

PROPOSED RESIDENTIAL DEVELOPMENT
BURTON ROAD, WEST GREEN

PLANNING APPLICATION BY
BEN BAILEY HOMES

TRANSPORT ASSESSMENT

Report by: C P Dallas

Bryan G Hall
Consulting Civil & Transportation
Planning Engineers
Suite E8
Joseph's Well
Hanover Walk
Leeds
LS3 1AB

March 2004

Ref: 04-115

CONTENTS

- 1.0 INTRODUCTION
- 2.0 LOCAL HIGHWAY NETWORK AND ITS USE
- 3.0 PROPOSED ACCESS ARRANGEMENTS
- 4.0 CONSIDERATIONS RELATING TO SUSTAINABILITY
- 5.0 HIGHWAY IMPACT OF DEVELOPMENT TRAFFIC
- 6.0 CONCLUSIONS

1.0 INTRODUCTION

1.1 This Transport Assessment considers the highway and transportation issues raised by the proposed residential development of land to the south of Burton Road, West Green.

1.2 The planning application by Ben Bailey Homes proposes the redevelopment of land, the primary use of which is a scrap metal merchant but which also includes other commercial uses. The application provides a mixed development of detached, semi-detached, town houses and apartments totalling 228 units served by way of two points of access to Burton Road. The access arrangements include for the widening of Burton Road in the immediate vicinity of the two accesses to ensure that development does not prejudice the potential for kerbside parking available for residents of dwellings located opposite the application site.

1.3 The function of Burton Road is currently that of a distributor type of road. However, Doncaster Metropolitan Borough Council are progressing a major highway infrastructure project for the by-pass of Cudworth and West Green that will, on completion of the by-pass, reduce the function of Burton Road within the road hierarchy to that of a local access road with through traffic movements removed from the Burton Road link.

1.4 The extent of the Cudworth and West Green By-pass scheme is shown on the

plan attached at Appendix BGH1. The scheme has two elements, the western section being the West Green by-pass that will reduce traffic flows on Burton Road and the eastern section by-passing Cudworth to its west. The junction between these two sections of by-pass, A628 Pontefract Road and Burton Road is to be in the form of a 5 arm roundabout as shown on the second plan attached at Appendix BGH1.

1.5 During pre-application discussions officers advised that the scheme is currently at the design stage and that an Environmental Statement is in preparation. A planning application is anticipated for August 2004 with construction beginning in March 2005, assuming any objections in relation to the CPO or Side Road Orders can be resolved without the need for a Public Inquiry. Officers indicated that they are confident that this would be the case.

1.6 On the basis of the above, it is likely that the Cudworth and West Green By-pass will be constructed before final completion of the residential development and hence a detailed assessment of the existing local highway network has not been undertaken. The traffic impact analysis section of this Transport Assessment will therefore consider only the junctions with Pontefract Road in the immediate vicinity of the site for the morning peak hour period, the critical period in terms of the number of vehicles generated by the proposed development seeking to join Pontefract Road.

1.7 At the time of drafting this Transport Assessment design flows for the by-pas

scheme were being reviewed by the Authority and therefore were not available to enable an assessment of the impact of the application proposals on the future local highway network. Any assessment required can therefore either be the subject of a Supplementary report if the design flows are available before determination of the planning application or the production of such a report can be made a condition on any grant of planning permission.

1.8 This Report will therefore consider three principle issues in relation to highway matters. These are:

- 1 the design of the access roads serving the site and the associated improvements to Burton Road;
- 2 the locational benefits arising from residential redevelopment of the site in relation to the sustainable transport policies and objectives set out in PPG13; and
- 3 the impact of the development proposals on the existing operation of the local highway network in the short term in advance of the Cudworth and West Green By-pass.

1.9 It will be shown that the traffic generated by development of 228 dwellings can be accessed and accommodated on Burton Road and at the junctions with Pontefract Road in a safe manner without prejudice to the existing users of the highway network. It will also be illustrated by reference to policies set out in PPG13 that the application site is in a sustainable location within easy walking distance of public transport services.

