Retention of manufacturing workshops
L4510-29, Knockauntouk, Gort, Co. Galway

Transport Statement

27th June 2018

Prepared for

Colman Rock

TTRSA
Traffic : Transport : Road Safety

Document Control Sheet

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Grealish Glynn Associates	1 Electronic

Contents

Non-technical summary

- TTRSA has been commissioned by Colman Rock to prepare a Transport Statement (TS) for retention of manufacturing workshops accessed off the eastern side of the L4510-29 local road at Knockauntouk, Gort, Co. Galway. The TS is being prepared as part of a planning application to Galway County Council.
- The proposed development seeks permission *'for the Retention of: (1) Extension to an existing engineering workshop previously granted under 01/393; (2) a new building consisting of an engineering workshop, including processing ancillary to light engineering works; (3) storage structures; and, (4) associated site works'*.
- The site layout of the proposed development, upon which the analysis contained within this TS is based, has been prepared by Grealish Glynn Associates, Drawing No. R18-01; Dated 19/06/2018.
- The scope of this TS addresses Item 4 in the reasons and considerations for refusal of retention of the existing development on this site, issued by An Bord Pleanála (ABP Ref: PL07.247214) on 16th January 2017.
- To assist in the preparation of this TS both Automatic Traffic Counts and video-based Manual Classified Traffic Counts have been undertaken.
- For the purpose of the assessment contained within this report an AM peak hour of 08:45-09:44 and a PM peak hour of 16:45-17:44 have been applied.
- Local traffic has been growthed to future assessment years of 2023 and 2033 (five and fifteen years into the future) using composite link based growth factors based on the TII Project Appraisal Guidelines central growth factors for the West region.
- As the proposed development is retention of an existing facility, trips from the development are already on the local road network. Heavy Commercial Vehicle (HCV) trips to and from the existing facility account for 10.8% of the current daily HCV trips on the L4510-29 and 2.4% of the current daily HCV trips on the L4519-0. It is not envisaged that a grant of permission for the retention will generate additional trips.
- Based on the number of agricultural sheds produced, current trip generation is estimated to be significantly lower than that in 2008, based on the previous 2001 grant of planning permission.
- The operation of the junction of the L4510-29 and L4519-0 local roads has been assessed using PICADY, which is recognised by TII as industry standard software packages for modelling priority junctions. The assessment covers the AM and PM peak hours in the current and future assessment years.
- The modelling output shows that the junction of the L4510-29 and L4519-0 will operate with an average of 97.4% spare capacity across all of the scenarios tested. The worst-case 2033 AM peak hour has 96.9% spare capacity. The proposed development does not have a material impact on the capacity of the L4510-29 or L4519-0 in the vicinity of the existing junction, or the capacity of the junction.
- The Road Safety Authority Collstats dataset indicates that no collisions resulting in injury have been reported in the vicinity of the proposed development during the period 2005-2014, the latest period for which data is publicly available.
- No alterations are being proposed to internal pedestrian access. Due to the nature of the industrial activities on the site, pedestrian access is limited to employees.
- Areas for informal bicycle and car parking are available within the site.
- The existing access is used by vehicles including articulated HCVs. Autotrack analysis has confirmed that entry and egress manoeuvres can be accommodated for such vehicles given the low flow of vehicles using the site access.
- No alterations to external access are being proposed as part of this development.

1   Introduction

1.1   Traffic Transport and Road Safety Associates

Traffic Transport and Road Safety Associates Ltd. (TTRSA) is a specialist Traffic Engineering and Transport Planning practice, based in Ireland. The senior managers within TTRSA have extensive experience of developing traffic management schemes, assessing the transport related impacts of development and improving road safety both nationally and internationally.

TTRSA has been commissioned by Colman Rock to prepare a Transport Statement (TS) for retention of manufacturing workshops accessed off the eastern side of the carriageway of the L4510-29 local road at Knockauntouk, Gort, Co. Galway. The TS is being prepared as part of a planning application to Galway County Council.

1.2   Proposed development

The proposed development seeks permission *'for the Retention of: (1) Extension to an existing engineering workshop previously granted under 01/393; (2) a new building consisting of an engineering workshop, including processing ancillary to light engineering works; (3) storage structures; and, (4) associated site works'*.

The site layout of the proposed development, upon which the analysis contained within this TS is based, has been prepared by Grealish Glynn Associates, Drawing No. R18-01; Dated 19/06/2018. A scaled copy of the drawing is included for information only within Appendix A.

1.3   Scoping

The scope of this TS addresses Item 4 in the reasons and considerations for refusal of retention of the existing development on this site issued by An Bord Pleanála (ABP Ref: PL07.247214) on 16th January 2017.

Item 4 specifically covered the carrying capacity of the local road network and the entrance to the site. In their previous deliberations, An Bord Pleanála was *'not satisfied, based on the documentation submitted with the application and appeal, that the applicant has demonstrated that the expanded engineering use on the site has not and does not generate an increase and intensification in traffic movements over that authorised by planning permission register reference number 01/393, and that such increase and intensification would be within the carrying capacity of the road and could be achieved without serious risk to traffic safety and convenience'*.

1.4   Format of this Transport Statement

This TS has been prepared in accordance with the requirements of the guidance set out in the Transport Infrastructure Ireland (TII) document 'Traffic and Transport Assessment Guidelines' (TII PE-PDV-02045) published in May 2014. All highway recommendations conform, as appropriate, to TII Standards. The remaining sections of the TS are set out as follows:

- Chapter 2 outlines the existing local conditions into which the proposed development meshes, including the nature of the road network and existing traffic levels;

- Chapter 3 assesses the traffic related impacts of the proposed development, including trip generation, distribution, assignment and junction operation;

- Chapter 4 discusses the internal layout of, and access to, the proposed development.

2 Existing conditions

2.1 The local highway network

The development is accessed off the eastern side of the carriageway of the L4510-29 local road at Knockauntouk, Gort, Co. Galway, approximately 930m to the north of its junction with the L4519-0 local road. The L4519-0 links, in turn, via the R460 regional road to Gort, with onward connections via the M18 motorway. The typical width of the L4510-29 is 4.1m wide with numerous informal passing places. Immediately to the south of the existing site access the combined width of the carriageway and frontage strip is 7.4m.

2.2 Current traffic levels

To assist in the preparation of this TS both Automatic Traffic Counts (ATC) and video-based Manual Classified Traffic Counts (MCC) have been undertaken. Two ATCs were undertaken, one on each of the L4510-29 and L4519-0 local roads covering the full 24 hour period on Wednesday 30th May 2018. The MCC was undertaken on the same day at the junction of the L4510-29 and L4519-0 local roads covering the periods 08:00-09:59 and 16:00-17:59.

For the purpose of the assessment contained within this report, and based on the traffic count data, an AM peak hour of 08:45-09:44 and a PM peak hour of 16:45-17:44 have been applied.

For the purpose of this assessment, the MCC data has been converted into Passenger Car Units (PCUs), using factors of: 0.2 for pedal cycles; 0.4 for motorcycles; 1.0 for cars and light goods vehicles (LGV) including those towing trailers; and 2.3 for buses and all types of rigid and articulated medium and HCVs.

The ATC data, and MCC data and the subsequent PCU values, are included within Appendix B.

2.3 Planning context

Galway County Council granted permission for a dwelling and a light engineering workshop on the proposed development site, including the existing site access (Planning Ref: 01/393) on 4th June 2001. The light engineering workshop was subsequently extended without permission and Galway County Council initiated enforcement action on 14th April 2016 (Ref: 16/021). Permission was subsequently sought for retention of the existing development which was refused by Galway County Council (Planning Ref: 16/834) and subsequently by An Bord Pleanála (ABP Ref: PL07.247214).

A contributory reason for Galway County Council refusing permission for retention on this site (Planning Ref: 16/834), was the absence of a Road Safety Audit. A Stage 1 Road Safety Audit has been prepared under separate cover for the proposed retention.

Contributory reasons for An Bord Pleanála refusing permission for retention on this site were covered in Section 1.3 of this report.

2.4 Road safety

The Road Safety Authority Collstats dataset indicates that no collisions resulting in injury have been reported in the vicinity of the proposed development during the period 2005-2014, the latest period for which data is publicly available.

As the proposed development is retention of an existing facility, the site has been operational during this period without collisions occurring within the vicinity of the site.

2.5   Proposed transport schemes

As part of preparing this TS, a review has been undertaken of proposed transport schemes in the vicinity of the development. No proposed transport schemes impacting upon, or impacted by, the proposed development have been identified.

2.6   Other planned developments

Information contained within the Galway County Council online planning system has been reviewed as part of the preparation of this TS. No planning applications likely to generate traffic in excess of TI growth factors have been identified.

3 Assessment of development impact

3.1 Current trip generation

As the proposed development is retention of an existing facility, trips from the development are already on the local road network. It is not envisaged that a grant of permission for the retention will generate additional trips. The applicant has provided details of the current trip generation of the site. The only (two) employees of the manufacturing facility, in addition to the owner and his son who live immediately adjacent to the site, cycle to work. Table 3.1 lists a delivery log of access by HCVs to the existing facility for the period January 2018 to June 2018 inclusive. Over the same period, 15 agricultural sheds were delivered from the existing facility. Over the 176 day period the existing facility generated 39 two-way HCV trips, equivalent to an average of 0.44 one-way trips per day. This represents 10.8% of the current daily HCV trips on the L4510-29 and 2.4% of the current daily HCV trips on the L4519-0 local road.

Table 3.1 – HCV delivery log

Date	Delivery
24/01/2018	Delivery steel girders
29/01/2018	Delivery of steel gutters
05/02/2018	Delivery steel girders
12/02/2018	Oil delivery
14/02/2018	Delivery of steel girders
22/02/2018	Delivery of timber
27/02/2018	Delivery of cladding sheets
07/03/2018	Delivery of roof cladding sheets
13/03/2018	Delivery of steel parts
16/03/2018	Delivery of steel girders
26/03/2018	Delivery steel bolts
02/04/2018	Delivery of steel parts
15/04/2018	Delivery of steel girders
24/04/2018	Collection of steel for construction
27/04/2018	Delivery of steel parts
02/05/2018	Delivery of steel parts
10/05/2018	Delivery of diesel
18/05/2018	Delivery of steel parts
24/05/2018	Delivery of steel parts
25/05/2018	Delivery of timber
31/05/2018	Delivery of steel parts
05/06/2018	Delivery of cladding material
14/06/2018	Delivery of timber
18/06/2018	Delivery of cladding material

3.2 Trip distribution and assignment

As the proposed development is retention of an existing facility, and as noted in Section 3.1, trips from the development are already on the local road network and it is not envisaged that additional trips will be generated, no additional trips require distribution and assignment as part of this assessment. TTRSA have been informed by the applicant that all deliveries to and from the site access to/from the direction of Gort via the L4510-29 and L4519-0 local roads.

