUI								

0.2 0.2 0.2 0.2 0.2 0.2

07.30 07.45 08.00 08.15 08.30 08.45

I	ARM	I	TOTA	LI	DEMAND	Ι	* QU	ΕU	JEING *	I	* INCLUS	EVE	QUEUEING *	I
I		I				Ι	* D	ΕI	LAY *	Ι	*	DEI	AY *	Ι
I		I-	(VEH) (VEH/H)											-I
I		I	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	Ι
I	A	I	484.0	Ι	322.7	Ι	23.8	Ι	0.05	Ι	23.8	I	0.05	Ι
I	В	I	226.2	Ι	150.8	Ι	9.5	Ι	0.04	Ι	9.5	I	0.04	Ι
I	С	I	370.2	Ι	246.8	Ι	17.3	Ι	0.05	Ι	17.3	I	0.05	Ι
I	ALL	I	1080.5	Ι	720.3	Ι	50.6	Ι	0.05	Ι	50.6	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2016 PM Peak - Existing Flows.vai" (drive-on-the-left ) at 15:20:14 on Thursday, 1 December 2016

# .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

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I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I	3.50 3.50	_							60.00	I I	51.0 49.0	_	0.562 0.596	_	30.623 33.767	I I
I ARM C I	7.00	I	9.00	I	30.00	I	3.00	I	13.00	I	53.0	I	0.551	Ι	28.086	I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

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.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2016	ΡM	Peak	-	Existing	Flows	
--------	-----	--------	------	----	------	---	----------	-------	--

I	I I	NUMBER OF	MINUT	ES FROM	STAR	T WHEN	I	RATE	OF	FLOW (	VEH	/MIN)	I
I ARM	I FL	OW STARTS	I TOP	OF PEAK	I F	LOW STOPS	Ι	BEFORE	I	AT TOP	I	AFTER	Ι
I	I '	TO RISE	I IS	REACHED	IFA:	LLING I	E	PEAK I	OF	PEAK I	PΕ	AK I	
I ARM A	. I	15.00	I	45.00	I	75.00	Ι	2.46	I	3.69	I	2.46	Ι
I ARM B	I	15.00	I	45.00	I	75.00	Ι	4.50	I	6.75	I	4.50	I
I ARM C	I	15.00	I	45.00	I	75.00	Ι	3.59	Ι	5.38	I	3.59	Ι

#### DEMAND SET TITLE: 2016 PM Peak - Existing Flows

· I I I		I I I		T	JRNING PRO JRNING COU ERCENTAGE	JNTS (VEH,	/HR) I	
I	TIME	I	FROM/TO	) I	ARM A I	ARM B I	ARM C I	
	16.30 - 18.00	I		I	I	I	I	
I		I	ARM A	I	0.000 I	0.563 I	0.437 I	
I		I		I	0.0 I	111.0 I	86.0 I	. 0
I		I		I	( 0.0)I	( 8.0)I	( 5.0)I	100
I		I		I	I	I	I	they
I		I	ARM B	I	0.514 I	0.000 I	0.486 I	or
I		I		I	185.0 I	0.0 I	175.0 I	7
I		I		I	( 9.0)I	( 0.0)I	( 9.0) I &	
I		I		I	I	I	86.0 1 ( 5.0) I I 0.486 I 175.0 I only only only	
I		I	ARM C	I	0.443 I	0.557 I	0.000	
I		I		I	127.0 I	160.0 I	ON ROLL	
I		I		I	( 9.0)I	( 10.0)I	( 00.00°)	
I		I		I	I	I	Sele On I	
						<u></u> ,	11-100	

_	. – – – – – –					371	_				
		QUEUE AND I	DELAY INFO	RMATION FO	R EACH 15 JOH	N TIME S	SEGMENT				
					nsent of						
I	•	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)		AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
Ι	16.30-	16.45									I
Ι	ARM A ARM B ARM C	2.46 4.50 3.59	27.54 30.36 24.37	0.089 0.148 0.147		0.0	0.1 0.2 0.2	1.4 2.6 2.5		0.04 0.04 0.05	I I I
_											
I	-	, , ,	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)		GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
	ARM A	2.94	27.32	0.108		0.1	0.1	1.8		0.04	I
	ARM B ARM C	5.37 4.28	30.24 24.12	0.178 0.178		0.2	0.2	3.2		0.04	I I I
I	-	, , ,	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	QUEUE	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
	ARM A	3.60	27.00	0.133		0.1	0.2	2.3		0.04	I
I	ARM B	6.58	30.07	0.219		0.2	0.3	4.1		0.04	Ι
Ι	ARM C	5.25	23.78	0.221		0.2	0.3	4.2		0.05	Ι

<sup>.</sup>TIME PERIOD BEGINS 16.30 AND ENDS 18.00 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

Ι	(VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	FLOW	START QUEUE	QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING
Ι			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	7.30								
	3.60				0.2		2.3		0.04
I ARM B	6.58 5.25	30.07	0.219		0.3	0.3	4.2 4.2		0.04 0.05
I ARM C I	5.25	23.78	0.221		0.3	0.3	4.2		0.05
								GEOMETRIC DELAY	
		( V 111 / 1111 V )	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)
	7.45	07 01	0 100		0 0	0 1	1 0		0 04
									0.04
L ARM B	5.37 4.28	30.24	0.178		0.3	0.2	3.3 3.3		0.04
I ARM C I	4.28	24.12	0.178		0.3	0.2	3.3		0.05
I TIME				PEDESTRIAN				GEOMETRIC DELAY (VEH.MIN/	
	(VEH/MIN)	(VEH/MIN)	CAPACITY	F LOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
[ - 17 4- 17			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	TIME SEGMENT)	VEHICLE (MIN)
	3.00	07 54	0 000		0 1	0 1	1 -		0 04
	2.46						1.5		0.04
L AKM B	4.50	30.36	U.148		0.2	0.2	2.6		0.04
I ARM C I	3.59	24.36	0.147		0.2	0.2	2.6		0.05
							<u>15</u> 8		
QUEUE AT A	ARM A						other		
						ouly.	2017		
	MENT NO.	OF				'جي جي ج			
	VEHICI					2020, reg			
21.2 11.0	VEHICI IN QUE	LES			n Pul	required .			
16.45	IN QUE	LES EUE .1			ection pur	poserited r			
16.45 17.00	IN QUE	LES EUE .1		. oʻ	Special purper	required t			
16.45 17.00 17.15	IN QUE 0. 0.	LES EUE .1 .1		a in	Spection put ight owner	required			
16.45 17.00	IN QUE 0. 0. 0.	GES GUE .1 .1 .2 .2		Fo <sup>r</sup> ito	spection pur tight owner	required			
16.45 17.00 17.15	IN QUE 0. 0. 0.	GES GUE .1 .1 .2 .2		Folia Cold	Spection put tight owner	required			
16.45 17.00 17.15 17.30	IN QUE 0. 0. 0.	EES 1 1 2 2 1		For in	spection put tight owner	positived t			
16.45 17.00 17.15 17.30 17.45	IN QUE  0. 0. 0. 0. 0.	EES 1 1 2 2 1		Consent of convi	Specification and the state of	possified treditied to			
16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  0. 0. 0. 0. 0. ARM B	EES 1 1 2 2 1		Consent of cons	spection purel	gosefited tredited to			
16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  0. 0. 0. 0. 0. ARM B	DES EUE 1 1 1 2 2 2 1 1 1		Consent of cons	Rection purel	possified to			
16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  0. 0. 0. 0. 0. ARM B	LES EUE 1 1 1 2 2 2 1 1 1		Consent of conv	Section autret	possified to			
16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  O. O. O. O. ARM B  VEHICI	LES EUE  1 1 2 2 1 1 1 OF LES EUE		Gonsent of cons	Rection purel	possified the specified the sp			
16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  O. O. O. O. O. ARM B MENT NO. VEHICI IN QUE	LES EUE 1 1 1 2 2 1 1 1 OF LES EUE		Gonsent of copy	Section autorigital Confession	possified to			
16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  0. 0. 0. 0. 0. ARM B VEHICI IN QUE	LES EUE 1 1 1 2 2 2 1 1 1		Gonsent of convi	specification and specificatio	possified to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT 2	IN QUE  0. 0. 0. 0. 0. ARM B WENT NO. VEHICI IN QUE 0. 0.	LES EUE 1 1 1 2 2 2 1 1 1 1 OF LES EUE		For in	specification and specificatio	possified to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGNENDING	IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O.	LES EUE 1 1 1 2 2 2 1 1 1 OF LES EUE 2 2 3 3		Gonsent of cons	Section purification in the section is a section of the section of the section is a section of the section of the section is a section of the	possified the property of the			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGNENDING  16.45 17.00 17.15 17.30	IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE O. O.	DES EUE  1		Gonsent of convi	Section autorities	possified to the second			
16.45 17.00 17.15 17.30 17.45 18.00 2UEUE AT 2 	IN QUE  O. O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. O.	DES EUE  1		Gonsent of convi	Specification and specificatio	possified to the possible of t			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. ARM C	DES EUE  1		Foith Cons	Section purel	possified the property of the			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT 2 ENDING  16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. ARM C	DES EUE  1		For in	Rection purel	possified the property of the			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGNENDING  16.45 17.00 17.15 17.30 17.45 18.00	IN QUE  O. O. O. O. ARM B  VEHICI IN QUE  O. O. O. ARM C	DES EUE  OF LES EUE  OF LES EUE  OF LES EUE  OF LES EUE		Gonsent of cons	Rection purel	possified the specified the sp			
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I		Ι	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	Ι		(MIN)		(MIN/VEH)	Ι
I	A	Ι	270.1	I	180.1	Ι	11.1 I	0.04	Ι		11.1	I	0.04	I
I	В	Ι	493.6	Ι	329.1	Ι	20.0 I	0.04	Ι		20.0	Ι	0.04	Ι
I	С	I	393.5	Ι	262.4	Ι	20.1 I	0.05	Ι		20.1	I	0.05	I
I	ALL	I	1157.3	Ι	771.5	Ι	51.2 I	0.04	Ι		51.2	I	0.04	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2017 PM Peak - No Development.vai" (drive-on-the-left ) at 15:20:32 on Thursday, 1 December 2016

# .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

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I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I	3.50	I			30.00					I	51.0	I	0.562	Ι		I
I ARM B I	3.50	I	9.50	I	30.00	I	20.00	I	60.00	I	49.0	I	0.596	I	33.767	I
I ARM C I	7.00	I	9.00	I	30.00	I	3.00	Ι	13.00	I	53.0	Ι	0.551	Ι	28.086	Ι

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

1

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2017	PΜ	Peak	-	No	Development
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I	I NUM	BER OF M	INUTES	FROM S	START	WHEN	Ι	RATE	OF F	V WOL	/EH/	MIN)	I
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I	I TO	RISE I	IS R	EACHED	IFALI	LING I	PE	EAK I	OF F	PEAK I	PEA	K I	
I ARM A	. I 1			5.00	I	75.00	Ι	2.49	I	3.73	I	2.49	Ι
I ARM B	I 1	5.00 I	4	5.00	I	75.00	Ι	4.53	I	6.79	Ι	4.53	I
I ARM C	I 1	5.00 I	4	5.00	I	75.00	Ι	3.61	I	5.42	I	3.61	Ι

#### DEMAND SET TITLE: 2017 PM Peak - No Development

									_
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I									_
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TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   QUEUE   (VEH.MIN   (VEH.MIN   VEH.MIN   PER ARRIVING   I   I 16.30-16.45   I   I   I   I   I   I   I   I   I	. –					····						
I ARM A	I		(VEH/MIN)		CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I ARM B 4.53 30.35 0.149 0.0 0.2 2.6 0.04 I I ARM C 3.61 24.36 0.148 0.04 0.0 0.2 2.6 0.05 I I I ARM C 3.61 24.36 0.148 0.0 0.2 2.6 0.05 I I I I I I I I I I I I I I I I I I I	Ι	16.30-1	6.45									Ι
I ARM C 3.61 24.36 0.148 0.0 0.2 2.6 0.05 I  I TIME DEMAND CAPACITY DEMAND/ (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ VEHICLE (MIN) I I ARM A 2.97 27.31 0.109 0.1 0.1 1.8 0.04 I ARM C 4.31 24.11 0.179 0.2 0.2 0.2 3.2 0.004 I I I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY ON THE SEGMENT OF THE	Ι	ARM A	2.49	27.54	0.090		0.0	0.1	1.5		0.04	Ι
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY I	Ι	ARM B	4.53	30.35	0.149		0.0	0.2	2.6		0.04	Ι
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY   I   (VEH/MIN) (VEH/MIN)   CAPACITY   FLOW   QUEUE   QUEUE   (VEH.MIN   (VEH.MIN   PER ARRIVING   I   16.45-17.00   I   ARM A   2.97   27.31   0.109   0.1   0.1   1.8   0.04   I   I   ARM B   5.40   30.23   0.179   0.2   0.2   3.2   0.05   I   I   ARM C   4.31   24.11   0.179   0.2   0.2   0.2   3.2   0.05   I   I   I   (VEH/MIN)   (VEH/MIN)   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY   I   (VEH/MIN)   (VEH/MIN)   CAPACITY   FLOW   QUEUE   QUEUE   (VEH.MIN   (VEH.MIN   PER ARRIVING   I   I   I   (RFC)   (PEDS/MIN)   (VEHS)   (VEHS)   TIME   SEGMENT)   TIME   SEGMENT   VEHICLE (MIN)   I   I   I   I   I   I   I   I   I	Ι	ARM C	3.61	24.36	0.148		0.0	0.2	2.6		0.05	Ι
TIME	Ι											Ι
I (VEH/MIN) (VEH/MIN) CAPACITY   FLOW   QUEUE   QUEUE   (VEH.MIN/   (VEH.MIN/   VEH.MIN/   VEHICLE   (MIN)   I   16.45-17.00												
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I ARM A 2.97 27.31 0.109 0.1 0.1 1.8 0.04 I I ARM B 5.40 30.23 0.179 0.2 0.2 3.2 0.04 I I ARM C 4.31 24.11 0.179 0.2 0.2 3.2 0.05 I I I I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.00-17.15 I ARM A 3.64 26.99 0.135 0.1 0.2 2.3 0.04 I I ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I	Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
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I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I 17.00-17.15 I ARM A 3.64 26.99 0.135 0.1 0.2 2.3 0.04 I 1 ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I	I	ARM B	5.40	30.23	0.179		0.2	0.2	3.2		0.04	Ι
I TIME DEMAND CAPACITY DEMAND/ PEDESTRIAN START END DELAY GEOMETRIC DELAY AVERAGE DELAY I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I 17.00-17.15 I ARM A 3.64 26.99 0.135 0.1 0.2 2.3 0.04 I 1 ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I	Ι	ARM C	4.31	24.11	0.179		0.2	0.2	3.2		0.05	Ι
TIME   DEMAND   CAPACITY   DEMAND   PEDESTRIAN   START   END   DELAY   GEOMETRIC DELAY   AVERAGE DELAY   I   (VEH/MIN)   (VEH/MIN)   CAPACITY   FLOW   QUEUE   QUEUE   (VEH.MIN   (VEH.MIN   PER ARRIVING   I   (RFC)   (PEDS/MIN)   (VEHS)   (VEHS)   TIME SEGMENT)   TIME SEGMENT)   VEHICLE (MIN)   I   17.00-17.15   I   ARM A   3.64   26.99   0.135   0.1   0.2   2.3   0.04   I   I   ARM B   6.62   30.06   0.220   0.2   0.3   4.2   0.04   I	I											Ι
I (VEH/MIN) (VEH/MIN) CAPACITY FLOW QUEUE QUEUE (VEH.MIN/ (VEH.MIN/ PER ARRIVING I (RFC) (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT) VEHICLE (MIN) I I 17.00-17.15 I ARM A 3.64 26.99 0.135 0.1 0.2 2.3 0.04 I I ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I												
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I 17.00-17.15 I ARM A 3.64 26.99 0.135 0.1 0.2 2.3 0.04 I I ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I	I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I ARM A 3.64 26.99 0.135 0.1 0.2 2.3 0.04 I I ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I	Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I ARM B 6.62 30.06 0.220 0.2 0.3 4.2 0.04 I	Ι	17.00-1	7.15									Ι
	Ι	ARM A	3.64	26.99	0.135		0.1	0.2	2.3		0.04	Ι
I ARM C 5.28 23.77 0.222 0.2 0.3 4.2 0.05 I I	Ι	ARM B	6.62	30.06	0.220		0.2	0.3	4.2		0.04	Ι
I I	Ι	ARM C	5.28	23.77	0.222		0.2	0.3	4.2		0.05	Ι
	I											Ι

	(VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING
I 17.15-17	3.0		(RFC)	(FEDS/MIN)	(vEns)	(VERS)	TIME SEGMENT)	IIME SEGMENI)	VERICLE (MIN)
I ARM A		26 99	0 135		0.2	0.2	2.3		0.04
I ARM B	6 62	30.06	0.220			0.3	4.2		
I ARM C	5 28	30.06 23.77	0.220		0.3	0.3	4.3		0.04 0.05
I	3.20	23.77	0.222		0.5	0.5	4.5		0.05
								GEOMETRIC DELAY	
	(VEH/MIN)	(VEH/MIN)	CAPACITY	F LOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/ TIME SEGMENT)	PER ARRIVING
I 17.30-17			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	IIME SEGMENI)	VEHICLE (MIN)
		27 31	0 100		0.2	0.1	1.9		0.04
I ARM B I ARM C	7.40	2/1 11	0.179		0.3	0.2	3.3 3.3		0.04 0.05
I									
I TIME					START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I								TIME SEGMENT)	
I 17.45-18	.00								
I ARM A					0.1		1.5		0.04
I ARM B I ARM C	4.53	30.35	0.149		0.2	0.2	2.7		0.04 0.05
I ARM C	3.61	24.36	0.148		0.2	0.2	2.7		0.05
I									
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.QUEUE AT A				Course					
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17.00	0.								
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17.30	0.								
17.45	0.								
18.00	0.								
QUEUE AT A									
TIME SEGM ENDING	ENT NO. VEHICI IN QUE	LES							

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16.45 17.00 17.15 17.30 17.45 18.00

I	ARM	I	TOTA	LI	DEMAND	Ι	* QU	ΕU	EING *	Ι	*	INCLUSI	VE	QUEUEING *	I
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I		I-													-I
I		I	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι		(MIN)		(MIN/VEH)	Ι
I	A	I	272.9	Ι	181.9	I	11.3	Ι	0.04	I		11.3	I	0.04	I
I	В	Ι	496.4	Ι	330.9	Ι	20.2	I	0.04	Ι		20.2	I	0.04	I
I	С	I	396.3	Ι	264.2	Ι	20.2	I	0.05	Ι		20.2	I	0.05	Ι
I	ALL	I	1165.5	Ι	777.0	Ι	51.7	I	0.04	Ι		51.7	I	0.04	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Consent of copyright owner required for any other use. "C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2017 PM Peak - With Development.vai" (drive-on-the-left ) at 15:20:55 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South

ARM C - N2 Slip Road

.GEOMETRIC DATA

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I .\_\_\_\_\_ I ARM A I I ARM A I 3.50 I 8.00 I 30.00 I I ARM B I 3.50 I 9.50 I 30.00 I I ARM C I 7.00 I 9.00 I 30.00 I 20.00 I 60.00 I 51.0 20.00 I 60.00 I 49.0 3.00 I 13.00 I 53.0 I 0.562 I I 0.596 I 30.623 Т 33.767 Ι 53.0 I 0.551 I 28.086 I

 $V = approach \ half-width \qquad \qquad L = effective \ flare \ length \ E = entry \ width \qquad \qquad R = entry \ radius$ 

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

1

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2017 PM Peak - With Development

I	I NUMBER OF	MINUTES FROM	START WHEN	I RATE	OF FLOW (VEH/MIN) I
I ARM	I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP I AFTER I
I	I TO RISE	I IS REACHED	IFALLING I	PEAK I	OF PEAK I PEAK I
I ARM A	I 15.00	I 45.00	I 75.00	I 2.50	I 3.75 I 2.50 I
I ARM B	I 15.00	I 45.00	I 75.00	I 4.54	I 6.81 I 4.54 I
I ARM C	I 15.00	I 45.00	I 75.00	I 3.61	I 5.42 I 3.61 I

DEMAND SET TITLE: 2017 PM Peak - With Development

I		I		Ι	TURNING PROPORTIONS I
I		I		Ι	TURNING COUNTS (VEH/HR) I
I		I		(P	PERCENTAGE OF H.V.S) I
I					
I	TIME	I	FROM/1	O I	I ARM A I ARM B I ARM C I
I	16.30 - 18.00	Ι			I I I
I		Ι	ARM A	A I	I 0.000 I 0.560 I 0.440 I
I		I		I	I 0.0 I 112.0 I 88.0 I
I		I		I	I ( 0.0)I ( 8.0)I ( 5.0)I
I		I		I	I I I I
I		I	ARM E	3 I	I 0.512 I 0.000 I 0.488 I
I		I		I	I 186.0 I 0.0 I 177.0 I
I		I		Ι	I ( 9.0) I ( 0.0) I ( 9.0) L
I		I			I 0.512 I 0.000 I 0.488 I 1 186.0 I 0.0 I 177.0 I 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
I		I	ARM (	ː	I 0.000 I 0.560 I 0.440 I I 0.0 I 112.0 I 88.0 I I (0.0)I (8.0)I (5.0)I I I I I I 0.512 I 0.000 I 0.488 I I 186.0 I 0.0 I 177.0 I I (9.0)I (0.0)I (9.0)I I I I I 0.443 I 0.557 I 0.000 Retrict
I		Ι		I	I 128.0 I 161.0 I
I		I		I	I ( 9.0) I ( 10.0) I ( 000) I
I		I			I I I'II'S ALL I
					* 203

				Con						
I TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I 16.30-1	6.45		(100)	(I LDS/ HIN)	( V 1110 )	( V 1115 )	TIME SECRETALY	TITHE SHOTHENT)	VEHICLE (HIN)	T
I ARM A	2.50	27.54	0.091		0.0	0.1	1.5		0.04	I
I ARM B	4.54	30.35	0.150		0.0	0.2	2.6		0.04	Ι
I ARM C	3.61	24.36	0.148		0.0	0.2	2.6		0.05	Ι
I										Ι
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I 16.45-1	7.00									Ι
I ARM A	2.99	27.31	0.109		0.1	0.1	1.8		0.04	Ι
I ARM B	5.42	30.22	0.179		0.2	0.2	3.2		0.04	Ι
I ARM C	4.31	24.11	0.179		0.2	0.2	3.2		0.05	Ι
I										Ι
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I 17.00-1	7.15									Ι
I ARM A	3.66	27.00	0.135		0.1	0.2	2.3		0.04	Ι
I ARM B	6.64	30.05	0.221		0.2	0.3	4.2		0.04	Ι
I ARM C	5.28	23.77	0.222		0.2	0.3	4.2		0.05	Ι
I										I

-	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING
ARM A	3.66	26.99	0.135		0.2	0.2	2.3		0.04
ARM B		30.05			0.3	0.3	4.2		0.04
	5.28	23.77	0.222		0.3	0.3	4.3		0.05
[									
								GEOMETRIC DELAY	
								(VEH.MIN/	
- [	( V 111/ 11111)	( V = 117 11111 )	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
17.30-1	7.45		, -,	, , ,	/	, -,	,	,	,
	2.99	27.31	0.109				1.9		0.04
ARM B	5.42 4.31	30.22	0.179		0.3	0.2	3.3 3.3		0.04 0.05
ARM C	4.31	24.11	0.179		0.3	0.2	3.3		0.05
TIME								GEOMETRIC DELAY	
	(VEH/MIN)							(VEH.MIN/	
. 17 45 1			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	8.00 2.50	27 53	0 091		0 1	0 1	1.5		0.04
ARM C	4.54 3.61	24.36	0.148		0.2	0.2	2.7 2.7		0.04 0.05
Ī.									
QUEUE AT A	ARM A						other use.		
TIME SEGI	ARM A  MENT NO.  VEHICL  IN QUE	JES			dut	goses only.	nary other use.		
TIME SEGI	MENT NO. VEHICI IN QUE	LES QUE			tion put	poses only.	any other use.		
TIME SEGI ENDING	MENT NO. VEHICI	LES CUE			pection puret	poses only.	any other use.		
TIME SEGI ENDING 16.45 17.00 17.15	MENT NO. VEHICI IN QUE  0. 0.	LES CUE 1 1 2		in	Specifor purification of the control	edited to	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30	MENT NO. VEHICI IN QUE  0. 0. 0.	LES CUE 1 1 2 2		Fortiff	spection put	pages only.	any other use.		
TIME SEGI ENDING 16.45 17.00 17.15	MENT NO. VEHICI IN QUE  0. 0.	LES CUE 1 1 2 2 1		Folia Folia	Recitor Difference	poses only.	any other use.		
TIME SEGI ENDING 16.45 17.00 17.15 17.30 17.45	MENT NO. VEHICI IN QUE  0. 0. 0. 0.	LES CUE 1 1 2 2 1		Folia Folia	spection put fight owner	poses only.	any other use.		
TIME SEGI ENDING 16.45 17.00 17.15 17.30 17.45	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	LES CUE 1 1 2 2 1		Gonsent of cook	spection put fight owner	poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  DUEUE AT 2	MENT NO. VEHICI IN QUE  0. 0. 0. 0. ARM B	DES CUE 1 1 1 2 2 2 1 1		Consent of copy	spection put fight owner	poses only.	any other use.		
TIME SEGI ENDING  16.45 17.00 17.15 17.30 17.45 18.00	MENT NO. VEHICI IN QUE  0. 0. 0. 0. ARM B	DES CUE 1 1 1 2 2 2 1 1 1		For in	specifor purification of the second	poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  DUEUE AT 2	MENT NO. VEHICI IN QUE  0. 0. 0. 0. ARM B MENT NO. VEHICI	LES CUE 1 1 2 2 1 1 1		For its	specification of the state of t	Poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  DUEUE AT ATTIME SEGIENDING	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE	DES CUE 1 1 1 2 2 1 1 1 OF JES CUE		Folik Consent of conv	spection purel	Poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  DUEUE AT ATTIME SEGIENDING	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0.  ARM B VEHICI IN QUE IN QUE	DES CUE 1 1 1 2 2 1 1 1 OF JES CUE 2 2		Gonsent of cons	spection put fight owner	poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  TIME SEGIENDING  16.45 17.00 17.15 17.30	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. VEHICI IN QUE IN QUE  0. 0. 0.	LES CUE 1 1 1 2 2 2 1 1 1 OF LES CUE 2 2 3		Gonsent of cook	specification put	poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  DUEUE AT ATTEMPT SEGIENDING  16.45 17.00 17.15 17.30 17.45	MENT NO. VEHICI IN QUE  O. O. O. O. O. VEHICI IN QUE  IN QUE  O.	DES CUE  1		Gonsent of cook	specification put	poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  TIME SEGIENDING  16.45 17.00 17.15 17.30	MENT NO. VEHICI IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE  IN QUE  O. O.	DES CUE  1		For in	Rection outer	Poses only.	any other use.		
TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  DUEUE AT ATTEMPT SEGIENDING  16.45 17.00 17.15 17.30 17.45	MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. 1. VEHICI IN QUE  MENT NO. VEHICI IN QUE  0. 0. 0. 0. 0. 0. 0. 0.	DES CUE  1		Gonsent of cons	specification of the state of t	poses only.	any other use.		

TIME SEGMENT NO. OF ENDING VEHICLES IN QUEUE

16.45 0.2 17.00 0.2 17.15 0.3 17.30 0.3 17.45 0.2 18.00 0.2

I	ARM	Ι	TOTAI	_ I	DEMAND	Ι	-					QUEUEING *	
Ι		Ι				Ι	* DE	ELAY *	Ι	*	DE1	LAY *	Ι
Т		Т-											— Т
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	A	I	274.2	I	182.8	I	11.3 I	0.04	I	11.3	I	0.04	I
Ι	В	I	497.7	Ι	331.8	Ι	20.2 I	0.04	Ι	20.2	Ι	0.04	Ι
Ι	С	Ι	396.3	Ι	264.2	Ι	20.2 I	0.05	Ι	20.2	I	0.05	Ι
Ι	ALL		1168.3	I	778.8	I	51.8 I	0.04	Ι	51.8	I	0.04	 I

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2022 PM Peak - No Development.vai" (drive-on-the-left ) at 15:21:55 on Thursday, 1 December 2016

# .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I	3.50	I			30.00					I	51.0	I	0.562	Ι		I
I ARM B I	3.50	I	9.50	I	30.00	I	20.00	I	60.00	I	49.0	I	0.596	I	33.767	I
I ARM C I	7.00	I	9.00	I	30.00	I	3.00	Ι	13.00	I	53.0	Ι	0.551	Ι	28.086	Ι

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

#### .TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
Ι	A	Ι		100	Ι
Ι	В	Ι		100	Ι
Ι	С	Ι		100	Ι

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2022	PM	Peak	_	No	Development
--------	-----	--------	------	----	------	---	----	-------------

I	I NUM	BER OF I	MINUTE	S FROM S	START	WHEN	Ι	RATE	OF E	/ WOL	/EH/	MIN)	I
I ARM	I FLOW	STARTS	I TOP	OF PEAK	I FLO	W STOPS	I	BEFORE	I Al	TOP	ΙA	FTER	Ι
I	I TO	RISE	I IS	REACHED	IFALI	ING I	PΙ	EAK I	OF F	PEAK I	PEA	K I	
I ARM A	. I 1	5.00	I	45.00	I	75.00	I	2.58	I	3.86	I	2.58	I
I ARM B	5 I 1	5.00	I	45.00	I	75.00	I	4.70	I	7.05	I	4.70	Ι
I ARM C	I 1	5.00	I	45.00	I	75.00	Ι	3.75	I	5.63	Ι	3.75	Ι

#### DEMAND SET TITLE: 2022 PM Peak - No Development

I		Ι		T	TURNING PROPORTIONS I
I		I		T	TURNING COUNTS (VEH/HR) I
I		I		(PI	PERCENTAGE OF H.V.S) I
I					·
I	TIME	I	FROM/TO	I	I ARM A I ARM B I ARM C I
	16 20 10 00				
I	16.30 - 18.00	I		Ι	
Ι		I	ARM A		[ 0.000 I 0.563 I 0.437 I
Ι		I		Ι	I 0.0 I 116.0 I 90.0 I
I		I		Ι	I ( 0.0)I ( 8.0)I ( 5.0)I
I		I		I	
I		I	ARM B	I	1 0.000 I 0.563 I 0.437 I 0.00 I 116.0 I 90.0 I 0.00 I 116.0 I 90.0 I 0.00 I 0.513 I 0.000 I 0.487 I 0.513 I 0.00 I 183.0 I 0.50 I 0.443 I 0.557 I 0.000 I 0.00 I 0.50 I 0.50 I 0.00 I 0.443 I 0.557 I 0.000 I 0.00 I 0.00 I 0.00 I 0.443 I 0.557 I 0.000 I 0.00
I		I		I	[ 193.0 I 0.0 I 183.0 I 🔊
I		I		I	[ ( 9.0) I ( 0.0) I ( 9.0) I ( 9.0)
I		I		I	I I I WE WILL
I		I	ARM C	I	I 0.443 I 0.557 I 0.000 K
I		I		I	I 133.0 I 167.0 I 👸 🧭
I		I		I	[ ( 9.0) I ( 10.0) I ( 0.00) I
I		I		I	I I III III
					<del>\(\daggregarting\)</del>

_					Cov						
I I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	16.30-1	.6.45									Ι
I	ARM A	2.58	27.49	0.094		0.0	0.1	1.5		0.04	Ι
I	ARM B	4.70	30.33	0.155		0.0	0.2	2.7		0.04	Ι
Ι	ARM C	3.75	24.31	0.154		0.0	0.2	2.7		0.05	Ι
Ι											Ι
_											
·I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	16.45-1	7.00									Ι
I	ARM A	3.07	27.26	0.113		0.1	0.1	1.9		0.04	Ι
I	ARM B	5.61	30.21	0.186		0.2	0.2	3.4		0.04	Ι
Ι	ARM C	4.48	24.05	0.186		0.2	0.2	3.4		0.05	Ι
Ι											Ι
_											
Ī	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	17.00-1	7.15									Ι
I	ARM A	3.77	26.93	0.140		0.1	0.2	2.4		0.04	Ι
I	ARM B	6.87	30.03	0.229		0.2	0.3	4.4		0.04	Ι
Ι	ARM C	5.48	23.70	0.231		0.2	0.3	4.4		0.05	Ι
I											Ι
_											

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)			START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	
I	17 15-1	7.30		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	IIME SEGMENI)	TIME SEGMENT)	VEHICLE (MIN) I
т	ARM A	7.30	26 93	0 140		0.2	0.2	2.4 4.4 4.5		0.04 I
T	ARM B	3.77 6.87	30.03	0.229		0.3	0.3	4.4		0.04 I
Т	ARM C	5 48	23 70	0.223		0.3	0.3	4 5		0.05 I
I	11141 0	3.10	23.70	0.231		0.0	0.5	1.0		J.03
					PEDESTRIAN		END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY I
I		(VEH/MIN)	(VEH/MIN)				QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN) I
		7.45								I
		3.07				0.2	0.1	1.9		0.04 I
	ARM B		30.20			0.3		3.5		0.04 I
I.	ARM C	4.48	24.05	0.186		0.3	0.2	3.5		0.05 I
	TIME				PEDESTRIAN		END		GEOMETRIC DELAY	
		(VEH/MIN)	(VEH/MIN)						(VEH.MIN/	
I	17 45 1	0.00		(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	
		8.00	27 40	0 004		0.1	0.1	1 6		0.04 I
	ARM A ARM B	2.58 4.70	30.33				0.1	1.6 2.8		0.04 I
		3.75		0.155		0.2	0.2	2.8		0.04 I
I	AITH C	3.75	24.51	0.134		0.2	0.2	2.0		0.05 I
					Consent of cons			<del>-</del>		
.OU	EUE AT	ARM A						nert		
							. 4.	N Oli		
							Only.	all		
		MENT NO.					es X to	•		
	ENDING	VEHICI					20° Hel			
		IN QUE	SUE			QU	edi			
	16.45	0.	1			ion et	Y			
	17.00	0.	1			Decr Mile				
	17.15	0.			.70	is hit				
	17.30	0.			cot,	198				
	17.45	0.			108	2.				
	18.00	0.			i of co					
					aseni					
.OU	EUE AT	ARM B			Collin					
Т	IME SEG	MENT NO.	OF							
	ENDING	VEHICI	LES							
		IN QUE	EUE							
	16.45	0.								
	17.00	0.								
	17.15	0.								
	17.30	0.								
	17.45	0.								
	18.00	0.	. 2							
.QU	EUE AT									
T	IME SEG	MENT NO.	OF							
	ENDING	VEHICI								
		IN QUE	EUE							

16.45 0.2 17.00 0.2 17.15 0.3 17.30 0.3 17.45 0.2 18.00 0.2

17.15 17.30 17.45 18.00

I	ARM	I	TOTA	LI	DEMAND	Ι	* QUE	EUEING *	I	* INCLUS	IVE	QUEUEING *	I
I		I				Ι	* DI	ELAY *	Ι	*	DEI	LAY *	I
I		I-											- I
I		Ι	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	Ι
I	A	I	282.5	I	188.3	I	11.7	0.04	Ι	11.7	I	0.04	I
I	В	I	515.6	Ι	343.7	Ι	21.2	0.04	Ι	21.2	I	0.04	I
I	С	Ι	411.4	Ι	274.2	Ι	21.3	0.05	Ι	21.3	I	0.05	Ι
I	ALL	Ι	1209.4	Ι	806.3	Ι	54.2	0.04	Ι	54.2	I	0.04	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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RG40 3GA IIV

RG40 3GA,UK

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

Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2022 PM Peak - With Development.vai" (drive-on-the-left ) at 15:22:48 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of convigit owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50	I	9.50	I		I	20.00	I	60.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I

V = approach half-width E = entry width

L = effective flare length
R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
Ι	A	Ι		100	Ι
Ι	В	Ι		100	Ι
Ι	С	Ι		100	Ι

1

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2022	PΜ	Peak	_	With	Development
--------	-----	--------	------	----	------	---	------	-------------

IN) I
TER I
I
.59 I
.71 I
.75 I

#### DEMAND SET TITLE: 2022 PM Peak - With Development

I		I		Τ	RNING PROPORTIONS I	
I		I		Τ	RNING COUNTS (VEH/HR) I	
I		I		(P	RCENTAGE OF H.V.S) I	
I						
I	TIME	I	FROM/T	0 I	ARM A I ARM B I ARM C I	
т	16.30 - 18.00	т		 I	т т т	
T T	10.30 - 10.00		A DM A			
Τ.		_	ARM A		0.000 1 0.360 1 0.440 1	reo.
Τ		1		_	0.0 I 116.0 I 91.0 I	of the
I		Ι		I	( 0.0)I ( 8.0)I ( 5.0)I	ine.
I		I		I	I I I	1. 40
I		I	ARM B	I	0.512 I 0.000 I 0.488 I	did any other use.
I		I		I	0.512 I 0.000 I 0.488 I 193.0 I 0.0 I 184.0 I ( 9.0) I ( 0.0) I ( 9.0) I	(60)
I		I		I	( 9.0)I ( 0.0)I ( 9.0)I	<b>&gt;</b> '
I		I		I	I I MER WILL	
I		I	ARM C	I	0.443 I 0.557 I 0.000 K	
I		I		I	133.0 I 167.0 I 👸 🥸 🔯	
I		I		I	( 9.0) I ( 10.0) I ( 0.0) I	
I		I		I	I INTEGIT I	

