ATTACHMENT

ATTACHMENT 1:

Consultation Organisations and Written Correspondence Received

BORD NA MÓNA

BORD NA MÓNA ENVIRONMENTAL LIMITED

1st March 2004

Re: Waste Transfer Station conducted by Oxigen Environmental Ltd. at Ballymount Industrial Estate, Ballymount Road, Clondalkin, Dublin 12.

Dear Sir/Madam,

Bord na Móna Environmental Limited have been commissioned by Oxigen Environmental Ltd., to undertake an Environmental Impact Statement (EIS), and subsequent waste licence application, for their waste transfer station at Ballymount Industrial Estate, Ballymount Road, Clondalkin, Dublin 12.

It is proposed that the facility (formally Corus Steel Ltd.) will initially be operated under a waste permit, which will cover the collection and sorting of dry recyclable waste, for which Oxigen Environmental Ltd. have a contract with South Dublin County Council (SDCC). An application for a permit is currently being drafted to be submitted to SDCC. Oxigen Environmental Ltd. also propose to apply for a waste licence for the receipt of non-hazardous and hazardous commercial and industrial waste, which will be deposited and sorted/treated onsite within the designated buildings. The waste transfer station operations will be designed to meet the Environmental Protection Agency's '*BAT Guidance Notes for the Waste Sector: Transfer Activities*' (Draft, April 2003).

Under Part 2 of Schedule 5 of the Planning and Development Regulations, 2001 *'Installation for the disposal of waste with an annual intake greater than 25,000 tonnes...'* requires the completion of an Environmental Impact Statement. In preparation of the EIS, due regard will be paid to the '*Advice Notes on Current Practice in the preparation of Environmental Impact Statements*' and '*Guidelines on the Information to be Contained in Environmental Impact Statements (March 2002)*' issued by the Environmental Protection Agency and the requirements of the Planning and Development Regulations, 2001 (S.I. No. 600 of 2001).

Bord na Móna Environmental Limited would, therefore, be grateful if you could provide any information relevant to the proposed development that you may hold and/or highlight any issues that you feel should be addressed in the EIS. As you are the central office for your organisation, you may also wish to involve your regional or local office, if you deem it appropriate. For your information, it is proposed to submit the completed Environmental Impact Statement to South Dublin County Council by May 2004.

Thanking you in anticipation of your co-operation in this matter.

Yours faithfully,

Ms. Naoimh Conneely
Environmental Consultant
For and on behalf of
Oxigen Environmental Ltd.

MAIN STREET, NEWBRIDGE, CO. KILDARE, IRELAND.
TELEPHONE: (045) 431201. INT: +353-45-431201. FAX: (045) 434207. INT: +353-45-434207.

REGISTERED OFFICE: MAIN STREET, NEWBRIDGE, CO. KILDARE.
REGISTERED IN IRELAND NUMBER: 303313

South Dublin County Council,
PO Box 4122
Town Centre,
Tallaght
Dublin 24

Dublin City Council,
Civic Offices,
Wood Quay,
Dublin 8

Eastern Regional Fisheries Board
15A Main St.
Blackrock
Co. Dublin

Enterprise Ireland
Glasnevin
Dublin 9

The Department of Transport, Energy & Communications,
44 Kildare St.,
Dublin 4.

The Department of Finance,
Government Buildings,
Upper Merrion Street,
Dublin 2.

The Environmental Protection Agency
PO Box 3000
Johnstown Castle Estate
C. Wexford

The National Roads Authority
St. Martins House
Waterloo Road
Ballsbridge
Dublin 4

Geological Survey of Ireland
Beggars Bush
Haddington Road
Dublin 4

Dublin Transport Office,
Hainault House,
Floor 3,
69-71 St. Stephens Green,
Dublin 2.

An Taisce
The Tailor's Hall
Back Lane
Dublin 8

Irish Business and Employers Confederation,
Confederation House,
84/86 Lower Baggot Street,
Dublin 2.

The Department of the Environment and Local Government,
Custom House,
Dublin 1.

Office of the Minister
Transport House, Kildare Street, Dublin 2, Ireland.

Oifig an Aire
Teach Iompair, Sráid Chill Dara, Baile Átha Cliath 2, Éire.

Department of Transport
An Roinn Iompair

Tel: +353 1 670 7444 .o90 443311 **Fax:** +353 1 604 1183 **Web:** www.transport.ie **Email:** minister@transport.ie

22 March 2004

Our Ref: MOTCO4/1066

Ms. Naoimh Conneely
Environmental Consultant
Oxigen Environmental Ltd
Bord Na Móna
Main Street
Newbridge
Co. Kildare

Dear Ms. Conneely,

The Minister for Transport, Mr. Séamus Brennan, T.D. has asked me to acknowledge receipt of your letter dated 3 March 2004 concerning the waste transfer station conducted by Oxigen Environmental Ltd at Ballymount Industrial Estate, Ballymount Road, Clondalkin, Dublin 12.