3.3 Historical trip generation

Whilst historical trip generation data for the site is not available, a proxy for such data is available in terms of the number of sheds invoiced each year since 2001 (the year of the previously granted planning permission). This information is presented in Table 3.2. Based on pro rata trip generation per shed, the HCV trip generation from the development in 2008 was approximately three times greater than the current trip generation detailed in Section 3.1.

Table 3.2 – Sheds invoiced by calendar year: 2001-2018

Year	Sheds Invoiced
2001	47
2002	57
2003	40
2004	61
2005	51
2006	57
2007	70
2008	103
2009	29
2010	36
2011	38
2012	40
2013	40
2014	50
2015	18
2016	31
2017	24
2018	15 (YTD)

3.4 Opening and future year traffic

As the proposed development is for retention of an existing facility, the 'opening year' of the development for assessment purposes is the current year (2018). Existing traffic has been growthed to future assessment years of 2023 and 2033 (five and fifteen years into the future) using composite link based growth factors based on the TII Project Appraisal Guidelines central growth factors for the West

region with 4.2% HCVs, consistent with the traffic counts detailed in Section 2.2 of this report. The growth factors applied are detailed overleaf and the impact of the growth is shown in Appendix C.

- From 2018 to 2023 a factor of 1.045; and,
- From 2018 to 2033 a factor of 1.109.

3.5 Assessment of junction operation

The operation of the junction of the L4510-29 and L4519-0 local roads has been assessed using PICADY, which is recognised by TII as industry standard software packages for modelling priority junctions. The assessment covers the AM and PM peak hours in the current and future assessment years.

The operation of the existing site access onto the L4510-29 local road has not been assessed because the very low traffic flows on the L4510-29 would not generate enough opposing movements to generate a meaningful Ratio of Flow to Capacity (RFC) value (see below), in that spare capacity would be close to 100% i.e. an RFC value of less than 0.01.

The assessment has all been undertaken using PCU values. The criteria used to assess the performance of a junction for a given traffic demand within the aforementioned traffic modelling software are:

- RFC is a measure of junction performance in terms of saturation. A value of 1.00, which can also be considered as 100% saturation, represents an arm of the junction operating at maximum capacity, in that any increase in the rate of vehicles arriving on the link will result in significant additional queue lengths. Traditionally a figure of 0.85 or 85% is the maximum acceptable degree of saturation, with anything above this level considered to be congested.
- Queue lengths (measured in PCUs) are primarily used to check for blocking back through adjacent junctions.

The results of the assessment are summarised in Table 3.3, and the modelling output file is included in Appendix D.

Table 3.3 shows that the junction of the L4510-29 and L4519-0 local roads will operate with an average of 97.4% spare capacity across all of the scenarios tested. The worst-case 2033 AM peak hour has 96.9% spare capacity. The proposed development does not have a material impact on the capacity of the L4510-29 local road or L4519-0 local road in the vicinity of the existing junction, or on the capacity of the junction.

Table 3.3 – Summary of PICADY output for the junction of the L4510-29 and L4519-0 local roads

Scenarios	AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue (Vehicles)	Max RFC	Max Queue (Vehicles)
2018 with current development	0.027	0.03	0.023	0.03
2023 with retention of development	0.027	0.03	0.023	0.03
2033 with retention of development	0.031	0.03	0.025	0.03

3.6   Assessment of link capacity

As part of this assessment, Congestion Reference Flows (CRF) have been calculated for the L4510-29 and L4519-0 local roads taking into account the traffic count data and the widths of these local roads. The CRF values are the AADT traffic flow at which congestion will be observed at peak hours, approximate to the carrying capacity of the road. The CRF value for the L4510-29 is 4140 and for the L4519-0 is 9164 vehicles. Based on these CRF values the current RFC values for the two roads would be 0.11 and 0.15 respectively. This means that the links currently have 89% and 85% spare capacity respectively before traffic congestion would be observed.

4 Internal layout

4.1 Site access

As detailed in Section 3.3, the existing site access was granted by Galway County Council as part of a previous planning application for the site. The width of the current site access is 28m measured at the effective bellmouth and 4.3m measured at the site access gate, this existing gate being set back 10m from the edge of the L4510-29 local road carriageway. Egress visibility splays are currently restricted from the low vision height due to roadside hedges. Clear visibility splays of 120m from a setback of 2.4m are proposed in accordance with the requirements of the prevailing Galway County Development Plan.

The absence of a Road Safety Audit for the existing access was cited as a contributory reason for Council refusing permission for retention on this site. A Stage 1 Road Safety Audit covering the site access, which recommends a number of minor improvements, has been prepared under separate cover.

4.2 Internal pedestrian access

No alterations are being proposed to internal pedestrian access. Due to the nature of the industrial activities on the site, pedestrian access is limited to employees.

4.3 Bicycle parking

Areas for informal bicycle parking are available within the site.

4.4 Car parking

Area for informal car parking are available within the site.

4.5 Service vehicles

The number of service vehicles using the existing permitted site access was detailed in Section 3.1 of this report. The existing site access is used by vehicles including articulated HCVs. Autotrack analysis has confirmed that entry and egress manoeuvres can be accommodated for such vehicles given the low flow of vehicles using the access. The Stage 1 Road Safety Audit recommends setting back the gate on the existing access to allow HCVs to fully leave the carriageway of the L4510-29 should a delivery arrive whilst the gate is closed.
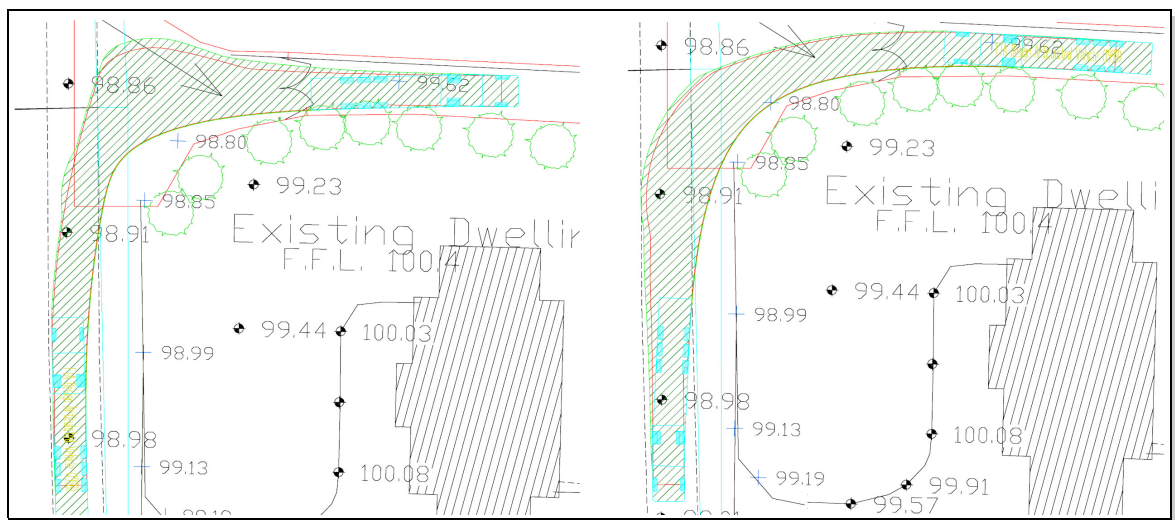
4.6 External access

No alterations to external access are being proposed as part of this development.

Appendix A

Grealish Glynn Associates Site Layout Plan; Drawing No. R18-01; Dated 19/06/2018. Scaled copy for information only.

Client: Coleman Rock			
Address: Knockaunatouk, Gort, Co. Galway			
Date: 19/06/18		Scale: 1/500	
Prepared by: DG		Drawing No. R-18-01	

Issue	Date	Description	By	Chkd
1	19/06/18	planning	MG	DG

ALL SPOT HEIGHTS BASED ON AN
ASSUMED TBM OF 98.86
ON THE CENTER LINE OF THE
ROAD TO THE FRONT OF THE SITE.

⊕ EXISTING LEVEL

AREA 0.544 Ha

OS EX. No. 3801

SITE NOTICE

Proposed Screen Planting

Proposed Screen Planting

Existing Storage Structure
FFL 100.05

Existing Shed 2
FFL 100.2

Existing Shed 1
FFL 100.2

Existing Dwelling
F.F.L. 100.4

Existing Garage
F.F.L. 100.3

SEPTIC TANK

PERCOLATION
AREA

SURFACE WATER
SOAK WAY

SURFACE WATER
SOAK WAY

N
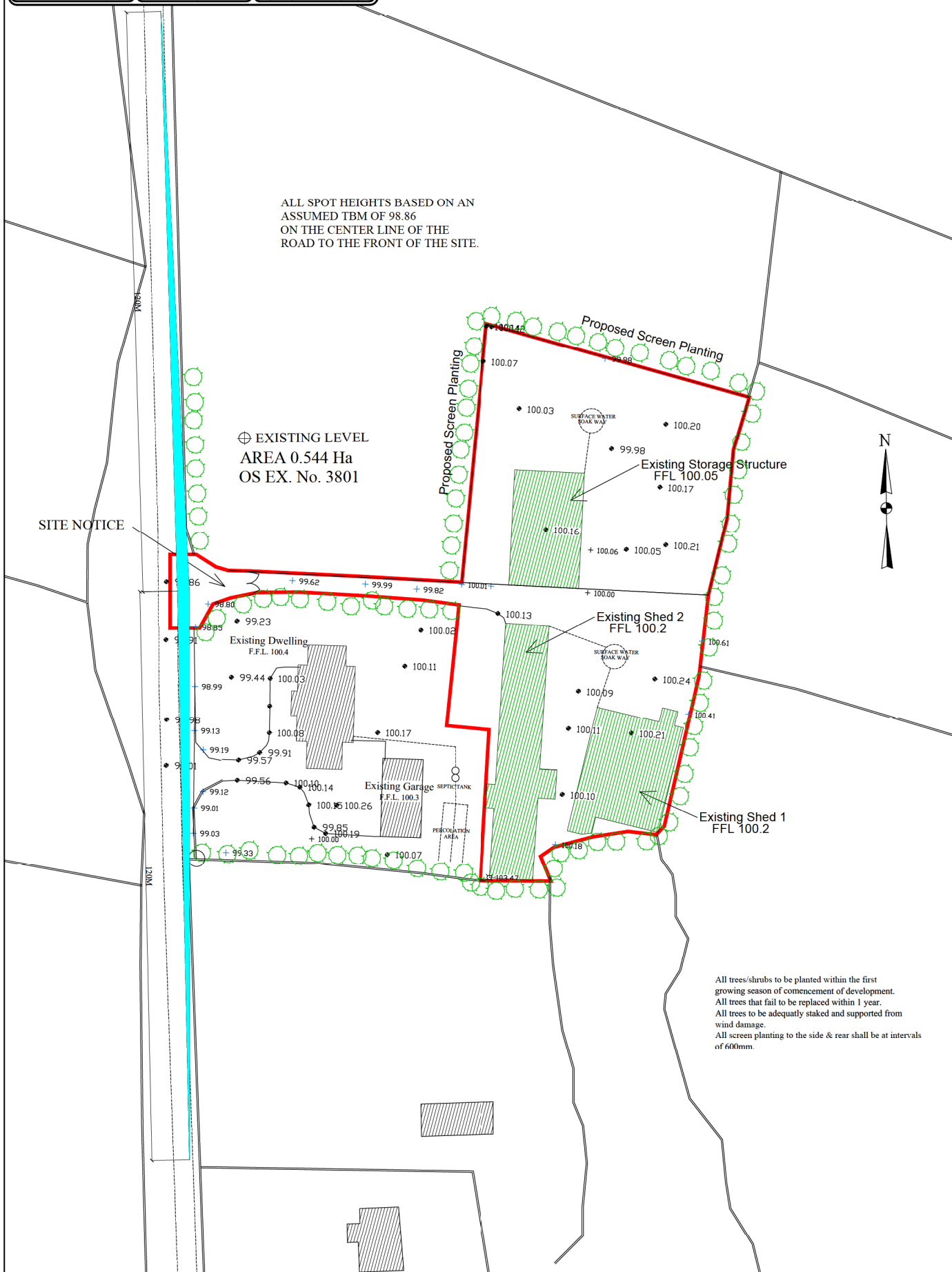
All trees/shrubs to be planted within the first
growing season of comencement of development.
All trees that fail to be replaced within 1 year.
All trees to be adequately staked and supported from
wind damage.
All screen planting to the side & rear shall be at intervals
of 600mm.