_					<del>Cov</del>						
I I I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	,	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	Ι
I	16.30-1	.6.45									Ι
I	ARM A	2.59	27.50	0.094		0.0	0.1	1.5		0.04	Ι
I	ARM B	4.71	30.33	0.155		0.0	0.2	2.7		0.04	Ι
I	ARM C	3.75	24.31	0.154		0.0	0.2	2.7		0.05	Ι
I											Ι
Ī	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	16.45-1	7.00									Ι
I	ARM A	3.09	27.26	0.113		0.1	0.1	1.9		0.04	Ι
I	ARM B	5.63	30.20	0.186		0.2	0.2	3.4		0.04	Ι
I	ARM C	4.48	24.05	0.186		0.2	0.2	3.4		0.05	Ι
I											Ι
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	17.00-1	7.15									Ι
I	ARM A	3.78	26.93	0.141		0.1	0.2	2.4		0.04	Ι
I	ARM B	6.89	30.02	0.230		0.2	0.3	4.4		0.04	Ι
I	ARM C	5.48	23.70	0.231		0.2	0.3	4.4		0.05	Ι
Ι											Ι
_											

I TIME I (VE	EH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING
I 17.15-17.30 I ARM A I ARM B	3.78 6.89		0.140		0.2	0.2	2.4 4.5 4.5	TIME SEGMENT)	0.04 0.04 0.05
I TIME I (VE	DEMAND CH/MIN)	 CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 17.30-17.45 I ARM A I ARM B I ARM C I	3.09 5.63 4.48	30.20 24.05	0.186 0.186		0.3	0.2	1.9 3.5 3.5		0.04 0.04 0.05
I TIME I (VE	DEMAND CH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 17.45-18.00 I ARM A I ARM B I ARM C I	2.59		0.155		0.1 0.2 0.2	0.2	1.6 2.8 2.8		0.04 0.04 0.05
.QUEUE AT ARM						74.	any other use.		
TIME SEGMENT ENDING	NO. VEHICL IN QUE	ES			a Pili	poses only	· S		
16.45 17.00 17.15 17.30 17.45 18.00	0. 0. 0. 0.	1 2 2 1		For in	spection fer	•			
.QUEUE AT ARM				Cotteer					
TIME SEGMENT ENDING	NO. VEHICL IN QUE	ES							
16.45 17.00 17.15 17.30 17.45 18.00	0. 0. 0. 0.	2 3 3 2							
.QUEUE AT ARM									
TIME SEGMENT ENDING	NO. VEHICL IN QUE	ES							

0.2 0.2 0.3 0.3 0.2

16.45 17.00 17.15 17.30 17.45 18.00

I	ARM	I	TOTA	LI	DEMAND	Ι	* QU	EU:	EING *	Ι	*	INCLUSI	VE	QUEUEING *	I
I		Ι				I	* D	EL	AY *	Ι		*	DEI	LAY *	I
I		I-													-I
I		I	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι		(MIN)		(MIN/VEH)	Ι
I	A	I	283.8	I	189.2	I	11.8	Ι	0.04	Ι		11.8	I	0.04	I
I	В	Ι	516.9	Ι	344.6	Ι	21.2	Ι	0.04	Ι		21.2	I	0.04	I
I	С	I	411.4	Ι	274.2	Ι	21.3	I	0.05	Ι		21.3	I	0.05	Ι
I	ALL	I	1212.2	Ι	808.1	Ι	54.3	Ι	0.04	Ι		54.3	I	0.04	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
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END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2022 PM Peak - With Development + Sensitivity Flows.vai" (drive-on-the-left ) at 15:31:53 on Thursday, 1 December 2016

### .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 17/07/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-02 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN	) I
I ARM A I I ARM B I	3.50 3.50	I	8.00 9.50	I I	30.00	I	20.00	I	60.00	I	49.0	I	0.562	_	33.767	I
I ARM C I	7.00 	I 	9.00 	I 	30.00	I	3.00	I	13.00	I	53.0 	I	0.551	Ι	28.086 	I

V = approach half-width E = entry width

L = effective flare length
R = entry radius

D = inscribed circle diameter

PHI = entry angle

#### .TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
т		т		100	т
_	В	I		100	I
Ι	С	Ι		100	Ι

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2022 PM Peak - With Development + Sensitivity Fl	DEMAND	SET	TITLE:	2022	ΡM	Peak	-	With	Development	+	Sensitivity	Flows	
--	--------	-----	--------	------	----	------	---	------	-------------	---	-------------	-------	--

I	I NUMBER OF	MINUTES FROM	START WHEN	I RATE	OF FLOW (VEH/MIN) I
I ARM	I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP I AFTER I
I	I TO RISE	I IS REACHED	IFALLING I	PEAK I	OF PEAK I PEAK I
I ARM A	I 15.00	I 45.00	I 75.00	I 2.86	I 4.29 I 2.86 I
I ARM B	I 15.00	I 45.00	I 75.00	I 4.99	I 7.48 I 4.99 I
I ARM C	15.00	I 45.00	I 75.00	I 3.75	I 5.63 I 3.75 I

DEMAND SET TITLE: 2022 PM Peak - With Development + Sensitivity Flows

•								
I		I		ΤŪ	JRNING PRO	OPORTIONS	I	
I		I		ΤŪ	JRNING COU	JNTS (VEH,	/HR) I	
I		I		(PI	ERCENTAGE	OF H.V.S)	I	
Ι								
I	TIME	I	FROM/TO	I	ARM A I	ARM B I	ARM C I	
I	16.30 - 18.00	I		Ι	I	I	I	
I		I	ARM A	Ι	0.000 I	0.507 I	0.493 I	Ø1*
I		I		Ι	0.0 I	116.0 I	113.0 I	, 150
I		I		Ι	( 0.0)I	( 8.0)I	( 5.0)I	her
I		I		Ι	I	I	I	101
I		I	ARM B	Ι	0.484 I	0.000 I	0.516 I	Roses only, any other use.
I		I		Ι	193.0 I	0.0 I	206.0 I	SO KOT
Ι		I		Ι	( 9.0)I	( 0.0)I	( 9.0)I	Ser ad t
Ι		I		Ι	·	·	· S	Palite
I		I	ARM C	Ι	0.443 I	0.557 I	0.000 I	ecc
I		I		I	133.0 I	167.0 I	io her	peetited for any c
Т		Т			( 9.0)I		(Se 00.9) I	
T		T		T	( J.0,1	( 10.0/1	De the T	
							1300	
						Y 3	22,	

. –											
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/		Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	16.30-1										Ι
	ARM A	2.86	27.54	0.104		0.0	0.1	1.7		0.04	Ι
	ARM B	4.99	30.17	0.165		0.0	0.2	2.9		0.04	Ι
	ARM C	3.75	24.31	0.154		0.0	0.2	2.7		0.05	Ι
Ι											Ι
·I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
Ι		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
Ι				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
Ι	16.45-1	7.00									Ι
Ι	ARM A	3.42	27.30	0.125		0.1	0.1	2.1		0.04	Ι
Ι	ARM B	5.96	30.01	0.198		0.2	0.2	3.7		0.04	Ι
Ι	ARM C	4.48	24.05	0.186		0.2	0.2	3.4		0.05	Ι
I											Ι
-											
·-	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т
T		(VEH/MIN)	(VEH/MIN)	,	FLOW	OUEUE	OUEUE	(VEH.MIN/	(VEH.MIN/		T
T		(VDII/IIIII)	( V 111 / 1111 /	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	_
T	17.00-1	7 15		(10.0)	(I DDO/ IIIII)	( V 1110 )	( V 1110 )	TITE ODGEDINT,	IIID ODOIDNI)	VEHICOED (HILW)	T
	ARM A	4.19	26.98	0.155		0.1	0.2	2.7		0.04	T
	ARM B	7.29	29.79	0.245		0.2	0.3	4.8		0.04	T
	ARM C	5.48	23.70	0.231		0.2	0.3	4.4		0.05	T
Т	111111 0	J. 10	23.70	J.2J1		0.2	0.0	1.1		0.00	T
_											

I TIME I (VE		CAPACITY VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING
I 17.15-17.30 I ARM A I ARM B I ARM C	4.19 7.29 5.48	26.98 29.79 23.70	0.155 0.245 0.231		0.2 0.3 0.3	0.2 0.3 0.3	2.7 4.8 4.5	TIME SEGMENT)	0.04 0.04 0.05
I TIME	DEMAND CH/MIN) (	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY
I ARM A I ARM B I ARM C I	3.42 5.96 4.48	30.01 24.05	0.198 0.186		0.3	0.2	2.2 3.8 3.5		0.04 0.04 0.05
I TIME I (VE	DEMAND CH/MIN) (	CAPACITY VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	END QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 17.45-18.00 I ARM A I ARM B I ARM C I	2.86		0.165		0.1 0.2 0.2	0.2	1.8 3.0 2.8		0.04 0.04 0.05
.QUEUE AT ARM						7A.	ony other use.		
TIME SEGMENT ENDING	NO. O VEHICLE IN QUEU	S			2 Pul	poses offici	.00		
16.45 17.00 17.15 17.30 17.45 18.00	0.1 0.1 0.2 0.2 0.1			For in	spection de la section de la s	•			
.QUEUE AT ARM				Cottger					
TIME SEGMENT ENDING	NO. O VEHICLE IN QUEU	S							
16.45 17.00 17.15 17.30 17.45	0.2 0.2 0.3 0.3 0.2								
.QUEUE AT ARM									
TIME SEGMENT ENDING	NO. O VEHICLE IN QUEU	S							

16.45 0.2 17.00 0.2 17.15 0.3 17.30 0.3 17.45 0.2 18.00 0.2

I	ARM	I	TOTAL	LI	DEMAND	Ι	* QU	EUI	EING *	I	*	INCLUSI	VE	QUEUEING *	I
I		I				Ι	* D:	EL	AY *	Ι		*	DEI	LAY *	I
I		I-													-I
I		I	(VEH)		(VEH/H)	Ι	(MIN)		(MIN/VEH)	Ι		(MIN)		(MIN/VEH)	Ι
I	A	I	314.0	I	209.3	I	13.2	I	0.04	I		13.2	I	0.04	I
I	В	Ι	547.1	Ι	364.7	Ι	23.0	Ι	0.04	Ι		23.0	I	0.04	I
I	С	I	411.4	I	274.2	I	21.3	I	0.05	I		21.3	I	0.05	I
I	ALL	I	1272.5	Ι	848.3	Ι	57.5	Ι	0.05	Ι		57.5	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2032 PM Peak - No Development.vai" (drive-on-the-left ) at 15:33:09 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

Consent of copyright owner required for any other use.

I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I ARM A I I ARM B I I ARM C I	3.50	I	9.50	I		I	20.00	I	60.00 60.00 13.00	I	49.0	I	0.562 0.596 0.551	I	33.767	I I I

V = approach half-width E = entry width

L = effective flare length R = entry radius

D = inscribed circle diameter

PHI = entry angle

#### .TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND	SET	TITLE:	2032	PΜ	Peak	_	No	Development
--------	-----	--------	------	----	------	---	----	-------------

I	I N	UMBER OF	MINUT	ES FROM	START	WHEN	Ι	RATE	OF	FLOW (	(VEH	/MIN)	I
I ARM	I FLO	W STARTS	I TOP	OF PEAK	I FL	OW STOPS	I	BEFORE	I	AT TOP	I	AFTER	I
I	I T	O RISE	I IS	REACHED	IFAL	LING I	Ρ	EAK I	OF	PEAK I	PE	AK I	
I ARM A	I	15.00	I	45.00	I	75.00	I	2.67	I	4.01	I	2.67	I
I ARM E	3 I	15.00	I	45.00	I	75.00	Ι	4.90	Ι	7.35	I	4.90	Ι
I ARM C	I	15.00	I	45.00	I	75.00	Ι	3.90	Ι	5.85	Ι	3.90	I

#### DEMAND SET TITLE: 2032 PM Peak - No Development

I I I I		I I I		T	JRNING PRO JRNING COU ERCENTAGE	JNTS (VEH,	/HR) I
I	TIME	I	FROM/T	O I	ARM A I	ARM B I	ARM C I
	16.30 - 18.00			I		I	
I		I	ARM A	I	0.000 I	0.565 I	0.435 I
I		I		I	0.0 I	121.0 I	93.0 I
I		I		I	( 0.0)I	( 8.0)I	( 5.0)I
I		I		I		I	I
I		I	ARM B	I	0.513 I	0.000 I	0.487 I
I		I		I	0.513 I 201.0 I ( 9.0)I I 0.442 I	0.0 I	0.435 I 93.0 I ( 5.0) I 0.487 I 191.0 I ( 9.0) I
I		I		I	( 9.0)I	( 0.0)I	( 9.0) J
I		I		I	I	I	aN <del>É</del>
I		I	ARM C	I	0.442 I	0.558 I	0.000 1
I		I		I	138.0 I	174.0 I	go get
I		I		I	( 9.0)I	( 10.0)I	(0°00) I
Ι		I		I	I	Į,	ingin I
							3

					Course						
· I	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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.30-1	6.45									Ι
I	ARM A	2.67	27.44	0.097		0.0	0.1	1.6		0.04	Ι
I	ARM B	4.90	30.31	0.162		0.0	0.2	2.8		0.04	Ι
I	ARM C	3.90	24.26	0.161		0.0	0.2	2.8		0.05	Ι
I											Ι
-											
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	16.45-1	7.00									Ι
I	ARM A	3.19	27.19	0.117		0.1	0.1	2.0		0.04	Ι
I	ARM B	5.85	30.18	0.194		0.2	0.2	3.6		0.04	Ι
I	ARM C	4.66	23.99	0.194		0.2	0.2	3.6		0.05	Ι
I											Ι
-											
I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	17.00-1	7.15									Ι
I	ARM A	3.91	26.86	0.146		0.1	0.2	2.5		0.04	Ι
I	ARM B	7.17	30.00	0.239		0.2	0.3	4.6		0.04	Ι
I	ARM C	5.70	23.62	0.241		0.2	0.3	4.7		0.06	Ι
Т											Т

	(VEH/MIN)	(VEH/MIN)	CAPACITY	PEDESTRIAN FLOW	QUEUE	QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	PER ARRIVING
I					(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
I 17.15-1	7.30								
I ARM A	3.91	26.86	0.146		0.2	0.2	2.6		0.04
		30.00	0.239		0.3	U 3	17		0.04
I ARM C	7.17 5.70	23.62	0.241		0.3	0.3	4.8		0.04
I									
								GEOMETRIC DELAY	
Т	, , ,	, , ,	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)
	7.45		( /	(= == =, ====,	( /	( /	,	,	
		27.19	0.117		0.2	0.1	2.0		0.04
									0.04
I ADM C	5.85 4.66	23 08	0.194		0.3	0.2	3.7 3.7		0.05
I									
								GEOMETRIC DELAY	
	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	8.00								
	2.67				0.1		1.6		0.04
I ARM B	4.90	30.31	0.162		0.2	0.2	2.9		0.04
I ARM C	3.90	24.25	0.161		0.2	0.2	2.9		0.05
[ 									
OUEUE AT A	ARM A						her isc		
						14.	any offi		
TIME SEG						Official	W.		
	MENT NO.	OF				05 1			
ENDING	VEHICI	ES			N	Poses die			
	VEHICI IN QUE	LES LUE			rion pur	required te			
16.45	VEHICI IN QUE	LES CUE			section pur	required te			
16.45 17.00	VEHICI IN QUE 0.	LES EUE .1		.oc	Special pur	poses die			
16.45 17.00 17.15	VEHICI IN QUE 0. 0.	LES CUE 1 1 2		on in	Spection put	required to			
16.45 17.00 17.15 17.30	VEHICI IN QUE 0. 0. 0.	JES CUE 1 1 2 2		Foliti	spection put tight owner	required to			
16.45 17.00 17.15 17.30 17.45	VEHICI IN QUE 0. 0. 0. 0.	LES CUE 1 1 2 2 1		For its	spection put tight owner	poses edite			
16.45 17.00 17.15 17.30	VEHICI IN QUE 0. 0. 0.	LES CUE 1 1 2 2 1		Folits on of copy	spection outer	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE 0. 0. 0. 0. 0.	LES CUE 1 1 2 2 1		For in	Petion pur	Posesified to			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	EES CUE 1 1 2 2 2 1 1		Gonsent of cons	spection put fight owner	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	LES CUE 1 1 2 2 2 1 1		Consent of copy	specifor purification of the control	posestred to			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	DES CUE 1 1 1 2 2 2 1 1 1		Gonsent of cons	spection put fight owner	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B WENT NO. VEHICI	LES CUE 1 1 2 2 1 1 1 OF LES CUE		Gonsent of cons	spection put fight owner	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT 7	VEHICI IN QUE  0. 0. 0. 0. 0. 0.  ARM B MENT NO. VEHICI IN QUE	DES CUE 1 1 2 2 1 1 1 OF JES CUE		Consent of copy	specifor put field owner	Poses redited to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT 7	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE  0. 0.	DES CUE 1 1 1 2 2 2 1 1 1		Consent of cons	specifor put fight owner	Roses redite			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGIENDING	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE  0. 0.	LES CUE 1 1 1 2 2 2 1 1 1 OF LES CUE 2 2 3		For its	specifor put	Posesified it			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGIENDING	VEHICI IN QUE  O. O. O. O. ARM B MENT NO. VEHICI IN QUE  O. O.	DES CUE  1		Gonsent of copy	specification put	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGIENDING	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE  0. 0.	DES CUE  1		Consent of cons	specifor put fight owner	Poses redite			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A ENDING  16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. 0. 0. VEHICI IN QUE  1N QUE  0. 0. 0. 0. 0.	DES CUE  1		Consent of cons	specifor put	Roses redited to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45	VEHICI IN QUE  0. 0. 0. 0. 0. 0. 0. 1. VEHICI IN QUE  0. 0. 0. 0. ARM B  ARM C	DES CUE  1		Gonsent of cons	specification put	Poses redified to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGI ENDING 16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. 0. 0. 1. VEHICI IN QUE  0. 0. 0. 0. ARM B  ARM C	DES CUE  1		Gonsent of cons	spection put fight owner	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGI ENDING 16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  O.	DES CUE  1 1 2 2 1 1 1 OF LES CUE 2 2 3 3 2 2 OF LES		Gonsent of conv	specification put	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT A ENDING  16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT A ENDING  TIME SEGING  TIME SEGING  TIME SEGING  TIME SEGING  TIME SEGING	VEHICI IN QUE  O.	DES CUE  1 1 2 2 1 1 1 OF LES CUE 2 2 3 3 2 2 COF LES CUE		Consent of cons	specification put	Poses redited to			
16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT 7  TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT 7  TIME SEGIENDING	VEHICI IN QUE  0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. ARM B MENT NO. VEHICI IN QUE  0. 0. 0. VEHICI IN QUE IN QUE  IN QUE  O.	DES CUE  1 1 2 2 1 1 1 OF LES CUE 2 2 2 3 3 2 2 OF LES CUE 2		Consent of cons	Section outer	Poses redited to			
16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT 7  TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT 7  TIME SEGIENDING	VEHICI IN QUE  O.	DES CUE  1 1 2 2 1 1 1 OF LES CUE 2 2 3 3 2 2 OF LES CUE 2 2 2 2		Gonzent of conv	specification put	Poses redified to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGI ENDING 16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGI ENDING	VEHICI IN QUE  O.	DES CUE  1		Gonsent of conv	specification put	Poses redired to			
16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT A  TIME SEGIENDING  16.45 17.00 17.15 17.30 17.45 18.00  QUEUE AT A  TIME SEGIENDING	VEHICI IN QUE  O.	DES CUE  1		Gonsent of conv	specification put	Poses redified to			
16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGI ENDING 16.45 17.00 17.15 17.30 17.45 18.00 QUEUE AT A TIME SEGI ENDING	VEHICI IN QUE  O.	DES CUE  1 1 2 2 1 1 1 OF LES CUE 2 2 3 3 2 2 OF LES CUE 2 2 3 3 2 2 2		Consent of cons	specification purification of the second sec	Poses redified to			

Ι	ARM	I	TOTAL	LI	DEMAND	Ι	* QUE				VE	QUEUEING *	Ι
I		I				I	* DE	LAY *	I	*	DE1	LAY *	I
Т		Т-											— Т
I		I	(VEH)		(VEH/H)	Ι	(MIN)	(MIN/VEH)	I	(MIN)		(MIN/VEH)	I
I	A	Ι	293.4	Ι	195.6	Ι	12.3 I	0.04	Ι	12.3	Ι	0.04	Ι
Ι	В	Ι	537.5	Ι	358.3	Ι	22.3 I	0.04	Ι	22.3	I	0.04	Ι
Ι	С	Ι	427.8	Ι	285.2	Ι	22.4 I	0.05	Ι	22.4	I	0.05	Ι
I	ALL	I	1258.8	I	839.2	I	57.0 I	0.05	I	57.0	I	0.05	I

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

Consent of copyright owner required for any other use. "C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2032 PM Peak - With Development.vai" (drive-on-the-left ) at 15:34:09 on Thursday, 1 December 2016

.FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 01/12/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-04 STATUS: TIA DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

I ARM I V (M) I E (M) I L (M) I R (M) I D (M) I PHI (DEG) I SLOPE I INTERCEPT (PCU/MIN) I .\_\_\_\_\_ I ARM A I I ARM A I 3.50 I 8.00 I I ARM B I 3.50 I 9.50 I I ARM C I 7.00 I 9.00 I 30.00 I 30.00 I 20.00 I 60.00 I 51.0 20.00 I 60.00 I 49.0 3.00 I 13.00 I 53.0 I 0.562 I I 0.596 I 30.623 Т 33.767 Ι 53.0 I 0.551 I 30.00 I 28.086 I

 $V = approach \ half-width \qquad \qquad L = effective \ flare \ length \ E = entry \ width \qquad \qquad R = entry \ radius$ 

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
_	A B C	I I I		100 100 100	I I I

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.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2032 PM Peak - With Development

EH/MIN) I
I AFTER I
PEAK I
I 2.69 I
I 4.90 I
I 3.90 I
-

DEMAND SET TITLE: 2032 PM Peak - With Development

								_
I		I		Τ	URNING PR	OPORTIONS		Ι
I		I		Τ	URNING CO	UNTS (VEH	/HR)	Ι
I		I		(P	ERCENTAGE	OF H.V.S	)	Ι
Ι								-
I	TIME	I	FROM/1	го І	ARM A I	ARM B I	ARM C	Ι
								-
I	16.30 - 18.00	I		I	I	I		Ι
I		I	ARM A	A I	0.000 I	0.563 I	0.437	Ι
I		I		I	0.0 I	121.0 I	94.0	Ι
I		I		I	( 0.0)I	( 8.0)I	( 5.0)	Ι
I		I		I	I	I		Ι
I		I	ARM E	3 I	0.513 I	0.000 I	0.487	Ι
I		I		I	201.0 I	0.0 I	191.0	Ι
Ι		Ι				( 0.0)I	( 9.0)	Lc
I		I			, I		0.487 191.0 ( 9.0)	30
I		Ι	ARM (	C I	0.442 I	0.558 I	0.000	I I I I I I
I		I			138.0 I			ĭ
Т		T				( 10.0)I	20 27	Т
T		Т		T		T,	113 ht	T
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						**	97	

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I	TIME	DEMAND	CAPACITY	,	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
Ι		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/		Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	16.30-1		0.5.44								Ι
	ARM A	2.69	27.44	0.098		0.0	0.1	1.6		0.04	Ι
	ARM B	4.90	30.30	0.162		0.0	0.2	2.8		0.04	Ι
	ARM C	3.90	24.26	0.161		0.0	0.2	2.8		0.05	Ι
I											Ι
_											
·	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	16.45-1	7.00									Ι
I	ARM A	3.21	27.19	0.118		0.1	0.1	2.0		0.04	Ι
I	ARM B	5.85	30.17	0.194		0.2	0.2	3.6		0.04	Ι
I	ARM C	4.66	23.99	0.194		0.2	0.2	3.6		0.05	Ι
I											Ι
_											
·-	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т
T		(VEH/MIN)	(VEH/MIN)	,	FLOW	OUEUE	OUEUE	(VEH.MIN/	(VEH.MIN/		T
Т		( V DII / IIII )	( V Δ11/ 11111/	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	-
Т	17.00-1	7 15		(141 0)	(I DDO) IIIIV)	( V 1110 )	( V 1110 )	TITE ODGEDINI,	TITIE OBOTIENT,	VEHICLE (HILL)	T
	ARM A	3.93	26.86	0.146		0.1	0.2	2.5		0.04	T
	ARM B	7.17	29.99	0.239		0.2	0.3	4.6		0.04	T
	ARM C	5.70	23.62	0.241		0.2	0.3	4.7		0.06	T
T		3.70	20.02	0.211		V • 2	0.0	֥ /		0.00	T
_											

I	(VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY	PEDESTRIAN FLOW	START QUEUE	QUEUE	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	PER ARRIVING
I - 13 15 1			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)
	7.30								
	3.93				0.2	0.2	2.6		0.04
I ARM B	7.17 5.70	29.99	0.239		0.3	0.3	4.7 4.8		0.04 0.06
	5.70	23.62	0.241		0.3	0.3	4.8		0.06
								GEOMETRIC DELAY	
I	(1211,11111,	( 1211 / 11111 )	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	(VEH.MIN/ TIME SEGMENT)	VEHICLE (MIN)
	7.45								
									0.04
I ARM B	5.85 4.66	30.17	0.194		0.3	0.2	3.7 3.7		0.04
	4.66	23.98	0.194		0.3	0.2	3.7		0.05
I 									
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY
I	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING
I								TIME SEGMENT)	
17.45-1	8.00								
	2.69				0.1		1.7		0.04
I ARM B	4.90	30.30	0.162		0.2	0.2	2.9		0.04
I ARM C	3.90	24.25	0.161		0.2	0.2	2.9		0.05
I 							<del>_e</del>		
QUEUE AT	ARM A						atherius		
						Ally.	atty Ot		
TIME SEG	MENT NO. VEHICI					oses of for			
	MENT NO. VEHICI IN QUE	ES			n Pul	poses of for			
ENDING	VEHICI IN QUE	EES CUE 1			ection pur	sedified to			
ENDING 16.45 17.00	VEHICI IN QUE 0. 0.	SES SUE 1 1		:0	spection put	poses of for			
16.45 17.00 17.15	VEHICI IN QUE 0. 0.	EES CUE 1 1 2		Coliff	spection put right owner	poses of for positive deal for			
16.45 17.00 17.15 17.30	VEHICI IN QUE 0. 0. 0.	EES CUE 1 1 2 2		Fot its	spection put	goses of for god			
16.45 17.00 17.15 17.30 17.45	VEHICI IN QUE 0. 0. 0. 0.	EES 1 1 2 2 1		Folia Folia	spection put tight owner	poses of for			
16.45 17.00 17.15 17.30	VEHICI IN QUE 0. 0. 0.	EES 1 1 2 2 1		Foling sent of copy	spection put field owner	Positied for			
16.45 17.00 17.15 17.30 17.45	VEHICI IN QUE 0. 0. 0. 0. 0.	EES 1 1 2 2 1		Consent of copy	specification for the state of	Positied for			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	EES CUE 1 1 2 2 2 1 1		Consent of cons	specifor pure	Political for			
16.45 17.00 17.15 17.30 17.45 18.00	VEHICI IN QUE  0. 0. 0. 0. 0. ARM B	DES DUE 1 1 1 2 2 2 1 1		Consent of cons	Rection pures	Positied for			
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-														
I	A	I	294.8	Ι	196.5	Ι	12.4	Ι	0.04	Ι	12.4	I	0.04	I
I	В	I	537.5	I	358.3	Ι	22.3	Ι	0.04	I	22.3	I	0.04	I
Ι	С	Ι	427.8	Ι	285.2	Ι	22.4	Ι	0.05	Ι	22.4	I	0.05	Ι
-														
I	ALL	I	1260.1	I	840.1	I	57.1	Ι	0.05	I	57.1	I	0.05	I
_														

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 4.0 (FEBRUARY 2006)

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Run with file:-

"C:\ARCADY\2016\16047-04\R135 - N2 Roundabout\PM Peak\2032 PM Peak - With Development + Sensitivity Flows.vai" (drive-on-the-left ) at 15:35:10 on Thursday, 1 December 2016

# .FILE PROPERTIES

RUN TITLE: Huntstown Quarry

LOCATION: Huntstown DATE: 17/07/16 CLIENT: Roadstone ENUMERATOR: Roadplan JOB NUMBER: 16047-02 STATUS: TIA

DESCRIPTION:

.INPUT DATA

ARM A - R135 North ARM B - R135 South ARM C - N2 Slip Road

.GEOMETRIC DATA

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I ARM I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I IN	ITERCEPT (PCU/MI	N) I
I ARM A I I ARM B I I ARM C I	3.50	I	9.50	I	30.00	I	20.00	I	60.00	I		I	0.562 0.596 0.551	I	30.623 33.767 28.086	I I I

V = approach half-width E = entry width

L = effective flare length
R = entry radius

D = inscribed circle diameter

PHI = entry angle

.TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

Ι	ARM	Ι	FLOW	SCALE(%)	Ι
I I I	_	I I I		100 100 100	I I I

1

.TIME PERIOD BEGINS 16.30 AND ENDS 18.00 .LENGTH OF TIME PERIOD - 90 MINUTES. LENGTH OF TIME SEGMENT - 15 MINUTES.

.DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: 2032 PM Peak - With Development + Sensi
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													-
I	I NUM	BER OF	MINUTE	S FROM S	START	WHEN	I	RATE	OF F	LOM (/	/EH/	MIN)	Ι
I ARM	I FLOW	STARTS	I TOP	OF PEAK	I FLO	OW STOPS	ΙE	BEFORE	I A	TOP	I A	FTER 1	Ι
I	I TO	RISE	I IS	REACHED	IFALI	LING I	PE	CAK I	OF E	PEAK I	PEA	K I	
													-
I ARM A	I 1	5.00	I	45.00	I	75.00	I	2.89	I	4.33	I	2.89	Ι
I ARM B	I 1	5.00	I	45.00	I	75.00	Ι	5.10	I	7.65	I	5.10	Ι
I ARM C	I 1	5.00	I	45.00	I	75.00	I	3.90	I	5.85	I	3.90	Ι

DEMAND SET TITLE: 2032 PM Peak - With Development + Sensitivity Flows

Ι		I			JΤ	JRNING F	PRC	PORTIONS		Ι
I		I			ΤŲ	JRNING (	COU	NTS (VEH	/HR)	Ι
I		I			(PE	ERCENTAG	ΞE	OF H.V.S	)	Ι
I										
I	TIME	I	FROM/	ТО	Ι	ARM A	Ι	ARM B I	ARM C	Ι
I	16.30 - 18.00	I			Ι		Ι	I		Ι
I		I	ARM	Α	Ι	0.000	Ι	0.524 I	0.476	Ι
I		I			Ι	0.0	Ι	121.0 I	110.0	Ι
I		I			Ι	( 0.0)	Ι	( 8.0)I	( 5.0	) I
I		I			Ι		Ι	I		Ι
I		I	ARM	В	Ι	0.493	Ι	0.000 I	0.507	Ι
Ι		I			Ι	201.0	Ι	0.0 I	207.0	Ι
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QUEUE AND DELAY INFORMATION FOR EACH 18 MIN TIME SEGMENT

I	TIME	DEMAND	CAPACITY	,	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	
I		(VEH/MIN)	(VEH/MIN)		FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/		Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	16.30-1		0.5.45	0 405				4 5			Ι
	ARM A	2.89	27.47	0.105		0.0	0.1	1.7		0.04	Ι
	ARM B	5.10	30.19	0.169		0.0	0.2	3.0		0.04	Ι
	ARM C	3.90	24.26	0.161		0.0	0.2	2.8		0.05	I
Ι											Ι
·	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	Ι
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	PER ARRIVING	Ι
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	Ι
I	16.45-1	7.00									Ι
I	ARM A	3.45	27.22	0.127		0.1	0.1	2.1		0.04	Ι
I	ARM B	6.09	30.03	0.203		0.2	0.3	3.8		0.04	Ι
I	ARM C	4.66	23.99	0.194		0.2	0.2	3.6		0.05	Ι
I											Ι
	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	AVERAGE DELAY	т
T	111111	(VEH/MIN)	(VEH/MIN)	,	FLOW	OUEUE	OUEUE	(VEH.MIN/	(VEH.MIN/		Т
T		( V DII / IIII )	( V 111 / 11111 /	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	_
T	17.00-1	7 15		(141 0)	(I DDD/IIIII)	( V 1110 )	( V 1110 )	TITE ODGEDINI)	TITE ODGEDNI)	VEHICLE (HILLY)	Т
	ARM A	4.22	26.89	0.157		0.1	0.2	2.8		0.04	T
	ARM B	7.46	29.82	0.250		0.3	0.3	4.9		0.04	T
	ARM C	5.70	23.62	0.241		0.2	0.3	4.7		0.06	T
T		3.70	23.02	0.211		· · ·	•••	± • /		0.00	Т

•								CEOMETRIC DELAY		
I TIME I	(VEH/MIN)	(VEH/MIN)	CAPACITY		QUEUE	QUEUE	(VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	PER ARRIVING	Ι
I			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	
	17.30	06.00	0 157		0 0	0 0	0 0		0.04	I
	4.22						2.8		0.04	I
I ARM B	7.46	29.82	0.250		0.3		5.0		0.04	I
	5.70	23.62	0.241		0.3	0.3	4.8		0.06	I I
I 										
I TIME	DEMAND	CAPACTTY	DEMAND /	PEDESTRIAN	 START	FND	DET.AV	GEOMETRIC DELAY	AVERACE DELAY	 т
		(VEH/MIN)	CAPACITY	FI.OW	OHEHE	OHEHE		(VEH.MIN/		
Ī	( V ==== / ===== /	( V 111 / 1111 V )	(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	VEHICLE (MIN)	T
	17.45		(/	(= == = , ==== ,	( /	( /	,			I
	3.45	27.22	0.127		0.2	0.1	2.2		0.04	I
	6.09				0.3	0.3	3.9		0.04	Ι
	4.66						3.7		0.05	I
I										Ι
I TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY	I
I	(VEH/MIN)							TIME SEGMENT)		
	18.00		(1/15 ())	(TITM)	(CHiv)	(vino)	TIME SEGMENT)	IIPE SEGMENI)	ADDITOND (LITIN)	I
	2.89	27 47	0 105		0 1	0 1	1.8		0.04	I
	5.10						3.1		0.04	Ī
	3.90		0.161		0.2	0.2	2.9			
I					**-				0.05	Τ.
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.QUEUE AT				C						
TIME SEC	GMENT NO.	OF								
ENDING	VEHICI									
DINDING	IN QUE									
	TM 501									
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17.00		.3								
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17.45		. 3 . 2								
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.OUEUE AT	ADM C									
~	ARM C									
TIME SEC	GMENT NO.	OF								
ENDING	VEHIC	LES								
	IN QUE	EUE								

16.45 0.2 17.00 0.2 17.15 0.3 17.30 0.3 17.45 0.2 18.00 0.2

## QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

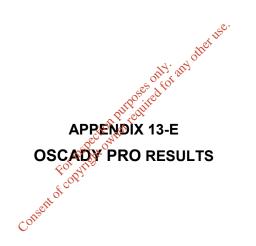
I	ARM	I	TOTAL	L D	EMAND	Ι	* QUI	EUEING *	Ι	* INCLUSI	VE	QUEUEING *	I
I		I				I	* D	ELAY *	I	*	DEI	AY *	I
I		I-											-I
I		I	(VEH)	(	VEH/H)	Ι	(MIN)	(MIN/VEH)	Ι	(MIN)		(MIN/VEH)	I
I	A	Ι	316.7	Ι	211.2	Ι	13.4	I 0.04	I	13.4	I	0.04	I
I	В	Ι	559.5	Ι	373.0	Ι	23.6	0.04	I	23.6	I	0.04	I
I	С	Ι	427.8	Ι	285.2	Ι	22.4	I 0.05	Ι	22.4	Ι	0.05	Ι
I	ALL	Ι	1304.0	Ι	869.3	Ι	59.5	I 0.05	Ι	59.5	I	0.05	Ι

- \* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
- \* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
- \* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

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# **TRAFFIC AND TRANSPORTATION 13**



## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc **Report generation date:** 05/12/2016 16:40:52

# Summary

## **File Description**

T:41 -	(
Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

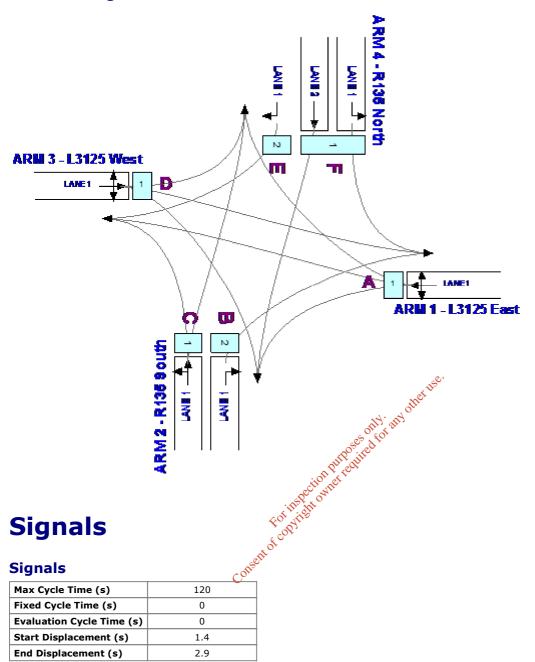
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
					Consent	For Hell o	1.00					