As this is an issue under the remit of the Department of the Environment, Heritage and Local Government I have forwarded a copy of your letter to Mr. Martin Cullen, T.D., Minister for Environment, Heritage and Local Government for direct reply to you as soon as possible.

Yours sincerely,

Dermot Murphy,
Private Secretary.

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

PO Box 3000, Johnstown Castle Estate
County Wexford, Ireland
Bosca Poist 3000, Eastát Chaisleán Bhaile Sheáin
Contae Loch Garman, Éire

T: +353 53 60600
F: +353 53 60699
E: info@epa.ie
W: www.epa.ie

Lo Call: 1890 33 55 99

Ms Naoimh Conneely
Environmental Consultant
Bord na Mona Environmental Ltd
Main Street
Newbridge
Co Kildare

5th March 2004

re: Waste Transfer Station conducted by Oxigen Environmental Ltd at Ballymount Industrial Estate, Ballymount Road, Clondalkin, Dublin 12

Dear Ms Conneely,

Further to your letter of 3rd March 2004 regarding the above.

Should you wish to arrange a 'scoping' meeting in relation to the Environmental Impact Statement you are preparing for Oxigen Environmental Ltd, please contact Mr Pat Byrne in our Dublin office. Contact details are (01) 2680100 or p.byrne@epa.ie

Yours sincerely

Noeleen Keavey

Noeleen Keavey
Programme Officer
Office of Licensing & Guidance

ENTERPRISE IRELAND

Glasnevin
Dublin 9
Ireland

Tel +353 1 857 0000
+353 1 808 2000
Fax +353 1 808 2020

Ms. Naoimh Conneely,
Environmental Consultant,
Bord Na Mona Environmental Ltd.,
Main Street,
Newbridge,
Co. Kildare.

5 March 2004

Dear Ms. Conneely,

We acknowledge receipt of your letter of 3rd March. We do not hold any information relevant to this development.

Yours sincerely,

Martin Reilly,
Manager,
Environmental Policy.

National Roads Authority
An tÚdarás um Bóithre Náisiúnta

Ms. Niamh Conneely
Environmental Consultant
Bord na Móna Environmental Ltd.
Main Street
Newbridge
Co. Kildare

St. Martin's House / Waterloo Road / Dublin 4
Tel: +353 1 660 2511 / **Fax:** +353 1 668 0009

Date	Our Ref.	Your Ref.
12th March 2004	EDMS 13024	

Re: ***Waste Transfer Station conducted by Oxigen Environmental Ltd.***
At Ballymount Industrial Estate, Ballymount Road, Clondalkin, Dublin 12

Dear Mr. Conneely

I wish to acknowledge receipt of your letter of 3rd March 2004, regarding the above. The contents of which have been noted.

Yours sincerely

P.P. **Olga Houlihan**
Programme Administrator

Eastern Regional Fisheries Board
Bord Iascaigh Réigiúnach an Oirthir

Fisheries Ireland
Our Natural Heritage

Ms Naoimh Conneely,
Bord Na Mona Environmental Ltd.,
Main Street,
Newbridge,
Co. Kildare.

Your Reference: n/a
Our Reference: GH/DD

24 March, 2004

Dear Ms.Conneely,

I refer to your letter of March 3, 2004 re preparation of an EIS for Oxigen Environmental Ltd., in respect of a Waste Transfer Station at Ballymount Road, Clondalkin, Dublin 12. Based on the brief summary of the proposed operation given, the following are our observations:

- The development is in the catchment of the Camac River, a Salmonid system. The development must not impact adversely on that status.
- Drainage from the Waste Inspection area should discharge to an adequately sized holding tank for either appropriate disposal off site or discharge to the public sewer system.
- Leachate generated when dealing with commercial and industrial waste will require on site treatment and disposal to the public sewer.
- Yard and car park drainage should be subject to petrol/oil interceptor.
- Wheel-Wash water should drain to a grit chamber and oil interceptor.
- All fuel/oil stored should be at a suitably located designated area. All tank and drum storage areas should re rendered impervious to the materials stored. All tanks should be bunded and all inlets, outlets etc should be within the bunded area.

We will comment further on receipt of the EIS.

Yours sincerely

Gretta Hannigan
Senior Fisheries Environmental Officer – Dublin District

The Eastern Regional
Fisheries Board
15a Main Street
Blackrock
Co. Dublin
T: (01) **278 7022**
F: (01) **278 7025**
E: info@erfb.ie
www.fishingireland.net

ATTACHMENT 2:

Drawings D.1: Site Infrastructure

Placeholder

This page has been inserted to indicate that content has been extracted from this location in the document and has been stored in a separate file. (This is due to file size issues.)