Appendix B

Traffic Survey Data and PCU Conversion

Manual Classified (Video) Count Wednesday 30th May 2018
L4519-0 / L4510-29 T-Junction, Cloonteen, Gort, Co. Galway

Arm A = L4519-0 (West)

Arm B = L4510-29 (North)

Arm C = L4519-0 (East)

Incidents: None

Weather: Dry

Cycle	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:14	0	0	0	0	0	0
08:15-08:29	0	0	0	0	0	1
08:30-08:44	0	0	0	0	0	1
08:45-08:59	0	0	0	0	0	0
09:00-09:14	0	0	0	0	0	0
09:15-09:29	0	0	0	0	0	0
09:30-09:44	0	0	0	0	0	0
09:45-09:59	0	0	0	0	0	0
16:00-16:14	0	0	0	0	0	0
16:15-16:29	0	0	0	0	0	0
16:30-16:44	2	0	0	0	0	0
16:45-16:59	0	0	0	0	0	0
17:00-17:14	0	0	0	0	0	0
17:15-17:29	0	0	0	0	0	0
17:30-17:44	0	0	0	0	0	0
17:45-17:59	0	0	0	0	0	0

Motorcycle	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:14	0	1	0	0	0	0
08:15-08:29	0	0	0	0	0	0
08:30-08:44	0	0	0	0	0	0
08:45-08:59	0	0	0	0	0	0
09:00-09:14	0	0	0	0	0	0
09:15-09:29	0	0	0	0	0	0
09:30-09:44	0	0	0	0	0	0
09:45-09:59	0	0	0	0	0	0
16:00-16:14	0	0	0	0	0	0
16:15-16:29	0	0	0	0	0	0
16:30-16:44	0	0	0	0	0	0
16:45-16:59	0	0	0	0	0	0
17:00-17:14	0	0	0	0	0	0
17:15-17:29	0	0	0	0	0	0
17:30-17:44	0	0	0	0	0	0
17:45-17:59	0	0	0	0	0	0

Car / LGV	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:14	0	6	0	2	2	2
08:15-08:29	0	10	3	5	5	2
08:30-08:44	0	15	1	3	6	1
08:45-08:59	2	14	2	1	12	1
09:00-09:14	1	13	2	2	12	3
09:15-09:29	6	27	5	3	12	2
09:30-09:44	1	16	1	1	10	1
09:45-09:59	2	8	0	1	10	2
16:00-16:14	0	15	1	1	11	2
16:15-16:29	1	7	2	0	15	1
16:30-16:44	3	8	0	2	12	1
16:45-16:59	1	15	0	4	13	1
17:00-17:14	4	8	1	0	7	3
17:15-17:29	0	11	0	1	16	2
17:30-17:44	0	9	1	5	18	1
17:45-17:59	1	8	5	1	13	2

HGV/PSV	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:14	0	0	0	0	1	0
08:15-08:29	0	1	0	0	0	0
08:30-08:44	0	0	0	0	1	0
08:45-08:59	0	1	0	0	0	0
09:00-09:14	0	0	1	0	1	0
09:15-09:29	0	0	0	0	0	0
09:30-09:44	0	0	0	0	0	0
09:45-09:59	0	0	0	0	0	0
16:00-16:14	0	0	1	0	1	1
16:15-16:29	0	1	0	0	0	0
16:30-16:44	0	1	0	0	0	1
16:45-16:59	0	0	1	0	0	1
17:00-17:14	0	1	0	1	0	0
17:15-17:29	0	2	0	0	0	1
17:30-17:44	0	0	0	0	0	0
17:45-17:59	0	1	0	0	0	1

Total Vehicles	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:14	0	7	0	2	3	2
08:15-08:29	0	11	3	5	5	3
08:30-08:44	0	15	1	3	7	2
08:45-08:59	2	15	2	1	12	1
09:00-09:14	1	13	3	2	13	3
09:15-09:29	6	27	5	3	12	2
09:30-09:44	1	16	1	1	10	1
09:45-09:59	2	8	0	1	10	2
16:00-16:14	0	15	2	1	12	3
16:15-16:29	1	8	2	0	15	1
16:30-16:44	5	9	0	2	12	2
16:45-16:59	1	15	1	4	13	2
17:00-17:14	4	9	1	1	7	3
17:15-17:29	0	13	0	1	16	3
17:30-17:44	0	9	1	5	18	1
17:45-17:59	1	9	5	1	13	3

PCUS	A-B	A-C	B-A	B-C	C-A	C-B
08:00-08:14	0	6	0	2	4	2
08:15-08:29	0	12	3	5	5	2
08:30-08:44	0	15	1	3	8	1
08:45-08:59	2	16	2	1	12	1
09:00-09:14	1	13	4	2	14	3
09:15-09:29	6	27	5	3	12	2
09:30-09:44	1	16	1	1	10	1
09:45-09:59	2	8	0	1	10	2
16:00-16:14	0	15	3	1	13	4
16:15-16:29	1	9	2	0	15	1
16:30-16:44	3	10	0	2	12	3
16:45-16:59	1	15	2	4	13	3
17:00-17:14	4	10	1	2	7	3
17:15-17:29	0	16	0	1	16	4
17:30-17:44	0	9	1	5	18	1
17:45-17:59	1	10	5	1	13	4

PCU Factors

Cycle	0.2
Motorcycle	0.4
Car/LGV	1
HGV/PSV	2.3

TTRSA - MetroCount Traffic Executive
Hourly Class Bins

CustomList-519 -- English (ENI)

Datasets:

Site:	**[L4510-29 Local Road] North of L4519-0 T-Junction**
File:	CRock_Local_Road_North_31May2018.EC0 (Plus)
Identifier:	HR44QS24 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:

Filter time:	**00:00 30 May 2018 => 00:00 31 May 2018**
Included classes:	1 (Light), 2 (Medium), 3 (Heavy)
Speed range:	10 - 160 km/h.
Direction:	North (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (Scheme F Aggregate (0 1 1 1 2 2 2 2 3 3 3 3 3 3 14))
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:

0 [Time]	24-hour time (0000 - 2359)
1 [Total]	Number in time step
2 [Cls]	Class totals

* 30 May 2018

Time	Total	Cls 1	Cls 2	Cls 3
0000	1	1	0	0
0100	1	1	0	0
0200	0	0	0	0
0300	0	0	0	0
0400	2	2	0	0
0500	0	0	0	0
0600	3	3	0	0
0700	2	2	0	0
0800	9	9	0	0
0900	19	19	0	0
1000	7	7	0	0
1100	11	11	0	0
1200	16	15	0	1
1300	13	13	0	0
1400	11	10	1	0
1500	17	16	1	0
1600	15	13	1	1
1700	16	15	1	0
1800	25	25	0	0
1900	11	11	0	0
2000	14	14	0	0
2100	6	6	0	0
2200	14	14	0	0
2300	5	4	1	0
07-19	**161**	**155**	**4**	**2**
06-22	**195**	**189**	**4**	**2**
06-00	**214**	**207**	**5**	**2**
00-00	**218**	**211**	**5**	**2**

* Grand Total

Time	Total	Cls 1	Cls 2	Cls 3
--	**218**	**211**	**5**	**2**

In profile: Vehicles = 218 / 473 (46.09%)

TTRSA - MetroCount Traffic Executive
Hourly Class Bins

CustomList-519 -- English (ENI)

Datasets:
Site:	**[L4510-29 Local Road] North of L4519-0 T-Junction**
File:	CRock_Local_Road_North_31May2018.EC0 (Plus)
Identifier:	HR44QS24 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:
Filter time:	**00:00 30 May 2018 => 00:00 31 May 2018**
Included classes:	1 (Light), 2 (Medium), 3 (Heavy)
Speed range:	10 - 160 km/h.
Direction:	South (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (Scheme F Aggregate (0 1 1 1 2 2 2 2 3 3 3 3 3 3 14))
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:
0	**[Time]**	24-hour time (0000 - 2359)
1	**[Total]**	Number in time step
2	**[Cls]**	Class totals

* 30 May 2018

Time	Total	Cls 1	Cls 2	Cls 3
0000	0	0	0	0
0100	0	0	0	0
0200	0	0	0	0
0300	0	0	0	0
0400	1	1	0	0
0500	0	0	0	0
0600	5	5	0	0
0700	6	5	1	0
0800	17	15	2	0
0900	16	16	0	0
1000	9	5	4	0
1100	12	12	0	0
1200	19	18	1	0
1300	17	15	1	1
1400	11	9	2	0
1500	15	14	1	0
1600	13	12	1	0
1700	16	16	0	0
1800	17	17	0	0
1900	12	11	1	0
2000	9	9	0	0
2100	15	14	0	1
2200	5	5	0	0
2300	2	2	0	0
07-19	**168**	**154**	**13**	**1**
06-22	**209**	**193**	**14**	**2**
06-00	**216**	**200**	**14**	**2**
00-00	**217**	**201**	**14**	**2**