## **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

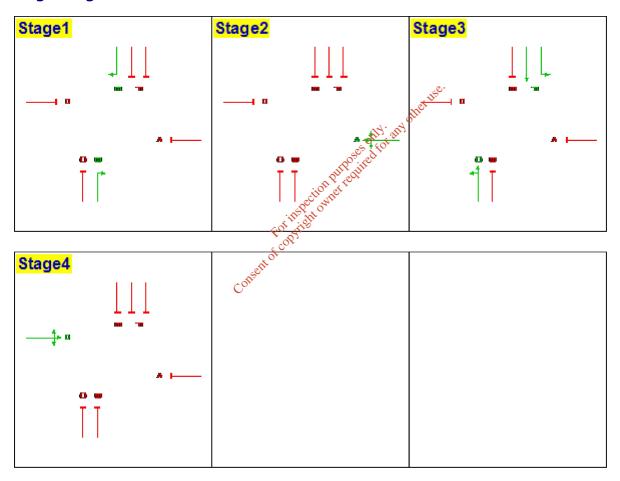
## **Intergreen Matrix**

	То						
		Α	В	С	D	E	F
	Α	-	5	5	5	5	5
	В	6	-	5	6		5
From	С	6	5	-	6	5	
	D	5	5	5	-	5	5
	E	6		5	6	-	5
	F	6	5		6	5	-

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence Name		Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## **Configuration**

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

## **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	Yes	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	<b>8:45</b>	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

## **Demand Set1 - 2016 AM Peak Existing**

## ODTAB Data (PCU/hr during central 60 min peak period)

	То					
		Arm 1	Arm 2	Arm 3	Arm 4	
	Arm 1	-	101	331	93	
From	Arm 2	88	-	224	77	
	Arm 3	163	111	-	11	
	Arm 4	234	137	30	-	

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	394	470	576	576	470	394
2 - R135 South	1	С	228	272	333	333	272	228
2 - R135 South	2	В	67	80	98	98	80	67
3 - L3125 West	1	D	214	255	313	313	255	214
4 - R135 North	1	F	277	330	405	405	330	277
4 - R135 North	2	Е	21	25	31	31	25	21

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	58	20	23
3 - L3125 West	4	57	39
4 - R135 North	58	34	7

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# Sequence3; Objective: MAXIMUM CAPACITY

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	21.48	20.44	20.44	68.8

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	1.30	21.71	21.71	66.40

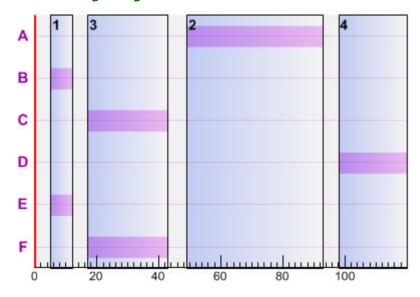
- PRC is the lowest value encountered over all streams and time segments.
- Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

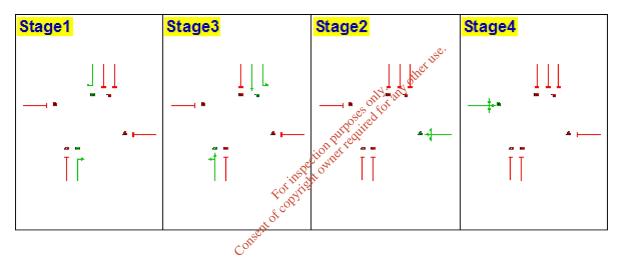
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	26.0	43.0
2	49.0	44.0	93.0
4	98.0	22.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0	,•		
1	5.0	7.0	12.0			ox 115°			
3	17.0	26.0	43.0			othe			
2	49.0	44.0	93.0		Š	IA. SUA			
4	98.0	22.0	0.0		ري د خيمي	801			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	49	44.0	93	S.					
В	5	7.0	12 es						
С	17	26.0	43000						
D	98	22.0	0						
E	5	7.0	12						
F	17	26.0	43						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	480	Α	45.50	39.92	5.32	70.68	27.33	1.24	12.22	10.99	28.10
2	1	278	С	27.50	56.47	4.36	70.36	27.90	1.15	8.72	7.56	10.30
2	2	82	В	8.50	82.36	1.88	61.97	45.23	0.66	3.25	2.58	1.70
3	1	261	D	23.50	64.03	4.64	74.08	21.48	1.45	8.83	7.38	8.00
4	1	337	F	27.50	40.87	3.83	38.85	131.65	0.17	9.46	9.28	19.90
4	2	26	E	8.50	56.91	0.41	19.65	358.02	0.03	0.84	0.81	0.80

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	394	1	45.50	34.32	3.76	58.02	55.12	0.56	9.42	8.85	4.90
2	1	228	3	27.50	48.83	3.09	57.71	55.95	0.53	6.67	6.14	1.80
2	2	67	2	8.50	70.20	1.31	50.64	77.74	0.33	2.43	2.10	0.30
3	1	214	4	23.50	53.71	3.19	60.74	48.17	0.62	6.62	5.99	1.40
4	1	277	6	27.50	39.74	3.06	31.93	181.83	0.10	7.64	7.53	2.90
4	2	21	5	8.50	55.72	0.33	15.87	467.07	0.02	0.67	0.65	0.10

## Traffic Stream Details (07:30-07:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	470	1	45.50	38.93	5.08	69.21	30.04	1.09	11.83	10.74	4.70
2	1	272	3	27.50	54.85	4.14	68.85	30.73	1.00	8.39	7.39	1.70
2	2	80	2	8.50	79.12	1.76	60.46	48.86	0.57	3.08	2.52	0.30
3	1	255	4	23.50	61.41	4.35	72.38	24.34	1.22	8.42	7.20	1.30
4	1	330	6	27.50	40.73	3.73	38.04	136.56	0.16	9.24	9.08	3.30
4	2	25	5	8.50	56.66	0.39	18.89	376.34	0.03	0.81	0.78	0.10

## Traffic Stream Details (07:45-08:00)

Traffic Stream Details (07:45-08:00)												
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	576	1	45.50	50.51	8.08	84.82	6.11	3.09	16.56	13.47	3.70
2	1	333	3	27.50	69.41	6.42	84.29	6.78	2.62	11.79	9.17	1.50
2	2	98	2	8.50	95.38	<b>2</b> .60	74.06	21.52	1.16	4.26	3.10	0.30
3	1	313	4	23.50	81.61	7.10	88.84	1.30	3.50	12.45	8.95	1.10
4	1	405	6	27.50	42.30	4.76	46.69	92.75	0.29	11.61	11.32	3.60
4	2	31	5	8.50	58.11	0.50	23.43	284.15	0.05	1.01	0.97	0.20

	-	51	-	0.50	0.11	0.50	25.15	201113	0.05	1.01	0.57	0.20
Trafí	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	576	1	45.50	52.66	8.43	84.82	6.11	3.21	16.69	13.47	3.70
2	1	333	3	27.50	73.75	6.82	84.29	6.78	2.79	11.96	9.17	1.50
2	2	98	2	8.50	101.46	2.76	74.06	21.52	1.24	4.33	3.10	0.30
3	1	313	4	23.50	90.90	7.90	88.84	1.30	3.89	12.84	8.95	1.10
4	1	405	6	27.50	42.32	4.76	46.69	92.75	0.29	11.62	11.32	3.60
4	2	31	5	8.50	58.15	0.50	23.43	284.15	0.05	1.01	0.97	0.20

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	470	1	45.50	40.09	5.23	69.21	30.04	1.17	11.91	10.74	4.70
2	1	272	3	27.50	57.78	4.37	68.85	30.73	1.12	8.51	7.39	1.70
2	2	80	2	8.50	85.73	1.91	60.46	48.86	0.68	3.20	2.52	0.30
3	1	255	4	23.50	67.99	4.82	72.38	24.34	1.43	8.63	7.20	1.30
4	1	330	6	27.50	40.75	3.74	38.04	136.56	0.17	9.24	9.08	3.30
4	2	25	5	8.50	56.72	0.39	18.89	376.34	0.03	0.81	0.78	0.10

## **Traffic Stream Details (08:30-08:45)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	394	1	45.50	34.63	3.79	58.02	55.12	0.58	9.44	8.85	4.90
2	1	228	3	27.50	49.71	3.15	57.71	55.95	0.56	6.70	6.14	1.80
2	2	67	2	8.50	73.79	1.37	50.64	77.74	0.37	2.47	2.10	0.30
3	1	214	4	23.50	55.28	3.29	60.74	48.17	0.67	6.67	5.99	1.40
4	1	277	6	27.50	39.76	3.06	31.93	181.83	0.11	7.64	7.53	2.90
4	2	21	5	8.50	55.81	0.33	15.87	467.07	0.02	0.67	0.65	0.10

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## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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 $\textbf{File: S:\lobs}\ 2016\ 16047\ New\ Access at\ Huntstown\ Quarry,\ Co.\ Dublin\ 16047-04\ Huntstown\ C\&D\ Waste\ Recovery\ Facility\ TIA\ Reports\ Appendices\ OSCADY\ PRO\ Crossroads.osc$ 

**Report generation date:** 05/12/2016 16:42:10

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
Driving Side	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsent
Evaluation Only	NO TO
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

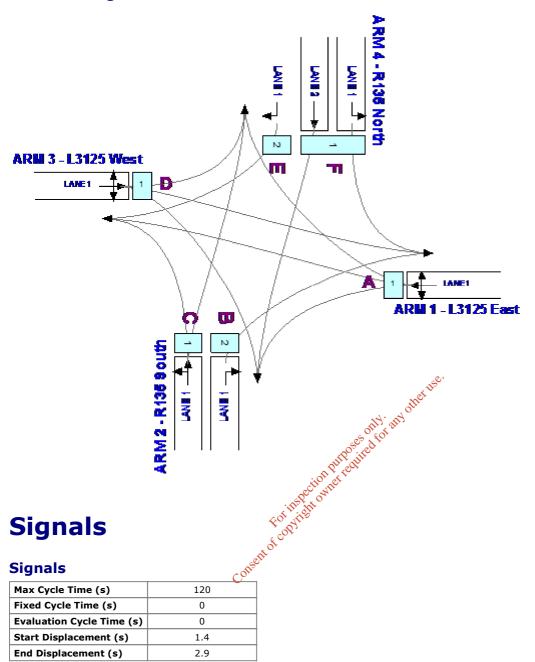
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8, 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	8 15° 300' 300' 15	Yes	3.00	0.0	0
2	2	1				1	1.00 14.00 0.430 1.01 0.01 0.430 1.01 0.01 0.01 0.01 0.01 0.01 0.01 0.	15	No	3.00	0.0	0
3	1	1		4	1	2	0.430160	10	Yes	3.00	0.0	0
4	1	1		1			45.00g	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6790	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

## **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

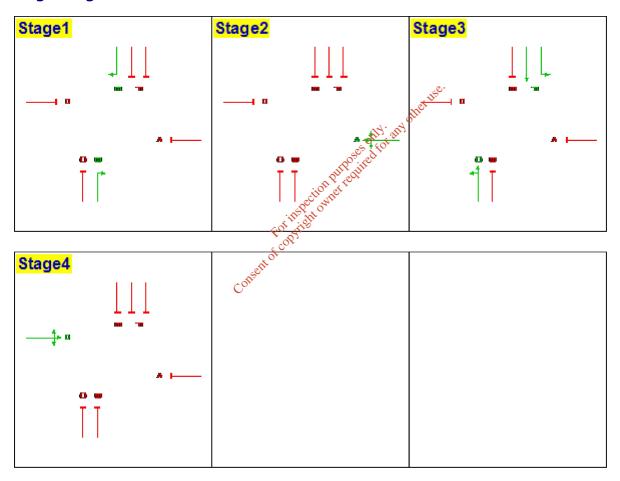
## **Intergreen Matrix**

	То						
		Α	В	С	D	E	F
	Α	-	5	5	5	5	5
	В	6	-	5	6		5
From	С	6	5	-	6	5	
	D	5	5	5	-	5	5
	E	6		5	6	-	5
	F	6	5		6	5	-

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	OBTABLIT	No	D1
2017 AM Peak No Dev	Yes	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	8:45	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

#### **Demand Set2 - 2017 AM Peak No Dev**

## ODTAB Data (PCU/hr during central 60 min peak period)

	То							
		Arm 1	Arm 2	Arm 3	Arm 4			
	Arm 1	-	102	333	94			
From	Arm 2	89	-	226	78			
	Arm 3	164	112	-	11			
	Arm 4	236	138	30	-			

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	397	474	580	580	474	397
2 - R135 South	1	С	230	275	336	336	275	230
2 - R135 South	2	В	68	81	99	99	81	68
3 - L3125 West	1	D	215	257	315	315	257	215
4 - R135 North	1	F	279	333	408	408	333	279
4 - R135 North	2	Е	21	25	31	31	25	21

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	58	20	23
3 - L3125 West	4	57	39
4 - R135 North	58	34	7

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	120.0 21.02		20.71	68.8

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	- 0.66		22.10	66.20

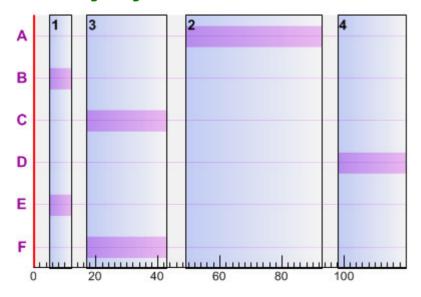
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

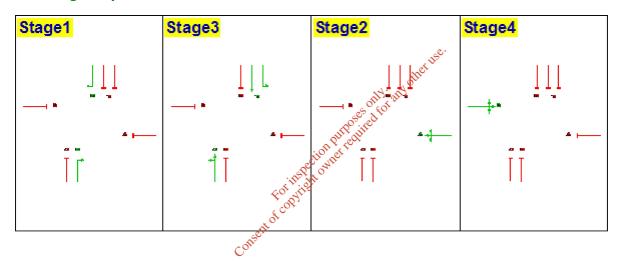
Stage	Start Time (s)	Duration (s)	End Time (s)		
1	5.0	7.0	12.0		
3	17.0	26.0	43.0		
2	49.0	44.0	93.0		
4	98.0	22.0	0.0		

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0	,•		
1	5.0	7.0	12.0			ox 115°			
3	17.0	26.0	43.0			othe			
2	49.0	44.0	93.0		Š	IA. SUA			
4	98.0	22.0	0.0		ري د خيمي	801			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	49	44.0	93	S.					
В	5	7.0	12 es						
С	17	26.0	43000						
D	98	22.0	0						
E	5	7.0	12						
F	17	26.0	43						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	484	Α	45.50	40.25	5.41	71.27	26.28	1.28	12.37	11.09	28.00
2	1	280	С	27.50	56.86	4.42	70.87	26.99	1.19	8.81	7.62	10.30
2	2	83	В	8.50	83.26	1.92	62.73	43.48	0.69	3.31	2.61	1.70
3	1	262	D	23.50	64.32	4.68	74.37	21.02	1.48	8.89	7.41	8.00
4	1	340	F	27.50	40.93	3.87	39.20	129.60	0.18	9.55	9.37	20.00
4	2	26	E	8.50	56.91	0.41	19.65	358.02	0.03	0.84	0.81	0.80

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	397	1	45.50	34.46	3.80	58.46	53.95	0.58	9.50	8.92	4.90
2	1	230	3	27.50	49.03	3.13	58.22	54.60	0.54	6.74	6.19	1.80
2	2	68	2	8.50	70.67	1.33	51.39	75.12	0.34	2.48	2.14	0.30
3	1	215	4	23.50	53.84	3.22	61.03	47.48	0.63	6.66	6.02	1.40
4	1	279	6	27.50	39.78	3.08	32.17	179.81	0.11	7.70	7.59	2.90
4	2	21	5	8.50	55.72	0.33	15.87	467.07	0.02	0.67	0.65	0.10

## Traffic Stream Details (07:30-07:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	474	1	45.50	39.22	5.16	69.80	28.94	1.13	11.97	10.84	4.70
2	1	275	3	27.50	55.33	4.23	69.61	29.30	1.05	8.53	7.48	1.70
2	2	81	2	8.50	79.92	1.80	61.22	47.02	0.59	3.14	2.55	0.30
3	1	257	4	23.50	61.86	4.42	72.95	23.37	1.26	8.52	7.26	1.30
4	1	333	6	27.50	40.79	3.77	38.39	134.43	0.17	9.34	9.17	3.30
4	2	25	5	8.50	56.66	0.39	18.89	376.34	0.03	0.81	0.78	0.10

## Traffic Stream Details (07:45-08:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	580	1	45.50	51.19	8.25	Will 85.41	5.38	3.23	16.81	13.58	3.60
2	1	336	3	27.50	70.51	. 6.58 °	85.05	5.83	2.77	12.02	9.26	1.40
2	2	99	2	8.50	96.58	<b>2</b> 166	74.82	20.29	1.21	4.34	3.13	0.30
3	1	315	4	23.50	82. <b>7</b> 1.3	7.24	89.41	0.66	3.64	12.65	9.01	1.10
4	1	408	6	27.50	42.37	4.80	47.04	91.34	0.30	11.71	11.41	3.70
4	2	31	5	8.50	58.11	0.50	23.43	284.15	0.05	1.01	0.97	0.20

	-	51	-	0.50	0.11	0.50	25.15	201113	0.05	1.01	0.57	0.20
Trafí	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	580	1	45.50	53.57	8.63	85.41	5.38	3.37	16.95	13.58	3.60
2	1	336	3	27.50	75.27	7.03	85.05	5.83	2.95	12.21	9.26	1.40
2	2	99	2	8.50	103.04	2.83	74.82	20.29	1.29	4.42	3.13	0.30
3	1	315	4	23.50	92.68	8.11	89.41	0.66	4.07	13.09	9.01	1.10
4	1	408	6	27.50	42.39	4.80	47.04	91.34	0.30	11.71	11.41	3.70
4	2	31	5	8.50	58.15	0.50	23.43	284.15	0.05	1.01	0.97	0.20

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	474	1	45.50	40.49	5.33	69.80	28.94	1.22	12.06	10.84	4.70
2	1	275	3	27.50	58.58	4.48	69.61	29.30	1.18	8.66	7.48	1.70
2	2	81	2	8.50	86.95	1.96	61.22	47.02	0.71	3.26	2.55	0.30
3	1	257	4	23.50	69.05	4.93	72.95	23.37	1.49	8.75	7.26	1.30
4	1	333	6	27.50	40.81	3.77	38.39	134.43	0.17	9.34	9.17	3.30
4	2	25	5	8.50	56.72	0.39	18.89	376.34	0.03	0.81	0.78	0.10

## Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	397	1	45.50	34.79	3.84	58.46	53.95	0.60	9.52	8.92	4.90
2	1	230	3	27.50	49.97	3.19	58.22	54.60	0.58	6.77	6.19	1.80
2	2	68	2	8.50	74.51	1.41	51.39	75.12	0.38	2.52	2.14	0.30
3	1	215	4	23.50	55.50	3.31	61.03	47.48	0.68	6.71	6.02	1.40
4	1	279	6	27.50	39.79	3.08	32.17	179.81	0.11	7.70	7.59	2.90
4	2	21	5	8.50	55.81	0.33	15.87	467.07	0.02	0.67	0.65	0.10

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## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc **Report generation date:** 05/12/2016 16:43:17

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
Driving Side	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

•	X
Run Evaluation Set	No sente
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

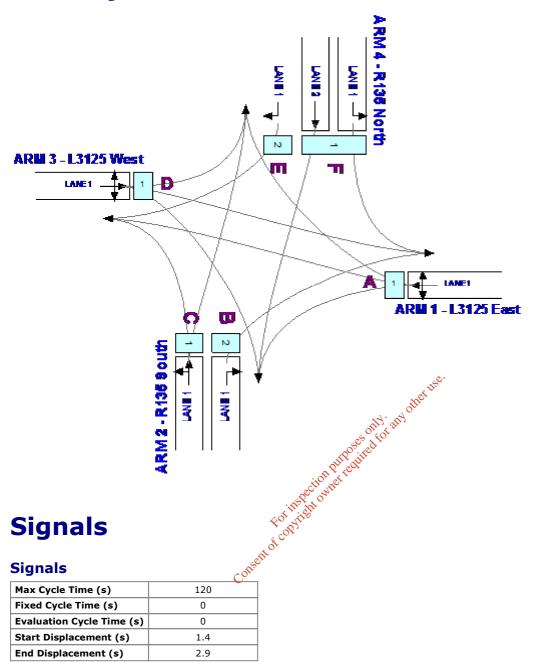
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	E	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

## **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

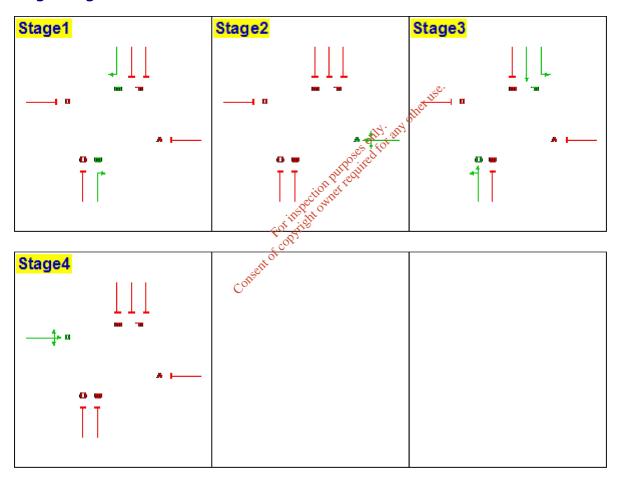
## **Intergreen Matrix**

	То								
		Α	В	С	D	E	F		
	Α	-	5	5	5	5	5		
	В	6	-	5	6		5		
From	С	6	5	-	6	5			
	D	5	5	5	-	5	5		
	E	6		5	6	-	5		
	F	6	5		6	5	-		

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	<b>Use To Generate Sequences</b>
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## **Configuration**

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	Yes	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	<b>8:45</b>	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

#### **Demand Set3 - 2017 AM Peak With Dev**

## ODTAB Data (PCU/hr during central 60 min peak period)

	То									
		Arm 1	Arm 2	Arm 3	Arm 4					
	Arm 1	-	102	333	94					
From	Arm 2	89	-	226	79					
	Arm 3	164	112	-	11					
	Arm 4	236	139	30	-					

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	397	474	580	580	474	397
2 - R135 South	1	С	228	272	333	333	272	228
2 - R135 South	2	В	68	81	99	99	81	68
3 - L3125 West	1	D	215	257	315	315	257	215
4 - R135 North	1	F	279	334	409	409	334	279
4 - R135 North	2	Е	21	25	31	31	25	21

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	57	20	23
3 - L3125 West	4	57	39
4 - R135 North	58	34	7

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	23.25 20.72		20.72	67.9

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve (PCU)  2.90 22.02	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)	
-	2.90	22.02	22.02	65.40

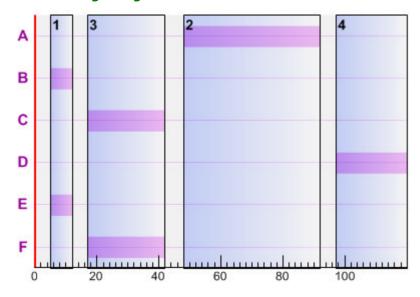
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

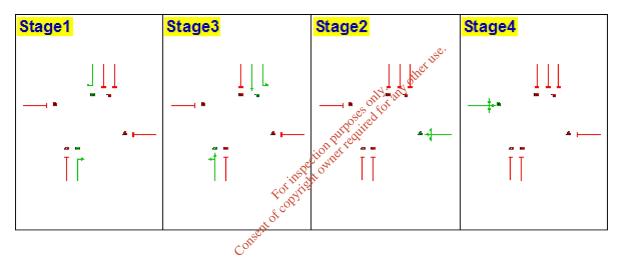
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	25.0	42.0
2	48.0	44.0	92.0
4	97.0	23.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0			
1	5.0	7.0	12.0			ox 115°			
3	17.0	25.0	42.0			othe			
2	48.0	44.0	92.0		Š	ITY any			
4	97.0	23.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	48	44.0	92	S.		(-,		<u> </u>	
В	5	7.0	12 es						
С	17	25.0	42011						
D	97	23.0	0						
E	5	7.0	12						
F	17	25.0	42						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	484	Α	45.50	40.25	5.41	71.27	26.28	1.28	12.37	11.09	28.00
2	1	278	С	26.50	59.84	4.62	73.02	23.25	1.36	9.01	7.65	9.50
2	2	83	В	8.50	83.26	1.92	62.73	43.48	0.69	3.31	2.61	1.70
3	1	262	D	24.50	60.16	4.38	71.33	26.17	1.22	8.55	7.33	8.80
4	1	341	F	26.50	41.99	3.98	40.80	120.61	0.20	9.70	9.50	19.10
4	2	26	E	8.50	56.91	0.41	19.65	358.02	0.03	0.84	0.81	0.80

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	397	1	45.50	34.46	3.80	58.46	53.95	0.58	9.50	8.92	4.90
2	1	228	3	26.50	50.69	3.21	59.89	50.28	0.60	6.80	6.20	1.70
2	2	68	2	8.50	70.67	1.33	51.39	75.12	0.34	2.48	2.14	0.30
3	1	215	4	24.50	51.72	3.09	58.54	53.75	0.55	6.51	5.96	1.50
4	1	279	6	26.50	40.74	3.16	33.38	169.63	0.12	7.79	7.67	2.80
4	2	21	5	8.50	55.72	0.33	15.87	467.07	0.02	0.67	0.65	0.10

## Traffic Stream Details (07:30-07:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	474	1	45.50	39.22	5.16	69.80	28.94	1.13	11.97	10.84	4.70
2	1	272	3	26.50	57.73	4.36	71.44	25.97	1.16	8.63	7.47	1.60
2	2	81	2	8.50	79.92	1.80	61.22	47.02	0.59	3.14	2.55	0.30
3	1	257	4	24.50	58.39	4.17	69.97	28.62	1.06	8.25	7.19	1.50
4	1	334	6	26.50	41.83	3.88	39.96	125.23	0.19	9.48	9.30	3.10
4	2	25	5	8.50	56.66	0.39	18.89	376.34	0.03	0.81	0.78	0.10

## Traffic Stream Details (07:45-08:00)

Traff	fic Stre	am Deta	ils (07:45	-08:00)				, USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	580	1	45.50	51.19	8.25	W <sup>1</sup> 85.41	5.38	3.23	16.81	13.58	3.60
2	1	333	3	26.50	75.65	. A.O.O.	87.47	2.90	3.24	12.51	9.27	1.30
2	2	99	2	8.50	96.58	<b>2</b> .66	74.82	20.29	1.21	4.34	3.13	0.30
3	1	315	4	24.50	74.87	6.55	85.76	4.94	2.85	11.77	8.92	1.20
4	1	409	6	26.50	43.54	4.95	48.93	83.93	0.33	11.90	11.57	3.50
4	2	31	5	8.50	\$8.11	0.50	23.43	284.15	0.05	1.01	0.97	0.20

•	_	J -	-	0.50	0.11	0.50	25.15	201113	0.05	1.01	0.57	0.20
Traff	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	580	1	45.50	53.57	8.63	85.41	5.38	3.37	16.95	13.58	3.60
2	1	333	3	26.50	82.67	7.65	87.47	2.90	3.54	12.81	9.27	1.30
2	2	99	2	8.50	103.04	2.83	74.82	20.29	1.29	4.42	3.13	0.30
3	1	315	4	24.50	80.68	7.06	85.76	4.94	3.08	11.99	8.92	1.20
4	1	409	6	26.50	43.56	4.95	48.93	83.93	0.33	11.90	11.57	3.50
4	2	31	5	8.50	58.15	0.50	23.43	284.15	0.05	1.01	0.97	0.20

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	474	1	45.50	40.49	5.33	69.80	28.94	1.22	12.06	10.84	4.70
2	1	272	3	26.50	62.50	4.72	71.44	25.97	1.34	8.81	7.47	1.60
2	2	81	2	8.50	86.95	1.96	61.22	47.02	0.71	3.26	2.55	0.30
3	1	257	4	24.50	62.42	4.46	69.97	28.62	1.21	8.40	7.19	1.50
4	1	334	6	26.50	41.86	3.88	39.96	125.23	0.19	9.48	9.30	3.10
4	2	25	5	8.50	56.72	0.39	18.89	376.34	0.03	0.81	0.78	0.10

## Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	397	1	45.50	34.79	3.84	58.46	53.95	0.60	9.52	8.92	4.90
2	1	228	3	26.50	51.91	3.29	59.89	50.28	0.64	6.84	6.20	1.70
2	2	68	2	8.50	74.51	1.41	51.39	75.12	0.38	2.52	2.14	0.30
3	1	215	4	24.50	52.84	3.16	58.54	53.75	0.59	6.55	5.96	1.50
4	1	279	6	26.50	40.75	3.16	33.38	169.63	0.12	7.79	7.67	2.80
4	2	21	5	8.50	55.81	0.33	15.87	467.07	0.02	0.67	0.65	0.10

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## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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File: S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc

**Report generation date:** 05/12/2016 16:43:49

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

## **Run Options**

	X.O
Run Evaluation Set	No settle
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

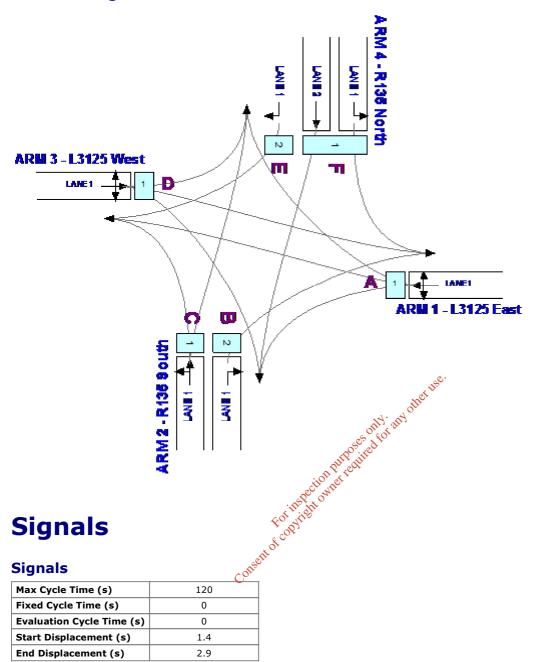
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr) Green Phase		Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	E	-

Arm	Arm Traffic Stream Relative Start Displacement (s)		Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8,150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
					Consent	For Hell o	1.00					

#### **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

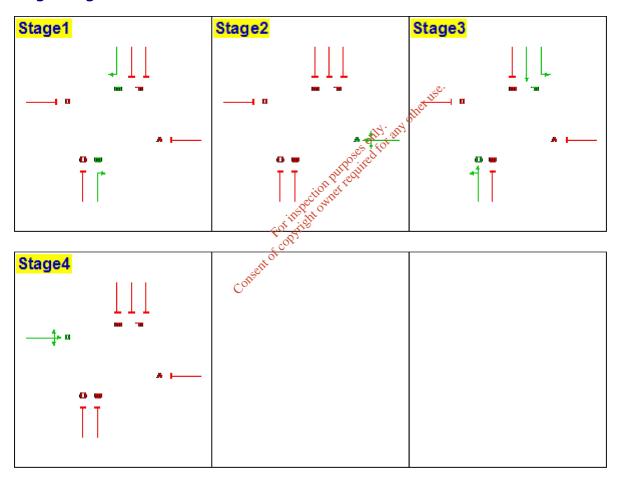
## **Intergreen Matrix**

	То						
		Α	В	С	D	E	F
	Α	-	5	5	5	5	5
	В	6	-	5	6		5
From	С	6	5	-	6	5	
	D	5	5	5	-	5	5
	E	6		5	6	-	5
	F	6	5		6	5	-

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	<b>Use To Generate Sequences</b>
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

#### **Configuration**

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	Yes	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	<b>8:45</b>	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

#### **Demand Set4 - 2022 AM Peak No Dev**

#### ODTAB Data (PCU/hr during central 60 min peak period)

	То				
		Arm 1	Arm 2	Arm 3	Arm 4
	Arm 1	-	105	345	97
From	Arm 2	92	-	234	80
	Arm 3	170	116	-	12
	Arm 4	244	143	31	-

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

### Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	410	490	600	600	490	410
2 - R135 South	1	С	238	284	347	347	284	238
2 - R135 South	2	В	70	84	102	102	84	70
3 - L3125 West	1	D	224	267	327	327	267	224
4 - R135 North	1	F	288	344	422	422	344	288
4 - R135 North	2	Е	22	26	32	32	26	22

#### **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	58	20	23
3 - L3125 West	4	57	39
4 - R135 North	58	34	7

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#### **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	19.55	22.04	22.04	67.3

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-0.38	23.85	23.85	64.50

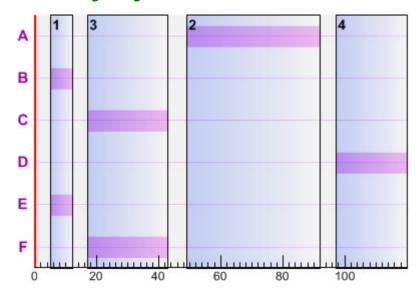
- PRC is the lowest value encountered over all streams and time segments.
- Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

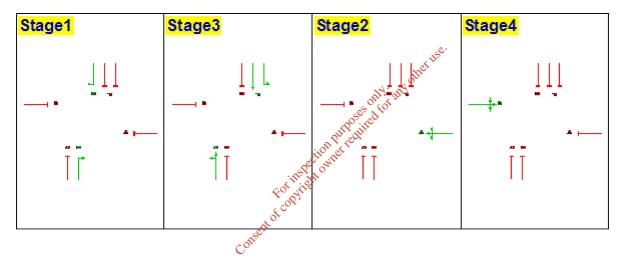
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	26.0	43.0
2	49.0	43.0	92.0
4	97.0	23.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	<b>s)</b>		.©			
1	5.0	7.0	12.0			ex 115°			
3	17.0	26.0	43.0			othe			
2	49.0	43.0	92.0		Š	IA. SUA			
4	97.0	23.0	0.0		ري د خيمي	FOI			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	49	43.0	92	St.					
В	5	7.0	12 es						
С	17	26.0	43000						
D	97	23.0	0						
E	5	7.0	12						
F	17	26.0	43						

### **Phase Timings Diagram**



#### **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	500	Α	44.50	43.63	6.06	75.28	19.55	1.66	13.32	11.65	25.60
2	1	290	С	27.50	58.99	4.75	73.40	22.61	1.40	9.31	7.91	10.10
2	2	85	В	8.50	85.16	2.01	64.24	40.10	0.76	3.44	2.68	1.80
3	1	273	D	24.50	62.92	4.77	74.33	21.09	1.48	9.14	7.66	8.60
4	1	351	F	27.50	41.15	4.01	40.47	122.41	0.20	9.89	9.70	20.40
4	2	27	E	8.50	57.15	0.43	20.41	341.06	0.03	0.88	0.84	0.80

#### Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	410	1	44.50	36.32	4.14	61.73	45.79	0.70	10.07	9.37	4.70
2	1	238	3	27.50	49.89	3.30	60.24	49.40	0.61	7.03	6.42	1.80
2	2	70	2	8.50	71.63	1.39	52.90	70.12	0.37	2.57	2.20	0.30
3	1	224	4	24.50	52.79	3.28	60.99	47.57	0.63	6.85	6.22	1.50
4	1	288	6	27.50	39.94	3.20	33.20	171.06	0.12	7.97	7.85	3.00
4	2	22	5	8.50	55.94	0.34	16.63	441.30	0.02	0.71	0.68	0.10

#### **Traffic Stream Details (07:30-07:45)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	490	1	44.50	42.21	5.75	73.78	21.99	1.45	12.84	11.39	4.30
2	1	284	3	27.50	56.94	4.49	71.88	25.20	1.20	8.94	7.74	1.70
2	2	84	2	8.50	82.11	1.92	63.48	41.77	0.67	3.31	2.65	0.30
3	1	267	4	24.50	60.43	4.48	72.69	23.81	1.25	8.73	7.48	1.40
4	1	344	6	27.50	41.01	3.92	39.66	126.93	0.18	9.68	9.49	3.40
4	2	26	5	8.50	56.89	0.41	19.65	358.02	0.03	0.84	0.81	0.10

#### Traffic Stream Details (07:45-08:00)

Traf	Traffic Stream Details (07:45-08:00)													
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)		
1	1	600	1	44.50	59.00	9.83	90.34	-0.38	4.79	19.09	14.30	3.00		
2	1	347	3	27.50	74.87	. A. 22 5	87.83	2.47	3.36	12.94	9.58	1.40		
2	2	102	2	8.50	100.34	2.84	77.09	16.75	1.37	4.59	3.22	0.30		
3	1	327	4	24.50	80.36	7.30	89.03	1.09	3.59	12.87	9.28	1.20		
4	1	422	6	27.50	42.70	5.01	48.65	84.99	0.33	12.17	11.84	3.70		
4	2	32	5	8.50	\$8.36	0.52	24.18	272.14	0.05	1.05	1.00	0.20		

•	_	52	-	0.50	30.50	0.52	2 2	2,2.1.	0.05	1.05	1.00	0.20		
Traff	Fraffic Stream Details (08:00-08:45)													
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)		
1	1	600	1	44.50	64.68	10.78	90.34	-0.38	5.22	19.52	14.30	2.90		
2	1	347	3	27.50	81.93	7.90	87.83	2.47	3.68	13.26	9.58	1.30		
2	2	102	2	8.50	108.27	3.07	77.09	16.75	1.47	4.70	3.22	0.30		
3	1	327	4	24.50	89.45	8.12	89.03	1.09	3.99	13.27	9.28	1.10		
4	1	422	6	27.50	42.72	5.01	48.65	84.99	0.33	12.17	11.84	3.70		
4	2	32	5	8.50	58.43	0.52	24.18	272.14	0.05	1.05	1.00	0.20		

#### Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	490	1	44.50	45.02	6.13	73.78	21.99	1.60	12.99	11.39	4.30
2	1	284	3	27.50	61.69	4.87	71.88	25.20	1.38	9.11	7.74	1.70
2	2	84	2	8.50	90.97	2.12	63.48	41.77	0.82	3.47	2.65	0.30
3	1	267	4	24.50	66.78	4.95	72.69	23.81	1.46	8.94	7.48	1.40
4	1	344	6	27.50	41.03	3.92	39.66	126.93	0.19	9.68	9.49	3.40
4	2	26	5	8.50	56.98	0.41	19.65	358.02	0.03	0.84	0.81	0.10

#### Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	410	1	44.50	36.83	4.19	61.73	45.79	0.73	10.10	9.37	4.70
2	1	238	3	27.50	51.07	3.38	60.24	49.40	0.65	7.07	6.42	1.80
2	2	70	2	8.50	76.22	1.48	52.90	70.12	0.42	2.62	2.20	0.30
3	1	224	4	24.50	54.28	3.38	60.99	47.57	0.68	6.90	6.22	1.50
4	1	288	6	27.50	39.95	3.20	33.20	171.06	0.12	7.97	7.85	3.00
4	2	22	5	8.50	56.02	0.34	16.63	441.30	0.02	0.71	0.68	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

Report generation date: 09/12/2016 11:02:56

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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#### **Traffic Streams**

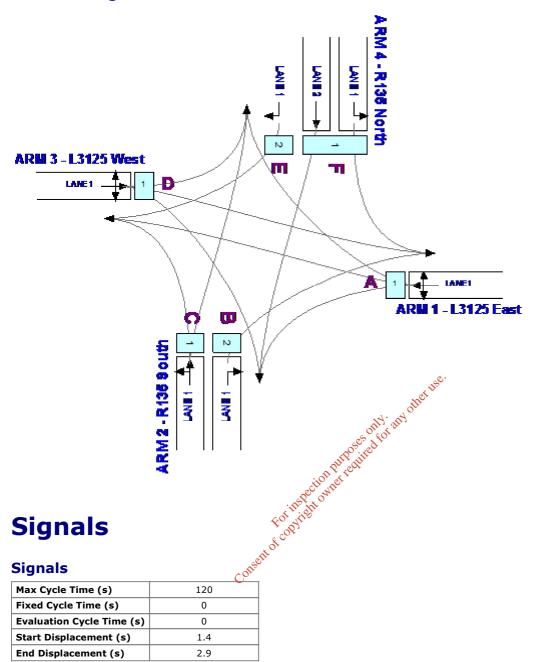
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

#### Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	78,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	1.00 N. 0.430 Co. 0.430 Co	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 0000	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 1 3 1 3 1 1 1 1 1 1 1 1 1 1 1												

#### **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

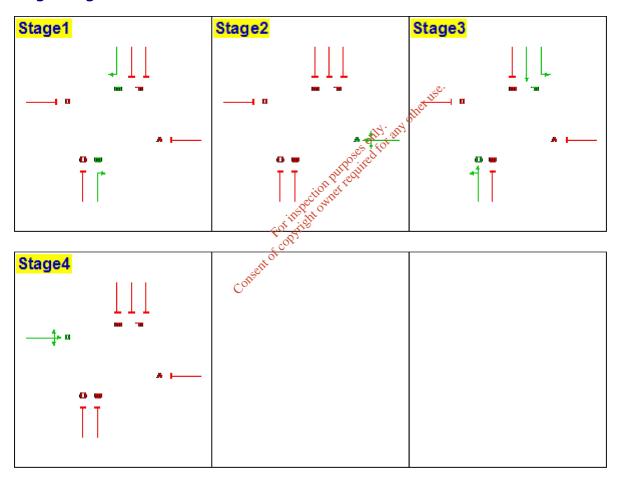
## **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	<b>Use To Generate Sequences</b>
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

### Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak With Dev	Yes	16:30	18:00	ODTAB	No	D1

#### Demand Set10 - 2022 PM Peak With Dev

#### ODTAB Data (PCU/hr during central 60 min peak period)

			То		
		Arm 1	Arm 2	Arm 3	Arm 4
	Arm 1	-	96	232	227
From	Arm 2	143	-	142	135
	Arm 3	188	184	-	25
	Arm 4	186	103	19	-

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

### Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	416	497	609	609	497	416
2 - R135 South	1	С	208	248	304	304	248	208
2 - R135 South	2	В	107	128	157	157	128	107
3 - L3125 West	1	D	295	352	431	431	352	295
4 - R135 North	1	F	215	257	314	314	257	215
4 - R135 North	2	Е	14	17	20	20	17	14

#### **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	60	33	6

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#### **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	10.87	25.77	25.77	55.9

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
7.65		30.05	30.05	52.90

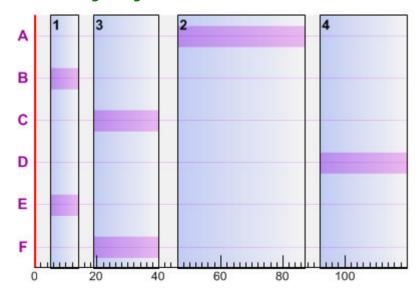
- PRC is the lowest value encountered over all streams and time segments.
- Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

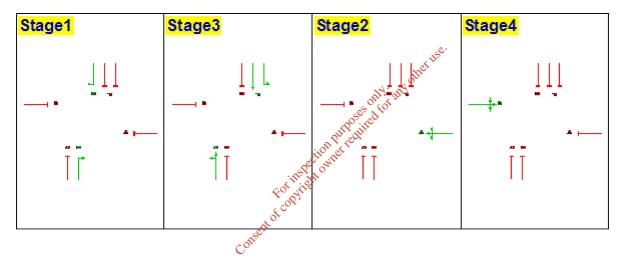
Stage	Start Time (s)	Duration (s)	End Time (s)		
1	5.0	9.0	14.0		
3	19.0	21.0	40.0		
2	46.0	41.0	87.0		
4	92.0	28.0	0.0		

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	<b>s)</b>		, e			
1	5.0	9.0	14.0			ox 1150			
3	19.0	21.0	40.0			othe			
2	46.0	41.0	87.0		ŝ	IA. MA			
4	92.0	28.0	0.0		ر د جھے	tor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time		Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	46	41.0	87	S. C.		ζ-,		<u> </u>	
В	5	9.0	14 es						
С	19	21.0	400000						
D	92	28.0	0						
E	5	9.0	14						
F	19	21.0	40						

### **Phase Timings Diagram**



#### **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	507	Α	42.50	49.36	6.95	79.93	12.60	2.30	14.45	12.15	21.70
2	1	253	С	22.50	71.56	5.03	78.27	14.99	1.91	9.13	7.22	6.90
2	2	131	В	10.50	106.06	3.86	80.15	12.29	2.06	6.15	4.09	2.40
3	1	359	D	29.50	64.65	6.45	81.18	10.87	2.42	12.15	9.72	10.90
4	1	262	F	22.50	44.51	3.24	36.92	143.79	0.15	7.64	7.49	13.40
4	2	17	E	10.50	52.10	0.25	10.40	765.32	0.01	0.53	0.52	0.60

#### Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	42.50	39.33	4.54	65.58	37.23	0.87	10.64	9.77	4.20
2	1	208	3	22.50	57.04	3.30	64.35	39.87	0.76	6.64	5.88	1.20
2	2	107	2	10.50	75.67	2.25	65.46	37.48	0.75	4.08	3.33	0.40
3	1	295	4	29.50	50.68	4.15	66.70	34.92	0.90	8.78	7.88	2.10
4	1	215	6	22.50	43.44	2.59	30.30	197.08	0.09	6.18	6.08	2.00
4	2	14	5	10.50	51.69	0.20	8.57	950.75	0.01	0.43	0.43	0.10

#### Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	42.50	47.06	6.50	78.35	14.87	1.93	13.81	11.88	3.70
2	1	248	3	22.50	67.45	4.65	76.72	17.31	1.56	8.63	7.07	1.20
2	2	128	2	10.50	94.15	3.35	78.31	14.93	1.52	5.52	4.00	0.40
3	1	352	4	29.50	60.76	5.94	79.59	13.08	1.97	11.48	9.52	1.90
4	1	257	6	22.50	44.39	3.17	36.21	148.53	0.14	7.48	7.34	2.20
4	2	17	5	10.50	52.09	0.25	10.40	765.32	0.01	0.53	0.52	0.10

#### **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	42.50	72.29	12,23	(lill 96.01	-6.26	7.82	22.75	14.93	2.10
2	1	304	3	22.50	95.67	. 8.08 °	94.04	-4.30	4.92	13.69	8.77	0.90
2	2	157	2	10.50	133.33	5.81	96.05	-6.30	4.16	9.09	4.93	0.40
3	1	431	4	29.50	91,53	10.96	97.46	-7.65	7.38	19.24	11.86	1.20
4	1	314	6	22.50	45.83	4.00	44.24	103.41	0.25	9.32	9.07	2.50
4	2	20	5	10.50	\$2.52	0.29	12.24	635.52	0.01	0.62	0.61	0.10

•	_			10.50	, C.J.	0.23	1	055.52	0.01	0.02	0.01	0.10
Traff	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	42.50	87.90	14.87	96.01	-6.26	9.48	24.41	14.93	2.00
2	1	304	3	22.50	115.03	9.71	94.04	-4.30	5.92	14.68	8.77	0.90
2	2	157	2	10.50	169.38	7.39	96.05	-6.30	5.27	10.20	4.93	0.40
3	1	431	4	29.50	115.61	13.84	97.46	-7.65	9.39	21.24	11.86	1.10
4	1	314	6	22.50	45.85	4.00	44.24	103.41	0.25	9.32	9.07	2.50
4	2	20	5	10.50	52.52	0.29	12.24	635.52	0.01	0.62	0.61	0.10

#### Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	42.50	56.04	7.74	78.35	14.87	2.25	14.13	11.88	3.60
2	1	248	3	22.50	84.27	5.80	76.72	17.31	1.98	9.04	7.07	1.10
2	2	128	2	10.50	144.60	5.14	78.31	14.93	2.36	6.36	4.00	0.40
3	1	352	4	29.50	81.15	7.94	79.59	13.08	2.49	12.01	9.52	1.80
4	1	257	6	22.50	44.41	3.17	36.21	148.53	0.14	7.48	7.34	2.20
4	2	17	5	10.50	52.11	0.25	10.40	765.32	0.01	0.53	0.52	0.10

#### Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	42.50	40.27	4.65	65.58	37.23	0.93	10.69	9.77	4.20
2	1	208	3	22.50	60.06	3.47	64.35	39.87	0.84	6.72	5.88	1.20
2	2	107	2	10.50	89.98	2.67	65.46	37.48	0.92	4.25	3.33	0.40
3	1	295	4	29.50	52.97	4.34	66.70	34.92	0.98	8.86	7.88	2.10
4	1	215	6	22.50	43.45	2.60	30.30	197.08	0.09	6.18	6.08	2.00
4	2	14	5	10.50	51.71	0.20	8.57	950.75	0.01	0.43	0.43	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc **Report generation date:** 05/12/2016 16:44:59

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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#### **Traffic Streams**

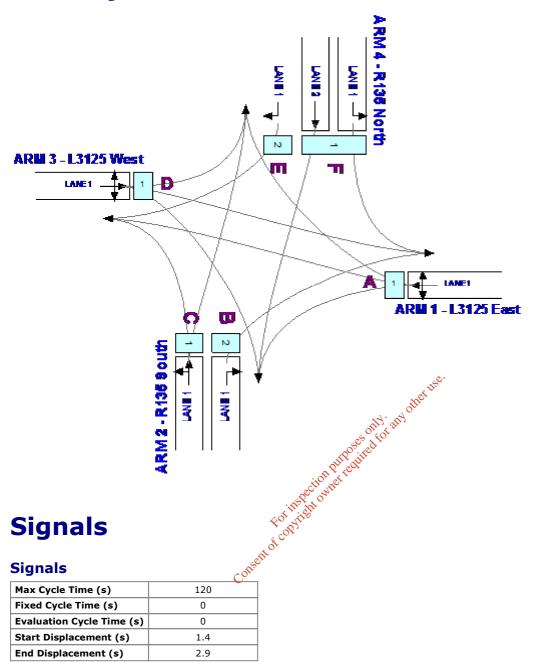
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	E	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

#### Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 in the 1.00 15 No 3.00 0.0 0  4 2 1 2 3 in the 1.00 15 No 3.00 0.0 0  Consent of contribute to the contribute of contribute to the contribute of contribut												

#### **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

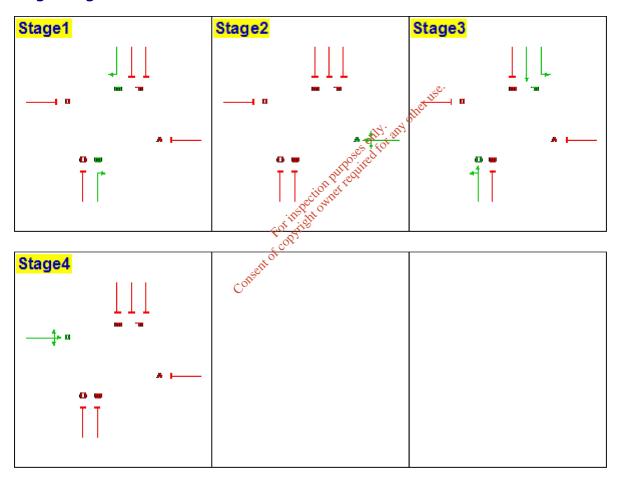
## **Intergreen Matrix**

	То								
		Α	В	С	D	E	F		
	Α	-	5	5	5	5	5		
	В	6	-	5	6		5		
From	С	6	5	-	6	5			
	D	5	5	5	-	5	5		
	E	6		5	6	-	5		
	F	6	5		6	5	-		

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences		
1	-1	B,E	Yes		
2	-1	Α	Yes		
3	-1	C,F	Yes		
4	-1	D	Yes		

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

### Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	OBTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	Yes	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	8:45	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

#### **Demand Set6 - 2022 AM Peak Sensitivity**

#### ODTAB Data (PCU/hr during central 60 min peak period)

	То									
		Arm 1	Arm 2	Arm 3	Arm 4					
	Arm 1	-	105	345	97					
From	Arm 2	92	-	234	103					
	Arm 3	170	116	-	11					
	Arm 4	244	166	31	-					

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

### Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	410	490	600	600	490	410
2 - R135 South	1	С	254	304	372	372	304	254
2 - R135 South	2	В	68	81	99	99	81	68
3 - L3125 West	1	D	223	266	326	326	266	223
4 - R135 North	1	F	308	367	450	450	367	308
4 - R135 North	2	Е	23	28	34	34	28	23

#### **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	55	24	21
3 - L3125 West	4	57	39
4 - R135 North	55	38	7

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	16.57	22.93	22.93	68.5

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-2.74	25.12	25.12	65.70

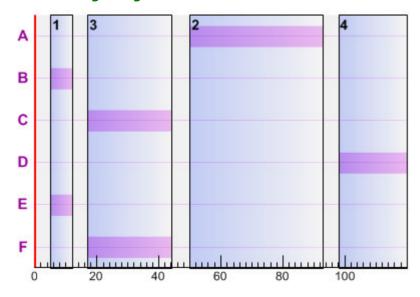
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

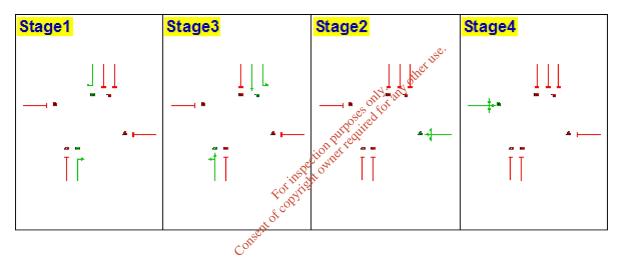
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	27.0	44.0
2	50.0	43.0	93.0
4	98.0	22.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0			
1	5.0	7.0	12.0			ox 115°			
3	17.0	27.0	44.0			othe			
2	50.0	43.0	93.0		Š	ITY any			
4	98.0	22.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	50	43.0	93	S.		(-,		<u> </u>	
В	5	7.0	12 es						
С	17	27.0	44000						
D	98	22.0	0						
E	5	7.0	12						
F	17	27.0	44						

### **Phase Timings Diagram**



#### **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	500	Α	44.50	43.63	6.06	75.28	19.55	1.66	13.32	11.65	25.60
2	1	310	С	28.50	60.03	5.17	75.71	18.87	1.63	10.03	8.40	10.50
2	2	83	В	8.50	83.26	1.92	62.73	43.48	0.69	3.31	2.61	1.70
3	1	272	D	23.50	67.59	5.11	77.21	16.57	1.79	9.50	7.71	7.80
4	1	375	F	28.50	40.61	4.23	41.72	115.74	0.21	10.52	10.30	22.10
4	2	28	E	8.50	57.39	0.45	21.16	325.30	0.04	0.91	0.87	0.80

#### Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	410	1	44.50	36.32	4.14	61.73	45.79	0.70	10.07	9.37	4.70
2	1	254	3	28.50	49.74	3.51	62.03	45.08	0.68	7.48	6.80	1.90
2	2	68	2	8.50	70.67	1.33	51.39	75.12	0.34	2.48	2.14	0.30
3	1	223	4	23.50	54.94	3.40	63.30	42.19	0.72	6.98	6.26	1.40
4	1	308	6	28.50	39.34	3.37	34.26	162.68	0.13	8.47	8.34	3.30
4	2	23	5	8.50	56.16	0.36	17.38	417.76	0.02	0.74	0.72	0.10

#### **Traffic Stream Details (07:30-07:45)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	490	1	44.50	42.21	5.75	73.78	21.99	1.45	12.84	11.39	4.30
2	1	304	3	28.50	57.65	4.87	74.25	21.22	1.39	9.62	8.23	1.80
2	2	81	2	8.50	79.92	1.80	61.22	47.02	0.59	3.14	2.55	0.30
3	1	266	4	23.50	64.12	4.74	75.50	19.20	1.47	9.00	7.53	1.30
4	1	367	6	28.50	40.45	4.12	40.83	120.45	0.20	10.27	10.07	3.60
4	2	28	5	8.50	57.36	0.45	21.16	325.30	0.04	0.91	0.87	0.10

#### Traffic Stream Details (07:45-08:00)

Traff	fic Stre	am Deta	ils (07:45	-08:00)				USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	600	1	44.50	59.00	9.83	90.34	-0.38	4.79	19.09	14.30	3.00
2	1	372	3	28.50	78.94	. 8.16	90.85	-0.94	4.25	14.46	10.21	1.30
2	2	99	2	8.50	96.58	<b>2</b> .66	74.82	20.29	1.21	4.34	3.13	0.30
3	1	326	4	23.50	89.08	8.07	92.53	-2.74	4.56	13.91	9.35	1.00
4	1	450	6	28.50	42.22	5.28	50.06	79.79	0.36	12.93	12.57	4.00
4	2	34	5	8.50	\$8.88	0.56	25.70	250.25	0.06	1.12	1.06	0.20

•	_	١ ٠.	-	0.50	30.00	0.50	23.70	250.25	0.00	1.12	1.00	0.20
Traff	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	600	1	44.50	64.68	10.78	90.34	-0.38	5.22	19.52	14.30	2.90
2	1	372	3	28.50	89.37	9.24	90.85	-0.94	4.80	15.02	10.21	1.30
2	2	99	2	8.50	103.04	2.83	74.82	20.29	1.29	4.42	3.13	0.30
3	1	326	4	23.50	104.14	9.43	92.53	-2.74	5.33	14.68	9.35	1.00
4	1	450	6	28.50	42.24	5.28	50.06	79.79	0.36	12.93	12.57	4.00
4	2	34	5	8.50	58.94	0.56	25.70	250.25	0.06	1.12	1.06	0.20

#### Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	490	1	44.50	45.02	6.13	73.78	21.99	1.60	12.99	11.39	4.30
2	1	304	3	28.50	64.68	5.46	74.25	21.22	1.63	9.86	8.23	1.80
2	2	81	2	8.50	86.95	1.96	61.22	47.02	0.71	3.26	2.55	0.30
3	1	266	4	23.50	75.73	5.60	75.50	19.20	1.79	9.32	7.53	1.30
4	1	367	6	28.50	40.47	4.13	40.83	120.45	0.20	10.27	10.07	3.60
4	2	28	5	8.50	57.45	0.45	21.16	325.30	0.04	0.91	0.87	0.10

#### Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	410	1	44.50	36.83	4.19	61.73	45.79	0.73	10.10	9.37	4.70
2	1	254	3	28.50	51.15	3.61	62.03	45.08	0.73	7.53	6.80	1.90
2	2	68	2	8.50	74.51	1.41	51.39	75.12	0.38	2.52	2.14	0.30
3	1	223	4	23.50	57.14	3.54	63.30	42.19	0.79	7.04	6.26	1.40
4	1	308	6	28.50	39.36	3.37	34.26	162.68	0.13	8.47	8.34	3.30
4	2	23	5	8.50	56.24	0.36	17.38	417.76	0.02	0.74	0.72	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc **Report generation date:** 05/12/2016 16:48:19

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)	
1	L3125 East	50.0	10	10	80	0	
2	R135 South	50.0	10	10	80	0	
3	L3125 West	50.0	10	10	80	0	
4	R135 North	50.0	10	10	80	0	

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#### **Traffic Streams**

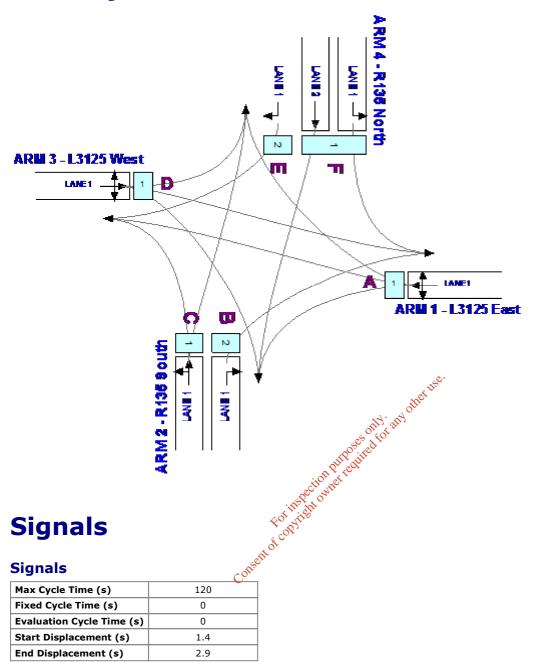
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	E	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

#### Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.430160	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
1         1         1         2         3         4         0.37         8         Yes         3.00         0.0         0           2         1         1         3         4         0.74         15         No         3.00         0.0         0           2         2         1         1         1.00         15         No         3.00         0.0         0           3         1         1         4         1         2         0.43 ftg         10         Yes         3.00         0.0         0           4         1         2         0.43 ftg         10         Yes         3.00         0.0         0           4         1         2         0.43 ftg         10         No         3.00         0.0         0           4         1         2         2         2         2         2         3.00         0.0         0           4         2         1         3         3.00         15         No         3.00         0.0         0												

#### **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

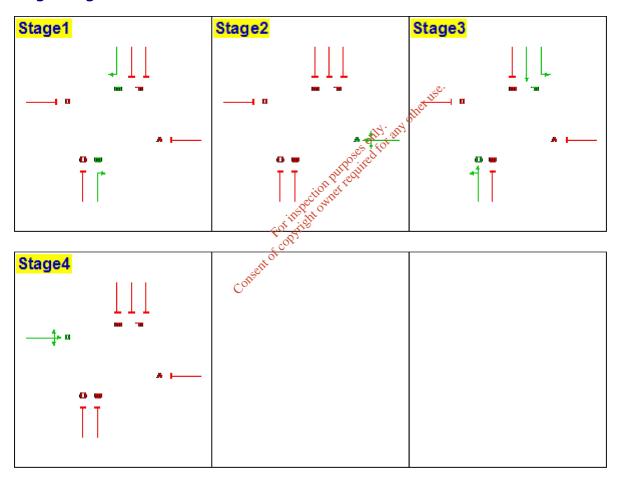
## **Intergreen Matrix**

	То									
		Α	В	С	D	E	F			
	Α	-	5	5	5	5	5			
	В	6	-	5	6		5			
From	С	6	5	-	6	5				
	D	5	5	5	-	5	5			
	E	6		5	6	-	5			
	F	6	5		6	5	-			

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	<b>Use To Generate Sequences</b>
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

#### **Configuration**

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	OBTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	8:45	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	Yes	07:15	08:45	ODTAB	No	D1

#### Demand Set10 - 2022 AM Peak + Link

#### ODTAB Data (PCU/hr during central 60 min peak period)

	То									
		Arm 1	Arm 2	Arm 3	Arm 4					
	Arm 1	-	105	345	48					
From	Arm 2	92	-	234	81					
	Arm 3	170	116	-	11					
	Arm 4	122	144	31	-					

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

### Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	374	446	546	546	446	374
2 - R135 South	1	С	235	281	344	344	281	235
2 - R135 South	2	В	70	84	103	103	84	70
3 - L3125 West	1	D	223	266	326	326	266	223
4 - R135 North	1	F	198	237	290	290	237	198
4 - R135 North	2	Е	22	27	33	33	27	22

#### **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage		
1 - L3125 East	21	69	10		
2 - R135 South	57	20	23		
3 - L3125 West	4	57	39		
4 - R135 North	41	48	10		

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#### **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	25.47	19.32	19.32	63.8

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	4.56	20.53	20.53	61.60

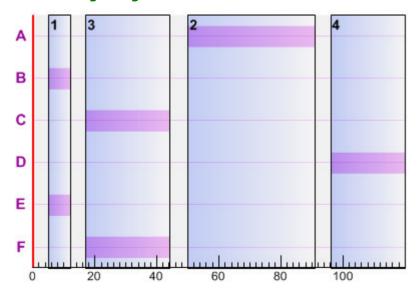
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

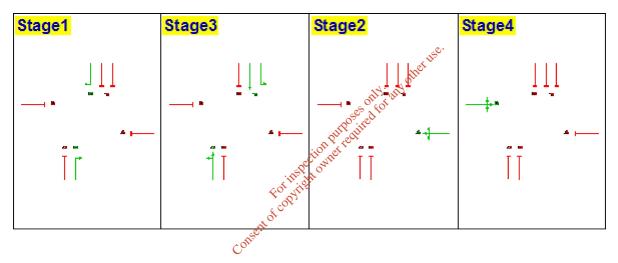
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	27.0	44.0
2	50.0	41.0	91.0
4	96.0	24.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	<b>s)</b>		ر و	)*		
1	5.0	7.0	12.0			ox 115			
3	17.0	27.0	44.0			othe			
2	50.0	41.0	91.0		ŝ	IA. SUA			
4	96.0	24.0	0.0		ر د جھے	tor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time		Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	50	41.0	91	S. C.					
В	5	7.0	12 es						
С	17	27.0	440000						
D	96	24.0	0						
E	5	7.0	12						
F	17	27.0	44						

### **Phase Timings Diagram**



#### **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	455	Α	42.50	42.91	5.42	71.73	25.47	1.31	12.09	10.78	24.20
2	1	287	С	28.50	55.16	4.40	70.09	28.40	1.14	8.88	7.74	11.00
2	2	86	В	8.50	86.16	2.06	65.00	38.47	0.79	3.50	2.71	1.80
3	1	272	D	25.50	58.79	4.44	71.15	26.49	1.21	8.76	7.55	9.40
4	1	242	F	28.50	38.24	2.57	26.92	234.32	0.07	6.53	6.46	16.60
4	2	27	Е	8.50	57.15	0.43	20.41	341.06	0.03	0.88	0.84	0.80

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	374	1	42.50	36.80	3.82	58.96	52.64	0.59	9.29	8.70	4.20
2	1	235	3	28.50	47.79	3.12	57.39	56.81	0.52	6.79	6.27	1.90
2	2	70	2	8.50	71.63	1.39	52.90	70.12	0.37	2.57	2.20	0.30
3	1	223	4	25.50	50.65	3.14	58.33	54.29	0.55	6.67	6.13	1.60
4	1	198	6	28.50	37.55	2.07	22.03	308.61	0.04	5.28	5.24	2.40
4	2	22	5	8.50	55.94	0.34	16.63	441.30	0.02	0.71	0.68	0.10

# Traffic Stream Details (07:30-07:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	446	1	42.50	41.82	5.18	70.31	28.00	1.16	11.70	10.54	4.10
2	1	281	3	28.50	53.66	4.19	68.63	31.14	0.99	8.56	7.57	1.90
2	2	84	2	8.50	82.11	1.92	63.48	41.77	0.67	3.31	2.65	0.30
3	1	266	4	25.50	56.98	4.21	69.58	29.35	1.04	8.42	7.37	1.60
4	1	237	6	28.50	38.16	2.51	26.36	241.37	0.07	6.39	6.32	2.70
4	2	27	5	8.50	57.12	0.43	20.41	341.06	0.03	0.88	0.84	0.10

# Traffic Stream Details (07:45-08:00)

Traff	fic Stre	am Deta	ils (07:45	-08:00)				USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	546	1	42.50	54.72	8.30	86.08	4.56	3.34	16.54	13.20	3.10
2	1	344	3	28.50	67.74	6.47	84.02	7.12	2.60	11.99	9.39	1.60
2	2	103	2	8.50	101.40	<b>2</b> .90	77.84	15.62	1.42	4.68	3.26	0.30
3	1	326	4	25.50	72.67	6.58	85.28	5.54	2.79	11.94	9.15	1.30
4	1	290	6	28.50	39.63	3.14	32.26	178.98	0.11	7.93	7.82	3.20
4	2	33	5	8.50	58.62	0.54	24.94	260.86	0.05	1.08	1.03	0.20

•	_	55	-	0.50	30.02	0.5		200.00	0.05	1.00	1.05	0.20		
Γrafí	raffic Stream Details (08:00-08:45)													
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)		
1	1	546	1	42.50	57.65	8.74	86.08	4.56	3.52	16.71	13.20	3.10		
2	1	344	3	28.50	71.71	6.85	84.02	7.12	2.75	12.14	9.39	1.50		
2	2	103	2	8.50	110.15	3.15	77.84	15.62	1.54	4.80	3.26	0.30		
3	1	326	4	25.50	77.85	7.05	85.28	5.54	2.99	12.14	9.15	1.30		
4	1	290	6	28.50	39.04	3.14	32.26	178.98	0.11	7.93	7.82	3.20		
4	2	33	5	8.50	58.68	0.54	24.94	260.86	0.05	1.08	1.03	0.20		

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	446	1	42.50	43.40	5.38	70.31	28.00	1.26	11.80	10.54	4.10
2	1	281	3	28.50	56.33	4.40	68.63	31.14	1.11	8.67	7.57	1.80
2	2	84	2	8.50	91.58	2.14	63.48	41.77	0.82	3.47	2.65	0.30
3	1	266	4	25.50	60.51	4.47	69.58	29.35	1.18	8.55	7.37	1.60
4	1	237	6	28.50	38.16	2.51	26.36	241.37	0.07	6.39	6.32	2.70
4	2	27	5	8.50	57.21	0.43	20.41	341.06	0.04	0.88	0.84	0.10

# Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	374	1	42.50	37.20	3.86	58.96	52.64	0.62	9.32	8.70	4.20
2	1	235	3	28.50	48.59	3.17	57.39	56.81	0.55	6.82	6.27	1.90
2	2	70	2	8.50	76.22	1.48	52.90	70.12	0.42	2.62	2.20	0.30
3	1	223	4	25.50	51.66	3.20	58.33	54.29	0.58	6.71	6.13	1.60
4	1	198	6	28.50	37.56	2.07	22.03	308.61	0.04	5.28	5.24	2.40
4	2	22	5	8.50	56.02	0.34	16.63	441.30	0.02	0.71	0.68	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads AM.osc

Report generation date: 09/12/2016 11:15:46

# **Summary**

## **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsente
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

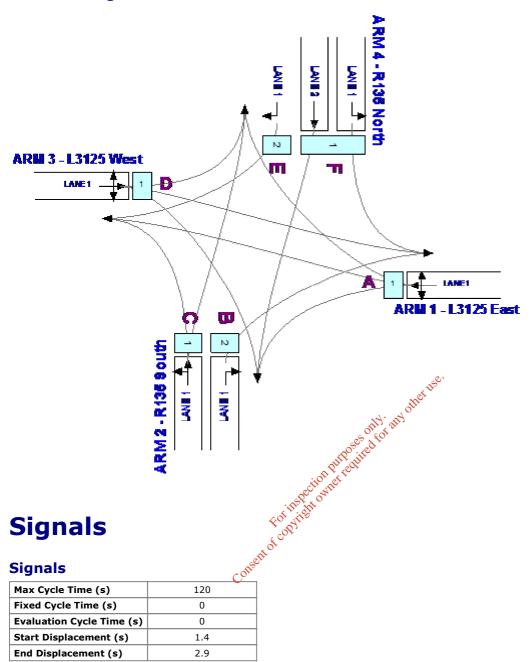
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	18	Yes	3.00	0.0	0
2	2	1				1	1.00	15 15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301101	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		1.00 N. 0.430 Co. 0.430 Co	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
					Consent	For Hell o	1.00					

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

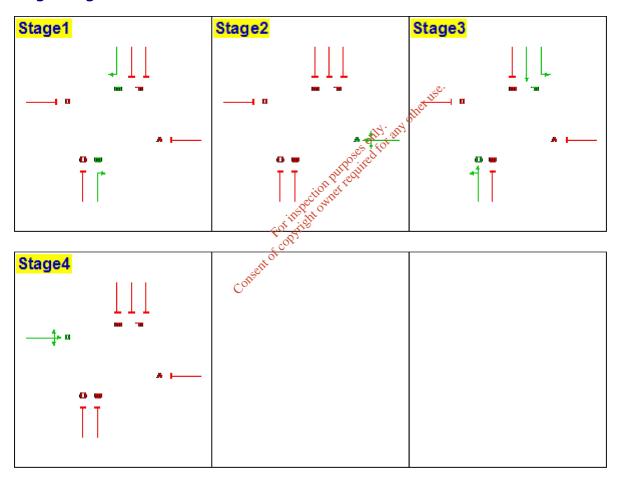
# **Intergreen Matrix**

	То						
		Α	В	С	D	E	F
	Α	-	5	5	5	5	5
	В	6	-	5	6		5
From	С	6	5	-	6	5	
	D	5	5	5	-	5	5
	E	6		5	6	-	5
	F	6	5		6	5	-

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



## **Sequences**

Sequence Name		Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

				<u> </u>	VO.	
Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🔬	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:450	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	Yes	07:15	8:45	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 م	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

#### **Demand Set7 - 2032 AM Peak No Dev**

## ODTAB Data (PCU/hr during central 60 min peak period)

	То					
		Arm 1	Arm 2	Arm 3	Arm 4	
	Arm 1	-	110	359	101	
From	Arm 2	96	-	243	84	
	Arm 3	177	121	-	12	
	Arm 4	254	149	33	-	

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	428	510	625	625	510	428
2 - R135 South	1	С	244	292	357	357	292	244
2 - R135 South	2	В	73	87	107	107	87	73
3 - L3125 West	1	D	233	278	340	340	278	233
4 - R135 North	1	F	301	359	440	440	359	301
4 - R135 North	2	Е	26	31	38	38	31	26

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	57	20	23
3 - L3125 West	4	57	39
4 - R135 North	58	34	8

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	14.98	24.07	24.07	66.2

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-4.02	26.70	26.70	63.10

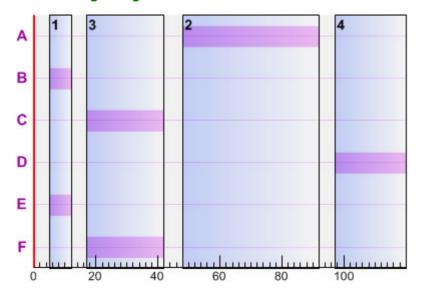
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

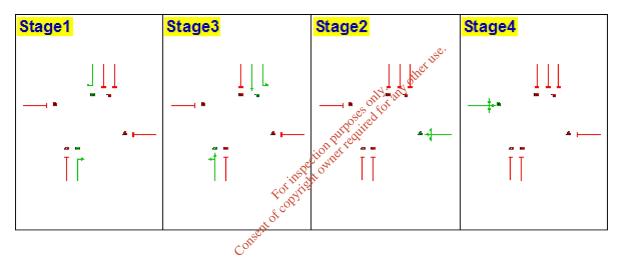
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	25.0	42.0
2	48.0	44.0	92.0
4	97.0	23.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0			
1	5.0	7.0	12.0			ox 115°			
3	17.0	25.0	42.0			othe			
2	48.0	44.0	92.0		Š	ITY any			
4	97.0	23.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	48	44.0	92	S.		(-,		<u> </u>	
В	5	7.0	12 es						
С	17	25.0	42011						
D	97	23.0	0						
E	5	7.0	12						
F	17	25.0	42						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	521	Α	45.50	43.89	6.35	76.72	17.31	1.84	13.88	12.04	26.30
2	1	298	С	26.50	65.55	5.43	78.27	14.98	1.93	10.16	8.23	9.00
2	2	89	В	8.50	89.40	2.21	67.26	33.80	0.90	3.71	2.81	1.80
3	1	284	D	24.50	66.27	5.23	77.32	16.40	1.81	9.79	7.99	8.40
4	1	367	F	26.50	42.56	4.34	43.91	104.98	0.24	10.53	10.29	19.80
4	2	32	E	8.50	58.40	0.52	24.18	272.14	0.05	1.05	1.00	0.90

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	428	1	45.50	36.08	4.29	63.03	42.80	0.76	10.44	9.69	4.90
2	1	244	3	26.50	52.65	3.57	64.09	40.43	0.76	7.42	6.66	1.60
2	2	73	2	8.50	73.15	1.48	55.17	63.13	0.42	2.72	2.29	0.30
3	1	233	4	24.50	53.96	3.49	63.44	41.87	0.73	7.21	6.48	1.50
4	1	301	6	26.50	41.16	3.44	36.01	149.92	0.14	8.46	8.32	3.00
4	2	26	5	8.50	56.83	0.41	19.65	358.02	0.03	0.84	0.81	0.10