The extracted content can be found in the following electronic pdf file:

EIS-Drawing-1

Licence: W0208-01

ATTACHMENT 3:

Letter from Dublin City Council.

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

Engineering Department
Block 1, Floor 4
Civic Offices
Fishamble Street
Dublin 8
Phone: 353-1-672 2022
Fax: 353-1-679 6193
email: engineering@dublincity.ie
Website:www.dublincity.ie

15 July, 2004

Ms. Naoimh Conneely,
Environmental Consultant,
Bord na Mona Technical Services,
Environmental Ltd.,
Main Street,
Newbridge,
Co. Kildare.

RE: Materials Recovery Facility (MRF) at 'Old Corus' site at Merrywell Industrial Estate.

Dear Mr. Conneely,

Following your recent email query I would like to confirm the following points raised in our discussion. Dublin City Council recently purchased a building and lands at Merrywell Industrial Estate consisting of a 44,000 approximately square foot building (which adjoins a site owned and operated by Oxigen) for the purposes of establishing a centralised materials Recovery Facility for the Dublin Region.

Oxigen Environmental Ltd are the engaged service provider for the dry recyclables kerbside collection for the Dublin Region and will operate from the new MRF at Merrywell with the full knowledge and permission of Dublin City Council.

Oxigen are also contractually obliged to apply for all relevant permits and licences to operate the facility on Dublin City Council's behalf.

If you require any further information regarding the above please do not hesitate to contact this office.

Yours sincerely,

D. DINNIGAN
SENIOR EXECUTIVE OFFICER

DD/ CD

An Roinn Innealtóireachta
Bloc 1,Urlár 4Oifigí na Cathrach
Sráid Sheamlas an Éisc
Baile Átha Cliath 8
Teil: 353-1-672 2022
Fac: 353-1-679 6193
email: engineering@dublin city.ie
Idirlíne:www.dublincity.ie

ATTACHMENT 4:

Groundwater Results for Galco Steel Ltd.

– Source: Galco Steel Waste Licence application

AD Analytical.

63 Loreto Ave., Rathfarnham, Dublin 14. * Mobile 088-549793 * Telephone 01-4943677 * Fax 01-4943677

Client: Mr. Benny Shanley,

Address: Galco Steel Ltd.,
Ballymount Rd.,
Walwinstown,
Dublin 10.

Lab No.: 1941

Date: 26/4/97

Sample I.D.: Water tests Production Well 1.

The following are the results of the Water tests Production Well 1 Sample as taken by AD Analytical 11/4/97.

PARAMETER	RESULT	UNITS
Calcium	125	mg/l
Magnesium	5	mg/l
Sodium	14	mg/l
Potassium	21	mg/l
Aluminium	0.1	mg/l
Boron	46	ug/l
Iron	10852	ug/l
Manganese	235	ug/l
Copper	45	ug/l
Zinc	33520	ug/l
Barium	42	ug/l
Arsenic	<10	ug/l
Cadmium	<5	ug/l
Chromium	<10	ug/l
Lead	25	ug/l
nickel	15	ug/l

Signed: Alyn Deane

Dr. Alyn Deane.

ATTACHMENT 5:

Traffic flow results (PICADY4).

D E P A R T M E N T O F T R A N S P O R T
TRANSPORT RESEARCH LABORATORY

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

PROGRAM PICADY/4
RELEASE 2.6 (DECEMBER 1996)

FOR PROGRAM ADVICE AND MAINTENANCE CONTACT:-
MAINTENANCE CONTRACTOR LISTED IN USER GUIDE

FOR SALES AND DISTRIBUTION INFORMATION
CONTACT TRL, Tel: CROWTHORNE (01344) 770178

AM PEAK TURNPIKE ROAD

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 TURNPIKE ROAD E
ARM B IS SITE ACCESS
ARM C IS TURNPIKE ROAD W
STREAM LABELLING CONVENTION

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

GEOMETRIC DATA

DATA ITEM	MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W) 7.50 M.
CENTRAL RESERVE WIDTH	(WCR) 0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B) 0.00 M.
- VISIBILITY	(VC-B) 100.0 M.
- BLOCKS TRAFFIC	YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C) 100.0 M.
- VISIBILITY TO RIGHT	(VB-A) 100.0 M.
- LANE 1 WIDTH	(WB-C) 2.50 M.
- LANE 2 WIDTH	(WB-A) 2.50 M.
- LENGTH OF FLARED SECTION	2 VEHS

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 10 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	3.14	4.71	3.14
ARM B	15.00	45.00	75.00	1.19	1.78	1.19
ARM C	15.00	45.00	75.00	9.46	14.19	9.46