- 1.10 It will be concluded therefore that the application proposals will not result in demonstrable harm to highway interests and that therefore subject to other Policies of the Plan, planning permission should be granted.

2.0 THE LOCAL HIGHWAY NETWORK AND ITS USE

- 2.1 The application site is located to the south of Burton Road, West Green, and to the west of the settlement of Cudworth. The location of the site in relation to the regional highway network is shown on the 1:50000 scale plan attached at Appendix BGH2 and the relationship of the site to the existing local highway network is shown on the 1:1250 scale plan attached at Appendix BGH3.
- 2.2 The application site accommodates a number of industrial, commercial and residential uses. The primary traffic generating use is a large car breakers and scrap metal operation that generates both car and heavy goods vehicle movements. In addition there is a MOT commercial outlet.
- 2.3 All vehicular access to the properties within the application site is obtained from Burton Road. Burton Road currently performs the function of a distributor type of road providing a link between Monk Bretton to the west and A628 Pontefract Road and Cudworth to the northeast. Along the site frontage the carriageway of Burton Road varies between 5.7 metres and 6.5 metres in width with a 1.5 metre wide footway to its south and a 1.8 metre wide footway to its north. The road is lit to main road standard and subject to a 30mph speed limit.
- 2.4 Opposite the application site there are a series of residential terraced properties. These properties generate some on-street parking throughout this section of

Burton Road and during site observations between 2 and 4 cars were observed to park on street. Toward the western extent of these terraced properties a block paved hard verge has been introduced to accommodate parking clear of the carriageway.

- 2.5 Some 200 metres to the east of the application site Burton Road meets Pontefract Road at a priority controlled ghost island junction, the layout of which is shown on the plan attached at Appendix BGH3. The junction provides for a single lane exit from Burton Road and Pontefract Road is laid out to provide a 3.7 metre wide right turn lane with 4.0 metre wide through lanes in both directions. Visibility splays of 4.0 metres x 120 metres and 4.5 metres x 120 metres are available to the right (south west) and left respectively.
- 2.6 Pontefract Road is classified A628 and provides the main radial route to the northeast of Barnsley. The road is lit to main road standard and subject to a 40mph speed limit.
- 2.7 An alternative route between Burton Road and Pontefract Road for residents driving to or from Barnsley is available by way of Tumbling Lane. Tumbling Lane has a 5.7 metre wide carriageway with a poorly maintained footway to its east and a soft highway verge to its west. The junction between Tumbling Lane and Pontefract Road is a simple give way junction. Hedgerow to both sides of the junction restricts the level of visibility available for drivers leaving Tumbling Lane to 2.4 metres x 120 metres in both directions. At its northern

junction with Burton Road visibility splays of 4.5 metres x 90 metres and 2.4 metres x 90 metres are available to the left (west) and right respectively for drivers of vehicles leaving Tumbling Lane.

- 2.8 A number of public transport services operate in the vicinity of the application site. Burton Road is a bus route accommodating services 30 and 31. In combination, these services provide a ½ hourly service between Monk Bretton and Cudworth at peak times and throughout the day Monday to Friday with an hourly service during the evenings and at weekends. In addition Pontefract Road accommodates 8 services providing in combination 9 buses per hour to and from Barnsley and hourly services to other centres including Doncaster and Pontefract. A schedule summarising the available services is attached at Appendix BGH4. There are both stops on the Burton Road site frontage for both directions of travel with the west bound service provided with a cantilever shelter. There is also a westbound bus stop on Pontefract Road in the vicinity of Pontefract Road and stops for both directions of travel are located approximately xxx metres

- 2.9 Fully classified traffic surveys were carried out at the Burton Road/Pontefract Road and Tumbling Lane/Pontefract Road junctions on Tuesday 22 March 2004 during the morning peak period 7:30am to 9:30am. The results of the survey carried out at the Burton Road/Pontefract Road attached at Appendix BGH5 reveal that the morning peak hour for traffic movement occurs between 8:00am and 9:00am when Burton Road carried a maximum 2-way flow of

some 670 vehicles across the site frontage, including 30 heavy goods vehicles. During the morning peak hour Pontefract Road carried a maximum 2-way flow of some 1580 vehicles.