# **Traffic Stream Details (07:30-07:45)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	510	1	45.50	42.27	5.99	75.10	19.84	1.58	13.33	11.75	4.50
2	1	292	3	26.50	62.13	5.04	76.70	17.34	1.60	9.65	8.05	1.50
2	2	87	2	8.50	84.70	2.05	65.75	36.88	0.75	3.49	2.74	0.30
3	1	278	4	24.50	62.98	4.86	75.69	18.91	1.49	9.30	7.81	1.40
4	1	359	6	26.50	42.37	4.23	42.95	109.55	0.23	10.27	10.05	3.30
4	2	31	5	8.50	58.11	0.50	23.43	284.15	0.05	1.01	0.97	0.20

# Traffic Stream Details (07:45-08:00)

Traff	ic Stre	am Deta	ils (07:45	-08:00)				, USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	625	1	45.50	60.99	10,59	QUI 92.04	-2.21	5.60	20.38	14.78	2.90
2	1	357	3	26.50	88.19	. 8.75	93.77	-4.02	5.16	15.15	9.99	1.10
2	2	107	2	8.50	106.90	3:18	80.87	11.29	1.67	5.06	3.39	0.30
3	1	340	4	24.50	87.51	8.27	92.57	-2.77	4.65	14.33	9.68	1.10
4	1	440	6	26.50	44.34	5.42	52.64	70.97	0.42	12.95	12.53	3.50
4	2	38	5	8.50	\$9.98	0.63	28.72	213.38	0.08	1.26	1.19	0.20

•	_	50	-	0.50	3.50	0.05	20.72	213.30	0.00	1.20	1.17	0.20
Trafí	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	hite							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	625	1	45.50	68.46	11.89	92.04	-2.21	6.24	21.02	14.78	2.80
2	1	357	3	26.50	104.71	10.38	93.77	-4.02	6.12	16.11	9.99	1.10
2	2	107	2	8.50	118.29	3.52	80.87	11.29	1.84	5.22	3.39	0.30
3	1	340	4	24.50	102.06	9.64	92.57	-2.77	5.42	15.10	9.68	1.00
4	1	440	6	26.50	44.37	5.42	52.64	70.97	0.42	12.95	12.53	3.50
4	2	38	5	8.50	60.09	0.63	28.72	213.38	0.08	1.26	1.19	0.20

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	510	1	45.50	45.87	6.50	75.10	19.84	1.76	13.51	11.75	4.40
2	1	292	3	26.50	74.91	6.08	76.70	17.34	1.96	10.02	8.05	1.50
2	2	87	2	8.50	97.18	2.35	65.75	36.88	0.95	3.69	2.74	0.30
3	1	278	4	24.50	74.00	5.71	75.69	18.91	1.82	9.62	7.81	1.40
4	1	359	6	26.50	42.40	4.23	42.95	109.55	0.23	10.28	10.05	3.30
4	2	31	5	8.50	58.24	0.50	23.43	284.15	0.05	1.01	0.97	0.20

# Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	428	1	45.50	36.65	4.36	63.03	42.80	0.79	10.48	9.69	4.90
2	1	244	3	26.50	54.80	3.71	64.09	40.43	0.83	7.49	6.66	1.60
2	2	73	2	8.50	78.86	1.60	55.17	63.13	0.49	2.78	2.29	0.30
3	1	233	4	24.50	56.03	3.63	63.44	41.87	0.80	7.28	6.48	1.50
4	1	301	6	26.50	41.18	3.44	36.01	149.92	0.14	8.46	8.32	3.00
4	2	26	5	8.50	56.95	0.41	19.65	358.02	0.03	0.84	0.81	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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File: S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc

**Report generation date:** 05/12/2016 16:46:52

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

•	X
Run Evaluation Set	No sente
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

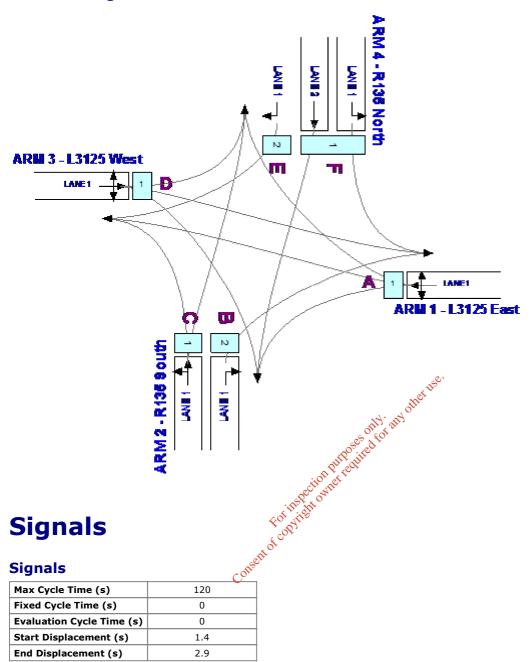
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	18	Yes	3.00	0.0	0
2	2	1				1	1.00	15 15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301101	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		1.00 N. 0.430 Co. 0.430 Co	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

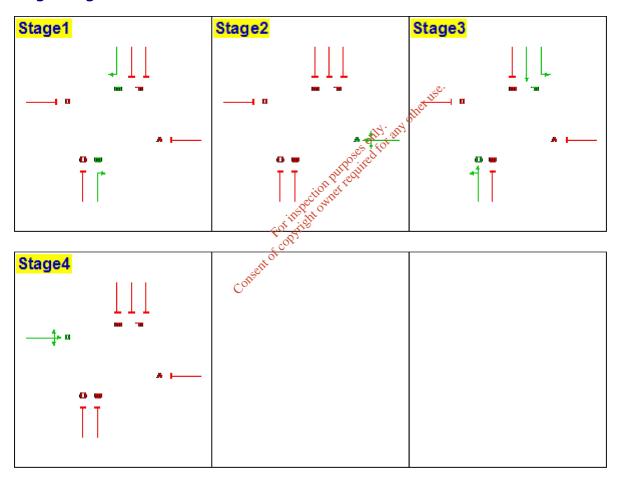
# **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# **Configuration**

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	<b>8:45</b>	ODTAB	No	D1
2032 AM Peak With Dev	Yes	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

#### **Demand Set8 - 2032 AM Peak With Dev**

## ODTAB Data (PCU/hr during central 60 min peak period)

			То		
		Arm 1	Arm 2	Arm 3	Arm 4
	Arm 1	-	110	359	101
From	Arm 2	96	-	243	85
	Arm 3	177	121	-	12
	Arm 4	254	150	33	-

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	428	510	625	625	510	428
2 - R135 South	1	С	245	292	358	358	292	245
2 - R135 South	2	В	73	87	107	107	87	73
3 - L3125 West	1	D	233	278	340	340	278	233
4 - R135 North	1	F	302	360	441	441	360	302
4 - R135 North	2	Е	26	31	38	38	31	26

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	57	20	23
3 - L3125 West	4	57	39
4 - R135 North	58	34	8

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

## **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	14.98	24.09	24.09	66.3

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	4.29		26.76	63.30

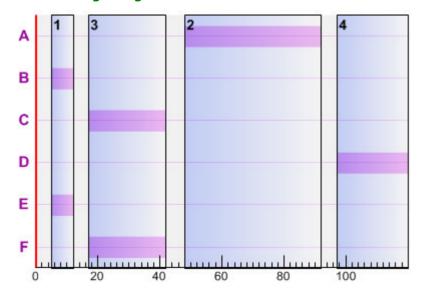
- PRC is the lowest value encountered over all streams and time segments.
- Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

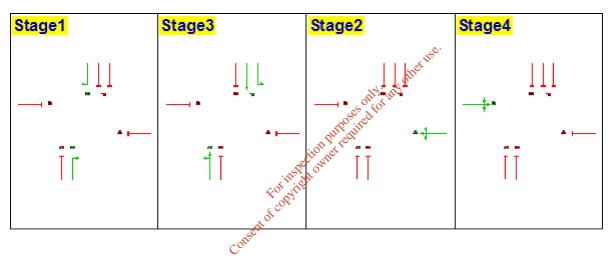
Stage	Start Time (s)	Duration (s)	End Time (s)		
1	5.0	7.0	12.0		
3	17.0	25.0	42.0		
2	48.0	44.0	92.0		
4	97.0	23.0	0.0		

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	<b>s)</b>		,e			
1	5.0	7.0	12.0			ex 115°			
3	17.0	25.0	42.0			othe			
2	48.0	44.0	92.0		Š	IA. SUA			
4	97.0	23.0	0.0		ري د خيمي	FOI			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	48	44.0	92	St.					
В	5	7.0	12 es						
С	17	25.0	42011						
D	97	23.0	0						
E	5	7.0	12						
F	17	25.0	42						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	521	А	45.50	43.89	6.35	76.72	17.31	1.84	13.88	12.04	26.30
2	1	298	С	26.50	65.55	5.43	78.27	14.98	1.93	10.16	8.23	9.00
2	2	89	В	8.50	89.40	2.21	67.26	33.80	0.90	3.71	2.81	1.80
3	1	284	D	24.50	66.27	5.23	77.32	16.40	1.81	9.79	7.99	8.40
4	1	368	F	26.50	42.58	4.35	44.03	104.42	0.25	10.56	10.32	19.90
4	2	32	Е	8.50	58.40	0.52	24.18	272.14	0.05	1.05	1.00	0.90

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	428	1	45.50	36.08	4.29	63.03	42.80	0.76	10.44	9.69	4.90
2	1	245	3	26.50	52.79	3.59	64.35	39.86	0.77	7.46	6.69	1.60
2	2	73	2	8.50	73.15	1.48	55.17	63.13	0.42	2.72	2.29	0.30
3	1	233	4	24.50	53.96	3.49	63.44	41.87	0.73	7.21	6.48	1.50
4	1	302	6	26.50	41.18	3.45	36.13	149.10	0.14	8.49	8.35	3.00
4	2	26	5	8.50	56.83	0.41	19.65	358.02	0.03	0.84	0.81	0.10

# **Traffic Stream Details (07:30-07:45)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	510	1	45.50	42.27	5.99	75.10	19.84	1.58	13.33	11.75	4.50
2	1	292	3	26.50	62.15	5.04	76.70	17.34	1.60	9.65	8.05	1.50
2	2	87	2	8.50	84.70	2.05	65.75	36.88	0.75	3.49	2.74	0.30
3	1	278	4	24.50	62.98	4.86	75.69	18.91	1.49	9.30	7.81	1.40
4	1	360	6	26.50	42.39	4.24	43.07	108.96	0.23	10.31	10.08	3.30
4	2	31	5	8.50	58.11	0.50	23.43	284.15	0.05	1.01	0.97	0.20

# **Traffic Stream Details (07:45-08:00)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	625	1	45.50	60.99	10,59	QUI 92.04	-2.21	5.60	20.38	14.78	2.90
2	1	358	3	26.50	88.71	· (8).82,1	94.03	-4.29	5.26	15.28	10.02	1.10
2	2	107	2	8.50	106.90	<b>3</b> 18	80.87	11.29	1.67	5.06	3.39	0.30
3	1	340	4	24.50	87.51	8.27	92.57	-2.77	4.65	14.33	9.68	1.10
4	1	441	6	26.50	44.37	5.44	52.76	70.58	0.42	12.98	12.56	3.60
4	2	38	5	8.50	\$9.98	0.63	28.72	213.38	0.08	1.26	1.19	0.20

•	-	50	-	0.50	3.50	0.05	20.72	213.30	0.00	1.20	1.17	0.20
Trafí	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	625	1	45.50	68.46	11.89	92.04	-2.21	6.24	21.02	14.78	2.80
2	1	358	3	26.50	105.85	10.53	94.03	-4.29	6.27	16.29	10.02	1.10
2	2	107	2	8.50	118.29	3.52	80.87	11.29	1.84	5.22	3.39	0.30
3	1	340	4	24.50	102.06	9.64	92.57	-2.77	5.42	15.10	9.68	1.00
4	1	441	6	26.50	44.40	5.44	52.76	70.58	0.42	12.98	12.56	3.60
4	2	38	5	8.50	60.09	0.63	28.72	213.38	0.08	1.26	1.19	0.20

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	510	1	45.50	45.87	6.50	75.10	19.84	1.76	13.51	11.75	4.40
2	1	292	3	26.50	75.39	6.12	76.70	17.34	1.96	10.02	8.05	1.50
2	2	87	2	8.50	97.18	2.35	65.75	36.88	0.95	3.69	2.74	0.30
3	1	278	4	24.50	74.00	5.71	75.69	18.91	1.82	9.62	7.81	1.40
4	1	360	6	26.50	42.42	4.24	43.07	108.96	0.23	10.31	10.08	3.30
4	2	31	5	8.50	58.24	0.50	23.43	284.15	0.05	1.01	0.97	0.20

# Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	428	1	45.50	36.65	4.36	63.03	42.80	0.79	10.48	9.69	4.90
2	1	245	3	26.50	54.96	3.74	64.35	39.86	0.84	7.53	6.69	1.60
2	2	73	2	8.50	78.86	1.60	55.17	63.13	0.49	2.78	2.29	0.30
3	1	233	4	24.50	56.03	3.63	63.44	41.87	0.80	7.28	6.48	1.50
4	1	302	6	26.50	41.20	3.46	36.13	149.10	0.14	8.49	8.35	3.00
4	2	26	5	8.50	56.95	0.41	19.65	358.02	0.03	0.84	0.81	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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File: S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc

**Report generation date:** 05/12/2016 16:47:41

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

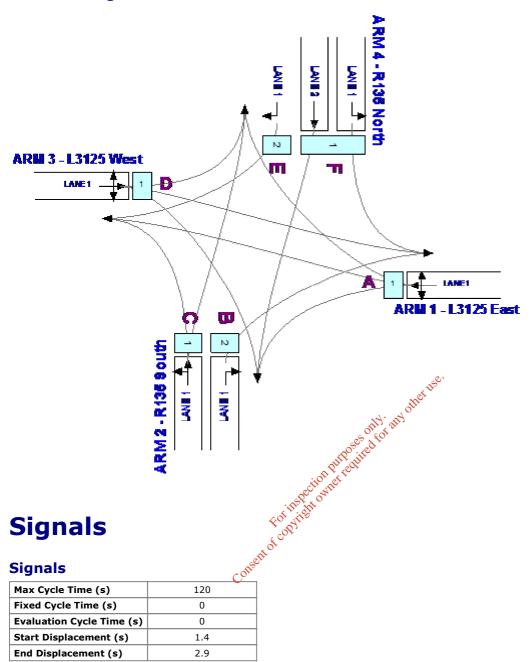
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	18	Yes	3.00	0.0	0
2	2	1				1	1.00	15 15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301101	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		1.00 N. 0.430 Co. 0.430 Co	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

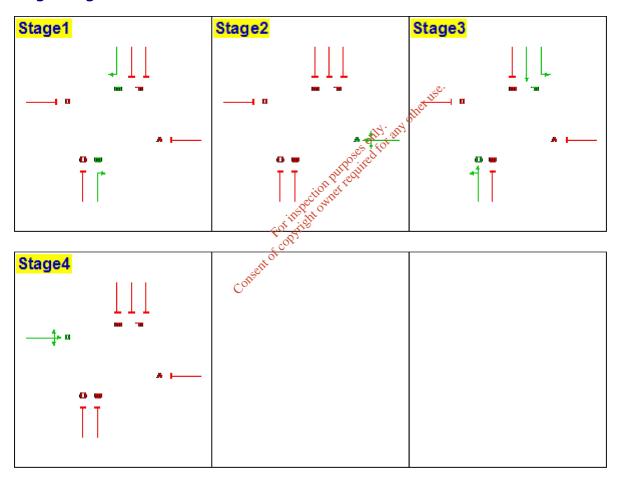
# **Intergreen Matrix**

	То								
		Α	В	С	D	E	F		
	Α	-	5	5	5	5	5		
	В	6	-	5	6		5		
From	С	6	5	-	6	5			
	D	5	5	5	-	5	5		
	E	6		5	6	-	5		
	F	6	5		6	5	-		

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences		
1	-1	B,E	Yes		
2	-1	Α	Yes		
3	-1	C,F	Yes		
4	-1	D	Yes		

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00		
Time Period (min)	90		
Time Segment Length (min)	15		
Signal Optimiser Flows	Average		
PCUs per Heavy Vehicle	2.00		

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	<b>8:45</b>	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	Yes	07:15	08:45	ODTAB	No	D1
2022 AM Peak + Link	No	07:15	08:45	ODTAB	No	D1

## **Demand Set9 - 2032 AM Peak Sensitivity**

## ODTAB Data (PCU/hr during central 60 min peak period)

	То								
		Arm 1	Arm 2	Arm 3	Arm 4				
	Arm 1	-	110	359	101				
From	Arm 2	96	-	243	101				
	Arm 3	177	121	-	12				
	Arm 4	254	166	33	-				

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	428	510	625	625	510	428
2 - R135 South	1	С	257	307	376	376	307	257
2 - R135 South	2	В	73	87	106	106	87	73
3 - L3125 West	1	D	233	278	340	340	278	233
4 - R135 North	1	F	316	377	462	462	377	316
4 - R135 North	2	E	24	28	35	35	28	24

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	19	63	18
2 - R135 South	55	23	22
3 - L3125 West	4	57	39
4 - R135 North	56	37	7

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	13.60	24.75	24.75	66.5

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Reserve (PCII)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-5.43	27.80	27.80	62.90

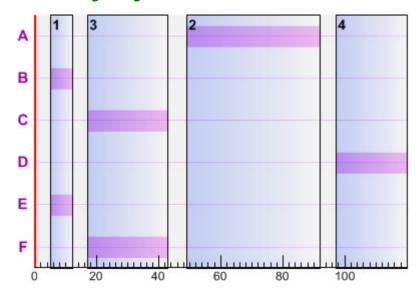
- PRC is the lowest value encountered over all streams and time segments.
- Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

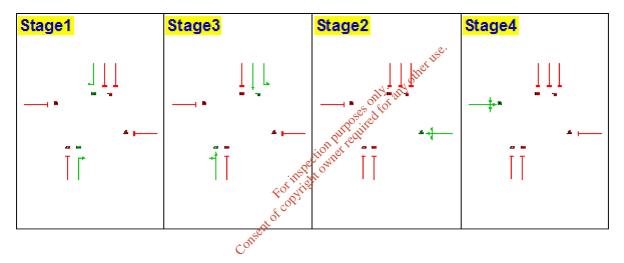
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	26.0	43.0
2	49.0	43.0	92.0
4	97.0	23.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0			
1	5.0	7.0	12.0			ox 115°			
3	17.0	26.0	43.0			othe			
2	49.0	43.0	92.0		Š	ITY any			
4	97.0	23.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	49	43.0	92	So					
В	5	7.0	12 es						
С	17	26.0	43001						
D	97	23.0	0						
E	5	7.0	12						
F	17	26.0	43						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	521	Α	44.50	46.17	6.68	78.44	14.73	2.08	14.27	12.20	24.50
2	1	313	С	27.50	65.45	5.69	79.22	13.60	2.08	10.66	8.58	9.50
2	2	89	В	8.50	89.40	2.21	67.26	33.80	0.90	3.71	2.81	1.80
3	1	284	D	24.50	66.27	5.23	77.32	16.40	1.81	9.79	7.99	8.40
4	1	385	F	27.50	41.87	4.48	44.39	102.77	0.25	10.97	10.72	21.40
4	2	29	E	8.50	57.64	0.46	21.92	310.64	0.04	0.94	0.90	0.90

## Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	428	1	44.50	37.36	4.44	64.44	39.66	0.82	10.64	9.82	4.60
2	1	257	3	27.50	52.15	3.72	65.05	38.36	0.80	7.77	6.96	1.80
2	2	73	2	8.50	73.15	1.48	55.17	63.13	0.42	2.72	2.29	0.30
3	1	233	4	24.50	53.96	3.49	63.44	41.87	0.73	7.21	6.48	1.50
4	1	316	6	27.50	40.45	3.55	36.43	147.04	0.15	8.81	8.67	3.20
4	2	24	5	8.50	56.38	0.38	18.14	396.19	0.03	0.77	0.75	0.10

# Traffic Stream Details (07:30-07:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	510	1	44.50	44.22	6.26	76.79	17.21	1.75	13.66	11.91	4.20
2	1	307	3	27.50	61.88	5.28	77.71	15.82	1.71	10.11	8.40	1.60
2	2	87	2	8.50	84.70	2.05	65.75	36.88	0.75	3.49	2.74	0.30
3	1	278	4	24.50	62.98	4.86	75.69	18.91	1.49	9.30	7.81	1.40
4	1	377	6	27.50	41.69	4.37	43.46	107.07	0.24	10.71	10.48	3.50
4	2	28	5	8.50	57.36	0.45	21.16	325.30	0.04	0.91	0.87	0.10

# Traffic Stream Details (07:45-08:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	625	1	44.50	66.01	11,46	QUI 94.10	-4.36	6.69	21.67	14.98	2.50
2	1	376	3	27.50	89.88	. (S).39, <sup>(V)</sup>	95.17	-5.43	5.83	16.28	10.45	1.10
2	2	106	2	8.50	105.74	<b>3</b> ₹11	80.11	12.34	1.61	4.96	3.35	0.30
3	1	340	4	24.50	87.51	8.27	92.57	-2.77	4.65	14.33	9.68	1.10
4	1	462	6	27.50	43.70	5.61	53.26	68.97	0.44	13.52	13.08	3.80
4	2	35	5	8.50	\$9.14	0.57	26.45	240.24	0.06	1.15	1.09	0.20

•	_	55	-	0.50	O	0.57	20.15	2.0.2.	0.00	1.13	1.05	0.20
Traff	fic Stre	am Deta	ils (08:00	-08: <b>15</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	625	1	44.50	76.97	13.36	94.10	-4.36	7.75	22.73	14.98	2.40
2	1	376	3	27.50	109.22	11.41	95.17	-5.43	7.10	17.54	10.45	1.10
2	2	106	2	8.50	116.22	3.42	80.11	12.34	1.76	5.11	3.35	0.30
3	1	340	4	24.50	102.06	9.64	92.57	-2.77	5.42	15.10	9.68	1.00
4	1	462	6	27.50	43.72	5.61	53.26	68.97	0.44	13.52	13.08	3.80
4	2	35	5	8.50	59.24	0.58	26.45	240.24	0.06	1.15	1.09	0.20

## Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	510	1	44.50	49.79	7.05	76.79	17.21	1.99	13.90	11.91	4.10
2	1	307	3	27.50	77.31	6.59	77.71	15.82	2.13	10.53	8.40	1.60
2	2	87	2	8.50	96.38	2.33	65.75	36.88	0.95	3.69	2.74	0.30
3	1	278	4	24.50	74.00	5.71	75.69	18.91	1.82	9.62	7.81	1.40
4	1	377	6	27.50	41.72	4.37	43.46	107.07	0.24	10.72	10.48	3.50
4	2	28	5	8.50	57.48	0.45	21.16	325.30	0.04	0.91	0.87	0.10

# Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	428	1	44.50	38.08	4.53	64.44	39.66	0.87	10.68	9.82	4.60
2	1	257	3	27.50	54.40	3.88	65.05	38.36	0.88	7.84	6.96	1.80
2	2	73	2	8.50	78.86	1.60	55.17	63.13	0.49	2.78	2.29	0.30
3	1	233	4	24.50	56.03	3.63	63.44	41.87	0.80	7.28	6.48	1.50
4	1	316	6	27.50	40.47	3.55	36.43	147.04	0.15	8.81	8.67	3.20
4	2	24	5	8.50	56.46	0.38	18.14	396.19	0.03	0.77	0.75	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads.osc

**Report generation date:** 05/12/2016 16:54:16

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsent
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

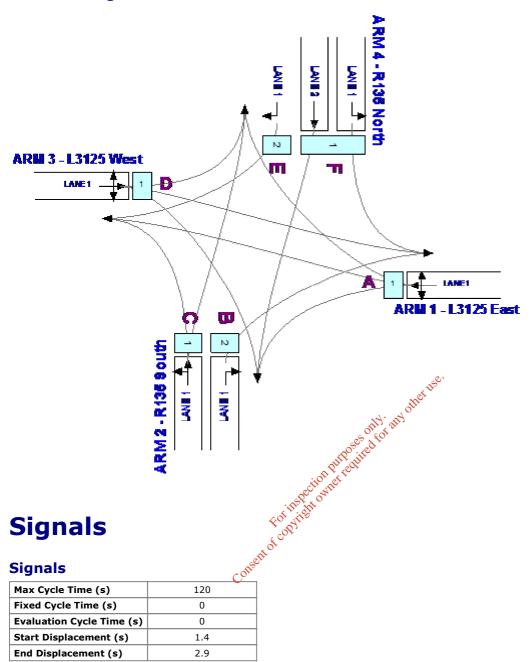
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	18	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301101	10	Yes	3.00	0.0	0
4	1	1		1			\$2.00c	14	Yes	3.00	0.0	0
4	1	2			2		1.00 14.00 0.430 1.01 0.00 0.00 0.00 0.00 0.00 0.00 0.	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

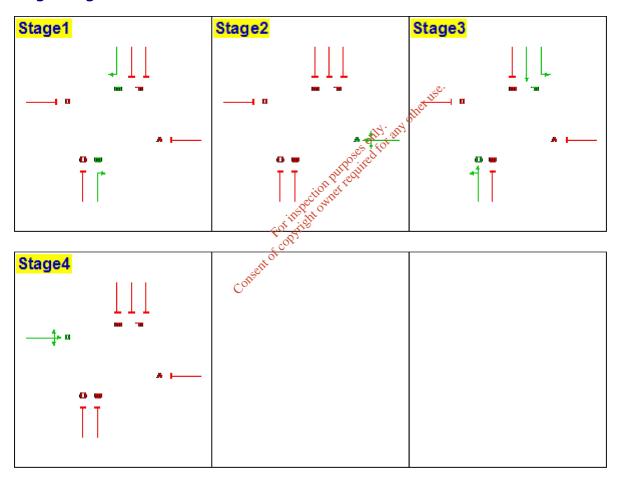
# **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00			
Time Period (min)	90			
Time Segment Length (min)	15			
Signal Optimiser Flows	Average			
PCUs per Heavy Vehicle	2.00			

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABLIT	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45 🌊	ODTAB	No	D1
2022 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2022 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak No Dev	No	07:15	<b>8:45</b>	ODTAB	No	D1
2032 AM Peak With Dev	No	07:15 و	08:45	ODTAB	No	D1
2032 AM Peak Sensitivity	No	07:15	08:45	ODTAB	No	D1
2032 AM Peak + Link	Yes	07:15	08:45	ODTAB	No	D1

#### Demand Set10 - 2032 AM Peak + Link

### ODTAB Data (PCU/hr during central 60 min peak period)

		То											
		Arm 1	Arm 2	Arm 3	Arm 4								
	Arm 1	-	110	359	50								
From	Arm 2	96	-	243	85								
	Arm 3	177	121	-	12								
	Arm 4	127	150	33	-								

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	07:15- 07:30	07:30- 07:45	07:45- 08:00	08:00- 08:15	08:15- 08:30	08:30- 08:45
1 - L3125 East	1	Α	389	465	569	569	465	389
2 - R135 South	1	С	245	292	358	358	292	245
2 - R135 South	2	В	73	87	107	107	87	73
3 - L3125 West	1	D	233	278	340	340	278	233
4 - R135 North	1	F	207	247	303	303	247	207
4 - R135 North	2	Е	26	31	37	37	31	26

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage	
1 - L3125 East	21	69	10	
2 - R135 South	57	20	23	
3 - L3125 West	4	57	39	
4 - R135 North	41	48	11	

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	20.44	20.91	20.91	63.3

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Сус	cle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
	-	0.33	22.71	22.71	60.30

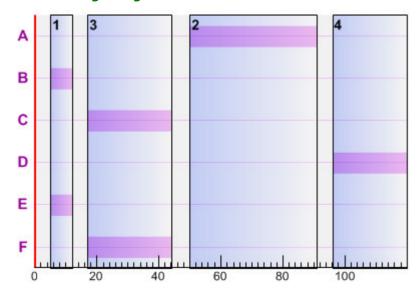
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

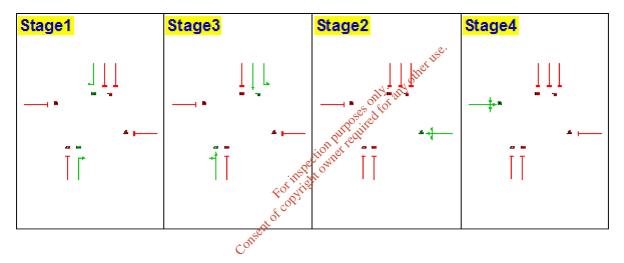
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	7.0	12.0
3	17.0	27.0	44.0
2	50.0	41.0	91.0
4	96.0	24.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0	,•		
1	5.0	7.0	12.0			ox 115°			
3	17.0	27.0	44.0			othe			
2	50.0	41.0	91.0		Š	IA. SUA			
4	96.0	24.0	0.0		ري د خيمي	801			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	50	41.0	91	S.		(-,		<u> </u>	
В	5	7.0	12 es						
С	17	27.0	44000						
D	96	24.0	0						
E	5	7.0	12						
F	17	27.0	44						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	474	Α	42.50	44.89	5.91	74.73	20.44	1.59	12.87	11.27	23.50
2	1	298	С	28.50	57.29	4.74	72.78	23.66	1.35	9.40	8.05	10.80
2	2	89	В	8.50	89.40	2.21	67.26	33.80	0.90	3.71	2.81	1.80
3	1	284	D	25.50	61.59	4.86	74.29	21.15	1.48	9.38	7.90	9.20
4	1	252	F	28.50	38.40	2.69	28.03	221.05	0.08	6.82	6.74	17.10
4	2	31	E	8.50	58.14	0.50	23.43	284.15	0.05	1.01	0.97	0.90

### Traffic Stream Details (07:15-07:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	389	1	42.50	37.65	4.07	61.33	46.76	0.68	9.76	9.08	4.20
2	1	245	3	28.50	48.78	3.32	59.84	50.41	0.60	7.15	6.55	1.90
2	2	73	2	8.50	73.15	1.48	55.17	63.13	0.42	2.72	2.29	0.30
3	1	233	4	25.50	51.78	3.35	60.95	47.66	0.63	7.05	6.42	1.60
4	1	207	6	28.50	37.69	2.17	23.03	290.84	0.05	5.54	5.49	2.40
4	2	26	5	8.50	56.83	0.41	19.65	358.02	0.03	0.84	0.81	0.10

# Traffic Stream Details (07:30-07:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	465	1	42.50	43.53	5.62	73.31	22.77	1.39	12.43	11.04	4.00
2	1	292	3	28.50	55.45	4.50	71.32	26.20	1.17	9.05	7.88	1.80
2	2	87	2	8.50	84.70	2.05	65.75	36.88	0.75	3.49	2.74	0.30
3	1	278	4	25.50	59.25	4.58	72.72	23.76	1.26	8.98	7.73	1.50
4	1	247	6	28.50	38.32	2.63	27.48	227.55	0.07	6.68	6.60	2.80
4	2	31	5	8.50	58.11	0.50	23.43	284.15	0.05	1.01	0.97	0.20

# Traffic Stream Details (07:45-08:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	569	1	42.50	59.89	9.43	89.70	0.33	4.47	18.29	13.82	2.80
2	1	358	3	28.50	72.79	. A.24, T	87.43	2.93	3.30	13.10	9.80	1.40
2	2	107	2	8.50	106.90	<b>3</b> 18	80.87	11.29	1.67	5.06	3.39	0.30
3	1	340	4	25.50	78.69	7.43	88.94	1.19	3.61	13.19	9.58	1.20
4	1	303	6	28.50	39.26	3.30	33.71	167.01	0.12	8.32	8.20	3.20
4	2	37	5	8.50	\$9.71	0.61	27.96	221.85	0.07	1.23	1.15	0.20

•	_			0.50	042.7 ±	0.01	27.30	221.03	0.07	1.23	1.15	0.20
Traffic Stream Details (08:00-08:15)												
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	569	1	42.50	65.26	10.32	89.70	0.33	4.85	18.67	13.82	2.70
2	1	358	3	28.50	79.24	7.88	87.43	2.93	3.59	13.39	9.80	1.40
2	2	107	2	8.50	118.29	3.52	80.87	11.29	1.84	5.22	3.39	0.30
3	1	340	4	25.50	87.25	8.24	88.94	1.19	4.00	13.57	9.58	1.20
4	1	303	6	28.50	39.26	3.30	33.71	167.01	0.12	8.32	8.20	3.20
4	2	37	5	8.50	59.78	0.61	27.96	221.85	0.07	1.23	1.15	0.20

### Traffic Stream Details (08:15-08:30)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	465	1	42.50	46.27	5.98	73.31	22.77	1.54	12.58	11.04	3.90
2	1	292	3	28.50	59.64	4.84	71.32	26.20	1.32	9.21	7.88	1.80
2	2	87	2	8.50	97.18	2.35	65.75	36.88	0.95	3.69	2.74	0.30
3	1	278	4	25.50	65.15	5.03	72.72	23.76	1.46	9.19	7.73	1.50
4	1	247	6	28.50	38.32	2.63	27.48	227.55	0.07	6.68	6.60	2.80
4	2	31	5	8.50	58.21	0.50	23.43	284.15	0.05	1.01	0.97	0.20

# Traffic Stream Details (08:30-08:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	389	1	42.50	38.18	4.13	61.33	46.76	0.71	9.79	9.08	4.20
2	1	245	3	28.50	49.82	3.39	59.84	50.41	0.64	7.19	6.55	1.90
2	2	73	2	8.50	78.86	1.60	55.17	63.13	0.49	2.78	2.29	0.30
3	1	233	4	25.50	53.16	3.44	60.95	47.66	0.68	7.10	6.42	1.60
4	1	207	6	28.50	37.69	2.17	23.03	290.84	0.05	5.54	5.49	2.50
4	2	26	5	8.50	56.95	0.41	19.65	358.02	0.03	0.84	0.81	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 10:37:35

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsent
Evaluation Only	NO TO
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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### **Traffic Streams**

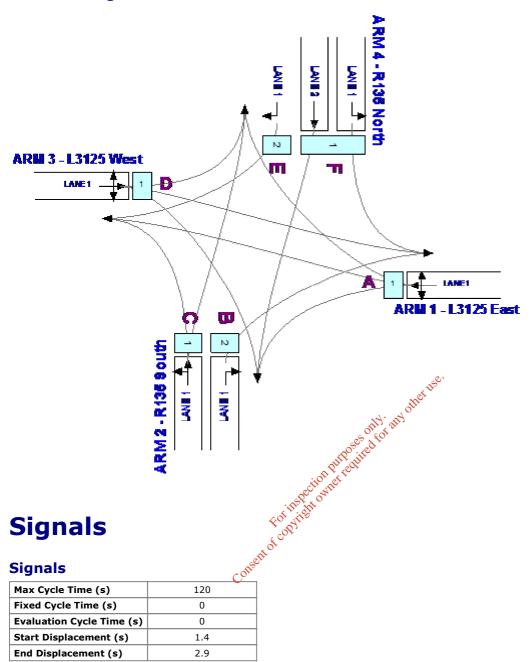
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

### Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	18	Yes	3.00	0.0	0
2	2	1				1	1.00	15 15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301101	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		1.00 N. 0.430 Co. 0.430 Co	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 is free 1.00 15 No 3.00 0.0 0  4 2 1 Cansent de confried to co												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

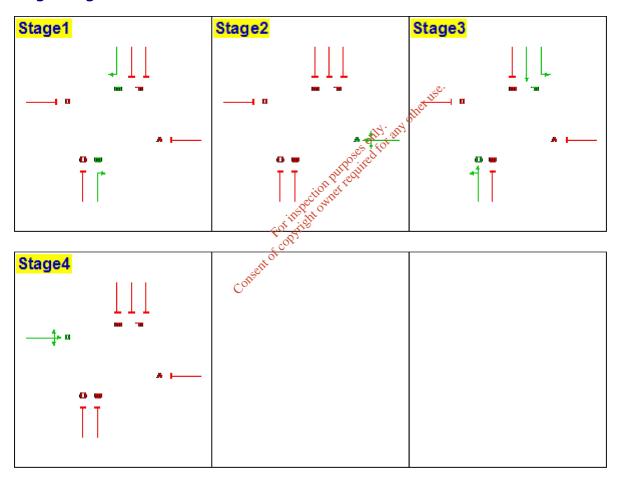
# **Intergreen Matrix**

	То								
		Α	В	С	D	E	F		
	Α	-	5	5	5	5	5		
	В	6	-	5	6		5		
From	С	6	5	-	6	5			
	D	5	5	5	-	5	5		
	E	6		5	6	-	5		
	F	6	5		6	5	-		

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences		
1	-1	B,E	Yes		
2	-1	Α	Yes		
3	-1	C,F	Yes		
4	-1	D	Yes		

# **Stage Diagrams**



#### **Sequences**

Sequence Name		Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# **Configuration**

Traffic Scaling Factor	1.00		
Time Period (min)	90		
Time Segment Length (min)	15		
Signal Optimiser Flows	Average		
PCUs per Heavy Vehicle	2.00		

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	Yes	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2023 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2023 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1

### **Demand Set6 - 2016 PM Peak Existing**

### ODTAB Data (PCU/hr during central 60 min peak period)

	То								
		Arm 1	Arm 2	Arm 3	Arm 4				
	Arm 1	-	91	221	216				
From	Arm 2	136	-	135	127				
	Arm 3	179	175	-	24				
	Arm 4	177	97	18	-				

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	396	473	579	579	473	396
2 - R135 South	1	С	197	235	288	288	235	197
2 - R135 South	2	В	101	121	148	148	121	101
3 - L3125 West	1	D	281	335	410	410	335	281
4 - R135 North	1	F	206	246	301	301	246	206
4 - R135 North	2	Е	13	16	19	19	16	13

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage	
1 - L3125 East	17	42	41	
2 - R135 South	34	32	34	
3 - L3125 West	6	47	46	
4 - R135 North	61	33	6	