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.235	0.765
		0.0	59.0	192.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.642	0.000	0.358
		61.0	0.0	34.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.893	0.107	0.000
		676.0	81.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 10 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.10								
B-C	0.43	8.95	0.047		0.0	0.0	0.5	
B-A	0.76	5.90	0.129		0.0	0.1	1.4	
C-AB	2.38	14.53	0.164		0.0	0.4	3.8	
C-A	7.08							
A-B	0.74							
A-C	2.40							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.10-08.20								
B-C	0.43	8.94	0.048		0.0	0.0	0.5	
B-A	0.76	5.89	0.129		0.1	0.1	1.5	
C-AB	2.41	14.54	0.166		0.4	0.4	4.0	
C-A	7.05							
A-B	0.74							
A-C	2.40							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.20-08.30								
B-C	0.53	8.67	0.061		0.0	0.1	0.6	
B-A	0.96	5.35	0.179		0.1	0.2	2.0	
C-AB	3.72	15.81	0.236		0.4	0.6	6.5	
C-A	8.13							
A-B	0.92							
A-C	3.01							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.40								
B-C	0.61	8.45	0.072		0.1	0.1	0.7	
B-A	1.09	4.95	0.221		0.2	0.3	2.6	
C-AB	5.11	16.81	0.304		0.6	0.9	9.6	
C-A	8.46							
A-B	1.06							
A-C	3.44							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.40-08.50								
B-C	0.64	8.37	0.076		0.1	0.1	0.8	
B-A	1.14	4.80	0.238		0.3	0.3	3.0	
C-AB	5.68	17.16	0.331		0.9	1.1	11.1	
C-A	8.51							
A-B	1.11							
A-C	3.60							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.50-09.00								
B-C	0.61	8.45	0.072		0.1	0.1	0.8	
B-A	1.09	4.94	0.221		0.3	0.3	2.9	
C-AB	5.13	16.84	0.305		1.1	1.0	9.9	
C-A	8.44							
A-B	1.06							
A-C	3.44							

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)
09.00-09.10								
B-C	0.53	8.66	0.061		0.1	0.1	0.7	
B-A	0.96	5.34	0.179		0.3	0.2	2.3	
C-AB	3.75	15.84	0.237		1.0	0.7	6.9	
C-A	8.10							
A-B	0.92							
A-C	3.01							

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)
09.10-09.20								
B-C	0.43	8.94	0.048		0.1	0.1	0.5	
B-A	0.76	5.89	0.129		0.2	0.2	1.6	
C-AB	2.42	14.56	0.166		0.7	0.4	4.2	
C-A	7.04							
A-B	0.74							
A-C	2.40							

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)
09.20-09.30								
B-C	0.43	8.94	0.048		0.1	0.1	0.5	
B-A	0.76	5.89	0.129		0.2	0.2	1.5	
C-AB	2.41	14.54	0.166		0.4	0.4	4.1	
C-A	7.05							
A-B	0.74							
A-C	2.40							

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.10	0.0
08.20	0.0
08.30	0.1
08.40	0.1
08.50	0.1
09.00	0.1
09.10	0.1
09.20	0.1
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.10	0.1
08.20	0.1
08.30	0.2
08.40	0.3
08.50	0.3
09.00	0.3
09.10	0.2
09.20	0.2
09.30	0.2

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.10	0.4	
08.20	0.4	
08.30	0.6	*
08.40	0.9	*
08.50	1.1	*
09.00	1.0	*
09.10	0.7	*
09.20	0.4	
09.30	0.4	

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	46.2	30.8	5.6	0.12	5.6	0.12
B-A	82.9	55.3	18.8	0.23	18.8	0.23
C-AB	330.1	220.1	60.2	0.18	60.2	0.18
C-A	698.8	465.8				
A-B	80.2	53.5				
A-C	261.0	174.0				
ALL	1499.1	999.4	84.6	0.06	84.7	0.06

* 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

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

PROGRAM PICADY/4
RELEASE 2.6 (DECEMBER 1996)

FOR PROGRAM ADVICE AND MAINTENANCE CONTACT:-
MAINTENANCE CONTRACTOR LISTED IN USER GUIDE

FOR SALES AND DISTRIBUTION INFORMATION
CONTACT TRL, Tel: CROWTHORNE (01344) 770178

PM PEAK TURNPIKE ROAD

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 TURNPIKE ROAD
ARM B IS SITE ACCESS
ARM C IS TURNPIKE ROAD W

STREAM LABELLING CONVENTION

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

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.50 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	0.00 M.
- VISIBILITY	(VC-B)	100.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	100.0 M.
- VISIBILITY TO RIGHT	(VB-A)	100.0 M.
- LANE 1 WIDTH	(WB-C)	2.50 M.
- LANE 2 WIDTH	(WB-A)	2.50 M.
- LENGTH OF FLARED SECTION		2 VEHS

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.15 AND ENDS 17.45
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 10 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	1.00	1.50	1.00
ARM B	15.00	45.00	75.00	2.56	3.84	2.56
ARM C	15.00	45.00	75.00	3.08	4.61	3.08