* Grand Total

Time	Total	Cls 1	Cls 2	Cls 3
--	**217**	**201**	**14**	**2**

In profile: Vehicles = 217 / 473 (45.88%)

TTRSA - MetroCount Traffic Executive
Hourly Class Bins

CustomList-519 -- English (ENI)

Datasets:
Site: **[L4510-29 Local Road] North of L4519-0 T-Junction**
File: CRock_Local_Road_North_31May2018.EC0 (Plus)
Identifier: HR44QS24 MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15322)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:
Filter time: **00:00 30 May 2018 => 00:00 31 May 2018**
Included classes: 1 (Light), 2 (Medium), 3 (Heavy)
Speed range: 10 - 160 km/h.
Direction: Two-way
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F Aggregate (0 1 1 1 2 2 2 2 3 3 3 3 3 3 14))
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:
 0 [Time]   24-hour time (0000 - 2359)
 1 [Total]   Number in time step
 2 [Cls]   Class totals

* 30 May 2018

Time	Total	Cls 1	Cls 2	Cls 3
0000	1	1	0	0
0100	1	1	0	0
0200	0	0	0	0
0300	0	0	0	0
0400	3	3	0	0
0500	0	0	0	0
0600	8	8	0	0
0700	8	7	1	0
0800	26	24	2	0
0900	35	35	0	0
1000	16	12	4	0
1100	23	23	0	0
1200	35	33	1	1
1300	30	28	1	1
1400	22	19	3	0
1500	32	30	2	0
1600	28	25	2	1
1700	32	31	1	0
1800	42	42	0	0
1900	23	22	1	0
2000	23	23	0	0
2100	21	20	0	1
2200	19	19	0	0
2300	7	6	1	0
07-19	**329**	**309**	**17**	**3**
06-22	**404**	**382**	**18**	**4**
06-00	**430**	**407**	**19**	**4**
00-00	**435**	**412**	**19**	**4**

* Grand Total

Time	Total	Cls 1	Cls 2	Cls 3
--	**435**	**412**	**19**	**4**

In profile: Vehicles = 435 / 473 (91.97%)

TTRSA - MetroCount Traffic Executive
Hourly Class Bins

CustomList-520 -- English (ENI)

Datasets:
Site:	**[L4519-0 Local Road] East of L4510-29 T-Junction**
File:	CRock_Local Road_East_31May2018.EC0 (Plus)
Identifier:	HR43TMTZ MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:
Filter time:	**00:00 30 May 2018 => 00:00 31 May 2018**
Included classes:	1 (Light), 2 (Medium), 3 (Heavy)
Speed range:	10 - 160 km/h.
Direction:	East (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (Scheme F Aggregate (0 1 1 1 2 2 2 2 3 3 3 3 3 3 14))
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:
0	**[Time]**	24-hour time (0000 - 2359)
1	**[Total]**	Number in time step
2	**[Cls]**	Class totals

* 30 May 2018

Time	Total	Cls 1	Cls 2	Cls 3
0000	3	3	0	0
0100	1	1	0	0
0200	2	2	0	0
0300	1	1	0	0
0400	1	1	0	0
0500	3	3	0	0
0600	20	18	0	2
0700	23	23	0	0
0800	59	58	0	1
0900	73	73	0	0
1000	36	35	0	1
1100	44	43	1	0
1200	38	36	1	1
1300	34	32	1	1
1400	40	38	1	1
1500	55	53	1	1
1600	54	53	1	0
1700	51	49	1	1
1800	37	37	0	0
1900	38	36	1	1
2000	30	30	0	0
2100	23	23	0	0
2200	12	12	0	0
2300	11	11	0	0
07-19	**544**	**530**	**7**	**7**
06-22	**655**	**637**	**8**	**10**
06-00	**678**	**660**	**8**	**10**
00-00	**689**	**671**	**8**	**10**

* Grand Total

Time	Total	Cls 1	Cls 2	Cls 3
--	689	671	8	10

In profile: Vehicles = 689 / 1442 (47.78%)

TTRSA - MetroCount Traffic Executive
Hourly Class Bins

CustomList-521 -- English (ENI)

Datasets:
Site:	**[L4519-0 Local Road] East of L4510-29 T-Junction**
File:	CRock_Local Road_East_31May2018.EC0 (Plus)
Identifier:	HR43TMTZ MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Factory default (v3.21 - 15322)
Data type:	Axle sensors - Paired (Class/Speed/Count)

Profile:
Filter time:	**00:00 30 May 2018 => 00:00 31 May 2018**
Included classes:	1 (Light), 2 (Medium), 3 (Heavy)
Speed range:	10 - 160 km/h.
Direction:	West (bound)
Separation:	All - (Headway)
Name:	Default Profile
Scheme:	Vehicle classification (Scheme F Aggregate (0 1 1 1 2 2 2 2 3 3 3 3 3 3 14))
Units:	Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:
0	**[Time]**	24-hour time (0000 - 2359)
1	**[Total]**	Number in time step
2	**[Cls]**	Class totals

* 30 May 2018

Time	Total	Cls 1	Cls 2	Cls 3
0000	4	4	0	0
0100	1	1	0	0
0200	1	1	0	0
0300	1	1	0	0
0400	3	3	0	0
0500	0	0	0	0
0600	4	4	0	0
0700	21	20	1	0
0800	36	33	1	2
0900	52	51	1	0
1000	27	27	0	0
1100	32	32	0	0
1200	38	36	1	1
1300	41	40	1	0
1400	44	43	0	1
1500	50	47	3	0
1600	60	57	1	2
1700	64	63	0	1
1800	55	55	0	0
1900	38	38	0	0
2000	30	29	0	1
2100	34	34	0	0
2200	17	17	0	0
2300	6	6	0	0
07-19	**520**	**504**	**9**	**7**
06-22	**626**	**609**	**9**	**8**
06-00	**649**	**632**	**9**	**8**
00-00	**659**	**642**	**9**	**8**

* Grand Total

Time	Total	Cls 1	Cls 2	Cls 3
--	659	642	9	8

In profile: Vehicles = 659 / 1442 (45.70%)

TTRSA - MetroCount Traffic Executive
Hourly Class Bins

CustomList-521 -- English (ENI)

Datasets:
Site: **[L4519-0 Local Road] East of L4510-29 T-Junction**
File: CRock_Local Road_East_31May2018.EC0 (Plus)
Identifier: HR43TMTZ MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm: Factory default (v3.21 - 15322)
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:
Filter time: **00:00 30 May 2018 => 00:00 31 May 2018**
Included classes: 1 (Light), 2 (Medium), 3 (Heavy)
Speed range: 10 - 160 km/h.
Direction: Two-way
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F Aggregate (0 1 1 1 2 2 2 2 3 3 3 3 3 3 14))
Units: Metric (meter, kilometer, m/s, km/h, kg, tonne)

Column Legend:
 0 [Time] 24-hour time (0000 - 2359)
 1 [Total] Number in time step
 2 [Cls] Class totals

* 30 May 2018

Time	Total	Cls 1	Cls 2	Cls 3
0000	7	7	0	0
0100	2	2	0	0
0200	3	3	0	0
0300	2	2	0	0
0400	4	4	0	0
0500	3	3	0	0
0600	24	22	0	2
0700	44	43	1	0
0800	95	91	1	3
0900	125	124	1	0
1000	63	62	0	1
1100	76	75	1	0
1200	76	72	2	2
1300	75	72	2	1
1400	84	81	1	2
1500	105	100	4	1
1600	114	110	2	2
1700	115	112	1	2
1800	92	92	0	0
1900	76	74	1	1
2000	60	59	0	1
2100	57	57	0	0
2200	29	29	0	0
2300	17	17	0	0
07-19	**1064**	**1034**	**16**	**14**
06-22	**1281**	**1246**	**17**	**18**
06-00	**1327**	**1292**	**17**	**18**
00-00	**1348**	**1313**	**17**	**18**

* Grand Total

Time	Total	Cls 1	Cls 2	Cls 3
--	**1348**	**1313**	**17**	**18**

In profile: Vehicles = 1348 / 1442 (93.48%)

Scheme F

Scheme F is an implementation of the FHWA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

- **Units:** Non-metric (ft)
- **Car class:** 2
- **Unclassifiable vehicle class:** 14

Axles	Class	Description	SP1	SP2	SP3	SP4	SP5	Aggregate
2	F1	motorcycle	< 6.0					1 (Light)
	F2	passenger car or light pickup	6.0 - 10.0					1
	F3	heavy pickup	10.0 - 15.0					1
	F5	two-axle truck	15.0 - 20.0					2 (Medium)
	F4	bus	> 20.0					2
3	F2	car with trailer	< 10.0	10.0 - 18.0				1
	F3	pickup with trailer	10.0 - 15.0	10.0 - 18.0				1
	F4	bus	> 19.0					2
	F8	2S1		> 18.0				3 (Heavy)
	F6	three-axle truck						2
4	F2	car with trailer	< 10.0		< 3.5			1
	F3	pickup with trailer	10.0 - 15.0		< 3.5			1
	F8	2S2		> 5.0	> 3.5			3
	F8	3S1		< 5.0	> 10.0			3
	F7	four-axle truck						2
5	F11	2S1-2		> 6.0				3
	F9	3S2		< 6.1		3.5 - 8.0		3
	F3	pickup with trailer	9.9 - 15.0			< 3.5		1
	F5	two-axle truck with trailer	14.9 - 20.0			< 3.5		2
	F9	five-axle combination						3
6	F10	six-axle combination			3.5 - 5.0			3
	F12	3S1-2					> 10.0	3
	F10	3S3						3
>=7	F13	seven (or more) axle combination						3

Appendix C

Traffic Calculations Summary

Traffic Calculations Summary
L4519-0 / L4510-29 T-Junction, Cloonteen, Gort, Co. Galway

Arm A = L4519-0 (West)
Arm B = L4510-29 (North)
Arm C = L4519-0 (East)

Scenario	A-B	A-C	B-A	B-C	C-A	C-B
2018 AM Peak Hour (08:45-09:44)	10	72	12	7	48	7
2023 AM Peak Hour (Factor 1.045) with retention	10	76	13	7	50	7
2033 AM Peak Hour (Factor 1.109) with retention	11	80	14	8	54	8
2018 PM Peak Hour (16:45-17:44)	5	50	4	12	54	12
2023 PM Peak Hour (Factor 1.045) with retention	5	52	4	13	56	12
2033 PM Peak Hour (Factor 1.109) with retention	6	55	5	14	60	13

Data in PCUs rounded to whole vehicles

Appendix D

PICADY Modelling Output File

 Run with file:-
 "D:\tjunction\input.vpi"
(drive-on-the-left) at 13:34:35 on Wednesday, 27 June 2018