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	15.83	22.96	22.96	57.3

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-3.47	25.46	25.46	54.40

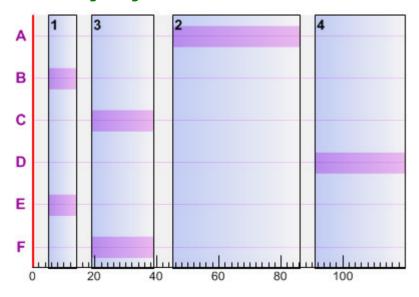
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

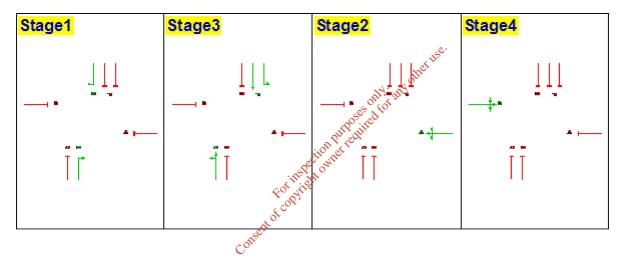
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	20.0	39.0
2	45.0	41.0	86.0
4	91.0	29.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0			
1	5.0	9.0	14.0			ox 115°			
3	19.0	20.0	39.0			othe			
2	45.0	41.0	86.0		Š	ITY any			
4	91.0	29.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	45	41.0	86	80		(-,		<u> </u>	
В	5	9.0	14 es						
С	19	20.0	390017						
D	91	29.0	0						
E	5	9.0	14						
F	19	20.0	39						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	483	Α	42.50	45.96	6.17	76.15	18.19	1.76	13.27	11.51	23.10
2	1	240	С	21.50	72.43	4.83	77.70	15.83	1.83	8.73	6.90	6.40
2	2	123	В	10.50	94.46	3.23	75.25	19.60	1.49	5.32	3.84	2.40
3	1	342	D	30.50	56.21	5.34	74.80	20.33	1.55	10.68	9.13	12.50
4	1	251	F	21.50	45.35	3.16	37.01	143.16	0.15	7.38	7.23	12.30
4	2	16	E	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.60

### Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	396	1	42.50	38.06	4.19	62.43	44.16	0.73	9.98	9.26	4.20
2	1	197	3	21.50	57.87	3.17	63.78	41.11	0.73	6.34	5.61	1.10
2	2	101	2	10.50	72.84	2.04	61.79	45.65	0.62	3.75	3.14	0.40
3	1	281	4	30.50	47.34	3.70	61.45	46.45	0.66	8.07	7.40	2.20
4	1	206	6	21.50	44.27	2.53	30.38	196.28	0.09	5.97	5.88	1.80
4	2	13	5	10.50	51.56	0.19	7.95	9999.00	0.00	0.40	0.40	0.10

# Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	473	1	42.50	44.33	5.82	74.57	20.69	1.51	12.76	11.25	3.90
2	1	235	3	21.50	68.26	4.46	76.08	18.30	1.49	8.24	6.75	1.10
2	2	121	2	10.50	87.72	2.95	74.03	21.57	1.20	4.98	3.77	0.40
3	1	335	4	30.50	54.24	5.05	73.26	22.84	1.33	10.25	8.93	2.10
4	1	246	6	21.50	45.22	3.09	36.28	148.10	0.14	7.22	7.08	2.00
4	2	16	5	10.50	51.96	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	579	1	42.50	62.54	10,06	(lill 91.28	-1.40	5.11	19.21	14.10	2.60
2	1	288	3	21.50	95.68	. A.65.	93.24	-3.47	4.56	12.93	8.36	0.80
2	2	148	2	10.50	118.53	4:87	90.55	-0.60	3.04	7.68	4.64	0.40
3	1	410	4	30.50	73.02	8.32	89.67	0.37	4.02	15.13	11.10	1.60
4	1	301	6	21.50	46.69	3.90	44.39	102.77	0.25	9.01	8.76	2.30
4	2	19	5	10.50	\$2.38	0.28	11.62	674.24	0.01	0.59	0.58	0.10

•	_	1 -2	-	10.50	2.50	0.20	11.02	0, 1.2 1	0.01	0.55	0.50	0.10
Traff	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	579	1	42.50	69.60	11.19	91.28	-1.40	5.66	19.75	14.10	2.60
2	1	288	3	21.50	113.91	9.11	93.24	-3.47	5.43	13.79	8.36	0.80
2	2	148	2	10.50	140.92	5.79	90.55	-0.60	3.59	8.23	4.64	0.40
3	1	410	4	30.50	80.83	9.21	89.67	0.37	4.45	15.55	11.10	1.60
4	1	301	6	21.50	46.71	3.91	44.39	102.77	0.25	9.01	8.76	2.30
4	2	19	5	10.50	52.38	0.28	11.62	674.24	0.01	0.59	0.58	0.10

### Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	473	1	42.50	47.90	6.29	74.57	20.69	1.68	12.93	11.25	3.90
2	1	235	3	21.50	84.06	5.49	76.08	18.30	1.88	8.63	6.75	1.10
2	2	121	2	10.50	114.18	3.84	74.03	21.57	1.67	5.44	3.77	0.40
3	1	335	4	30.50	59.07	5.50	73.26	22.84	1.52	10.45	8.93	2.10
4	1	246	6	21.50	45.24	3.09	36.28	148.10	0.14	7.22	7.08	2.00
4	2	16	5	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	396	1	42.50	38.67	4.25	62.43	44.16	0.76	10.02	9.26	4.20
2	1	197	3	21.50	60.94	3.33	63.78	41.11	0.81	6.42	5.61	1.10
2	2	101	2	10.50	81.40	2.28	61.79	45.65	0.73	3.86	3.14	0.40
3	1	281	4	30.50	48.37	3.78	61.45	46.45	0.71	8.11	7.40	2.20
4	1	206	6	21.50	44.29	2.53	30.38	196.28	0.09	5.97	5.88	1.80
4	2	13	5	10.50	51.57	0.19	7.95	9999.00	0.00	0.40	0.40	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

Report generation date: 09/12/2016 10:38:24

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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### **Traffic Streams**

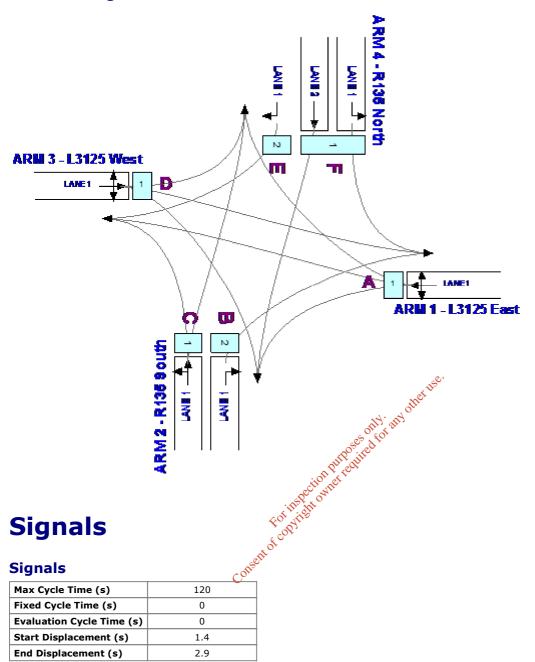
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

### Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

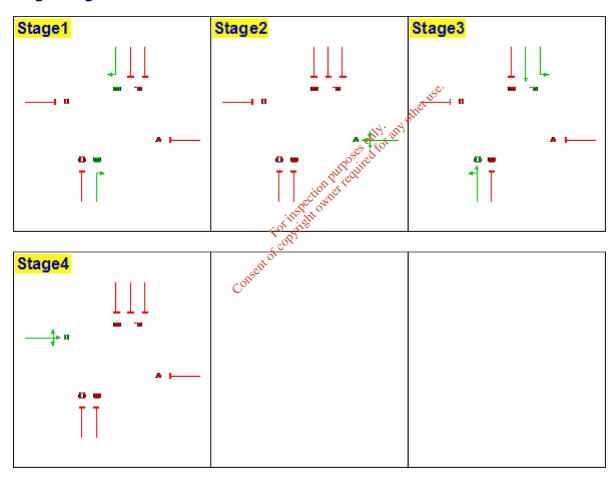
# **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

# **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	Yes	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2023 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2023 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1

#### **Demand Set7 - 2017 PM Peak No Dev**

### ODTAB Data (PCU/hr during central 60 min peak period)

	То								
		Arm 1	Arm 2	Arm 3	Arm 4				
	Arm 1	-	92	223	218				
From	Arm 2	137	-	136	128				
	Arm 3	180	176	-	24				
	Arm 4	178	98	18	-				

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	400	477	585	585	477	400
2 - R135 South	1	С	198	237	290	290	237	198
2 - R135 South	2	В	102	122	150	150	122	102
3 - L3125 West	1	D	282	337	413	413	337	282
4 - R135 North	1	F	207	248	303	303	248	207
4 - R135 North	2	Е	13	16	19	19	16	13

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	61	33	6

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	14.87	23.42	23.42	57.2

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-4.14	26.12	26.12	54.00

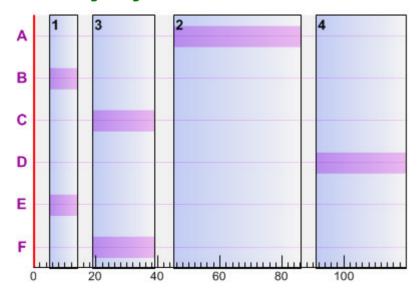
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

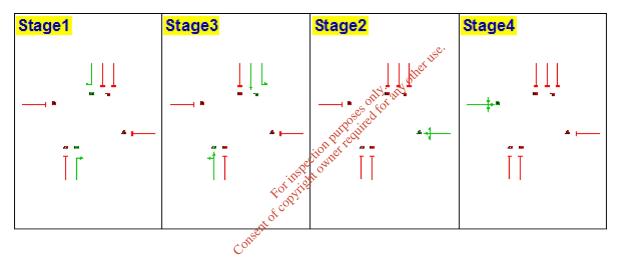
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	20.0	39.0
2	45.0	41.0	86.0
4	91.0	29.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		,e			
1	5.0	9.0	14.0			ex 115°			
3	19.0	20.0	39.0			othe			
2	45.0	41.0	86.0		Š	IA. SUA			
4	91.0	29.0	0.0		ري د خيمي	FOI			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	45	41.0	86	S.		(-)		<u> </u>	
В	5	9.0	14 es						
С	19	20.0	390017						
D	91	29.0	0						
E	5	9.0	14						
F	19	20.0	39						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	487	Α	42.50	46.47	6.29	76.78	17.22	1.83	13.45	11.62	22.90
2	1	242	С	21.50	73.39	4.93	78.35	14.87	1.91	8.87	6.96	6.40
2	2	125	В	10.50	97.02	3.37	76.48	17.68	1.61	5.51	3.90	2.40
3	1	344	D	30.50	56.61	5.41	75.23	19.63	1.60	10.78	9.18	12.50
4	1	253	F	21.50	45.40	3.19	37.31	141.24	0.15	7.45	7.29	12.40
4	2	16	E	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.60

### Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	400	1	42.50	38.31	4.26	63.06	42.72	0.75	10.11	9.36	4.20
2	1	198	3	21.50	58.05	3.19	64.10	40.40	0.74	6.39	5.64	1.10
2	2	102	2	10.50	73.29	2.08	62.40	44.22	0.64	3.81	3.17	0.40
3	1	282	4	30.50	47.43	3.72	61.67	45.93	0.67	8.10	7.43	2.20
4	1	207	6	21.50	44.29	2.55	30.52	194.85	0.09	6.00	5.91	1.80
4	2	13	5	10.50	51.56	0.19	7.95	9999.00	0.00	0.40	0.40	0.10

# Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	477	1	42.50	44.75	5.93	75.20	19.68	1.57	12.92	11.35	3.90
2	1	237	3	21.50	68.91	4.54	76.73	17.30	1.55	8.36	6.81	1.10
2	2	122	2	10.50	88.60	3.00	74.64	20.58	1.25	5.05	3.80	0.40
3	1	337	4	30.50	54.55	5.11	73.70	22.11	1.36	10.35	8.98	2.10
4	1	248	6	21.50	45.27	3.12	36.57	146.10	0.15	7.29	7.14	2.00
4	2	16	5	10.50	51.96	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	585	1	42.50	64.24	10,44	(lill 92.23	-2.41	5.55	19.81	14.26	2.50
2	1	290	3	21.50	97.28	. A.84, <sup>1</sup>	93.89	-4.14	4.78	13.20	8.42	0.80
2	2	150	2	10.50	121.27	<b>5</b> :05	91.77	-1.93	3.25	7.96	4.70	0.40
3	1	413	4	30.50	74.18	8.51	90.32	-0.36	4.23	15.42	11.19	1.60
4	1	303	6	21.50	46.75	3.93	44.68	101.43	0.25	9.08	8.83	2.30
4	2	19	5	10.50	\$2.38	0.28	11.62	674.24	0.01	0.59	0.58	0.10

•	_	1 -2	-	10.50	2.50	0.20	11.02	0, 1.2 1	0.01	0.55	0.50	0.10
Traff	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	585	1	42.50	72.56	11.79	92.23	-2.41	6.23	20.49	14.26	2.50
2	1	290	3	21.50	116.89	9.42	93.89	-4.14	5.74	14.16	8.42	0.80
2	2	150	2	10.50	146.58	6.11	91.77	-1.93	3.90	8.61	4.70	0.40
3	1	413	4	30.50	82.82	9.50	90.32	-0.36	4.71	15.91	11.19	1.50
4	1	303	6	21.50	46.77	3.94	44.68	101.43	0.25	9.08	8.83	2.30
4	2	19	5	10.50	52.38	0.28	11.62	674.24	0.01	0.59	0.58	0.10

### Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	477	1	42.50	48.94	6.48	75.20	19.68	1.76	13.12	11.35	3.80
2	1	237	3	21.50	86.48	5.69	76.73	17.30	1.98	8.79	6.81	1.10
2	2	122	2	10.50	118.83	4.03	74.64	20.58	1.75	5.56	3.80	0.40
3	1	337	4	30.50	59.89	5.61	73.70	22.11	1.57	10.55	8.98	2.10
4	1	248	6	21.50	45.29	3.12	36.57	146.10	0.15	7.29	7.14	2.00
4	2	16	5	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	400	1	42.50	38.96	4.33	63.06	42.72	0.79	10.15	9.36	4.20
2	1	198	3	21.50	61.35	3.37	64.10	40.40	0.83	6.47	5.64	1.10
2	2	102	2	10.50	82.55	2.34	62.40	44.22	0.76	3.93	3.17	0.40
3	1	282	4	30.50	48.50	3.80	61.67	45.93	0.72	8.15	7.43	2.20
4	1	207	6	21.50	44.31	2.55	30.52	194.85	0.09	6.00	5.91	1.80
4	2	13	5	10.50	51.57	0.19	7.95	9999.00	0.00	0.40	0.40	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:32:51

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

# **Run Options**

	X.O
Run Evaluation Set	No settle
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Aı	rm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
	1	L3125 East	50.0	10	10	80	0
	2	R135 South	50.0	10	10	80	0
	3	L3125 West	50.0	10	10	80	0
4	4	R135 North	50.0	10	10	80	0

For its pection buttores only any other use.

### **Traffic Streams**

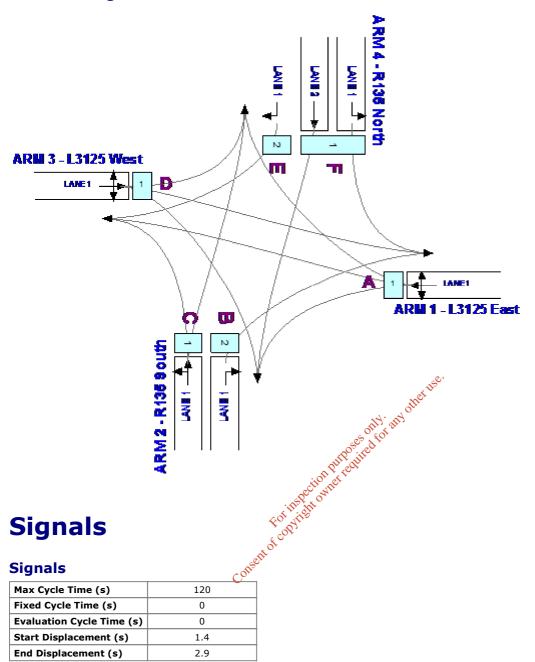
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

### Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 0.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

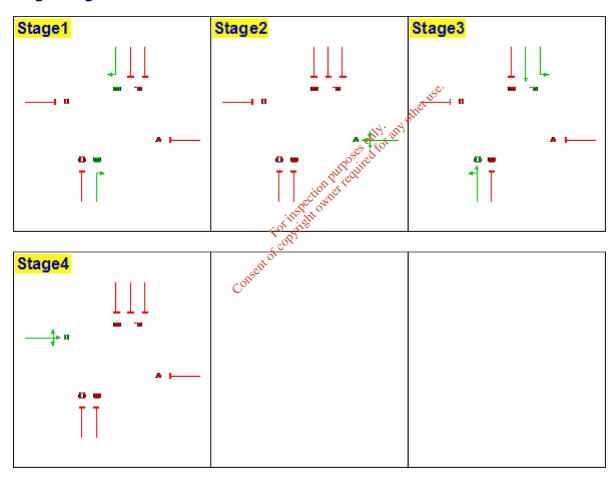
# **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences	
1	-1	B,E	Yes	
2	-1	Α	Yes	
3	-1	C,F	Yes	
4	-1	D	Yes	

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00		
Time Period (min)	90		
Time Segment Length (min)	15		
Signal Optimiser Flows	Average		
PCUs per Heavy Vehicle	2.00		

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	Yes	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2032 PM Peak + Link	No	16:30	18:00	ODTAB	No	D1

#### **Demand Set8 - 2017 PM Peak With Dev**

### ODTAB Data (PCU/hr during central 60 min peak period)

	То								
		Arm 1	Arm 2	Arm 3	Arm 4				
	Arm 1	-	92	223	218				
From	Arm 2	137	-	136	129				
	Arm 3	180	176	-	24				
	Arm 4	178	99	18	-				

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	400	477	585	585	477	400
2 - R135 South	1	С	199	238	291	291	238	199
2 - R135 South	2	В	103	122	150	150	122	103
3 - L3125 West	1	D	282	337	413	413	337	282
4 - R135 North	1	F	208	248	304	304	248	208
4 - R135 North	2	Е	13	16	19	19	16	13

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	60	34	6

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	15.71	23.32	23.32	57.5

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-3.63	26.05	26.05	54.50

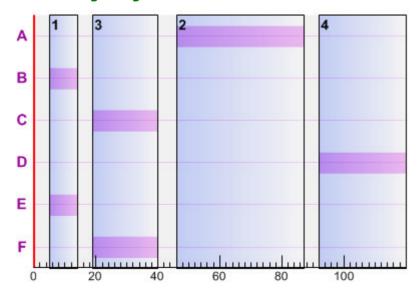
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

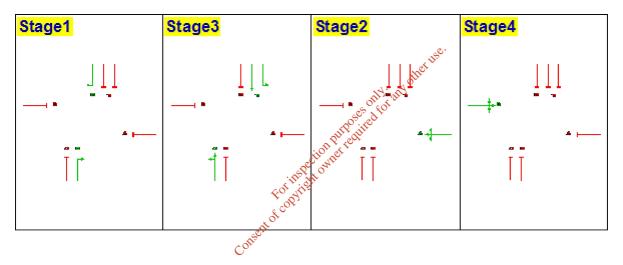
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	21.0	40.0
2	46.0	41.0	87.0
4	92.0	28.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0	,•		
1	5.0	9.0	14.0			ox 115			
3	19.0	21.0	40.0			othe			
2	46.0	41.0	87.0		Š	ITY any			
4	92.0	28.0	0.0		د چې د د	to			
Phase Phase	Start Time (s)	Duration (s)	End Time (s)	(S)	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
	Start Time		(s)	\$ ( <b>5</b> )	Ondicative Arrow Start (s)	Duracion	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase	Start Time (s)	(s)	(s)	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duracion	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A	Start Time (s)	(s) 41.0	(s)	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duracion	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A B	<b>Start Time</b> (s) 46 5	41.0 9.0	(s)	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duracion	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A B C	Start Time (s)  46  5  19	(s) 41.0 9.0 21.0	87 14 est 40 of	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duracion	Start Time (s) (2nd green)	(s) (2nd	(s)

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	487	Α	42.50	46.47	6.29	76.78	17.22	1.83	13.45	11.62	22.90
2	1	243	С	22.50	67.50	4.56	75.17	19.72	1.55	8.46	6.92	7.10
2	2	125	В	10.50	97.02	3.37	76.48	17.68	1.61	5.51	3.90	2.40
3	1	344	D	29.50	60.33	5.76	77.78	15.71	1.89	11.18	9.29	11.40
4	1	253	F	22.50	44.30	3.11	35.65	152.46	0.14	7.35	7.22	13.10
4	2	16	E	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.60

### Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	400	1	42.50	38.31	4.26	63.06	42.72	0.75	10.11	9.36	4.20
2	1	199	3	22.50	55.58	3.07	61.56	46.19	0.65	6.26	5.61	1.20
2	2	103	2	10.50	73.75	2.11	63.02	42.82	0.66	3.86	3.20	0.40
3	1	282	4	29.50	49.26	3.86	63.76	41.14	0.76	8.27	7.51	2.10
4	1	208	6	22.50	43.29	2.50	29.31	207.08	0.08	5.96	5.88	1.90
4	2	13	5	10.50	51.56	0.19	7.95	9999.00	0.00	0.40	0.40	0.10

# Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	477	1	42.50	44.75	5.93	75.20	19.68	1.57	12.92	11.35	3.90
2	1	238	3	22.50	64.45	4.26	73.63	22.24	1.30	8.06	6.77	1.20
2	2	122	2	10.50	88.76	3.01	74.64	20.58	1.25	5.05	3.80	0.40
3	1	337	4	29.50	57.58	5.39	76.20	18.11	1.58	10.67	9.08	1.90
4	1	248	6	22.50	44.18	3.04	34.94	157.55	0.13	7.20	7.07	2.20
4	2	16	5	10.50	51.96	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	585	1	42.50	64.24	10,44	(lill 92.23	-2.41	5.55	19.81	14.26	2.50
2	1	291	3	22.50	86.83	. 3.02°	90.02	-0.03	3.70	12.07	8.37	1.00
2	2	150	2	10.50	121.40	<b>5</b> %6	91.77	-1.93	3.25	7.96	4.70	0.40
3	1	413	4	29.50	81.65	9.37	93.39	-3.63	5.32	16.63	11.32	1.40
4	1	304	6	22.50	45.56	3.85	42.84	110.10	0.22	8.99	8.77	2.40
4	2	19	5	10.50	\$2.38	0.28	11.62	674.24	0.01	0.59	0.58	0.10

•	_	1 -2		10.50	2.50	0.20	11.02	0, 1.2 1	0.01	0.55	0.50	0.10	
Traff	raffic Stream Details (17:15-17:30)												
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)	
1	1	585	1	42.50	72.56	11.79	92.23	-2.41	6.23	20.49	14.26	2.50	
2	1	291	3	22.50	98.59	7.97	90.02	-0.03	4.19	12.56	8.37	0.90	
2	2	150	2	10.50	146.58	6.11	91.77	-1.93	3.90	8.61	4.70	0.40	
3	1	413	4	29.50	95.57	10.96	93.39	-3.63	6.22	17.53	11.32	1.30	
4	1	304	6	22.50	45.57	3.85	42.84	110.10	0.22	8.99	8.77	2.40	
4	2	19	5	10.50	52.38	0.28	11.62	674.24	0.01	0.59	0.58	0.10	

### Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	477	1	42.50	48.94	6.48	75.20	19.68	1.76	13.12	11.35	3.80
2	1	238	3	22.50	73.55	4.86	73.63	22.24	1.56	8.33	6.77	1.20
2	2	122	2	10.50	118.83	4.03	74.64	20.58	1.75	5.56	3.80	0.40
3	1	337	4	29.50	66.99	6.27	76.20	18.11	1.88	10.97	9.08	1.90
4	1	248	6	22.50	44.19	3.04	34.94	157.55	0.13	7.20	7.07	2.20
4	2	16	5	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	400	1	42.50	38.96	4.33	63.06	42.72	0.79	10.15	9.36	4.20
2	1	199	3	22.50	57.69	3.19	61.56	46.19	0.71	6.32	5.61	1.20
2	2	103	2	10.50	83.16	2.38	63.02	42.82	0.79	3.99	3.20	0.40
3	1	282	4	29.50	50.76	3.98	63.76	41.14	0.81	8.33	7.51	2.10
4	1	208	6	22.50	43.30	2.50	29.31	207.08	0.08	5.96	5.88	1.90
4	2	13	5	10.50	51.57	0.19	7.95	9999.00	0.00	0.40	0.40	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

Report generation date: 09/12/2016 10:59:37

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsente
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width Approach Speed (m) (kph)		Exit Speed Speed Limit (kph)		Stagger Distance (m)	
1	L3125 East	50.0	10	10	80	0	
2	R135 South	50.0	10	10	80	0	
3	L3125 West	50.0	10	10	80	0	
4	R135 North	50.0	10	10	80	0	

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## **Traffic Streams**

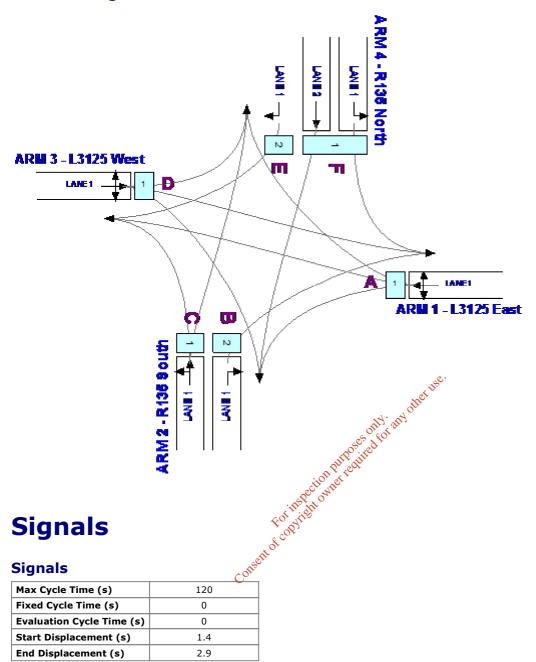
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	А	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8,150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	15	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.43000	10	Yes	3.00	0.0	0
4	1	1		1			\$2.00c	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6790	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 0 0.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

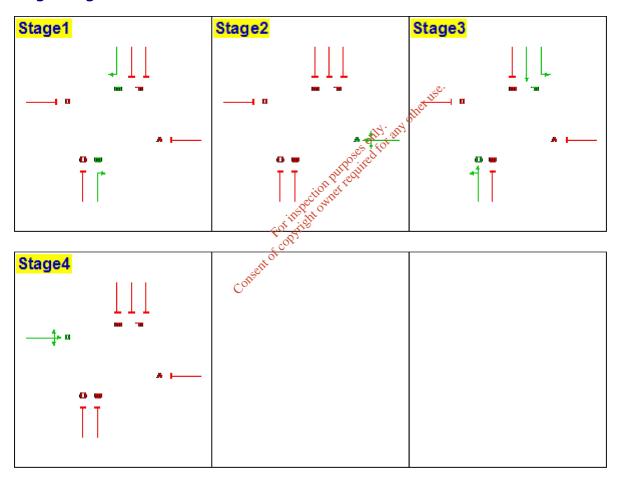
# **Intergreen Matrix**

	То									
		Α	В	С	D	E	F			
	Α	-	5	5	5	5	5			
	В	6	-	5	6		5			
From	С	6	5	-	6	5				
	D	5	5	5	-	5	5			
	E	6		5	6	-	5			
	F	6	5		6	5	-			

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

# **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>ODTAB</b>	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	Yes	16:30	18:00	ODTAB	No	D1
2023 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1

#### **Demand Set9 - 2022 PM Peak No Dev**

## ODTAB Data (PCU/hr during central 60 min peak period)

			То		
		Arm 1	Arm 2	Arm 3	Arm 4
	Arm 1	-	96	232	227
From	Arm 2	143	-	142	133
	Arm 3	188	184	-	25
	Arm 4	186	102	19	-

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	416	497	609	609	497	416
2 - R135 South	1	С	207	247	303	303	247	207
2 - R135 South	2	В	107	127	156	156	127	107
3 - L3125 West	1	D	295	352	431	431	352	295
4 - R135 North	1	F	216	258	317	317	258	216
4 - R135 North	2	Е	14	16	20	20	16	14

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	61	33	6

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	10.32	25.83	25.83	55.6

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-8.25	30.07	30.07	52.10

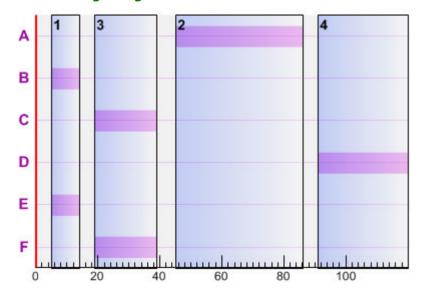
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

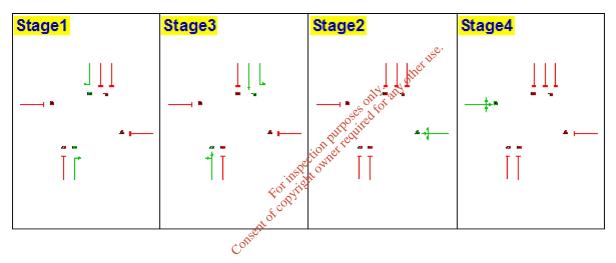
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	20.0	39.0
2	45.0	41.0	86.0
4	91.0	29.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0			
1	5.0	9.0	14.0			ox 115°			
3	19.0	20.0	39.0			othe			
2	45.0	41.0	86.0		Š	ITY any			
4	91.0	29.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	45	41.0	86	80		(-,		<u> </u>	
В	5	9.0	14 es						
С	19	20.0	390017						
D	91	29.0	0						
E	5	9.0	14						
F	19	20.0	39						

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	507	Α	42.50	49.36	6.95	79.93	12.60	2.30	14.45	12.15	21.70
2	1	252	С	21.50	78.99	5.53	81.58	10.32	2.42	9.68	7.26	6.20
2	2	130	В	10.50	104.39	3.77	79.54	13.16	1.98	6.04	4.06	2.40
3	1	359	D	30.50	59.98	5.98	78.51	14.63	2.00	11.62	9.62	12.00
4	1	264	F	21.50	45.69	3.35	38.93	131.19	0.17	7.80	7.63	12.70
4	2	17	Е	10.50	52.10	0.25	10.40	765.32	0.01	0.53	0.52	0.60

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	42.50	39.33	4.54	65.58	37.23	0.87	10.64	9.77	4.20
2	1	207	3	21.50	59.76	3.44	67.02	34.30	0.88	6.79	5.91	1.10
2	2	107	2	10.50	75.67	2.25	65.46	37.48	0.75	4.08	3.33	0.40
3	1	295	4	30.50	48.69	3.99	64.52	39.50	0.79	8.59	7.79	2.20
4	1	216	6	21.50	44.50	2.67	31.85	182.56	0.10	6.28	6.18	1.90
4	2	14	5	10.50	51.69	0.20	8.57	950.75	0.01	0.43	0.43	0.10

# Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	42.50	47.06	6.50	78.35	14.87	1.93	13.81	11.88	3.70
2	1	247	3	21.50	72.72	4.99	79.97	12.55	1.89	9.00	7.11	1.00
2	2	127	2	10.50	93.32	3.29	77.70	15.83	1.48	5.44	3.96	0.40
3	1	352	4	30.50	57.19	5.59	76.98	16.91	1.67	11.09	9.41	2.00
4	1	258	6	21.50	45.52	3.26	38.04	136.56	0.16	7.60	7.44	2.10
4	2	16	5	10.50	51.96	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# **Traffic Stream Details (17:00-17:15)**

Traff	fic Stre	am Deta	ils (17:00	-17:15)				, USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	42.50	72.29	12,23	Q <sup>111</sup> 96.01	-6.26	7.82	22.75	14.93	2.10
2	1	303	3	21.50	108.25	. (S. 14. <sup>5</sup>	98.10	-8.25	6.43	15.26	8.83	0.70
2	2	156	2	10.50	131.49	<b>5</b> 170	95.44	-5.70	4.01	8.91	4.90	0.40
3	1	431	4	30.50	82.25	9.85	94.26	-4.52	5.78	17.51	11.73	1.40
4	1	317	6	21.50	47.47	4.15	46.75	92.53	0.29	9.55	9.26	2.30
4	2	20	5	10.50	\$2.52	0.29	12.24	635.52	0.01	0.62	0.61	0.10

•	-			10.50	, Z52	0.23	1	055.52	0.01	0.02	0.01	0.10
Traff	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	hite							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	42.50	87.90	14.87	96.01	-6.26	9.48	24.41	14.93	2.00
2	1	303	3	21.50	139.59	11.75	98.10	-8.25	8.35	17.17	8.83	0.70
2	2	156	2	10.50	165.93	7.19	95.44	-5.70	5.05	9.95	4.90	0.40
3	1	431	4	30.50	97.56	11.68	94.26	-4.52	6.86	18.58	11.73	1.30
4	1	317	6	21.50	47.19	4.16	46.75	92.53	0.29	9.55	9.26	2.30
4	2	20	5	10.50	52.52	0.29	12.24	635.52	0.01	0.62	0.61	0.10

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	42.50	56.04	7.74	78.35	14.87	2.25	14.13	11.88	3.60
2	1	247	3	21.50	107.47	7.37	79.97	12.55	2.62	9.73	7.11	1.00
2	2	127	2	10.50	140.11	4.94	77.70	15.83	2.25	6.21	3.96	0.40
3	1	352	4	30.50	67.69	6.62	76.98	16.91	2.00	11.42	9.41	2.00
4	1	258	6	21.50	45.55	3.26	38.04	136.56	0.16	7.61	7.44	2.10
4	2	16	5	10.50	51.97	0.23	9.79	819.41	0.01	0.50	0.49	0.10

# Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	42.50	40.27	4.65	65.58	37.23	0.93	10.69	9.77	4.20
2	1	207	3	21.50	64.77	3.72	67.02	34.30	1.00	6.91	5.91	1.10
2	2	107	2	10.50	89.14	2.65	65.46	37.48	0.92	4.25	3.33	0.40
3	1	295	4	30.50	50.24	4.12	64.52	39.50	0.85	8.65	7.79	2.20
4	1	216	6	21.50	44.52	2.67	31.85	182.56	0.10	6.28	6.18	1.90
4	2	14	5	10.50	51.71	0.20	8.57	950.75	0.01	0.43	0.43	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

Report generation date: 09/12/2016 11:35:27

# **Summary**

## **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsett
Evaluation Only	No
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

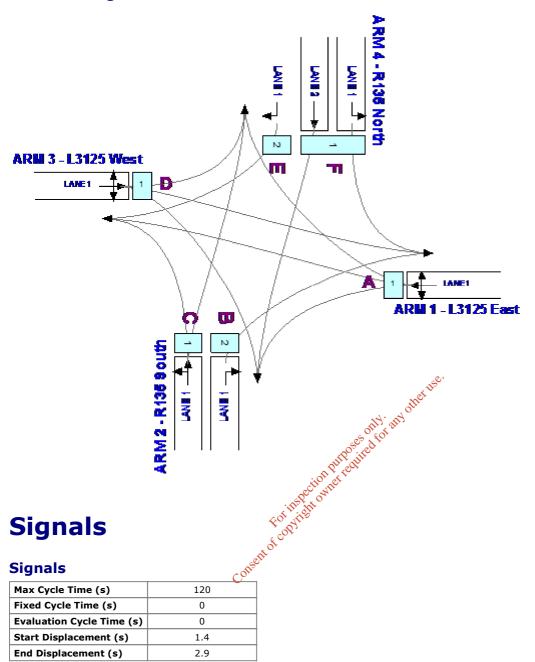
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	А	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8,150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	15	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.43000	10	Yes	3.00	0.0	0
4	1	1		1			4.000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6790	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

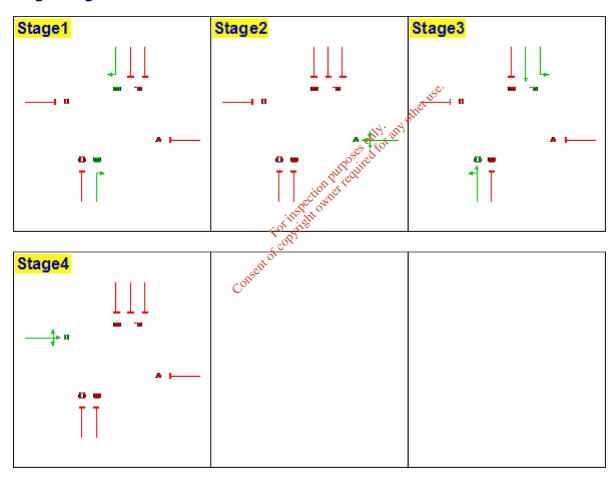
# **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences	
1	-1	B,E	Yes	
2	-1	Α	Yes	
3	-1	C,F	Yes	
4	-1	D	Yes	

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTABUIL	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>G</b> DTAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>28</b> :00	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak With Dev	Yes	16:30	18:00	ODTAB	No	D1

#### Demand Set10 - 2022 PM Peak With Dev

## ODTAB Data (PCU/hr during central 60 min peak period)

		То											
		Arm 1	Arm 2	Arm 3	Arm 4								
	Arm 1	-	96	232	227								
From	Arm 2	143	-	142	135								
	Arm 3	188	184	-	25								
	Arm 4	186	103	19	-								

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	416	497	609	609	497	416
2 - R135 South	1	С	208	248	304	304	248	208
2 - R135 South	2	В	107	128	157	157	128	107
3 - L3125 West	1	D	295	352	431	431	352	295
4 - R135 North	1	F	215	257	314	314	257	215
4 - R135 North	2	Е	14	17	20	20	17	14