TIME	FROM/TO	TURNING PROPORTIONS / TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C
16.15 - 17.45				
	ARM A	0.000	0.300	0.700
		0.0	24.0	56.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.902	0.000	0.098
		185.0	0.0	20.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.902	0.098	0.000
		222.0	24.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 10 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.15-16.25								
B-C	0.25	8.86	0.028		0.0	0.0	0.3	
B-A	2.31	7.38	0.313		0.0	0.4	4.1	
C-AB	0.39	11.15	0.035		0.0	0.0	0.5	
C-A	2.68							
A-B	0.30							
A-C	0.70							
16.25-16.35								
B-C	0.25	8.83	0.028		0.0	0.0	0.3	
B-A	2.31	7.38	0.313		0.4	0.4	4.5	
C-AB	0.40	11.15	0.035		0.0	0.0	0.5	
C-A	2.68							
A-B	0.30							
A-C	0.70							
16.35-16.45								
B-C	0.31	8.44	0.037		0.0	0.0	0.4	
B-A	2.90	7.21	0.402		0.4	0.6	6.1	
C-AB	0.53	11.55	0.046		0.0	0.1	0.7	
C-A	3.32							
A-B	0.38							
A-C	0.88							
16.45-16.55								
B-C	0.36	8.06	0.044		0.0	0.0	0.4	
B-A	3.32	7.09	0.468		0.6	0.8	8.0	
C-AB	0.63	11.83	0.053		0.1	0.1	0.8	
C-A	3.78							
A-B	0.43							
A-C	1.00							
16.55-17.05								
B-C	0.37	7.89	0.048		0.0	0.0	0.5	
B-A	3.47	7.04	0.493		0.8	0.9	9.1	
C-AB	0.67	11.93	0.056		0.1	0.1	0.9	
C-A	3.94							
A-B	0.45							
A-C	1.05							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.05-17.15								
B-C	0.36	8.04	0.045		0.0	0.0	0.5	
-A	3.32	7.08	0.468		0.9	0.9	9.2	
-AB	0.63	11.83	0.054		0.1	0.1	0.8	
-A	3.78							
A-B	0.43							
A-C	1.00							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.15-17.25								
B-C	0.31	8.41	0.037		0.0	0.0	0.4	
B-A	2.90	7.21	0.402		0.9	0.7	7.3	
C-AB	0.53	11.55	0.046		0.1	0.1	0.7	
C-A	3.32							
A-B	0.38							
A-C	0.88							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.25-17.35								
B-C	0.25	8.82	0.028		0.0	0.0	0.3	
B-A	2.31	7.38	0.313		0.7	0.5	4.9	
C-AB	0.40	11.15	0.036		0.1	0.0	0.5	
C-A	2.68							
A-B	0.30							
A-C	0.70							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.35-17.45								
B-C	0.25	8.83	0.028		0.0	0.0	0.3	
B-A	2.31	7.38	0.313		0.5	0.5	4.6	
C-AB	0.40	11.15	0.035		0.0	0.0	0.5	
C-A	2.68							
A-B	0.30							
A-C	0.70							

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.25	0.0	
16.35	0.0	
16.45	0.0	
16.55	0.0	
17.05	0.0	
17.15	0.0	
17.25	0.0	
7.35	0.0	
/.45	0.0	

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.25	0.4	
16.35	0.4	
16.45	0.6	*
16.55	0.8	*
17.05	0.9	*
17.15	0.9	*
17.25	0.7	*
17.35	0.5	
17.45	0.5	

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.25	0.0
35	0.0
45	0.1
55	0.1
17.05	0.1
17.15	0.1
17.25	0.1
17.35	0.0
17.45	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	27.2	18.1	3.3	0.12	3.3	0.12
B-A	251.4	167.6	57.8	0.23	57.8	0.23
C-AB	45.8	30.5	5.9	0.13	5.9	0.13
C-A	288.6	192.4				
A-B	32.6	21.7				
A-C	76.1	50.7				
ALL	721.7	481.1	67.0	0.09	67.0	0.09

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

D E P A R T M E N T O F T R A N S P O R T
TRANSPORT RESEARCH LABORATORY

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

PROGRAM PICADY/4
RELEASE 2.6 (DECEMBER 1996)

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FOR SALES AND DISTRIBUTION INFORMATION
CONTACT TRL, Tel: CROWTHORNE (01344) 770178

AM PEAK BALLYMOUNT ROAD

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 BALLYMOUNT ROAD LOWER EAST
ARM B IS SITE ACCESS
ARM C IS BALLYMOUNT ROAD LOWER WEST

STREAM LABELLING CONVENTION

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

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.50 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	0.00 M.
- VISIBILITY	(VC-B)	100.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	100.0 M.
- VISIBILITY TO RIGHT	(VB-A)	100.0 M.
- LANE 1 WIDTH	(WB-C)	2.50 M.
- LANE 2 WIDTH	(WB-A)	2.50 M.
- LENGTH OF FLARED SECTION		2 VEHS