- 2.10 Advice regarding the capacity of urban road links is set out in TA79/99, "Traffic Capacity of Urban Roads". This indicates that a 6.0 metre wide road such as Burton Road has a theoretical capacity of about 900 vehicles in the busiest direction of flow or some 1500 vehicles 2-way. Burton Road is therefore operating at about 45% of its theoretical capacity during the morning peak hour.
- 2.11 The existing operation of the Burton Road/Pontefract Road junction has been analysed using the TRL program PICADY4 and the results of this are attached at Appendix BGH6. This shows that the junction operates with a maximum ratio of demand to capacity (RFC value) of 0.42 with no significant queues forming on the Burton Road approach to the junction. This general level of operation is consistent with that observed during the survey period.
- 2.12 The results of the turning movement survey at the Tumbling Lane junction are also attached at Appendix BGH5. From this it can be seen that 31 vehicles, 90% of all traffic travelling from Burton Road toward Barnsley, used Tumbling Lane thereby avoiding the Burton Road/Pontefract Road junction. Also 64 vehicles turned left from Pontefract Road to Tumbling Lane during the morning peak.

2.13 The existing operation of the Tumbling Lane/Pontefract Road junction has also been analysed using PICADY4 and the results of this are attached at Appendix BGH7. This shows that the junction operates with a maximum ratio of demand to capacity (RFC value) of 0.12 with no significant queuing forming on the Tumbling Lane approach to the junction. Again, this general level of operation is consistent with that observed during the survey period. Whilst on occasion queues of 3 or 4 vehicles formed this extent of queuing was not constant and dissipated within a relatively short period of time.

3.0 PROPOSED ACCESS ARRANGEMENTS

- 3.1 The proposed development of 228 dwellings is to be served by way of a two new junctions with Burton Road. These points of access will be linked to form a network providing alternative routes to dwellings.
- 3.2 The layout develops a street hierarchy as suggested within the companion guide to Design Bulletin 32, Places Streets and Movement providing initial sections of traditional residential estate roads linking to the Public Open Space with the remaining network designed as a 'Local Streets' or Squares, Mews or courtyards providing wherever possible a pedestrian dominated environment. The network of streets could also incorporate a range of speed management techniques in the form of highway features (junction layouts, vertical and horizontal changes in alignment etc) that can also be complemented with other features such as street furniture design and landscape to achieve the desired design speeds.
- 3.3 Design Bulletin 32 also sets out that the road layout should be designed to help minimise risks of access problems for the emergency services and residents arising as a result of the vehicle breakdown, road maintenance or the need to gain access to services underground. While none of these events are likely to occur very frequently they may block access or cause inconvenience unless means can be found to either by-pass them or ameliorate their impact.

- 3.4 In considering various densities of development, Design Bulletin 32 advises that up to around 50 dwellings may be served by way of a cul-de-sac that does not benefit from an alternative means of access that can be used by vehicles in emergencies and suggests that developments of up to 100 dwellings should provide such a link to minimise risks of access problems. As general guidance Design Bulletin 32 goes on to advise that where a traditional residential estate road serves between 100 and up to and around 300 dwellings two points of access should be provided.
- 3.5 The internal road layout conforms fully with this advice. In the eastern portion of the site the 2 shared surface culs-de-sac each serve fewer than 50 dwellings and these can be reached by way of either junction with Burton Road. In the western portion of the site approximately 100 dwellings are served from a single point but thereafter the roads form a loop within this area. Whilst part of this loop is designed as a shared surface road Design Bulletin 32 advises that this form of road may serve up to around 50 dwellings when not designed as a cul-de-sac and where its terminal junctions are to traditional residential estate roads with separate footway provision.
- 3.6 Turning to the proposed junctions with Burton Road, during initial discussions between officers of the Local Highway Authority and representatives of the applicants, officers advised that the junctions should take the form of ghost island junctions. It is considered however that this level of junction provision is not appropriate in this instance for two reasons.