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	60	33	6

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	10.87	25.77	25.77	55.9

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-7.65	30.05	30.05	52.90

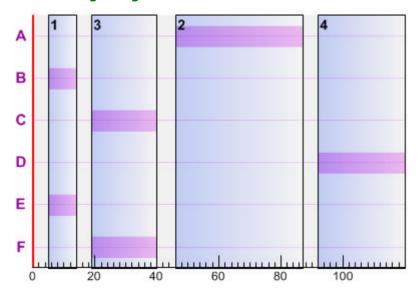
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

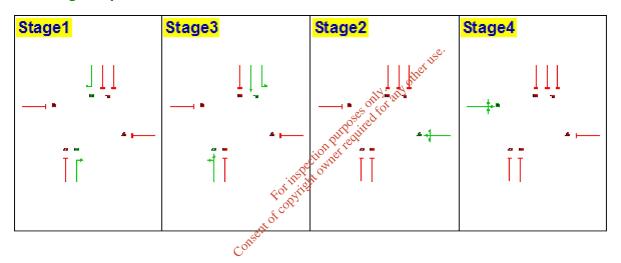
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	21.0	40.0
2	46.0	41.0	87.0
4	92.0	28.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		ر و			
1	5.0	9.0	14.0			ox 115			
3	19.0	21.0	40.0			othe			
2	46.0	41.0	87.0		Š	illy, stud			
4	92.0	28.0	0.0		لا دعي	Eor			
					~~~				
Phase Phase	Start Time (s)	Duration (s)	End Time (s)	(S)	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
	Start Time		(s) 87	\$ (5)	Indicative Arrow Start (s)	Daration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase	Start Time (s)	(s)	(s) 87	\$ (5)	Indicative Arrow Start (s)	Daration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A	Start Time (s)	(s) 41.0	(s) 87	\$ (5)	Indicative Arrow Start (s)	Daration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A B	<b>Start Time</b> (s) 46 5	41.0 9.0	(s)	\$ (5)	Indicative Arrow Start (s)	Daration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A B C	Start Time (s)  46  5  19	(s) 41.0 9.0 21.0	87 14 est 40 of	\$ (5)	Indicative Arrow Start (s)	Daration	Start Time (s) (2nd green)	(s) (2nd	(s)

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	507	Α	42.50	49.36	6.95	79.93	12.60	2.30	14.45	12.15	21.70
2	1	253	С	22.50	71.56	5.03	78.27	14.99	1.91	9.13	7.22	6.90
2	2	131	В	10.50	106.06	3.86	80.15	12.29	2.06	6.15	4.09	2.40
3	1	359	D	29.50	64.65	6.45	81.18	10.87	2.42	12.15	9.72	10.90
4	1	262	F	22.50	44.51	3.24	36.92	143.79	0.15	7.64	7.49	13.40
4	2	17	E	10.50	52.10	0.25	10.40	765.32	0.01	0.53	0.52	0.60

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	42.50	39.33	4.54	65.58	37.23	0.87	10.64	9.77	4.20
2	1	208	3	22.50	57.04	3.30	64.35	39.87	0.76	6.64	5.88	1.20
2	2	107	2	10.50	75.67	2.25	65.46	37.48	0.75	4.08	3.33	0.40
3	1	295	4	29.50	50.68	4.15	66.70	34.92	0.90	8.78	7.88	2.10
4	1	215	6	22.50	43.44	2.59	30.30	197.08	0.09	6.18	6.08	2.00
4	2	14	5	10.50	51.69	0.20	8.57	950.75	0.01	0.43	0.43	0.10

# Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	42.50	47.06	6.50	78.35	14.87	1.93	13.81	11.88	3.70
2	1	248	3	22.50	67.45	4.65	76.72	17.31	1.56	8.63	7.07	1.20
2	2	128	2	10.50	94.15	3.35	78.31	14.93	1.52	5.52	4.00	0.40
3	1	352	4	29.50	60.76	5.94	79.59	13.08	1.97	11.48	9.52	1.90
4	1	257	6	22.50	44.39	3.17	36.21	148.53	0.14	7.48	7.34	2.20
4	2	17	5	10.50	52.09	0.25	10.40	765.32	0.01	0.53	0.52	0.10

# **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	42.50	72.29	12,23	(lill 96.01	-6.26	7.82	22.75	14.93	2.10
2	1	304	3	22.50	95.67	. 8.08 °	94.04	-4.30	4.92	13.69	8.77	0.90
2	2	157	2	10.50	133.33	5.81	96.05	-6.30	4.16	9.09	4.93	0.40
3	1	431	4	29.50	91,53	10.96	97.46	-7.65	7.38	19.24	11.86	1.20
4	1	314	6	22.50	45.83	4.00	44.24	103.41	0.25	9.32	9.07	2.50
4	2	20	5	10.50	\$2.52	0.29	12.24	635.52	0.01	0.62	0.61	0.10

•	_		-	10.50	, C.J.	0.23	12.2.	055.52	0.01	0.02	0.01	0.10
Traff	raffic Stream Details (17:15-17: <mark>30</mark> )											
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	42.50	87.90	14.87	96.01	-6.26	9.48	24.41	14.93	2.00
2	1	304	3	22.50	115.03	9.71	94.04	-4.30	5.92	14.68	8.77	0.90
2	2	157	2	10.50	169.38	7.39	96.05	-6.30	5.27	10.20	4.93	0.40
3	1	431	4	29.50	115.61	13.84	97.46	-7.65	9.39	21.24	11.86	1.10
4	1	314	6	22.50	45.85	4.00	44.24	103.41	0.25	9.32	9.07	2.50
4	2	20	5	10.50	52.52	0.29	12.24	635.52	0.01	0.62	0.61	0.10

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	42.50	56.04	7.74	78.35	14.87	2.25	14.13	11.88	3.60
2	1	248	3	22.50	84.27	5.80	76.72	17.31	1.98	9.04	7.07	1.10
2	2	128	2	10.50	144.60	5.14	78.31	14.93	2.36	6.36	4.00	0.40
3	1	352	4	29.50	81.15	7.94	79.59	13.08	2.49	12.01	9.52	1.80
4	1	257	6	22.50	44.41	3.17	36.21	148.53	0.14	7.48	7.34	2.20
4	2	17	5	10.50	52.11	0.25	10.40	765.32	0.01	0.53	0.52	0.10

# Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	42.50	40.27	4.65	65.58	37.23	0.93	10.69	9.77	4.20
2	1	208	3	22.50	60.06	3.47	64.35	39.87	0.84	6.72	5.88	1.20
2	2	107	2	10.50	89.98	2.67	65.46	37.48	0.92	4.25	3.33	0.40
3	1	295	4	29.50	52.97	4.34	66.70	34.92	0.98	8.86	7.88	2.10
4	1	215	6	22.50	43.45	2.60	30.30	197.08	0.09	6.18	6.08	2.00
4	2	14	5	10.50	51.71	0.20	8.57	950.75	0.01	0.43	0.43	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:04:29

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

•	X
Run Evaluation Set	No sent
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

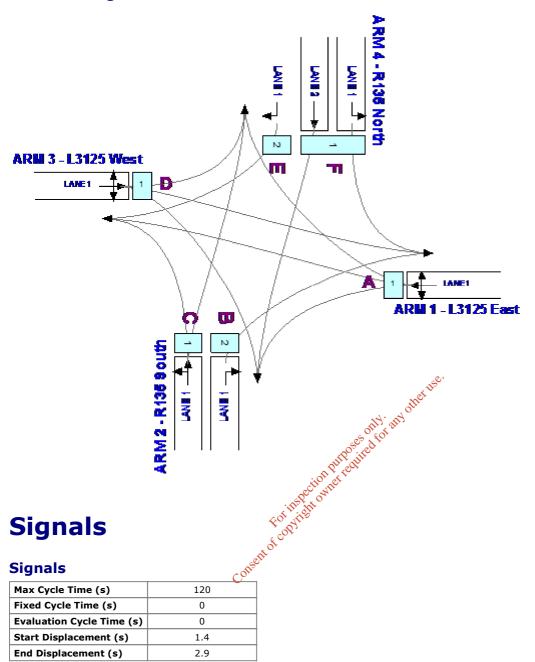
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	А	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.37 0.74 1.00 0.43 0.43 0.00 0.43 0.00 0.43 0.00	40,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301601	10	Yes	3.00	0.0	0
4	1	1		1			\$2000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 6200	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

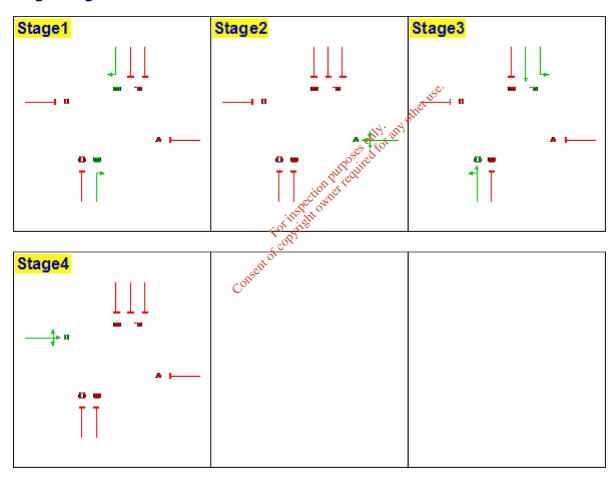
# **Intergreen Matrix**

		То											
		Α	В	С	D	E	F						
	Α	-	5	5	5	5	5						
	В	6	-	5	6		5						
From	С	6	5	-	6	5							
	D	5	5	5	-	5	5						
	E	6		5	6	-	5						
	F	6	5		6	5	-						

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# **Configuration**

Traffic Scaling Factor	1.00		
Time Period (min)	90		
Time Segment Length (min)	15		
Signal Optimiser Flows	Average		
PCUs per Heavy Vehicle	2.00		

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>ODTAB</b>	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak Sen	Yes	16:30	18:00	ODTAB	No	D1

#### Demand Set10 - 2022 PM Peak Sen

# ODTAB Data (PCU/hr during central 60 min peak period)

	То										
		Arm 1	Arm 2	Arm 3	Arm 4						
	Arm 1	-	96	232	227						
From	Arm 2	143	-	142	156						
	Arm 3	188	184	-	25						
	Arm 4	186	125	19	-						

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	416	497	609	609	497	416
2 - R135 South	1	С	222	265	324	324	265	222
2 - R135 South	2	В	106	126	155	155	126	106
3 - L3125 West	1	D	295	352	431	431	352	295
4 - R135 North	1	F	233	278	340	340	278	233
4 - R135 North	2	Е	15	18	22	22	18	15

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	32	35	32
3 - L3125 West	6	47	46
4 - R135 North	56	38	6

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# **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

#### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	3.17	27.54	27.54	56.7

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Reserve		Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-14.13	32.53	32.53	53.10

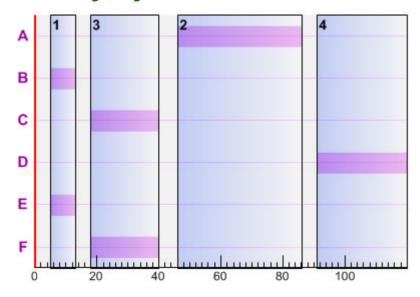
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

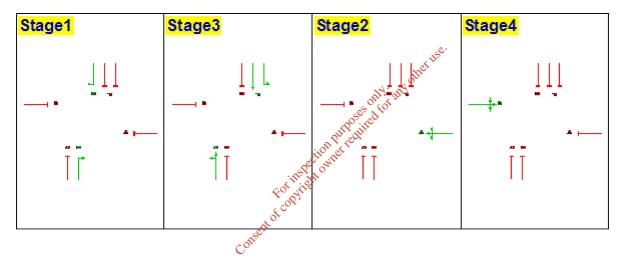
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	8.0	13.0
3	18.0	22.0	40.0
2	46.0	40.0	86.0
4	91.0	29.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		ر و	,•		
1	5.0	8.0	13.0			ox 115			
3	18.0	22.0	40.0			othe			
2	46.0	40.0	86.0		Š	ITY STITY			
4	91.0	29.0	0.0		د دعي	Eor			
Phase Phase	Start Time (s)	Duration (s)	End Time (s)		Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
	Start Time		(s) 86	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase	Start Time (s)	(s)	(s) 86	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A	Start Time (s)	(s) 40.0	(s) 86	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A B	<b>Start Time</b> (s) 46 5	40.0 8.0	(s)	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duration	Start Time (s) (2nd green)	(s) (2nd	(s)
Phase A B C	Start Time (s)  46  5  18	(s) 40.0 8.0 22.0	86 13 est 40 of	\$ ( <b>5</b> )	Indicative Arrow Start (s)	Duration	Start Time (s) (2nd green)	(s) (2nd	(s)

# **Phase Timings Diagram**



# **Final Stage Sequence**



# **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	507	Α	41.50	52.44	7.39	81.86	9.95	2.66	14.96	12.30	20.00
2	1	270	С	23.50	72.52	5.44	79.97	12.54	2.16	9.81	7.65	7.20
2	2	129	В	9.50	139.44	5.00	87.23	3.17	3.48	7.54	4.06	2.10
3	1	359	D	30.50	59.98	5.98	78.51	14.63	2.00	11.62	9.62	12.00
4	1	284	F	23.50	43.94	3.47	38.31	134.90	0.17	8.24	8.07	14.80
4	2	18	E	9.50	53.59	0.27	12.17	639.42	0.01	0.57	0.55	0.60

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	41.50	40.79	4.71	67.16	34.00	0.96	10.85	9.89	4.00
2	1	222	3	23.50	56.70	3.50	65.76	36.87	0.82	7.05	6.23	1.30
2	2	106	2	9.50	84.18	2.48	71.68	25.56	1.03	4.36	3.32	0.40
3	1	295	4	30.50	48.69	3.99	64.52	39.50	0.79	8.59	7.79	2.20
4	1	233	6	23.50	42.80	2.77	31.43	186.31	0.10	6.65	6.55	2.20
4	2	15	5	9.50	53.09	0.22	10.14	787.30	0.01	0.47	0.46	0.10

# Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	41.50	49.52	6.84	80.24	12.16	2.18	14.21	12.03	3.40
2	1	265	3	23.50	67.94	5.00	78.49	14.66	1.75	9.25	7.50	1.20
2	2	126	2	9.50	111.92	3.92	85.20	5.63	2.19	6.16	3.97	0.30
3	1	352	4	30.50	57.19	5.59	76.98	16.91	1.67	11.09	9.41	2.00
4	1	278	6	23.50	43.79	3.38	37.51	139.97	0.16	8.05	7.89	2.40
4	2	18	5	9.50	53.60	0.27	12.17	639.42	0.01	0.57	0.55	0.10

# **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	609	1	41.50	79.19	13,40	(lill 98.32	-8.46	9.57	24.69	15.12	1.70
2	1	324	3	23.50	98.73	. 89.°	95.97	-6.22	5.77	15.06	9.29	0.90
2	2	155	2	9.50	165.01	<b>%</b> 10	104.81	-14.13	6.31	11.00	4.68	0.30
3	1	431	4	30.50	82.25	9.85	94.26	-4.52	5.78	17.51	11.73	1.40
4	1	340	6	23.50	45.32	4.28	45.87	96.21	0.27	10.05	9.78	2.70
4	2	22	5	9.50	54.27	0.33	14.88	504.98	0.02	0.70	0.68	0.10

•	-		-	7.50	0,112,	0.55	1	301.30	0.02	0.70	0.00	0.10			
Traff	raffic Stream Details (17:15-17:30)														
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)			
1	1	609	1	41.50	101.75	17.21	98.32	-8.46	12.35	27.47	15.12	1.60			
2	1	324	3	23.50	122.26	11.00	95.97	-6.22	7.17	16.46	9.29	0.90			
2	2	155	2	9.50	233.76	10.06	104.81	-14.13	8.92	13.60	4.68	0.30			
3	1	431	4	30.50	97.56	11.68	94.26	-4.52	6.86	18.58	11.73	1.30			
4	1	340	6	23.50	45.34	4.28	45.87	96.21	0.27	10.05	9.78	2.70			
4	2	22	5	9.50	54.30	0.33	14.88	504.98	0.02	0.70	0.68	0.10			

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	41.50	65.32	9.02	80.24	12.16	2.64	14.67	12.03	3.30
2	1	265	3	23.50	90.00	6.63	78.49	14.66	2.28	9.78	7.50	1.20
2	2	126	2	9.50	244.70	8.56	85.20	5.63	4.71	8.68	3.97	0.30
3	1	352	4	30.50	67.69	6.62	76.98	16.91	2.00	11.42	9.41	2.00
4	1	278	6	23.50	43.81	3.38	37.51	139.97	0.16	8.05	7.89	2.40
4	2	18	5	9.50	53.62	0.27	12.17	639.42	0.01	0.57	0.55	0.10

# Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	416	1	41.50	42.04	4.86	67.16	34.00	1.02	10.92	9.89	4.00
2	1	222	3	23.50	60.12	3.71	65.76	36.87	0.92	7.15	6.23	1.30
2	2	106	2	9.50	134.33	3.96	71.68	25.56	1.44	4.77	3.32	0.40
3	1	295	4	30.50	50.24	4.12	64.52	39.50	0.85	8.65	7.79	2.20
4	1	233	6	23.50	42.82	2.77	31.43	186.31	0.10	6.65	6.55	2.20
4	2	15	5	9.50	53.11	0.22	10.14	787.30	0.01	0.47	0.46	0.10

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# **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:12:12

# **Summary**

#### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

•	X
Run Evaluation Set	No sent
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

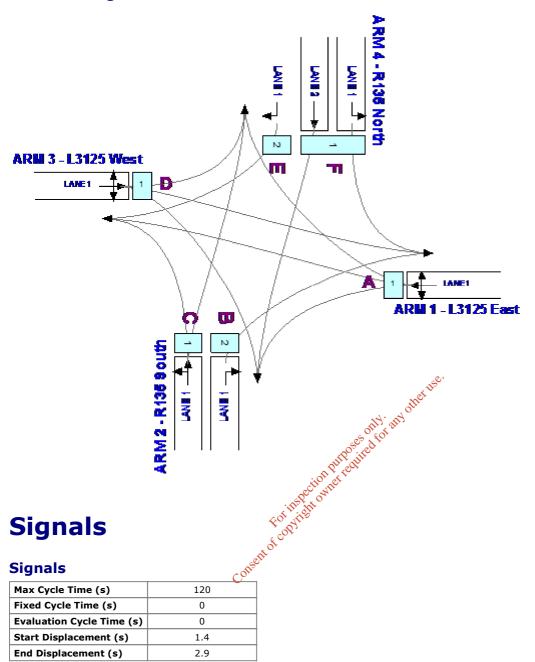
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	А	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	78,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	1.00 N. 0.430 Co. 0.430 Co	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 0000	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
					Consent	Folytight o	1.00					

# **Junction Diagram**



#### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

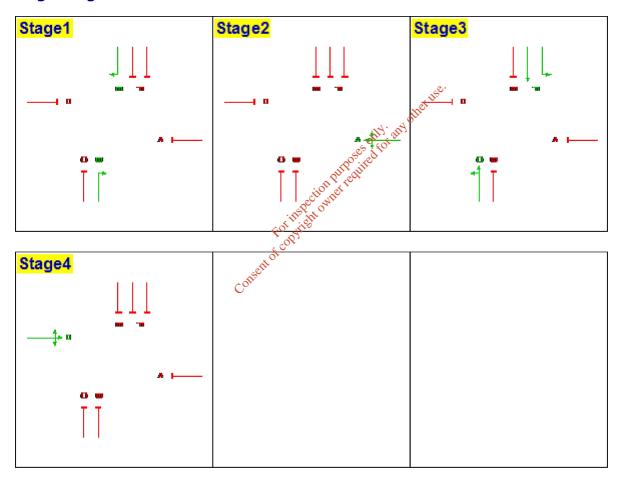
# **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

# Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

# **Stage Diagrams**



#### **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

# Configuration

Traffic Scaling Factor	1.00		
Time Period (min)	90		
Time Segment Length (min)	15		
Signal Optimiser Flows	Average		
PCUs per Heavy Vehicle	2.00		

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak + Link	Yes	16:30	18:00	ODTAB	No	D1

#### Demand Set10 - 2022 PM Peak + Link

## ODTAB Data (PCU/hr during central 60 min peak period)

	То								
		Arm 1	Arm 2	Arm 3	Arm 4				
	Arm 1	-	99	232	114				
From	Arm 2	143	-	142	135				
	Arm 3	188	184	-	25				
	Arm 4	92	103	19	-				

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

# Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	334	399	488	488	399	334
2 - R135 South	1	С	208	248	304	304	248	208
2 - R135 South	2	В	107	128	157	157	128	107
3 - L3125 West	1	D	295	352	431	431	352	295
4 - R135 North	1	F	146	174	214	214	174	146
4 - R135 North	2	Е	14	17	21	21	17	14

# **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage	
1 - L3125 East	22	52	26	
2 - R135 South	34	32	34	
3 - L3125 West	6	47	46	
4 - R135 North	43	48	9	

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## **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

### **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	20.10	20.79	20.79	54.7

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-0.05	22.66	22.66	51.90

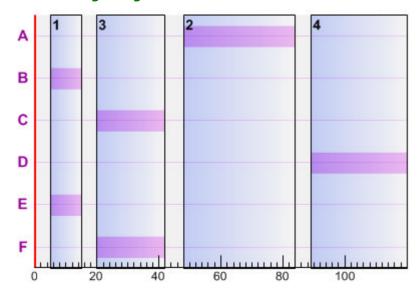
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

### **Stage Timings**

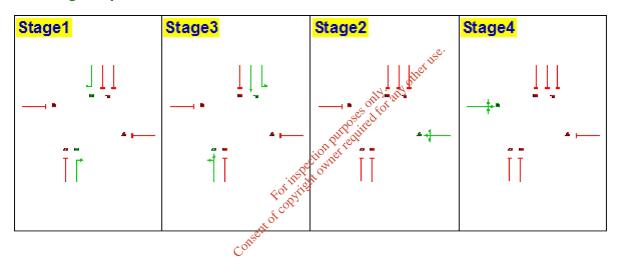
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	10.0	15.0
3	20.0	22.0	42.0
2	48.0	36.0	84.0
4	89.0	31.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		ر و			
1	5.0	10.0	15.0			ox 115°			
3	20.0	22.0	42.0			othe			
2	48.0	36.0	84.0		Š	ITY any			
4	89.0	31.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	48	36.0	84	S.					
В	5	10.0	15 es						
С	20	22.0	42000						
D	89	31.0	0						
E	5	10.0	15						
F	20	22.0	42						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	407	Α	37.50	47.80	5.40	72.72	23.76	1.38	11.53	10.15	18.80
2	1	253	С	23.50	65.75	4.62	74.94	20.10	1.53	8.67	7.14	7.60
2	2	131	В	11.50	86.87	3.16	73.18	22.99	1.31	5.37	4.05	2.80
3	1	359	D	32.50	53.19	5.30	73.68	22.15	1.45	10.85	9.40	14.20
4	1	178	F	23.50	41.73	2.06	24.01	274.78	0.05	5.00	4.95	10.60
4	2	17	Е	11.50	50.89	0.24	9.50	847.74	0.01	0.52	0.51	0.70

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	334	1	37.50	40.86	3.79	59.68	50.81	0.61	8.81	8.20	3.30
2	1	208	3	23.50	54.52	3.15	61.61	46.08	0.65	6.47	5.82	1.30
2	2	107	2	11.50	69.29	2.06	59.77	50.57	0.56	3.85	3.30	0.40
3	1	295	4	32.50	45.24	3.71	60.55	48.65	0.63	8.25	7.62	2.50
4	1	146	6	23.50	41.14	1.67	19.70	356.92	0.03	4.06	4.03	1.50
4	2	14	5	11.50	50.54	0.20	7.82	9999.00	0.00	0.43	0.42	0.10

## Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	399	1	37.50	46.49	5.15	71.29	26.25	1.21	11.15	9.94	3.20
2	1	248	3	23.50	62.97	4.34	73.46	22.52	1.29	8.29	6.99	1.30
2	2	128	2	11.50	81.45	2.90	71.50	25.87	1.06	5.02	3.96	0.50
3	1	352	4	32.50	51.56	5.04	72.25	24.58	1.26	10.46	9.20	2.40
4	1	174	6	23.50	41.65	2.01	23.47	283.39	0.05	4.88	4.83	1.70
4	2	17	5	11.50	50.89	0.24	9.50	847.74	0.01	0.52	0.51	0.10

## **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	488	1	37.50	61.11	8.28	Will 87.19	3.22	3.52	15.92	12.39	2.40
2	1	304	3	23.50	85.09	. A.19.	90.04	-0.05	3.76	12.43	8.68	1.00
2	2	157	2	11.50	107.45	4:69	87.70	2.62	2.65	7.54	4.89	0.40
3	1	431	4	32.50	68.47	8.20	88.46	1.74	3.74	15.20	11.46	1.80
4	1	214	6	23.50	42.42	2.52	28.87	211.73	0.08	6.07	5.99	2.00
4	2	21	5	11.50	\$1.37	0.30	11.73	667.21	0.01	0.65	0.64	0.10

	_			11.50	( T. )	0.50	11.75	007.21	0.01	0.05	0.0.	0.10
Traff	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	hite							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	488	1	37.50	65.27	8.85	87.19	3.22	3.76	16.15	12.39	2.40
2	1	304	3	23.50	96.41	8.14	90.04	-0.05	4.25	12.92	8.68	1.00
2	2	157	2	11.50	123.47	5.38	87.70	2.62	3.03	7.92	4.89	0.40
3	1	431	4	32.50	74.52	8.92	88.46	1.74	4.06	15.52	11.46	1.80
4	1	214	6	23.50	42.43	2.52	28.87	211.73	0.08	6.07	5.99	2.00
4	2	21	5	11.50	51.37	0.30	11.73	667.21	0.01	0.65	0.64	0.10

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	399	1	37.50	48.82	5.41	71.29	26.25	1.33	11.27	9.94	3.10
2	1	248	3	23.50	71.43	4.92	73.46	22.52	1.54	8.54	6.99	1.30
2	2	128	2	11.50	98.02	3.49	71.50	25.87	1.38	5.34	3.96	0.50
3	1	352	4	32.50	55.15	5.39	72.25	24.58	1.42	10.62	9.20	2.40
4	1	174	6	23.50	41.66	2.01	23.47	283.39	0.05	4.88	4.83	1.70
4	2	17	5	11.50	50.90	0.24	9.50	847.74	0.01	0.52	0.51	0.10

## Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	334	1	37.50	41.41	3.84	59.68	50.81	0.64	8.84	8.20	3.30
2	1	208	3	23.50	56.43	3.26	61.61	46.08	0.71	6.53	5.82	1.30
2	2	107	2	11.50	74.76	2.22	59.77	50.57	0.64	3.94	3.30	0.40
3	1	295	4	32.50	46.05	3.77	60.55	48.65	0.67	8.29	7.62	2.50
4	1	146	6	23.50	41.14	1.67	19.70	356.92	0.03	4.06	4.03	1.50
4	2	14	5	11.50	50.55	0.20	7.82	9999.00	0.00	0.43	0.42	0.10

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## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:06:24

# **Summary**

### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsente
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

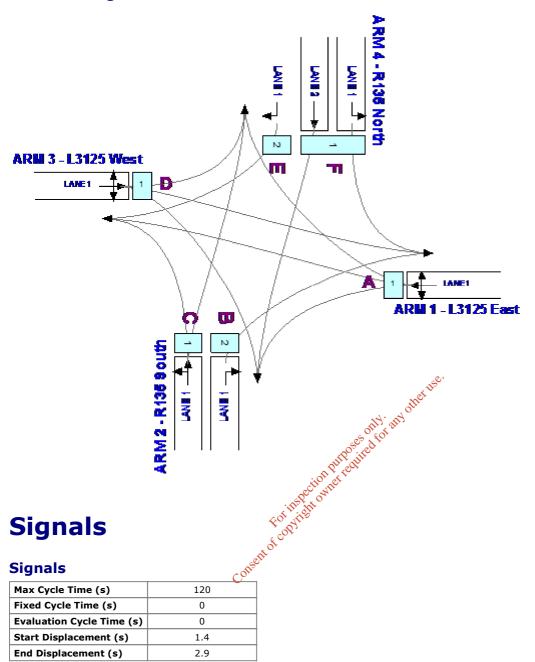
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	18	Yes	3.00	0.0	0
2	2	1				1	1.00	15 15	No	3.00	0.0	0
3	1	1		4	1	2	0.4301101	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		1.00 N. 0.430 Co. 0.430 Co	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 3 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

## **Junction Diagram**



### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

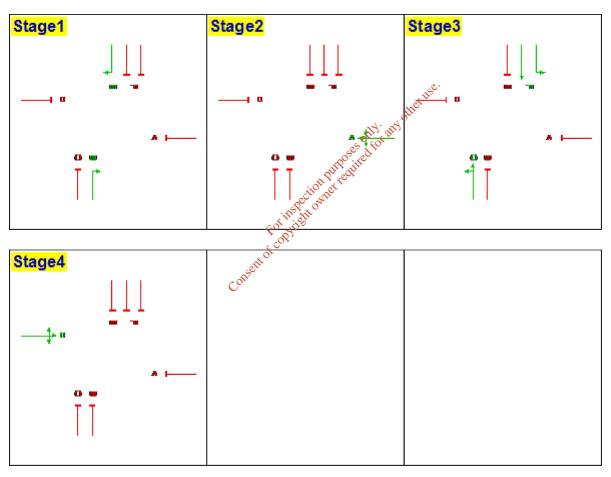
## **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

## Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

## **Stage Diagrams**



## **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

## **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2032 PM Peak No Dev	Yes	16:30	18:00	ODTAB	No	D1

### **Demand Set10 - 2032 PM Peak No Dev**

## ODTAB Data (PCU/hr during central 60 min peak period)

	То									
		Arm 1	Arm 2	Arm 3	Arm 4					
	Arm 1	-	99	240	235					
From	Arm 2	148	-	147	138					
	Arm 3	194	190	-	26					
	Arm 4	192	105	20	-					

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	431	514	630	630	514	431
2 - R135 South	1	С	214	256	313	313	256	214
2 - R135 South	2	В	110	132	161	161	132	110
3 - L3125 West	1	D	304	364	445	445	364	304
4 - R135 North	1	F	223	267	327	327	267	223
4 - R135 North	2	Е	14	17	21	21	17	14

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	61	33	6

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# Sequence3; Objective: MAXIMUM CAPACITY

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

### **Summary (Signal Optimiser Run)**

	Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
ſ	120.0	-0.68	29.24	29.24	55.1

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-17.33	35.40	35.40	51.50

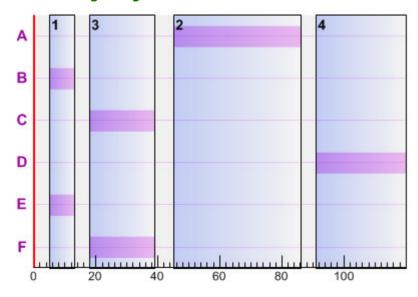
- PRC is the lowest value encountered over all streams and time segments.
- Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

### **Stage Timings**

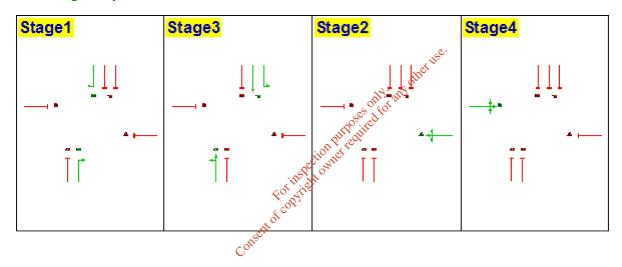
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	8.0	13.0
3	18.0	21.0	39.0
2	45.0	41.0	86.0
4	91.0	29.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	<b>s)</b>		ر و	)*		
1	5.0	8.0	13.0			ox 115			
3	18.0	21.0	39.0			othe			
2	45.0	41.0	86.0		ŝ	IA. SUA			
4	91.0	29.0	0.0		ر د جھے	tor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time		Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	45	41.0	86	S. C.		(-,		<u> </u>	
В	5	8.0	13 es						
С	18	21.0	390017						
D	91	29.0	0						
E	5	8.0	13						
F	18	21.0	39						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	525	Α	42.50	52.64	7.68	82.77	8.74	2.87	15.50	12.63	20.50
2	1	261	С	22.50	75.54	5.48	80.74	11.47	2.28	9.74	7.46	6.70
2	2	134	В	9.50	159.18	5.93	90.61	-0.68	4.65	8.88	4.23	2.00
3	1	371	D	30.50	63.33	6.53	81.14	10.92	2.43	12.39	9.96	11.60
4	1	272	F	22.50	44.75	3.38	38.33	134.82	0.17	7.96	7.79	13.70
4	2	17	E	9.50	53.43	0.25	11.50	682.91	0.01	0.53	0.52	0.60

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	431	1	42.50	40.38	4.83	67.95	32.46	1.00	11.16	10.15	4.20
2	1	214	3	22.50	58.09	3.45	66.20	35.95	0.84	6.90	6.05	1.20
2	2	110	2	9.50	87.08	2.66	74.38	21.00	1.19	4.64	3.45	0.40
3	1	304	4	30.50	49.64	4.19	66.49	35.37	0.89	8.93	8.05	2.20
4	1	223	6	22.50	43.61	2.70	31.42	186.42	0.10	6.42	6.32	2.00
4	2	14	5	9.50	52.93	0.21	9.47	850.68	0.01	0.44	0.43	0.10

## Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	514	1	42.50	49.36	7.05	81.03	11.07	2.31	14.65	12.33	3.50
2	1	256	3	22.50	70.18	4.99	79.20	13.64	1.82	9.12	7.31	1.10
2	2	132	2	9.50	121.09	4.44	89.26	0.83	2.74	6.90	4.16	0.30
3	1	364	4	30.50	59.63	6.03	79.61	13.06	1.98	11.74	9.76	2.00
4	1	267	6	22.50	44.63	3.31	37.62	139.22	0.16	7.80	7.64	2.30
4	2	17	5	9.50	53.43	0.25	11.50	682.91	0.01	0.53	0.52	0.10

## **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	_	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	630	1	42.50	80.85	14,15	(lill 99.32	-9.38	10.65	26.17	15.52	1.70
2	1	313	3	22.50	102.93	. 8.95	96.83	-7.05	6.02	15.06	9.04	0.80
2	2	161	2	9.50	180.22	8:06	108.87	-17.33	7.77	12.46	4.69	0.30
3	1	445	4	30.50		11.10	97.32	-7.52	7.43	19.58	12.14	1.20
4	1	327	6	22.50	46.19	4.20	46.08	95.33	0.28	9.75	9.48	2.50
4	2	21	5	9.50	\$4.10	0.32	14.20	533.79	0.02	0.66	0.65	0.10

•	_			7.50	J 05±0	0.52	120	333.73	0.02	0.00	0.05	0.10
Trafí	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	630	1	42.50	106.56	18.65	99.32	-9.38	14.14	29.66	15.52	1.50
2	1	313	3	22.50	129.52	11.26	96.83	-7.05	7.61	16.65	9.04	0.80
2	2	161	2	9.50	265.22	11.86	108.87	-17.33	11.35	16.04	4.69	0.30
3	1	445	4	30.50	113.04	13.97	97.32	-7.52	9.42	21.56	12.14	1.20
4	1	327	6	22.50	46.21	4.20	46.08	95.33	0.28	9.75	9.48	2.50
4	2	21	5	9.50	54.10	0.32	14.20	533.79	0.02	0.66	0.65	0.10

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	514	1	42.50	68.84	9.83	81.03	11.07	2.84	15.18	12.33	3.40
2	1	256	3	22.50	97.18	6.91	79.20	13.64	2.43	9.74	7.31	1.10
2	2	132	2	9.50	304.89	11.18	89.26	0.83	7.49	11.66	4.16	0.30
3	1	364	4	30.50	78.80	7.97	79.61	13.06	2.49	12.25	9.76	1.90
4	1	267	6	22.50	44.65	3.31	37.62	139.22	0.16	7.80	7.64	2.30
4	2	17	5	9.50	53.43	0.25	11.50	682.91	0.01	0.53	0.52	0.10

## Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	431	1	42.50	41.72	4.99	67.95	32.46	1.08	11.23	10.15	4.10
2	1	214	3	22.50	62.18	3.70	66.20	35.95	0.95	7.00	6.05	1.20
2	2	110	2	9.50	190.07	5.81	74.38	21.00	1.84	5.29	3.45	0.40
3	1	304	4	30.50	51.77	4.37	66.49	35.37	0.97	9.01	8.05	2.20
4	1	223	6	22.50	43.63	2.70	31.42	186.42	0.10	6.42	6.32	2.00
4	2	14	5	9.50	52.95	0.21	9.47	850.68	0.01	0.44	0.43	0.10

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## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:08:11

# **Summary**

### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

•	X
Run Evaluation Set	No sent
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No
-	

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)	
1	L3125 East	50.0	10	10	80	0	
2	R135 South	50.0	10	10	80	0	
3	L3125 West	50.0	10	10	80	0	
4	R135 North	50.0	10	10	80	0	