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 10 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	8.59	12.88	8.59
ARM B	15.00	45.00	75.00	1.35	2.03	1.35
ARM C	15.00	45.00	75.00	8.54	12.81	8.54

TIME	FROM/TO	ARM A	ARM B	ARM C
08.00 - 09.30				
	ARM A	0.000	0.092	0.908
		0.0	63.0	624.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.315	0.000	0.685
		34.0	0.0	74.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.836	0.164	0.000
		571.0	112.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 10 MIN TIME SEGMENT

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.10									
	B-C	0.93	7.79	0.119		0.0	0.1	1.3	
	B-A	0.43	4.72	0.090		0.0	0.1	0.9	
	C-AB	3.16	12.74	0.248		0.0	0.6	5.8	
	C-A	5.38							
	A-B	0.79							
	A-C	7.80							

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.10-08.20									
	B-C	0.93	7.79	0.119		0.1	0.1	1.3	
	B-A	0.43	4.71	0.090		0.1	0.1	1.0	
	C-AB	3.20	12.76	0.250		0.6	0.6	6.3	
	C-A	5.34							
	A-B	0.79							
	A-C	7.80							

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.20-08.30									
	B-C	1.16	7.22	0.160		0.1	0.2	1.8	
	B-A	0.53	3.86	0.138		0.1	0.2	1.5	
	C-AB	5.01	13.69	0.366		0.6	1.1	11.2	
	C-A	5.68							
	A-B	0.99							
	A-C	9.77							

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.30-08.40									
	B-C	1.33	6.79	0.195		0.2	0.2	2.3	
	B-A	0.61	3.25	0.188		0.2	0.2	2.1	
	C-AB	6.92	14.47	0.478		1.1	1.8	18.6	
	C-A	5.32							
	A-B	1.13							
	A-C	11.18							

TIME		DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.40-08.50									
	B-C	1.39	6.63	0.209		0.2	0.3	2.5	
	B-A	0.64	3.01	0.212		0.2	0.3	2.5	
	C-AB	7.77	14.78	0.526		1.8	2.3	23.2	
	C-A	5.04							
	A-B	1.18							
	A-C	11.70							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.50-09.00								
B-C	1.33	6.78	0.196		0.3	0.2	2.5	
B-A	0.61	3.23	0.189		0.3	0.2	2.5	
C-AB	7.00	14.54	0.481		2.3	2.1	20.1	
C-A	5.25							
A-B	1.13							
A-C	11.18							

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)
09.00-09.10								
B-C	1.16	7.21	0.161		0.2	0.2	2.0	
B-A	0.53	3.84	0.139		0.2	0.2	1.8	
C-AB	5.09	13.77	0.369		2.1	1.2	12.6	
C-A	5.61							
A-B	0.99							
A-C	9.77							

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)
09.10-09.20								
B-C	0.93	7.78	0.119		0.2	0.1	1.4	
B-A	0.43	4.70	0.090		0.2	0.1	1.1	
C-AB	3.22	12.79	0.252		1.2	0.6	6.7	
C-A	5.32							
A-B	0.79							
A-C	7.80							

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)
09.20-09.30								
B-C	0.93	7.78	0.119		0.1	0.1	1.4	
B-A	0.43	4.71	0.090		0.1	0.1	1.0	
C-AB	3.20	12.76	0.251		0.6	0.6	6.3	
C-A	5.34							
A-B	0.79							
A-C	7.80							

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.10	0.1
08.20	0.1
08.30	0.2
08.40	0.2
08.50	0.3
09.00	0.2
09.10	0.2
09.20	0.1
09.30	0.1

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.10	0.1
08.20	0.1
08.30	0.2
08.40	0.2
08.50	0.3
09.00	0.2
09.10	0.2
09.20	0.1
09.30	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.10	0.6	*
.20	0.6	*
.30	1.1	*
.40	1.8	**
08.50	2.3	**
09.00	2.1	**
09.10	1.2	*
09.20	0.6	*
09.30	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	100.6	67.1	16.6	0.16	16.6	0.16
B-A	46.2	30.8	14.2	0.31	14.2	0.31
C-AB	445.5	297.0	110.8	0.25	110.8	0.25
C-A	482.7	321.8				
A-B	85.6	57.1				
A-C	848.1	565.4				
ALL	2008.8	1339.2	141.6	0.07	141.6	0.07

* 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

DEPARTMENT OF TRANSPORT
TRANSPORT RESEARCH LABORATORY

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PM PEAK BALLYMOUNT ROAD

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 BALLYMOUNT ROAD LOWER EAST
ARM B IS SITE ACCESS
ARM C IS BALLYMOUNT ROAD LOWER WEST