1. To achieve this level of provision Burton Road would have to be widened by some 3.5 metres across the entire site frontage so that the minor roads to the north could also be incorporated within the ghost island layouts. This would conflict with any on-street parking that takes place outside the terraced properties, which would inevitably take place within the eastbound straight-on lane and hence would result in eastbound vehicles travelling within the right turn lanes, thereby negating the value of the ghost islands.
 2. Widening of Burton Road would encourage higher through traffic speeds and make more attractive the use of the road by non-local traffic, which would be in conflict with the objectives of the by-pass and the likely function of the Burton Road link after its opening.
- 3.7 The application proposals therefore provide for the widening of Burton Road in only the immediate vicinity of the site access road junctions. This would allow the offsetting of the centre line of Burton Road to provide for both on-street parking and eastbound through traffic movements within the eastbound lane and when parked vehicles are not present, would also allow through vehicles to pass to the nearside of those right turners waiting within the centre of the major road, as promoted within paragraph 2.17 of the Highway Agency Standard TD42/95, Geometric Design of Major/Minor Priority Junctions.

3.8 Furthermore, the adoption of these design principles as opposed to the provision of formal right turn ghost island layouts would better enable the introduction of any traffic management measures considered appropriate by the Local Highway Authority to enhance the general environment following the opening of the Cudworth and West Green By-pass, discourage through traffic on Burton Road and lower major road traffic speeds. Such an approach and development of a comprehensive traffic calming scheme for the Burton Road link could include for the introduction of mini-roundabout control at the site access junctions.

4.0 CONSIDERATIONS RELATING TO SUSTAINABILITY

4.1 A choice in how people can travel will produce travel patterns that are more sustainable in environmental terms. One of the major locational benefits that arise from development of sites within urban areas is the opportunity to provide such a choice in the mode of transport available for residents. A choice of destinations close to home will reduce travel distances and encourage a higher proportion of trips to be made on foot and by bicycle. These general principles need to be considered in relation to the existing land use as well as the proposed residential development.

4.2 PPG13, Transport, sets out the aims and objectives of the Government's Sustainable Transport Policies. It advises that land use planning has a key role in delivering the Government's Integrated Transport Strategy and that by shaping the pattern of development and influencing the location and density of development, planning can help reduce the need to travel, reduce the length of journeys to make it safer and easier for people to access jobs, shopping, leisure facilities and services by public transport, walking and cycling. The overall objectives for the guidance are to integrate planning and transport to:

- Promote more sustainable transport choices,
- promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling, and
- reduce the need to travel, especially by car.

- 4.3 In order to deliver the objectives of this guidance, when considering planning applications, Authorities should, amongst other things accommodate housing in locations which are accessible by public transport, walking and cycling.
- 4.4 With specific reference to policies on the development of housing, PPG13 makes reference to PPG3, which requires Local Planning Authorities to build in ways that exploit and deliver accessibility by public transport to local services. They are also encouraged to place the needs of people before ease of traffic movement in designing the layout of residential developments in order to seek to reduce car dependency and increase the attractiveness of walking and cycling.
- 4.5 As set out in Section 2.0 of this Report, the application site is within convenient walking distance of bus services that operate on both Burton Road and Pontefract Road. There are stops located on the Burton Road site frontage and all dwellings will therefore be within a 400 metre walking distance of these services. The Government has suggested that residents should not have to walk more than 400 metres to the nearest bus stop.
- 4.6 There is only one westbound bus stop on Pontefract Road and it is proposed therefore to introduce a further eastbound stop in the short term in the vicinity of either the Burton Road or Tumbling Lane junctions. The precise location of this stop will be determined in consultation with the Passenger Transport Executive and its location would have to be reviewed on construction of the

West Green and Cudworth By-pass.