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## **Traffic Streams**

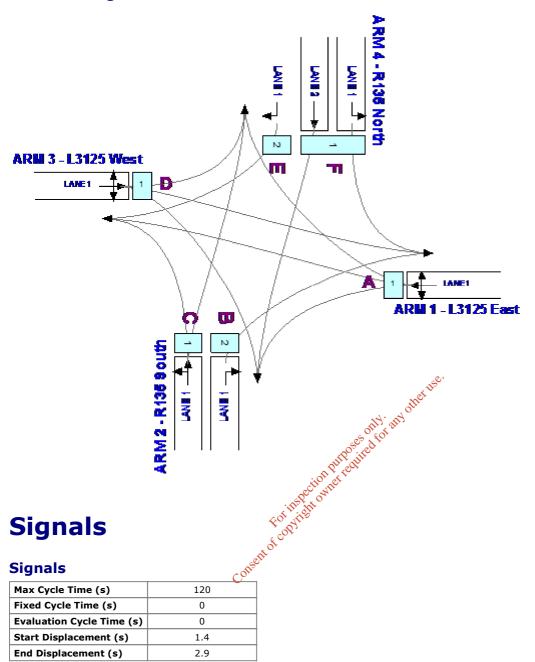
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	78,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	1.00 N. 0.430 Co. 0.430 Co	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 0000	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

## **Junction Diagram**



### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

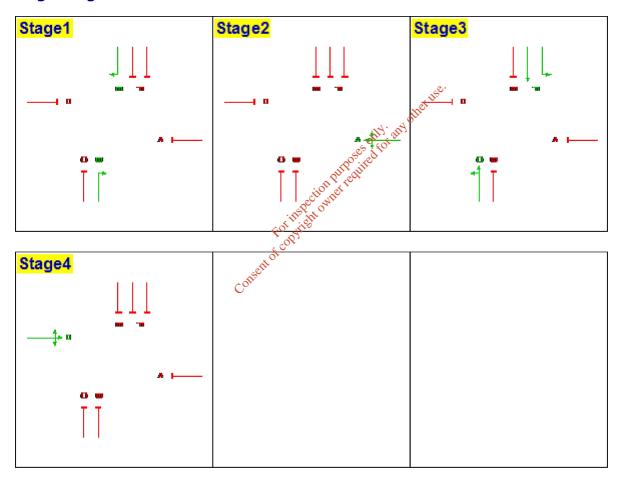
## **Intergreen Matrix**

	То						
		Α	В	С	D	E	F
	Α	-	5	5	5	5	5
	В	6	-	5	6		5
From	С	6	5	-	6	5	
	D	5	5	5	-	5	5
	E	6		5	6	-	5
	F	6	5		6	5	-

## Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

## **Stage Diagrams**



## **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## Configuration

Traffic Scaling Factor	1.00
Time Period (min)	90
Time Segment Length (min)	15
Signal Optimiser Flows	Average
PCUs per Heavy Vehicle	2.00

## **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>28</b> :00	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2032 PM Peak With Dev	Yes	16:30	18:00	ODTAB	No	D1

### Demand Set10 - 2032 PM Peak With Dev

## ODTAB Data (PCU/hr during central 60 min peak period)

			То				
		Arm 1	Arm 2	Arm 3	Arm 4		
	Arm 1	-	99	240	235		
From	Arm 2	148	-	147	139		
	Arm 3	194	190	-	26		
	Arm 4	192	106	20	-		

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	431	514	630	630	514	431
2 - R135 South	1	С	215	257	314	314	257	215
2 - R135 South	2	В	111	132	162	162	132	111
3 - L3125 West	1	D	304	364	445	445	364	304
4 - R135 North	1	F	222	265	324	324	265	222
4 - R135 North	2	Е	14	17	21	21	17	14

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage
1 - L3125 East	17	42	41
2 - R135 South	34	32	34
3 - L3125 West	6	47	46
4 - R135 North	60	33	6



## **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

## **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	7.29	28.19	28.19	54.2

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-10.56	34.36	34.36	50.50

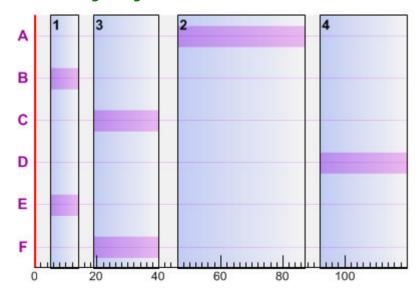
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

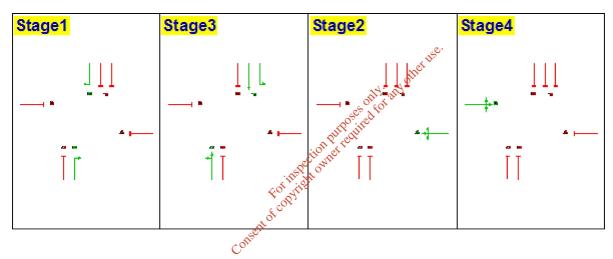
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	21.0	40.0
2	46.0	41.0	87.0
4	92.0	28.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	<b>s)</b>		,e			
1	5.0	9.0	14.0			ox 115			
3	19.0	21.0	40.0			othe			
2	46.0	41.0	87.0		Ś	IA. SUA			
4	92.0	28.0	0.0		ر د خعم	tor			
Phase Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
A	46	41.0	87	S. C.		(3)		<b>g</b> .cc,	
В	5	9.0	14 es						
С	19	21.0	40001						
D	92	28.0	0						
E	5	9.0	14						
F	19	21.0	40						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	525	Α	42.50	52.64	7.68	82.77	8.74	2.87	15.50	12.63	20.50
2	1	262	С	22.50	76.10	5.54	81.05	11.04	2.33	9.82	7.49	6.70
2	2	135	В	10.50	113.55	4.26	82.59	8.97	2.46	6.68	4.22	2.40
3	1	371	D	29.50	69.11	7.12	83.89	7.29	3.00	13.08	10.07	10.40
4	1	270	F	22.50	44.70	3.35	38.04	136.56	0.16	7.89	7.73	13.60
4	2	17	Е	10.50	52.10	0.25	10.40	765.32	0.01	0.53	0.52	0.60

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	431	1	42.50	40.38	4.83	67.95	32.46	1.00	11.16	10.15	4.20
2	1	215	3	22.50	58.27	3.48	66.51	35.31	0.86	6.94	6.08	1.20
2	2	111	2	10.50	77.75	2.40	67.91	32.53	0.86	4.31	3.45	0.40
3	1	304	4	29.50	51.76	4.37	68.74	30.93	1.01	9.15	8.14	2.10
4	1	222	6	22.50	43.59	2.69	31.28	187.71	0.10	6.39	6.29	2.00
4	2	14	5	10.50	51.69	0.20	8.57	950.75	0.01	0.43	0.43	0.10

## Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	514	1	42.50	49.36	7.05	81.03	11.07	2.31	14.65	12.33	3.50
2	1	257	3	22.50	70.57	5.04	79.51	13.20	1.85	9.19	7.34	1.10
2	2	132	2	10.50	98.45	3.61	80.76	11.44	1.75	5.87	4.12	0.40
3	1	364	4	29.50	63.72	6.44	82.31	9.35	2.35	12.22	9.87	1.80
4	1	265	6	22.50	44.58	3.28	37.34	141.03	0.15	7.73	7.58	2.20
4	2	17	5	10.50	52.09	0.25	10.40	765.32	0.01	0.53	0.52	0.10

## **Traffic Stream Details (17:00-17:15)**

Traff	fic Stre	am Deta	ils (17:00	-17:15)				, USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	1 _	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	630	1	42.50	80.85	14,15	QUI 99.32	-9.38	10.65	26.17	15.52	1.70
2	1	314	3	22.50	103.81	· (\$.05, \$	97.14	-7.35	6.16	15.23	9.07	0.80
2	2	162	2	10.50	142.76	6.42	99.11	-9.19	4.94	10.03	5.09	0.40
3	1	445	4	29.50	100.22	12.39	100.62	-10.56	9.53	21.73	12.20	1.00
4	1	324	6	22.50	46.41	4.15	45.65	97.14	0.27	9.65	9.38	2.50
4	2	21	5	10.50	\$2.67	0.31	12.85	600.50	0.01	0.65	0.64	0.10

•	_		-	10.50		0.51	12.00	000.50	0.01	0.05	0.0.	0.10
Trafí	fic Stre	am Deta	ils (17:15	-17: <b>30</b> )	ht							
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	630	1	42.50	106.56	18.65	99.32	-9.38	14.14	29.66	15.52	1.50
2	1	314	3	22.50	131.34	11.46	97.14	-7.35	7.83	16.91	9.07	0.80
2	2	162	2	10.50	188.32	8.47	99.11	-9.19	6.52	11.61	5.09	0.40
3	1	445	4	29.50	135.29	16.72	100.62	-10.56	13.06	25.26	12.20	0.90
4	1	324	6	22.50	46.13	4.15	45.65	97.14	0.27	9.65	9.38	2.50
4	2	21	5	10.50	52.67	0.31	12.85	600.50	0.01	0.65	0.64	0.10

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	514	1	42.50	68.84	9.83	81.03	11.07	2.84	15.18	12.33	3.40
2	1	257	3	22.50	99.02	7.07	79.51	13.20	2.50	9.83	7.34	1.10
2	2	132	2	10.50	169.75	6.22	80.76	11.44	2.95	7.08	4.12	0.40
3	1	364	4	29.50	102.44	10.36	82.31	9.35	3.23	13.10	9.87	1.70
4	1	265	6	22.50	44.60	3.28	37.34	141.03	0.16	7.73	7.58	2.20
4	2	17	5	10.50	52.11	0.25	10.40	765.32	0.01	0.53	0.52	0.10

## Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	431	1	42.50	41.72	4.99	67.95	32.46	1.08	11.23	10.15	4.10
2	1	215	3	22.50	62.52	3.73	66.51	35.31	0.97	7.05	6.08	1.20
2	2	111	2	10.50	97.96	3.02	67.91	32.53	1.09	4.54	3.45	0.40
3	1	304	4	29.50	55.10	4.65	68.74	30.93	1.12	9.25	8.14	2.00
4	1	222	6	22.50	43.61	2.69	31.28	187.71	0.10	6.39	6.29	2.00
4	2	14	5	10.50	51.71	0.20	8.57	950.75	0.01	0.43	0.43	0.10

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## **OSCADY PRO**

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:09:38

# **Summary**

### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
Driving Side	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

Run Evaluation Set	Nonsente
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

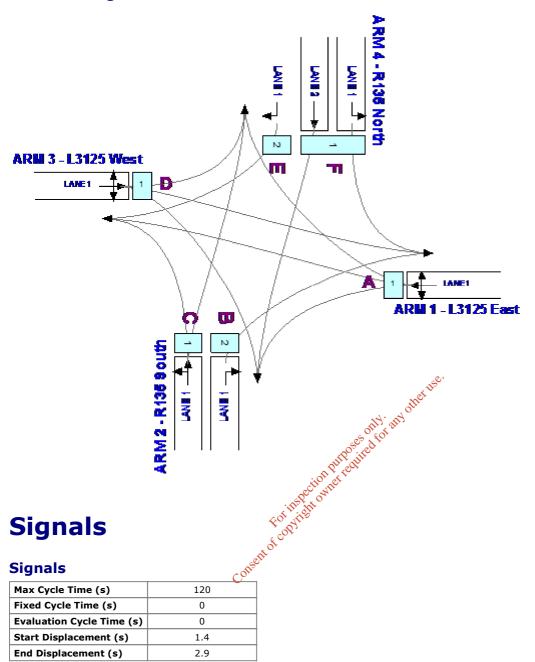
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	78,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	1.00 N. 0.430 Co. 0.430 Co	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 0000	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 1 No 3.00 0.0 0  4 2 1 No 3.00 0.0 0  Consent of contribution.												

## **Junction Diagram**



### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

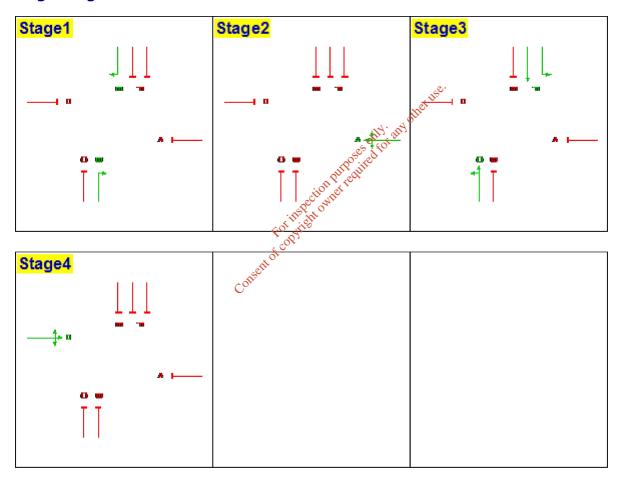
## **Intergreen Matrix**

		То							
		Α	В	С	D	E	F		
	Α	-	5	5	5	5	5		
	В	6	-	5	6		5		
From	С	6	5	-	6	5			
	D	5	5	5	-	5	5		
	E	6		5	6	-	5		
	F	6	5		6	5	-		

## Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences
1	-1	B,E	Yes
2	-1	Α	Yes
3	-1	C,F	Yes
4	-1	D	Yes

## **Stage Diagrams**



## **Sequences**

Sequence	Name	Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## **Configuration**

Traffic Scaling Factor	1.00			
Time Period (min)	90			
Time Segment Length (min)	15			
Signal Optimiser Flows	Average			
PCUs per Heavy Vehicle	2.00			

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>8:00</b>	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2032 PM Peak Sen	Yes	16:30	18:00	ODTAB	No	D1

### Demand Set10 - 2032 PM Peak Sen

## ODTAB Data (PCU/hr during central 60 min peak period)

	То											
		Arm 1	Arm 2	Arm 3	Arm 4							
	Arm 1	-	99	240	235							
From	Arm 2	148	-	147	155							
	Arm 3	194	190	-	26							
	Arm 4	192	122	20	-							

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	431	514	630	630	514	431
2 - R135 South	1	С	226	270	331	331	270	226
2 - R135 South	2	В	111	133	163	163	133	111
3 - L3125 West	1	D	304	364	445	445	364	304
4 - R135 North	1	F	235	281	344	344	281	235
4 - R135 North	2	Е	15	18	22	22	18	15

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage		
1 - L3125 East	17	42	41		
2 - R135 South	33	34	33		
3 - L3125 West	6	47	46		
4 - R135 North	57	37	6		

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## **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

## **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	5.41	29.59	29.59	54.4

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-12.11	36.51	36.51	50.60

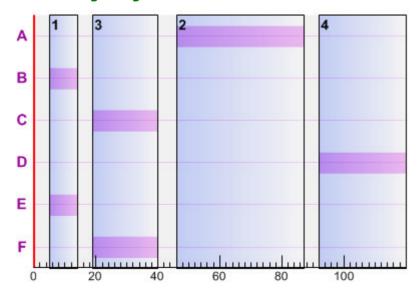
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

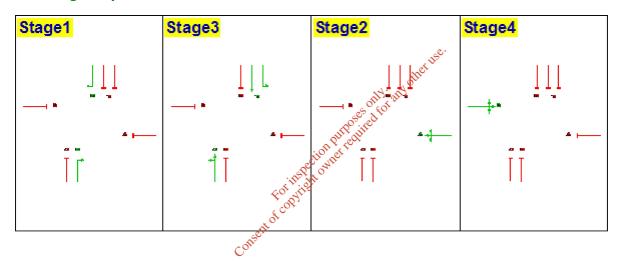
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	9.0	14.0
3	19.0	21.0	40.0
2	46.0	41.0	87.0
4	92.0	28.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		.0	,•		
1	5.0	9.0	14.0			ox 115°			
3	19.0	21.0	40.0			othe			
2	46.0	41.0	87.0		Š	IA. SUA			
4	92.0	28.0	0.0		ري د خيمي	801			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	46	41.0	87	80		(-)		<u> </u>	
В	5	9.0	14 es						
С	19	21.0	400011						
D	92	28.0	0						
E	5	9.0	14						
F	19	21.0	40						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	525	Α	42.50	52.64	7.68	82.77	8.74	2.87	15.50	12.63	20.50
2	1	276	С	22.50	85.67	6.57	85.38	5.41	3.29	11.20	7.91	6.30
2	2	136	В	10.50	115.65	4.37	83.21	8.17	2.57	6.82	4.25	2.40
3	1	371	D	29.50	69.11	7.12	83.89	7.29	3.00	13.08	10.07	10.40
4	1	287	F	22.50	45.13	3.60	40.44	122.55	0.19	8.44	8.25	14.10
4	2	18	E	10.50	52.24	0.26	11.01	717.25	0.01	0.56	0.55	0.70

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	431	1	42.50	40.38	4.83	67.95	32.46	1.00	11.16	10.15	4.20
2	1	226	3	22.50	60.42	3.79	69.91	28.73	1.04	7.45	6.41	1.20
2	2	111	2	10.50	77.75	2.40	67.91	32.53	0.86	4.31	3.45	0.40
3	1	304	4	29.50	51.76	4.37	68.74	30.93	1.01	9.15	8.14	2.10
4	1	235	6	22.50	43.87	2.86	33.11	171.80	0.11	6.79	6.68	2.10
4	2	15	5	10.50	51.82	0.22	9.18	880.70	0.01	0.46	0.46	0.10

## Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	514	1	42.50	49.36	7.05	81.03	11.07	2.31	14.65	12.33	3.50
2	1	270	3	22.50	75.94	5.70	83.53	7.75	2.39	10.12	7.73	1.10
2	2	133	2	10.50	99.36	3.67	81.37	10.61	1.81	5.96	4.16	0.40
3	1	364	4	29.50	63.72	6.44	82.31	9.35	2.35	12.22	9.87	1.80
4	1	281	6	22.50	44.97	3.51	39.59	127.30	0.18	8.24	8.06	2.30
4	2	18	5	10.50	52.25	0.26	11.01	717.25	0.01	0.56	0.55	0.10

## Traffic Stream Details (17:00-17:15)

Traff	fic Stre	am Deta	ils (17:00	-17:15)				, USC.				
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	630	1	42.50	80.85	14,15	(lill 99.32	-9.38	10.65	26.17	15.52	1.70
2	1	331	3	22.50	118.03	10.85	102.40	-12.11	8.92	18.30	9.38	0.70
2	2	163	2	10.50	144.84	6.56	99.72	-9.75	5.11	10.24	5.12	0.30
3	1	445	4	29.50	100.22	12.39	100.62	-10.56	9.53	21.73	12.20	1.00
4	1	344	6	22.50	46.69	4.46	48.47	85.67	0.32	10.32	10.01	2.60
4	2	22	5	10.50	\$2.81	0.32	13.46	568.66	0.01	0.69	0.67	0.10

•				10.50		0.52	13.10	300.00	0.01	0.05	0.07	0.10	
Traffic Stream Details (17:15-17:30)													
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)	
1	1	630	1	42.50	106.56	18.65	99.32	-9.38	14.14	29.66	15.52	1.50	
2	1	331	3	22.50	164.57	15.13	102.40	-12.11	12.59	21.96	9.38	0.70	
2	2	163	2	10.50	192.57	8.72	99.72	-9.75	6.81	11.93	5.12	0.30	
3	1	445	4	29.50	135.29	16.72	100.62	-10.56	13.06	25.26	12.20	0.90	
4	1	344	6	22.50	46.71	4.46	48.47	85.67	0.32	10.33	10.01	2.60	
4	2	22	5	10.50	52.81	0.32	13.46	568.66	0.01	0.69	0.67	0.10	

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	514	1	42.50	68.84	9.83	81.03	11.07	2.84	15.18	12.33	3.40
2	1	270	3	22.50	142.70	10.70	83.53	7.75	3.76	11.49	7.73	1.00
2	2	133	2	10.50	176.19	6.51	81.37	10.61	3.13	7.29	4.16	0.40
3	1	364	4	29.50	102.44	10.36	82.31	9.35	3.23	13.10	9.87	1.70
4	1	281	6	22.50	45.00	3.51	39.59	127.30	0.18	8.25	8.06	2.30
4	2	18	5	10.50	52.25	0.26	11.01	717.25	0.01	0.56	0.55	0.10

## Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	431	1	42.50	41.72	4.99	67.95	32.46	1.08	11.23	10.15	4.10
2	1	226	3	22.50	68.32	4.29	69.91	28.73	1.21	7.62	6.41	1.20
2	2	111	2	10.50	99.57	3.07	67.91	32.53	1.09	4.54	3.45	0.40
3	1	304	4	29.50	55.10	4.65	68.74	30.93	1.12	9.25	8.14	2.00
4	1	235	6	22.50	43.90	2.87	33.11	171.80	0.11	6.79	6.68	2.10
4	2	15	5	10.50	51.84	0.22	9.18	880.70	0.01	0.46	0.46	0.10

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## **OSCADY PRO**

GUI Version: 1.3.1 [05/05/11] Analysis Program Version: v1.3 23/03/2009

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**File:** S:\Jobs\2016\16047 New Access at Huntstown Quarry, Co. Dublin\16047-04 Huntstown C&D Waste Recovery Facility TIA\Reports\Appendices\OSCADY PRO\Crossroads PM.osc

**Report generation date:** 09/12/2016 11:13:52

# **Summary**

### **File Description**

Title	(untitled)
Date	21/07/2016
Location	
<b>Driving Side</b>	Left
Identifier	
Client	
Jobnumber	
Enumerator	gfrisby [ROADPLAN-PC02]
Status	(new file)
Description	

**Run Options** 

•	X
Run Evaluation Set	No sent
Evaluation Only	No.
Optimise Critical Cycle TimeOnly	No
Use Horizontal Queues	Yes
Favour Continuous Green	No
Phase Timings Fuzziness (s)	0.5
Integer Phase Timings	Yes
Phase Snapping Distance (s)	0
Automatic Lane Turning Props	Yes
Automatic Vehicle Props	No

# **Geometry**

#### **Arms**

Arm	Name	Exit Width (m)	Approach Speed (kph)	Exit Speed (kph)	Speed Limit (kph)	Stagger Distance (m)
1	L3125 East	50.0	10	10	80	0
2	R135 South	50.0	10	10	80	0
3	L3125 West	50.0	10	10	80	0
4	R135 North	50.0	10	10	80	0

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## **Traffic Streams**

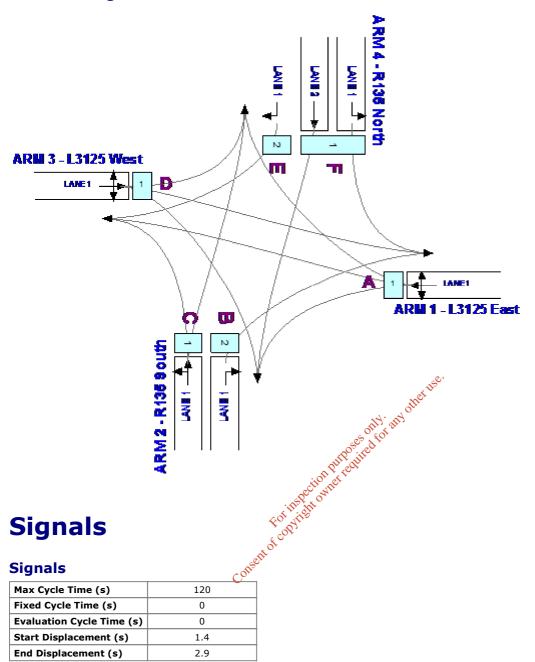
Arm	Traffic Stream	Туре	Name	Sat Flow (PCU/hr)	Estimate Sat Flow	Sat Flow 2 (PCU/hr)	Green Phase	Arrow Phase
1	1	Traffic		1791	Yes	0	Α	-
2	1	Traffic		1724	Yes	0	С	-
2	2	Traffic		1868	Yes	0	В	-
3	1	Traffic		1799	Yes	0	D	-
4	1	Traffic		3785	Yes	0	F	-
4	2	Traffic		1868	Yes	0	Е	-

Arm	Traffic Stream	Relative Start Displacement (s)	Relative End Displacement (s)	Max Deg Sat (%)	Delay Weight (%)	Max Queue (PCU)	Initial Queue (PCU)	Average PCU Per Veh	Heavy Vehicles Percentage
1	1	0.0	0.0	90	100	0	0.0	1.10	0
2	1	0.0	0.0	90	100	0	0.0	1.10	0
2	2	0.0	0.0	90	100	0	0.0	1.10	0
3	1	0.0	0.0	90	100	0	0.0	1.10	0
4	1	0.0	0.0	90	100	0	0.0	1.10	0
4	2	0.0	0.0	90	100	0	0.0	1.10	0

## Lanes

Arm	Traffic Stream	Lane	Name	Nearside Dest Arm	Straight Dest Arm	Offside Dest Arm	Proportion That Turn	Turning Radius (m)	IsNearside Lane	Width (m)	Gradient (%)	Short Lane Storage (PCU)
1	1	1		2	3	4	0.37	8 150	Yes	3.00	0.0	0
2	1	1		3	4		0.74	78,	Yes	3.00	0.0	0
2	2	1				1	1.00	15	No	3.00	0.0	0
3	1	1		4	1	2	1.00 N. 0.430 Co. 0.430 Co	10	Yes	3.00	0.0	0
4	1	1		1			45.000	14	Yes	3.00	0.0	0
4	1	2			2		Jul 0000	10	No	3.00	0.0	0
4	2	1				3 💥	1.00	15	No	3.00	0.0	0
4 1 2 2 2 1 3 3 1 1 1 1 1 1 1 1 1 1 1 1 1												

## **Junction Diagram**



### **Phases**

Phase	Name	Туре	Associated Phase	Phase Min Green (s)	Phase Max Green (s)	Double Green
Α	(Name)	Traffic	-	7.0	0.0	No
В	(Name)	Traffic	-	7.0	0.0	No
С	(Name)	Traffic	-	7.0	0.0	No
D	(Name)	Traffic	-	7.0	0.0	No
E	(Name)	Traffic	-	7.0	0.0	No
F	(Name)	Traffic	-	7.0	0.0	No

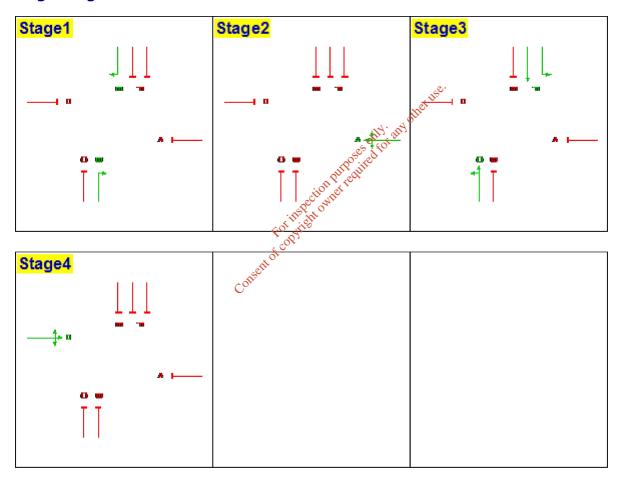
## **Intergreen Matrix**

	То							
		Α	В	С	D	E	F	
	Α	-	5	5	5	5	5	
	В	6	-	5	6		5	
From	С	6	5	-	6	5		
	D	5	5	5	-	5	5	
	E	6		5	6	-	5	
	F	6	5		6	5	-	

## Stages

Stage	Stage Min Green (s)	Phases In This Stage	Use To Generate Sequences		
1	-1	B,E	Yes		
2	-1	Α	Yes		
3	-1	C,F	Yes		
4	-1	D	Yes		

## **Stage Diagrams**



## **Sequences**

Sequence Name		Stages In This Sequence
1		1,2,3,4
2		1,4,3,2
3		1,3,2,4
4		1,4,2,3
5		1,2,4,3
6		1,3,4,2

#### **Constraints**

(No constraints)

# **Traffic**

**Note:**Traffic flows are only shown for selected demand sets. Resultant flows are the sums of the selected demand sets adjusted by the global traffic scaling factor, and are shown as the arrival rates in the final results tables.

## **Configuration**

Traffic Scaling Factor	1.00		
Time Period (min)	90		
Time Segment Length (min)	15		
Signal Optimiser Flows	Average		
PCUs per Heavy Vehicle	2.00		

#### **Demand Sets**

Name	Selected	Time Start	Time End	Profile Type	Use Relationship	Relationship
2016 AM Peak Existing	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2017 AM Peak With Dev	No	07:15	08:45	<b>O O D</b> TAB	No	D1
2023 AM Peak No Dev	No	07:15	08:45	ODTAB	No	D1
2023 AM Peak With Dev	No	07:15	08:45	ODTAB	No	D1
2016 PM Peak Existing	No	16:30	18:00	ODTAB	No	D1
2017 PM Peak No Dev	No	16:30	<b>28</b> :00	ODTAB	No	D1
2017 PM Peak With Dev	No	16:30	18:00	ODTAB	No	D1
2022 PM Peak No Dev	No	16:30	18:00	ODTAB	No	D1
2032 PM Peak + Link	Yes	16:30	18:00	ODTAB	No	D1

### Demand Set10 - 2032 PM Peak + Link

## ODTAB Data (PCU/hr during central 60 min peak period)

	То									
		Arm 1	Arm 2	Arm 3	Arm 4					
	Arm 1	-	99	240	114					
From	Arm 2	148	-	147	139					
	Arm 3	194	190	-	26					
	Arm 4	96	106	20	-					

Average pedestrian flow on each pedestrian stream (if applicable): 0 ped/hr

## Traffic flows (PCU/hr)

Arm	Traffic Stream	Phase	16:30- 16:45	16:45- 17:00	17:00- 17:15	17:15- 17:30	17:30- 17:45	17:45- 18:00
1 - L3125 East	1	Α	340	406	497	497	406	340
2 - R135 South	1	С	215	257	314	314	257	215
2 - R135 South	2	В	111	132	162	162	132	111
3 - L3125 West	1	D	304	364	445	445	364	304
4 - R135 North	1	F	152	181	222	222	181	152
4 - R135 North	2	Е	15	18	22	22	18	15

## **Turning Proportions**

Arm	Left Movement Percentage	Straight Movement Percentage	Right Movement Percentage	
1 - L3125 East	22	53	25	
2 - R135 South	34	32	34	
3 - L3125 West	6	47	46	
4 - R135 North	43	48	9	

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## **Sequence3; Objective: MAXIMUM CAPACITY**

**Note:**Individual time segment results are included for this sequence/objective. Results for the 'Signal Optimiser Run' tables are based on the signal optimiser traffic flows, rather than individual time segment flows.

## **Summary (Signal Optimiser Run)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
120.0	18.20	22.00	22.00	54.2

- Cycle Time is the minimum cycle time that meets all safety criteria whilst optimising this objective.
- PRC is the lowest value encountered over all streams.
- Rate of delay is the sum of each stream's rate of delay.

#### **Summary (Time Segments)**

Cycle Time (s)	Practical Reserve Capacity (%)	Rate of Delay (PCU)	Weighted Rate of Delay (PCU)	Geometric Delay (PCU-min)
-	-1.46	24.39	24.39	51.50

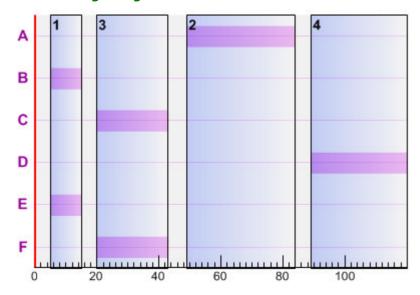
- PRC is the lowest value encountered over all streams and time segments.
  Rate of delay is the sum of each stream's rate of delay, averaged over time segments.

#### **Stage Timings**

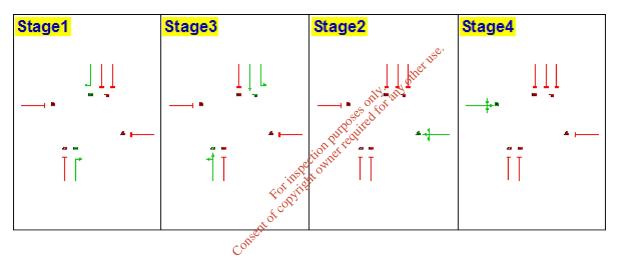
Stage	Start Time (s)	Duration (s)	End Time (s)
1	5.0	10.0	15.0
3	20.0	23.0	43.0
2	49.0	35.0	84.0
4	89.0	31.0	0.0

Stage	Timings								
Stage	Start Time (s)	Duration (s)	End Time (s	5)		ر و			
1	5.0	10.0	15.0			ox 115°			
3	20.0	23.0	43.0			othe			
2	49.0	35.0	84.0		Š	ITY any			
4	89.0	31.0	0.0		ري د خيمي	Eor			
Phase	Start Time (s)	Duration (s)	End Time (s)	Filter Arrow Time	Indicative Arrow Start (s)	Indicative Arrow Duration (s)	Start Time (s) (2nd green)	Duration (s) (2nd green)	End Time (s) (2nd green)
Α	49	35.0	84	S.					
В	5	10.0	15 es						
С	20	23.0	430011						
D	89	31.0	0						
E	5	10.0	15						
F	20	23.0	43						

## **Phase Timings Diagram**



## **Final Stage Sequence**



## **Traffic Stream Details (Signal Optimiser Run)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	414	Α	36.50	51.24	5.89	76.00	18.43	1.71	12.18	10.47	17.20
2	1	262	С	24.50	63.80	4.64	74.44	20.91	1.48	8.82	7.33	8.20
2	2	135	В	11.50	90.81	3.41	75.41	19.34	1.51	5.69	4.18	2.70
3	1	371	D	32.50	55.31	5.70	76.14	18.20	1.71	11.45	9.74	13.90
4	1	185	F	24.50	40.92	2.10	23.94	275.94	0.05	5.15	5.10	11.50
4	2	18	E	11.50	51.01	0.26	10.05	795.08	0.01	0.55	0.54	0.70

## Traffic Stream Details (16:30-16:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	340	1	36.50	42.71	4.03	62.41	44.20	0.71	9.17	8.46	3.10
2	1	215	3	24.50	53.22	3.18	61.08	47.34	0.64	6.59	5.96	1.40
2	2	111	2	11.50	70.79	2.18	62.01	45.15	0.63	4.05	3.42	0.50
3	1	304	4	32.50	45.99	3.88	62.39	44.25	0.70	8.57	7.87	2.50
4	1	152	6	24.50	40.34	1.70	19.67	357.56	0.03	4.19	4.16	1.60
4	2	15	5	11.50	50.66	0.21	8.38	974.10	0.01	0.46	0.45	0.10

## Traffic Stream Details (16:45-17:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	406	1	36.50	49.45	5.58	74.53	20.76	1.47	11.72	10.25	2.90
2	1	257	3	24.50	61.31	4.38	73.01	23.26	1.26	8.45	7.19	1.40
2	2	132	2	11.50	84.24	3.09	73.74	22.06	1.20	5.29	4.09	0.50
3	1	364	4	32.50	53.29	5.39	74.71	20.47	1.46	11.01	9.54	2.30
4	1	181	6	24.50	40.85	2.05	23.42	284.25	0.05	5.03	4.98	1.90
4	2	18	5	11.50	51.00	0.26	10.05	795.08	0.01	0.55	0.54	0.10

## **Traffic Stream Details (17:00-17:15)**

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	497	1	36.50	68.76	9.49	(lill 91.23	-1.35	4.82	17.62	12.80	2.00
2	1	314	3	24.50	81.85	. A.14, C	89.21	0.89	3.59	12.48	8.89	1.10
2	2	162	2	11.50	113.84	<b>5</b> %12	90.49	-0.55	3.12	8.17	5.05	0.40
3	1	445	4	32.50	73.55	9.09	91.33	-1.46	4.68	16.55	11.87	1.70
4	1	222	6	24.50	41.60	2.57	28.73	213.29	0.08	6.24	6.16	2.20
4	2	22	5	11.50	\$1.49	0.31	12.29	632.34	0.01	0.68	0.67	0.10

•	_		-	11.50	\ \(\sigma_{\pi}\)\	0.51	12.25	052.51	0.01	0.00	0.07	0.10	
Traff	raffic Stream Details (17:15-17:30)												
Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)	
1	1	497	1	36.50	77.00	10.63	91.23	-1.35	5.38	18.18	12.80	2.00	
2	1	314	3	24.50	91.54	7.98	89.21	0.89	4.01	12.90	8.89	1.10	
2	2	162	2	11.50	134.80	6.07	90.49	-0.55	3.68	8.72	5.05	0.40	
3	1	445	4	32.50	82.96	10.26	91.33	-1.46	5.27	17.14	11.87	1.60	
4	1	222	6	24.50	41.61	2.57	28.73	213.29	0.08	6.24	6.16	2.20	
4	2	22	5	11.50	51.49	0.31	12.29	632.34	0.01	0.68	0.67	0.10	

## Traffic Stream Details (17:30-17:45)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	406	1	36.50	54.07	6.10	74.53	20.76	1.67	11.92	10.25	2.90
2	1	257	3	24.50	68.36	4.88	73.01	23.26	1.49	8.68	7.19	1.40
2	2	132	2	11.50	107.35	3.94	73.74	22.06	1.62	5.71	4.09	0.50
3	1	364	4	32.50	58.99	5.96	74.71	20.47	1.69	11.23	9.54	2.30
4	1	181	6	24.50	40.85	2.05	23.42	284.25	0.05	5.03	4.98	1.90
4	2	18	5	11.50	51.02	0.26	10.05	795.08	0.01	0.55	0.54	0.10

## Traffic Stream Details (17:45-18:00)

Arm	Traffic Stream	Arrival Rate (PCU/hr)	Controlling Phase	Effective Green (s)	Average Delay (s)	Rate of Delay (PCU)	Degree of Saturation (%)	Practical Reserve Capacity (%)	Queue at End of Green (PCU)	Queue at End of Red (PCU)	Uniform Queue (PCU)	Geometric Delay (PCU- min)
1	1	340	1	36.50	43.53	4.11	62.41	44.20	0.75	9.22	8.46	3.10
2	1	215	3	24.50	54.90	3.28	61.08	47.34	0.69	6.65	5.96	1.40
2	2	111	2	11.50	77.84	2.40	62.01	45.15	0.74	4.16	3.42	0.50
3	1	304	4	32.50	47.04	3.97	62.39	44.25	0.75	8.62	7.87	2.50
4	1	152	6	24.50	40.34	1.70	19.67	357.56	0.03	4.19	4.16	1.60
4	2	15	5	11.50	50.67	0.21	8.38	974.10	0.01	0.46	0.45	0.10

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