STREAM LABELLING CONVENTION

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

GEOMETRIC DATA

DATA ITEM		MINOR ROAD B
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	(W)	7.50 M.
CENTRAL RESERVE WIDTH	(WCR)	0.00 M.
MAJOR ROAD RIGHT TURN - WIDTH	(WC-B)	0.00 M.
- VISIBILITY	(VC-B)	100.0 M.
- BLOCKS TRAFFIC		YES
MINOR ROAD - VISIBILITY TO LEFT	(VB-C)	100.0 M.
- VISIBILITY TO RIGHT	(VB-A)	100.0 M.
- LANE 1 WIDTH	(WB-C)	2.50 M.
- LANE 2 WIDTH	(WB-A)	2.50 M.
- LENGTH OF FLARED SECTION		2 VEHS

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.15 AND ENDS 17.45
LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 10 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	4.19	6.28	4.19
ARM B	15.00	45.00	75.00	2.88	4.31	2.88
ARM C	15.00	45.00	75.00	6.01	9.02	6.01

TIME	FROM/TO	ARM A	ARM B	ARM C
16.15 - 17.45				
	ARM A	0.000	0.125	0.875
		0.0	42.0	293.0
		(0.0)	(10.0)	(10.0)
	ARM B	0.183	0.000	0.817
		42.0	0.0	188.0
		(10.0)	(0.0)	(10.0)
	ARM C	0.520	0.480	0.000
		250.0	231.0	0.0
		(10.0)	(10.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS (VEH/HR)
(PERCENTAGE OF H.V.S)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

QUEUE AND DELAY INFORMATION FOR EACH 10 MIN TIME SEGMENT

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.15-16.25								
B-C	2.35	8.77	0.268		0.0	0.4	3.4	
B-A	0.52	5.77	0.091		0.0	0.1	0.9	
C-AB	4.06	10.75	0.378		0.0	0.7	7.2	
C-A	1.95							
A-B	0.53							
A-C	3.66							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.25-16.35								
B-C	2.35	8.76	0.268		0.4	0.4	3.6	
B-A	0.52	5.74	0.091		0.1	0.1	1.0	
C-AB	4.09	10.77	0.380		0.7	0.8	7.7	
C-A	1.93							
A-B	0.53							
A-C	3.66							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.35-16.45								
B-C	2.94	8.46	0.348		0.4	0.5	5.0	
B-A	0.66	5.13	0.128		0.1	0.1	1.4	
C-AB	5.60	11.09	0.505		0.8	1.3	12.8	
C-A	1.93							
A-B	0.66							
A-C	4.59							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-16.55								
B-C	3.37	8.22	0.410		0.5	0.7	6.4	
B-A	0.75	4.66	0.161		0.1	0.2	1.8	
C-AB	6.90	11.36	0.607		1.3	1.9	19.6	
C-A	1.72							
A-B	0.75							
A-C	5.25							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.55-17.05								
B-C	3.53	8.13	0.434		0.7	0.7	7.2	
B-A	0.79	4.47	0.176		0.2	0.2	2.0	
C-AB	7.43	11.48	0.647		1.9	2.3	23.9	
C-A	1.59							
A-B	0.79							
A-C	5.49							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.05-17.15								
B-C	3.37	8.21	0.410		0.7	0.7	7.2	
B-A	0.75	4.64	0.162		0.2	0.2	2.0	
C-AB	6.94	11.40	0.609		2.3	2.2	21.2	
C-A	1.68							
A-B	0.75							
A-C	5.25							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.15-17.25								
B-C	2.94	8.45	0.348		0.7	0.5	5.7	
B-A	0.66	5.10	0.129		0.2	0.2	1.6	
C-AB	5.65	11.14	0.507		2.2	1.4	14.3	
C-A	1.88							
A-B	0.66							
A-C	4.59							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.25-17.35								
B-C	2.35	8.76	0.268		0.5	0.4	3.9	
B-A	0.52	5.73	0.092		0.2	0.1	1.1	
C-AB	4.10	10.78	0.380		1.4	0.8	8.2	
C-A	1.91							
A-B	0.53							
A-C	3.66							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
17.35-17.45								
B-C	2.35	8.76	0.268		0.4	0.4	3.7	
B-A	0.52	5.74	0.091		0.1	0.1	1.0	
C-AB	4.09	10.77	0.380		0.8	0.8	7.8	
C-A	1.93							
A-B	0.53							
A-C	3.66							

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.25	0.4	
16.35	0.4	
16.45	0.5	*
16.55	0.7	*
17.05	0.7	*
17.15	0.7	*
17.25	0.5	*
17.35	0.4	
17.45	0.4	