.RUN INFORMATION
 ****

   RUN TITLE: L4510-29 / L4519-0 T-junction
    LOCATION: Cloonteen (Townland), Gort, Galway
        DATE: 26/06/18
      CLIENT: Colman Rock
  ENUMERATOR: TTRSA
  JOB NUMBER: 161002-002
      STATUS: TS
 DESCRIPTION: Modelling in PCUs

 .MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ****

  INPUT DATA

                     MAJOR ROAD (ARM C) -------------------- MAJOR ROAD (ARM A)
                                          I
                                          I
                                          I
                                          I
                                          I
                                          I
                                MINOR ROAD (ARM B)

 ARM A IS L4519-0 (West)
 ARM B IS L4510-29 (North)
 ARM C IS L4519-0 (East to Gort)

  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   I   MINOR ROAD B   I

 I TOTAL MAJOR ROAD CARRIAGEWAY WIDTH   I (W) 6.00 M.   I
 I CENTRAL RESERVE WIDTH   I (WCR) 0.00 M.   I
 I   I   I
 I MAJOR ROAD RIGHT TURN - WIDTH   I (WC-B) 2.20 M.   I

```
I                          - VISIBILITY       I (VC-B)  55.0 M.   I
I                          - BLOCKS TRAFFIC  I          YES       I
I                                            I                    I
I  MINOR ROAD - VISIBILITY TO LEFT           I (VB-C)  21.0 M.   I
I             - VISIBILITY TO RIGHT          I (VB-A)  33.0 M.   I
I             - LANE 1 WIDTH                 I (WB-C)    -        I
I             - LANE 2 WIDTH                 I (WB-A)    -        I
I             - WIDTH AT  0 M FROM JUNC.     I        10.00 M.   I
I             - WIDTH AT  5 M FROM JUNC.     I         8.40 M.   I
I             - WIDTH AT 10 M FROM JUNC.     I         4.70 M.   I
I             - WIDTH AT 15 M FROM JUNC.     I         2.20 M.   I
I             - WIDTH AT 20 M FROM JUNC.     I         2.20 M.   I
I             - LENGTH OF FLARED SECTION     I         2 VEHS    I
 -------------------------------------------------------------------


 .SLOPES AND INTERCEPT
 --------------------

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

 will be adjusted )


 ---------------------------------------------------------
 I Intercept For Slope For Opposing  Slope For Opposing I
 I Stream B-C    Stream  A-C          Stream A-B         I
 ---------------------------------------------------------
 I    593.07          0.23                   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    460.50          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
 ---------------------------------------------------------
 I    605.81          0.23                   0.23        I
 ---------------------------------------------------------

 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: 2018 AM with current development


 TIME PERIOD BEGINS 08.15 AND ENDS 09.45

 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 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  I  FALLING   I  PEAK  I OF PEAK I PEAK  I
 --------------------------------------------------------------------------------
 I ARM A I    15.00    I    45.00    I    75.00   I 1.02  I  1.54   I 1.02 I
 I ARM B I    15.00    I    45.00    I    75.00   I 0.24  I  0.36   I 0.24 I
 I ARM C I    15.00    I    45.00    I    75.00   I 0.69  I  1.03   I 0.69 I
 --------------------------------------------------------------------------------


 .
 -----------------------------------------------------------
 I                I        TURNING PROPORTIONS      I
```

```
I                     I       TURNING COUNTS (VEH/HR)    I
I                     I        (PERCENTAGE OF H.V.S)     I
I                     I    ---------------------------------
I       TIME          I FROM/TO I ARM A I  ARM B I  ARM C I
---------------------------------------------------------
I  08.15 - 09.45      I         I       I        I        I
I                     I  ARM A  I 0.000 I  0.122 I  0.878 I
I                     I         I   0.0 I   10.0 I   72.0 I
I                     I         I (  0.0)I (  0.0)I (  0.0)I
I                     I         I       I        I        I
I                     I  ARM B  I 0.632 I  0.000 I  0.368 I
I                     I         I  12.0 I    0.0 I    7.0 I
I                     I         I (  0.0)I (  0.0)I (  0.0)I
I                     I         I       I        I        I
I                     I  ARM C  I 0.873 I  0.127 I  0.000 I
I                     I         I  48.0 I    7.0 I    0.0 I
I                     I         I (  0.0)I (  0.0)I (  0.0)I
I                     I         I       I        I        I
---------------------------------------------------------

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

.          QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
           -------------------------------------------------------
              FOR DEMAND SET 2018 AM with current development
              AND FOR TIME PERIOD     1
```

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)
08.15-08.30									
B-C	0.09	10.85	0.008		0.00	0.01	0.1		0.09
B-A	0.15	8.39	0.018		0.00	0.02	0.3		0.12
C-AB	0.09	10.26	0.009		0.00	0.01	0.1		0.10
C-A	0.60								
A-B	0.13								
A-C	0.90								

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)
08.30-08.45									
B-C	0.10	10.80	0.010		0.01	0.01	0.1		0.09
B-A	0.18	8.32	0.022		0.02	0.02	0.3		0.12
C-AB	0.11	10.29	0.011		0.01	0.01	0.2		0.10
C-A	0.71								
A-B	0.15								
A-C	1.08								

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)
08.45-09.00									
B-C	0.13	10.72	0.012		0.01	0.01	0.2		0.09
B-A	0.22	8.22	0.027		0.02	0.03	0.4		0.13
C-AB	0.14	10.34	0.014		0.01	0.02	0.2		0.10
C-A	0.87								
A-B	0.18								
A-C	1.32								

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)
09.00-09.15									
B-C	0.13	10.72	0.012		0.01	0.01	0.2		0.09
B-A	0.22	8.22	0.027		0.03	0.03	0.4		0.13
C-AB	0.14	10.34	0.014		0.02	0.02	0.2		0.10
C-A	0.87								
A-B	0.18								
A-C	1.32								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/	GEOMETRIC DELAY (VEH.MIN/	AVERAGE DELAY PER ARRIVING

```
I                              (RFC)    (PEDS/MIN) (VEHS) (VEHS) TIME SEGMENT) TIME SEGMENT)    VEHICLE (MIN) I
I 09.15-09.30                                                                                                  I
I   B-C      0.10    10.80    0.010                0.01   0.01       0.2                            0.09       I
I   B-A      0.18     8.32    0.022                0.03   0.02       0.3                            0.12       I
I   C-AB     0.11    10.29    0.011                0.02   0.01       0.2                            0.10       I
I   C-A      0.71                                                                                             I
I   A-B      0.15                                                                                             I
I   A-C      1.08                                                                                             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 09.30-09.45                                                                                                  I
I   B-C      0.09    10.85    0.008                0.01   0.01       0.1                            0.09       I
I   B-A      0.15     8.39    0.018                0.02   0.02       0.3                            0.12       I
I   C-AB     0.09    10.26    0.009                0.01   0.01       0.1                            0.10       I
I   C-A      0.60                                                                                             I
I   A-B      0.13                                                                                             I
I   A-C      0.90                                                                                             I
I                                                                                                             I
.-------------------------------------------------------------------------------------------------------------

*WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
QUEUE FOR STREAM   B-C
------------------------
TIME SEGMENT   NO. OF
  ENDING      VEHICLES
              IN QUEUE
  08.30         0.0
  08.45         0.0
  09.00         0.0
  09.15         0.0
  09.30         0.0
  09.45         0.0
.
QUEUE FOR STREAM   B-A
------------------------
TIME SEGMENT   NO. OF
  ENDING      VEHICLES
              IN QUEUE
  08.30         0.0
  08.45         0.0
  09.00         0.0
  09.15         0.0
  09.30         0.0
  09.45         0.0
.
QUEUE FOR STREAM   C-AB
-----------------------
TIME SEGMENT   NO. OF
  ENDING      VEHICLES
              IN QUEUE
  08.30         0.0
  08.45         0.0
  09.00         0.0
  09.15         0.0
  09.30         0.0
  09.45         0.0
.
             QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
             -------------------------------------------

-----------------------------------------------------------------------------
I STREAM I   TOTAL DEMAND  I  * QUEUEING *    I * INCLUSIVE QUEUEING * I
I        I                 I  * DELAY *       I      * DELAY *         I
I        I-----------------------------------------------------------------I
I        I (VEH)  (VEH/H) I  (MIN)   (MIN/VEH) I  (MIN)    (MIN/VEH) I
-----------------------------------------------------------------------------
I B-C  I   9.6 I    6.4 I    0.9 I   0.09  I      0.9 I    0.09   I
I B-A  I  16.5 I   11.0 I    2.0 I   0.12  I      2.0 I    0.12   I
I C-AB I  10.4 I    6.9 I    1.1 I   0.11  I      1.1 I    0.11   I
I C-A  I  65.3 I   43.5 I        I         I          I           I
I A-B  I  13.8 I    9.2 I        I         I          I           I
I A-C  I  99.1 I   66.1 I        I         I          I           I
-----------------------------------------------------------------------------
I ALL  I 214.7 I  143.1 I    4.0 I   0.02  I      4.0 I    0.02   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

.SLOPES AND INTERCEPT

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

will be adjusted)

I Intercept For Slope For Opposing   Slope For Opposing I
I Stream B-C   Stream A-C   Stream A-B   I

I   593.07   0.23   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   460.50   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

I   605.81   0.23   0.23   I

 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: 2018 PM with current development

 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

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 I FALLING   I PEAK   I OF PEAK I PEAK I

I ARM A I   15.00   I   45.00   I   75.00   I 0.69 I   1.03 I 0.69 I
I ARM B I   15.00   I   45.00   I   75.00   I 0.20 I   0.30 I 0.20 I
I ARM C I   15.00   I   45.00   I   75.00   I 0.82 I   1.24 I 0.82 I

.

I   I   TURNING PROPORTIONS   I
I   I   TURNING COUNTS (VEH/HR)   I
I   I   (PERCENTAGE OF H.V.S)   I
I   I -----------------------------------
I   TIME   I FROM/TO I ARM A I ARM B I ARM C I

I 16.30 - 18.00   I   I   I   I   I
I   I ARM A I 0.000 I 0.091 I 0.909 I
I   I   I   0.0 I   5.0 I   50.0 I
I   I   I (0.0)I (0.0)I (0.0)I
I   I   I   I   I   I

```
I                       I  ARM B  I  0.250 I  0.000 I  0.750 I
I                       I        I    4.0 I    0.0 I   12.0 I
I                       I        I (  0.0)I (  0.0)I (  0.0)I
I                       I        I        I        I        I
I                       I  ARM C  I  0.818 I  0.182 I  0.000 I
I                       I        I   54.0 I   12.0 I    0.0 I
I                       I        I (  0.0)I (  0.0)I (  0.0)I
I                       I        I        I        I        I
 --------------------------------------------------------