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.25	0.1
16.35	0.1
16.45	0.1
16.55	0.2
17.05	0.2
17.15	0.2
17.25	0.2
17.35	0.1
17.45	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
16.25	0.7	*
1.35	0.8	*
.45	1.3	*
.55	1.9	**
17.05	2.3	**
17.15	2.2	**
17.25	1.4	*
17.35	0.8	*
17.45	0.8	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND (VEH)	TOTAL DEMAND (VEH/H)	* QUEUEING * DELAY * (MIN)	* QUEUEING * DELAY * (MIN/VEH)	* INCLUSIVE QUEUEING * DELAY * (MIN)	* INCLUSIVE QUEUEING * DELAY * (MIN/VEH)
B-C	255.5	170.3	46.2	0.18	46.2	0.18
B-A	57.1	38.1	12.8	0.22	12.8	0.22
C-AB	488.6	325.7	122.6	0.25	122.7	0.25
C-A	165.2	110.1				
A-B	57.1	38.1				
A-C	398.2	265.5				
ALL	1421.7	947.8	181.6	0.13	181.7	0.13

* 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

ATTACHMENT 6:

Meteorological Data.

30 Year Averages

CASEMENT AERODROME													
monthly and annual mean and extreme values													
1968-1996													
TEMPERATURE *(degrees Celsius)*	*jan*	*feb*	*mar*	*apr*	*may*	*jun*	*jul*	*aug*	*sep*	*oct*	*nov*	*dec*	*year*
mean daily max.	7.8	7.6	9.6	11.8	14.6	17.7	19.7	19.3	16.8	13.6	9.9	8.3	**13.1**
mean daily min.	2.0	1.7	2.5	3.2	5.7	8.6	10.7	10.3	8.5	6.7	3.6	2.8	**5.5**
mean	4.9	4.6	6.0	7.5	10.1	13.1	15.2	14.8	12.6	10.1	6.7	5.6	**9.3**
absolute max.	15.4	14.7	18.8	21.3	24.7	27.5	29.8	30.5	24.7	21.3	17.7	15.4	**30.5**
absolute min.	-12.4	-10.3	-7.8	-4.5	-3.0	0.3	2.5	2.5	-0.3	-4.1	-6.2	-9.7	**-12.4**
mean no. of days with air frost	7.5	7.7	6.3	4.9	1.0	0.0	0.0	0.0	0.0	1.4	5.9	6.6	**41.3**
mean no. of days with ground frost	15.3	15.0	13.1	12.8	6.3	1.1	0.1	0.1	1.6	4.5	11.0	13.5	**94.3**
RELATIVE HUMIDITY *(%)*													
mean at 0900UTC	87	86	84	80	77	77	79	81	84	86	87	87	**83**
mean at 1500UTC	82	77	72	68	68	68	68	68	71	76	81	83	**74**
SUNSHINE *(hours)*													
mean daily duration	1.63	2.38	3.04	4.85	5.65	5.63	5.01	4.83	4.04	3.07	2.16	1.42	**3.64**
greatest daily duration	8.1	9.2	10.9	13.6	15.4	16.0	15.4	14.4	12.3	9.8	8.5	6.9	**16.0**
mean no. of days with no sun	10	7	5	2	2	2	1	2	3	5	7	11	**55**
RAINFALL *(mm)*													
mean monthly total	68.7	50.7	53.8	49.9	56.6	53.0	48.9	63.7	58.7	67.2	67.2	73.1	**711.4**
greatest daily total	31.4	42.8	30.0	35.3	34.3	108.6	41.4	73.0	32.1	48.5	58.4	42.9	**108.6**
mean no. of days with >= 0.2mm	18	14	17	14	15	14	14	14	15	16	16	17	**185**
mean no. of days with >= 1.0mm	13	10	12	10	11	10	9	10	10	11	11	12	**131**
mean no. of days with >= 5.0mm	5	3	3	3	4	3	3	4	4	4	4	5	**45**
WIND *(knots)*													
mean monthly speed	14.1	12.5	12.8	10.1	9.1	8.7	8.9	8.7	10.1	11.2	12.3	13.3	**11.0**
max. gust	80	78	71	59	63	53	58	58	69	65	68	81	**81**
max. mean 10-minute speed	57	54	47	43	43	36	39	39	46	44	49	57	**57**
mean no. of days with gales	5.2	2.7	2.7	0.6	0.5	0.1	0.1	0.2	0.6	1.4	2.4	3.7	**20.3**
WEATHER *(mean no. of days with..)*													
snow or sleet	4.6	4.8	3.5	1.4	0.1	0.0	0.0	0.0	0.0	0.0	0.4	2.1	**16.9**
snow lying at 0900UTC	2.4	1.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	**5.3**
hail	0.8	1.2	2.8	2.2	1.3	0.5	0.1	0.1	0.3	0.1	0.7	0.6	**10.7**
thunder	0.0	0.1	0.2	0.3	0.9	0.9	0.8	0.6	0.3	0.2	0.2	0.1	**4.8**
fog	2.5	2.3	1.8	2.4	1.6	1.4	1.2	2.8	2.9	2.7	1.8	2.3	**25.9**