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

              QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
              -----------------------------------------------------
               FOR DEMAND SET 2018 PM with current development
               AND FOR TIME PERIOD    2
.----------------------------------------------------------------------------------------------------
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 16.30-16.45                                                                                                     I
I   B-C       0.15     11.18    0.013                   0.00   0.01      0.2                             0.09      I
I   B-A       0.05      8.20    0.006                   0.00   0.01      0.1                             0.12      I
I   C-AB      0.16     10.39    0.015                   0.00   0.02      0.3                             0.10      I
I   C-A       0.67                                                                                                I
I   A-B       0.06                                                                                                I
I   A-C       0.63                                                                                                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 16.45-17.00                                                                                                     I
I   B-C       0.18     11.15    0.016                   0.01   0.02      0.2                             0.09      I
I   B-A       0.06      8.14    0.007                   0.01   0.01      0.1                             0.12      I
I   C-AB      0.19     10.45    0.019                   0.02   0.02      0.3                             0.10      I
I   C-A       0.79                                                                                                I
I   A-B       0.07                                                                                                I
I   A-C       0.75                                                                                                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
I   B-C       0.22     11.10    0.020                   0.02   0.02      0.3                             0.09      I
I   B-A       0.07      8.06    0.009                   0.01   0.01      0.1                             0.13      I
I   C-AB      0.24     10.52    0.023                   0.02   0.03      0.4                             0.10      I
I   C-A       0.97                                                                                                I
I   A-B       0.09                                                                                                I
I   A-C       0.92                                                                                                I
I                                                                                                                 I
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.----------------------------------------------------------------------------------------------------
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 17.15-17.30                                                                                                     I
I   B-C       0.22     11.10    0.020                   0.02   0.02      0.3                             0.09      I
I   B-A       0.07      8.06    0.009                   0.01   0.01      0.1                             0.13      I
I   C-AB      0.24     10.52    0.023                   0.03   0.03      0.4                             0.10      I
I   C-A       0.97                                                                                                I
I   A-B       0.09                                                                                                I
I   A-C       0.92                                                                                                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 17.30-17.45                                                                                                     I
I   B-C       0.18     11.15    0.016                   0.02   0.02      0.3                             0.09      I
I   B-A       0.06      8.14    0.007                   0.01   0.01      0.1                             0.12      I
I   C-AB      0.19     10.45    0.019                   0.03   0.02      0.3                             0.10      I
I   C-A       0.79                                                                                                I
I   A-B       0.07                                                                                                I
I   A-C       0.75                                                                                                I
I                                                                                                                 I
.----------------------------------------------------------------------------------------------------
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.-----------------------------------------------------------------------------------------------------
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 17.45-18.00                                                                                                        I
I   B-C       0.15     11.18     0.013                 0.02   0.01       0.2                              0.09        I
I   B-A       0.05      8.20     0.006                 0.01   0.01       0.1                              0.12        I
I   C-AB      0.16     10.39     0.016                 0.02   0.02       0.3                              0.10        I
I   C-A       0.67                                                                                                   I
I   A-B       0.06                                                                                                   I
I   A-C       0.63                                                                                                   I
I                                                                                                                    I
.-----------------------------------------------------------------------------------------------------

*WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
QUEUE FOR STREAM   B-C
------------------------
TIME SEGMENT    NO. OF
   ENDING      VEHICLES
              IN QUEUE
   16.45         0.0
   17.00         0.0
   17.15         0.0
   17.30         0.0
   17.45         0.0
   18.00         0.0
.
QUEUE FOR STREAM   B-A
------------------------
TIME SEGMENT    NO. OF
   ENDING      VEHICLES
              IN QUEUE
   16.45         0.0
   17.00         0.0
   17.15         0.0
   17.30         0.0
   17.45         0.0
   18.00         0.0
.
QUEUE FOR STREAM   C-AB
------------------------
TIME SEGMENT    NO. OF
   ENDING      VEHICLES
              IN QUEUE
   16.45         0.0
   17.00         0.0
   17.15         0.0
   17.30         0.0
   17.45         0.0
   18.00         0.0
.
              QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
              -------------------------------------------


---------------------------------------------------------------------------------
I STREAM I    TOTAL DEMAND  I   * QUEUEING *      I * INCLUSIVE QUEUEING * I
I        I                  I   * DELAY *         I      * DELAY *         I
I        I-----------------------------------------------------------------I
I        I (VEH)  (VEH/H) I (MIN)   (MIN/VEH) I   (MIN)    (MIN/VEH) I
---------------------------------------------------------------------------------
I  B-C   I  16.5 I  11.0 I   1.5 I   0.09   I     1.5 I    0.09    I
I  B-A   I   5.5 I   3.7 I   0.7 I   0.12   I     0.7 I    0.12    I
I  C-AB  I  18.0 I  12.0 I   2.1 I   0.11   I     2.1 I    0.11    I
I  C-A   I  72.9 I  48.6 I       I          I         I           I
I  A-B   I   6.9 I   4.6 I       I          I         I           I
I  A-C   I  68.8 I  45.9 I       I          I         I           I
---------------------------------------------------------------------------------
I  ALL   I 188.6 I 125.7 I   4.2 I   0.02   I     4.2 I    0.02    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

.SLOPES AND INTERCEPT
--------------------

(NB:Streams may be combined, in which case capacity
```

will be adjusted)


```
----------------------------------------------------------
I Intercept For Slope For Opposing  Slope For Opposing I
I Stream B-C    Stream  A-C         Stream A-B       I
----------------------------------------------------------
I    593.07             0.23               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    460.50             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
----------------------------------------------------------
I    605.81             0.23               0.23       I
----------------------------------------------------------
```

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: 2023 AM with retention of development

TIME PERIOD BEGINS 08.15 AND ENDS 09.45

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 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  I  FALLING   I  PEAK  I OF PEAK I PEAK  I
---------------------------------------------------------------------------
I ARM A I    15.00    I    45.00    I    75.00   I  1.08  I   1.61  I  1.08 I
I ARM B I    15.00    I    45.00    I    75.00   I  0.24  I   0.36  I  0.24 I
I ARM C I    15.00    I    45.00    I    75.00   I  0.71  I   1.07  I  0.71 I
---------------------------------------------------------------------------
```


```
.
----------------------------------------------------------
I                      I      TURNING PROPORTIONS    I
I                      I      TURNING COUNTS (VEH/HR)   I
I                      I      (PERCENTAGE OF H.V.S)     I
I                      I --------------------------------I
I       TIME       I FROM/TO I  ARM A I  ARM B I  ARM C I
----------------------------------------------------------
I  08.15 - 09.45   I       I      I      I      I
I                  I ARM A  I  0.000 I  0.116 I  0.884 I
I                  I       I    0.0 I   10.0 I   76.0 I
I                  I       I (  0.0)I (  0.0)I (  0.0)I
I                  I       I      I      I      I
I                  I ARM B  I  0.632 I  0.000 I  0.368 I
I                  I       I   12.0 I    0.0 I    7.0 I
I                  I       I (  0.0)I (  0.0)I (  0.0)I
I                  I       I      I      I      I
I                  I ARM C  I  0.877 I  0.123 I  0.000 I
I                  I       I   50.0 I    7.0 I    0.0 I
I                  I       I (  0.0)I (  0.0)I (  0.0)I
I                  I       I      I      I      I
----------------------------------------------------------
```

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

```
.         QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
          ----------------------------------------------------
          FOR DEMAND SET 2023 AM with retention of development
          AND FOR TIME PERIOD    1
```

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)
08.15-08.30									
B-C	0.09	10.84	0.008		0.00	0.01	0.1		0.09
B-A	0.15	8.37	0.018		0.00	0.02	0.3		0.12
C-AB	0.09	10.26	0.009		0.00	0.01	0.1		0.10
C-A	0.62								
A-B	0.13								
A-C	0.95								

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)
08.30-08.45									
B-C	0.10	10.78	0.010		0.01	0.01	0.1		0.09
B-A	0.18	8.30	0.022		0.02	0.02	0.3		0.12
C-AB	0.11	10.30	0.011		0.01	0.01	0.2		0.10
C-A	0.74								
A-B	0.15								
A-C	1.14								

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)
08.45-09.00									
B-C	0.13	10.70	0.012		0.01	0.01	0.2		0.09
B-A	0.22	8.20	0.027		0.02	0.03	0.4		0.13
C-AB	0.14	10.35	0.014		0.01	0.02	0.2		0.10
C-A	0.91								
A-B	0.18								
A-C	1.39								

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)
09.00-09.15									
B-C	0.13	10.70	0.012		0.01	0.01	0.2		0.09
B-A	0.22	8.20	0.027		0.03	0.03	0.4		0.13
C-AB	0.14	10.35	0.014		0.02	0.02	0.2		0.10
C-A	0.91								
A-B	0.18								
A-C	1.39								

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)
09.15-09.30									
B-C	0.10	10.78	0.010		0.01	0.01	0.2		0.09
B-A	0.18	8.30	0.022		0.03	0.02	0.3		0.12
C-AB	0.11	10.30	0.011		0.02	0.01	0.2		0.10
C-A	0.74								
A-B	0.15								
A-C	1.14								

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)
09.30-09.45									
B-C	0.09	10.84	0.008		0.01	0.01	0.1		0.09
B-A	0.15	8.37	0.018		0.02	0.02	0.3		0.12
C-AB	0.09	10.26	0.009		0.01	0.01	0.1		0.10
C-A	0.62								

```
I   A-B      0.13                                                                                                I
I   A-C      0.95                                                                                                I
I                                                                                                                I
.----------------------------------------------------------------------------------------------------------------

*WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
QUEUE FOR STREAM   B-C
------------------------
TIME SEGMENT    NO. OF
  ENDING       VEHICLES
              IN QUEUE
  08.30          0.0
  08.45          0.0
  09.00          0.0
  09.15          0.0
  09.30          0.0
  09.45          0.0
.
QUEUE FOR STREAM   B-A
------------------------
TIME SEGMENT    NO. OF
  ENDING       VEHICLES
              IN QUEUE
  08.30          0.0
  08.45          0.0
  09.00          0.0
  09.15          0.0
  09.30          0.0
  09.45          0.0
.
QUEUE FOR STREAM   C-AB
------------------------
TIME SEGMENT    NO. OF
  ENDING       VEHICLES
              IN QUEUE
  08.30          0.0
  08.45          0.0
  09.00          0.0
  09.15          0.0
  09.30          0.0
  09.45          0.0
.
               QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
               --------------------------------------------


--------------------------------------------------------------------------------
I STREAM I    TOTAL DEMAND  I  * QUEUEING *     I * INCLUSIVE QUEUEING * I
I        I                  I  * DELAY *        I       * DELAY *        I
I        I------------------------------------------------------------------I
I        I (VEH)  (VEH/H) I (MIN)    (MIN/VEH) I   (MIN)     (MIN/VEH) I
--------------------------------------------------------------------------------
I  B-C   I   9.6 I    6.4 I   0.9 I    0.09   I     0.9 I    0.09    I
I  B-A   I  16.5 I   11.0 I   2.0 I    0.12   I     2.0 I    0.12    I
I  C-AB  I  10.4 I    7.0 I   1.1 I    0.11   I     1.1 I    0.11    I
I  C-A   I  68.0 I   45.4 I       I           I         I           I
I  A-B   I  13.8 I    9.2 I       I           I         I           I
I  A-C   I 104.6 I   69.7 I       I           I         I           I
--------------------------------------------------------------------------------
I  ALL   I 223.0 I  148.7 I   4.1 I    0.02   I     4.1 I    0.02    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

.SLOPES AND INTERCEPT
--------------------

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

will be adjusted )


-----------------------------------------------------------
I Intercept For Slope For Opposing   Slope For Opposing I
I Stream B-C     Stream  A-C          Stream  A-B        I
-----------------------------------------------------------
I    593.07           0.23                 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   460.50         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
------------------------------------------------------------
I   605.81         0.23                 0.23             I
------------------------------------------------------------

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: 2033 AM with retention of development


TIME PERIOD BEGINS 08.15 AND ENDS 09.45

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 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  I  FALLING   I  PEAK  I OF PEAK I PEAK  I
-------------------------------------------------------------------------------
I ARM A I   15.00   I    45.00   I   75.00   I 1.14 I   1.71 I  1.14 I
I ARM B I   15.00   I    45.00   I   75.00   I 0.28 I   0.41 I  0.28 I
I ARM C I   15.00   I    45.00   I   75.00   I 0.77 I   1.16 I  0.77 I
-------------------------------------------------------------------------------


.
-----------------------------------------------------------
I                   I       TURNING PROPORTIONS        I
I                   I       TURNING COUNTS (VEH/HR)     I
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  08.15 - 09.45    I         I        I        I        I
I                   I ARM A  I  0.000 I  0.121 I  0.879 I
I                   I        I    0.0 I   11.0 I   80.0 I
I                   I        I (  0.0)I (  0.0)I (  0.0)I
I                   I        I        I        I        I
I                   I ARM B  I  0.636 I  0.000 I  0.364 I
I                   I        I   14.0 I    0.0 I    8.0 I
I                   I        I (  0.0)I (  0.0)I (  0.0)I
I                   I        I        I        I        I
I                   I ARM C  I  0.871 I  0.129 I  0.000 I
I                   I        I   54.0 I    8.0 I    0.0 I
I                   I        I (  0.0)I (  0.0)I (  0.0)I
I                   I        I        I        I        I
-----------------------------------------------------------

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

.          QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
           -----------------------------------------------------------
            FOR DEMAND SET 2033 AM with retention of development
            AND FOR TIME PERIOD    1
.-----------------------------------------------------------------------------------------------------
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 08.15-08.30                                                                                              I
I   B-C      0.10    10.81   0.009                    0.00   0.01      0.1                            0.09  I
I   B-A      0.18     8.35   0.021                    0.00   0.02      0.3                            0.12  I
I   C-AB     0.11    10.28   0.010                    0.00   0.01      0.2                            0.10  I
I   C-A      0.67                                                                                          I
I   A-B      0.14                                                                                          I
I   A-C      1.00                                                                                          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 08.30-08.45                                                                                              I
I   B-C      0.12    10.75   0.011                    0.01   0.01      0.2                            0.09  I
I   B-A      0.21     8.27   0.025                    0.02   0.03      0.4                            0.12  I
I   C-AB     0.13    10.32   0.013                    0.01   0.01      0.2                            0.10  I
I   C-A      0.80                                                                                          I
I   A-B      0.16                                                                                          I
I   A-C      1.20                                                                                          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 08.45-09.00                                                                                              I
I   B-C      0.15    10.66   0.014                    0.01   0.01      0.2                            0.10  I
I   B-A      0.26     8.17   0.031                    0.03   0.03      0.5                            0.13  I
I   C-AB     0.16    10.37   0.016                    0.01   0.02      0.3                            0.10  I
I   C-A      0.98                                                                                          I
I   A-B      0.20                                                                                          I
I   A-C      1.47                                                                                          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 09.00-09.15                                                                                              I
I   B-C      0.15    10.66   0.014                    0.01   0.01      0.2                            0.10  I
I   B-A      0.26     8.17   0.031                    0.03   0.03      0.5                            0.13  I
I   C-AB     0.16    10.37   0.016                    0.02   0.02      0.3                            0.10  I
I   C-A      0.98                                                                                          I
I   A-B      0.20                                                                                          I
I   A-C      1.47                                                                                          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 09.15-09.30                                                                                              I
I   B-C      0.12    10.75   0.011                    0.01   0.01      0.2                            0.09  I
I   B-A      0.21     8.27   0.025                    0.03   0.03      0.4                            0.12  I
I   C-AB     0.13    10.32   0.013                    0.02   0.01      0.2                            0.10  I
I   C-A      0.80                                                                                          I
I   A-B      0.16                                                                                          I
I   A-C      1.20                                                                                          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 09.30-09.45                                                                                              I
I   B-C      0.10    10.81   0.009                    0.01   0.01      0.1                            0.09  I
I   B-A      0.18     8.35   0.021                    0.03   0.02      0.3                            0.12  I
I   C-AB     0.11    10.28   0.010                    0.01   0.01      0.2                            0.10  I
I   C-A      0.67                                                                                          I
I   A-B      0.14                                                                                          I
I   A-C      1.00                                                                                          I
I                                                                                                          I
.----------------------------------------------------------------------------------------------------------


*WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
QUEUE FOR STREAM  B-C
------------------------
TIME SEGMENT    NO. OF
```

```
  ENDING      VEHICLES
              IN QUEUE
  08.30         0.0
  08.45         0.0
  09.00         0.0
  09.15         0.0
  09.30         0.0
  09.45         0.0
.
QUEUE FOR STREAM   B-A
-------------------------
TIME SEGMENT    NO. OF
  ENDING      VEHICLES
              IN QUEUE
  08.30         0.0
  08.45         0.0
  09.00         0.0
  09.15         0.0
  09.30         0.0
  09.45         0.0
.
QUEUE FOR STREAM   C-AB
-------------------------
TIME SEGMENT    NO. OF
  ENDING      VEHICLES
              IN QUEUE
  08.30         0.0
  08.45         0.0
  09.00         0.0
  09.15         0.0
  09.30         0.0
  09.45         0.0
.
              QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
              --------------------------------------------
```

```
-----------------------------------------------------------------------
I STREAM I   TOTAL DEMAND  I  * QUEUEING *    I * INCLUSIVE QUEUEING * I
I        I                 I  * DELAY *       I      * DELAY *         I
I        I----------------------------------------------------------I
I        I (VEH)  (VEH/H) I (MIN)   (MIN/VEH) I  (MIN)     (MIN/VEH) I
-----------------------------------------------------------------------
I  B-C   I  11.0 I   7.3 I   1.0 I    0.09  I    1.0 I    0.09   I
I  B-A   I  19.3 I  12.8 I   2.4 I    0.12  I    2.4 I    0.12   I
I  C-AB  I  12.0 I   8.0 I   1.3 I    0.11  I    1.3 I    0.11   I
I  C-A   I  73.3 I  48.9 I       I          I        I          I
I  A-B   I  15.1 I  10.1 I       I          I        I          I
I  A-C   I 110.1 I  73.4 I       I          I        I          I
-----------------------------------------------------------------------
I  ALL   I 240.9 I 160.6 I   4.7 I    0.02  I    4.7 I    0.02   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

.SLOPES AND INTERCEPT

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

will be adjusted)


```
---------------------------------------------------------
I Intercept For Slope For Opposing  Slope For Opposing I
I Stream B-C    Stream  A-C         Stream  A-B       I
---------------------------------------------------------
I    593.07          0.23                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    460.50          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
---------------------------------------------------------
I   605.81         0.23               0.23        I
---------------------------------------------------------
```

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: 2023 PM with retention of development

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


```
--------------------------------------------------------------------------------
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  I  FALLING   I  PEAK  I OF PEAK I PEAK  I
--------------------------------------------------------------------------------
I ARM A I    15.00   I    45.00    I    75.00   I 0.71 I   1.07  I 0.71 I
I ARM B I    15.00   I    45.00    I    75.00   I 0.21 I   0.32  I 0.21 I
I ARM C I    15.00   I    45.00    I    75.00   I 0.85 I   1.28  I 0.85 I
--------------------------------------------------------------------------------
```

```
.
--------------------------------------------------------------
I                    I      TURNING PROPORTIONS        I
I                    I      TURNING COUNTS (VEH/HR)     I
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  16.30 - 18.00     I         I        I        I        I
I                    I ARM A  I 0.000 I  0.088 I  0.912 I
I                    I        I   0.0 I    5.0 I   52.0 I
I                    I        I (  0.0)I (  0.0)I (  0.0)I
I                    I        I       I        I        I
I                    I ARM B  I 0.235 I  0.000 I  0.765 I
I                    I        I   4.0 I    0.0 I   13.0 I
I                    I        I (  0.0)I (  0.0)I (  0.0)I
I                    I        I       I        I        I
I                    I ARM C  I 0.824 I  0.176 I  0.000 I
I                    I        I  56.0 I   12.0 I    0.0 I
I                    I        I (  0.0)I (  0.0)I (  0.0)I
I                    I        I       I        I        I
--------------------------------------------------------------
```

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

```
.           QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
            ---------------------------------------------------------
            FOR DEMAND SET 2023 PM with retention of development
            AND FOR TIME PERIOD    2
.--------------------------------------------------------------------------------------------------------------
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 16.30-16.45                                                                                                  I
I  B-C      0.16     11.19     0.015                 0.00   0.01      0.2                             0.09      I
I  B-A      0.05      8.17     0.006                 0.00   0.01      0.1                             0.12      I
I  C-AB     0.16     10.40     0.016                 0.00   0.02      0.3                             0.10      I
I  C-A      0.69                                                                                               I
I  A-B      0.06                                                                                               I
I  A-C      0.65                                                                                               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 16.45-17.00                                                                                              I
I   B-C     0.19    11.15    0.017                 0.01   0.02     0.3                            0.09      I
I   B-A     0.06     8.11    0.007                 0.01   0.01     0.1                            0.12      I
I   C-AB    0.20    10.46    0.019                 0.02   0.02     0.3                            0.10      I
I   C-A     0.82                                                                                           I
I   A-B     0.07                                                                                           I
I   A-C     0.78                                                                                           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
I   B-C     0.24    11.10    0.021                 0.02   0.02     0.3                            0.09      I
I   B-A     0.07     8.03    0.009                 0.01   0.01     0.1                            0.13      I
I   C-AB    0.24    10.54    0.023                 0.02   0.03     0.4                            0.10      I
I   C-A     1.00                                                                                           I
I   A-B     0.09                                                                                           I
I   A-C     0.95                                                                                           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 17.15-17.30                                                                                              I
I   B-C     0.24    11.10    0.021                 0.02   0.02     0.3                            0.09      I
I   B-A     0.07     8.03    0.009                 0.01   0.01     0.1                            0.13      I
I   C-AB    0.24    10.54    0.023                 0.03   0.03     0.4                            0.10      I
I   C-A     1.00                                                                                           I
I   A-B     0.09                                                                                           I
I   A-C     0.95                                                                                           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 17.30-17.45                                                                                              I
I   B-C     0.19    11.15    0.017                 0.02   0.02     0.3                            0.09      I
I   B-A     0.06     8.11    0.007                 0.01   0.01     0.1                            0.12      I
I   C-AB    0.20    10.46    0.019                 0.03   0.02     0.3                            0.10      I
I   C-A     0.82                                                                                           I
I   A-B     0.07                                                                                           I
I   A-C     0.78                                                                                           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 17.45-18.00                                                                                              I
I   B-C     0.16    11.19    0.015                 0.02   0.01     0.2                            0.09      I
I   B-A     0.05     8.17    0.006                 0.01   0.01     0.1                            0.12      I
I   C-AB    0.16    10.40    0.016                 0.02   0.02     0.3                            0.10      I
I   C-A     0.69                                                                                           I
I   A-B     0.06                                                                                           I
I   A-C     0.65                                                                                           I
I                                                                                                         I
.-------------------------------------------------------------------------------------------------------

*WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
QUEUE FOR STREAM   B-C
------------------------
TIME SEGMENT    NO. OF
  ENDING       VEHICLES
              IN QUEUE
  16.45          0.0
  17.00          0.0
  17.15          0.0
  17.30          0.0
  17.45          0.0
  18.00          0.0
.
QUEUE FOR STREAM   B-A
```

```
                    ------------------------
TIME SEGMENT    NO. OF
   ENDING      VEHICLES
              IN QUEUE
   16.45         0.0
   17.00         0.0
   17.15         0.0
   17.30         0.0
   17.45         0.0
   18.00         0.0
.
QUEUE FOR STREAM   C-AB
                    ------------------------
TIME SEGMENT    NO. OF
   ENDING      VEHICLES
              IN QUEUE
   16.45         0.0
   17.00         0.0
   17.15         0.0
   17.30         0.0
   17.45         0.0
   18.00         0.0
.
               QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
               -------------------------------------------
```

```
--------------------------------------------------------------------------
I STREAM I    TOTAL DEMAND  I   * QUEUEING *    I * INCLUSIVE QUEUEING * I
I        I                  I   * DELAY *       I      * DELAY *         I
I        I------------------------------------------------------------I
I        I (VEH)  (VEH/H) I (MIN)   (MIN/VEH) I   (MIN)    (MIN/VEH) I
--------------------------------------------------------------------------
I  B-C   I  17.9 I  11.9 I   1.6 I   0.09  I    1.6 I    0.09    I
I  B-A   I   5.5 I   3.7 I   0.7 I   0.12  I    0.7 I    0.12    I
I  C-AB  I  18.0 I  12.0 I   2.1 I   0.11  I    2.1 I    0.11    I
I  C-A   I  75.6 I  50.4 I       I         I        I            I
I  A-B   I   6.9 I   4.6 I       I         I        I            I
I  A-C   I  71.6 I  47.7 I       I         I        I            I
--------------------------------------------------------------------------
I  ALL   I 195.5 I 130.3 I   4.4 I   0.02  I    4.4 I    0.02    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

.SLOPES AND INTERCEPT

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

will be adjusted)


```
---------------------------------------------------------
I Intercept For Slope For Opposing   Slope For Opposing I
I Stream B-C    Stream  A-C          Stream A-B         I
---------------------------------------------------------
I    593.07          0.23                 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    460.50          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
-------------------------------------------------------
I    605.81          0.23                 0.23          I
-------------------------------------------------------
```

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: 2033 PM with retention of development


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


-------------------------------------------------------------------------------
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  I  FALLING   I  PEAK  I OF PEAK I PEAK   I
-------------------------------------------------------------------------------
I ARM A I   15.00   I    45.00    I    75.00   I 0.76 I  1.14 I  0.76 I
I ARM B I   15.00   I    45.00    I    75.00   I 0.24 I  0.36 I  0.24 I
I ARM C I   15.00   I    45.00    I    75.00   I 0.91 I  1.37 I  0.91 I
-------------------------------------------------------------------------------


.
----------------------------------------------------------
I                     I      TURNING PROPORTIONS       I
I                     I      TURNING COUNTS (VEH/HR)    I
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  16.30 - 18.00      I         I       I        I        I
I                     I ARM A   I 0.000 I  0.098 I  0.902 I
I                     I         I   0.0 I    6.0 I   55.0 I
I                     I         I ( 0.0)I (  0.0)I (  0.0)I
I                     I         I       I        I        I
I                     I ARM B   I 0.263 I  0.000 I  0.737 I
I                     I         I   5.0 I    0.0 I   14.0 I
I                     I         I ( 0.0)I (  0.0)I (  0.0)I
I                     I         I       I        I        I
I                     I ARM C   I 0.822 I  0.178 I  0.000 I
I                     I         I  60.0 I   13.0 I    0.0 I
I                     I         I ( 0.0)I (  0.0)I (  0.0)I
I                     I         I       I        I        I
----------------------------------------------------------


TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

.           QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
           --------------------------------------------------------
            FOR DEMAND SET 2033 PM with retention of development
            AND FOR TIME PERIOD    2
.-------------------------------------------------------------------------------------------------------------------
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 16.30-16.45                                                                                                    I
I  B-C       0.18    11.15     0.016                 0.00   0.02      0.2                             0.09        I
I  B-A       0.06     8.18     0.008                 0.00   0.01      0.1                             0.12        I
I  C-AB      0.18    10.42     0.017                 0.00   0.02      0.3                             0.10        I
I  C-A       0.74                                                                                                I
I  A-B       0.08                                                                                                I
I  A-C       0.69                                                                                                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 16.45-17.00                                                                                                    I
I  B-C       0.21    11.11     0.019                 0.02   0.02      0.3                             0.09        I
I  B-A       0.07     8.12     0.009                 0.01   0.01      0.1                             0.12        I
I  C-AB      0.21    10.48     0.020                 0.02   0.02      0.4                             0.10        I
I  C-A       0.88                                                                                                I
I  A-B       0.09                                                                                                I
```

```
I  A-C      0.82                                                                                            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
I   B-C      0.26     11.05      0.023                0.02   0.02      0.3                            0.09      I
I   B-A      0.09      8.03      0.011                0.01   0.01      0.2                            0.13      I
I   C-AB     0.27     10.57      0.025                0.02   0.03      0.5                            0.10      I
I   C-A      1.07                                                                                            I
I   A-B      0.11                                                                                            I
I   A-C      1.01                                                                                            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 17.15-17.30                                                                                                I
I   B-C      0.26     11.05      0.023                0.02   0.02      0.4                            0.09      I
I   B-A      0.09      8.03      0.011                0.01   0.01      0.2                            0.13      I
I   C-AB     0.27     10.57      0.025                0.03   0.03      0.5                            0.10      I
I   C-A      1.07                                                                                            I
I   A-B      0.11                                                                                            I
I   A-C      1.01                                                                                            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 17.30-17.45                                                                                                I
I   B-C      0.21     11.11      0.019                0.02   0.02      0.3                            0.09      I
I   B-A      0.07      8.12      0.009                0.01   0.01      0.1                            0.12      I
I   C-AB     0.21     10.48      0.020                0.03   0.02      0.4                            0.10      I
I   C-A      0.88                                                                                            I
I   A-B      0.09                                                                                            I
I   A-C      0.82                                                                                            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 17.45-18.00                                                                                                I
I   B-C      0.18     11.15      0.016                0.02   0.02      0.2                            0.09      I
I   B-A      0.06      8.18      0.008                0.01   0.01      0.1                            0.12      I
I   C-AB     0.18     10.42      0.017                0.02   0.02      0.3                            0.10      I
I   C-A      0.74                                                                                            I
I   A-B      0.08                                                                                            I
I   A-C      0.69                                                                                            I
I                                                                                                           I
.----------------------------------------------------------------------------------------------------------


*WARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR
.
QUEUE FOR STREAM   B-C
------------------------
TIME SEGMENT    NO. OF
  ENDING       VEHICLES
               IN QUEUE
  16.45          0.0
  17.00          0.0
  17.15          0.0
  17.30          0.0
  17.45          0.0
  18.00          0.0
.
QUEUE FOR STREAM   B-A
------------------------
TIME SEGMENT    NO. OF
  ENDING       VEHICLES
               IN QUEUE
  16.45          0.0
  17.00          0.0
  17.15          0.0
  17.30          0.0
  17.45          0.0
  18.00          0.0
```

```
.
 QUEUE FOR STREAM   C-AB
 -----------------------
 TIME SEGMENT    NO. OF
   ENDING       VEHICLES
               IN QUEUE
   16.45          0.0
   17.00          0.0
   17.15          0.0
   17.30          0.0
   17.45          0.0
   18.00          0.0
.
                 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                 -------------------------------------------


 ------------------------------------------------------------------------
 I STREAM I    TOTAL DEMAND  I  * QUEUEING *      I * INCLUSIVE QUEUEING * I
 I        I                  I   * DELAY *        I       * DELAY *        I
 I        I------------------------------------------------------------------I
 I        I  (VEH)  (VEH/H) I (MIN)    (MIN/VEH) I   (MIN)     (MIN/VEH) I
 ------------------------------------------------------------------------
 I  B-C   I  19.3 I   12.8 I    1.8 I   0.09   I     1.8 I    0.09    I
 I  B-A   I   6.9 I    4.6 I    0.9 I   0.12   I     0.9 I    0.12    I
 I  C-AB  I  19.6 I   13.1 I    2.3 I   0.12   I     2.3 I    0.12    I
 I  C-A   I  80.8 I   53.9 I        I          I         I          I
 I  A-B   I   8.3 I    5.5 I        I          I         I          I
 I  A-C   I  75.7 I   50.5 I        I          I         I          I
 ------------------------------------------------------------------------
 I  ALL   I 210.6 I  140.4 I    4.9 I   0.02   I     4.9 I    0.02    I
 ------------------------------------------------------------------------


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 * 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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