- 4.7 If the bus stop was to be located in the vicinity of the Tumbling Lane junction the pedestrian facilities on Tumbling Lane would have to be enhanced. There is the opportunity however to improve the existing footway to the east of the road and introduce a new footway to its west along the site frontage to Tumbling Lane.
- 4.8 The proposed residential development is therefore within a sustainable location in terms of the availability of alternative modes of transport. It will further the aims and objectives of the Government's Sustainable Transport Policy as set out in PPG13 by promoting the use of alternative modes of transport and hence reducing the need to travel by private car.

5.0 HIGHWAY IMPACT OF DEVELOPMENT TRAFFIC

5.1 It is generally accepted that residential development typically generates between 0.6 and 0.8 vehicle movements per dwelling during peak hour periods, depending upon the form and density of the development proposed. The TRICS database provides trip rates for two forms of private housing development. The classification "Residential/Houses Privately Owned" primarily includes 3 and 4 bed detached housing developments whilst the land use classification "Residential/Mixed Private Housing" includes higher density developments of 2/3/4 bed apartments and town houses as well as semi-detached and detached dwellings.

5.2 The planning application plan shows a mixed density development of town houses, semi-detached and detached dwellings and apartments to provide a total of 228 dwellings. Regard has therefore been had to the "Residential/Mixed Private Housing" classification and the data for this form of development obtained from the TRICS database is attached at Appendix BGH8. This provides the following trip rates, expressed as vehicle movements per dwelling, along with the resulting predicted generations.

	ARRIVALS		DEPARTURES		TOTAL	
	Trip rate	Vehicles	Trip rate	Vehicles	Trip rate	Vehicles
Morning Peak Hour	0.13	38	0.50	114	0.63	144

- 5.3 As regards the distribution of this traffic, whilst Barnsley is the major centre of employment, the pattern of traffic movements identified by the surveys also indicates that a significant proportion of traffic is likely to travel to the Monk Bretton area to access the industrial estate to its north, and the northern areas of Barnsley. Also a proportion of traffic will travel north eastbound on Pontefract Road. For the purposes of this assessment it has been assumed that 50% of development traffic will use Pontefract Road southbound to Barnsley, 20% northeast bound on Pontefract Road and 30% towards Monk Bretton. On this basis development flows would be as follows.

	A628 to Barnsley		A628 to north east		Burton Road to west	
	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals
Morning Peak Hour	57	19	23	8	34	11

- 5.4 It has also been assumed that all traffic travelling to and from Barnsley will use Tumbling Lane and those travelling to the north east will use the Burton Road/Pontefract Road junction, in accordance with existing traffic patterns.

- 5.5 The likely future operation of the Burton Road/Pontefract Road junction has been assessed using PICADY/4 and the results of the analysis are attached at Appendix BGH9. This shows that the junction will continue to operate efficiently with RFC values of less than 0.46 occurring during the morning peak period. The maximum recommended RFC value is 0.85 as up to this

value queuing will be avoided in 5 out of 6 occasions whilst achieving a scale of junction that can be both economically and environmentally justified. The analysis predicts that no substantial queuing will form at any time on either Burton Road or Pontefract Road. Development will not therefore change the existing operation of the junction to any material extent.

- 5.6 It should be highlighted that this assumes full development of the application site in advance of the opening of the Cudworth and West Green By-pass which, based on information received from officers of the Local Highway Authority set out in the Introduction to this report, is unlikely to be the case. In reality, it is most unlikely that any dwellings will be occupied before the projected start of construction of the by-pass in March 2005 and even based on a completion rate of 50 dwellings per annum only about half of the development will be complete on opening of the By-pass. The above level of operation for the Burton Road/Pontefract Road junction is therefore unlikely to occur.
- 5.7 Turning to the Tumbling Lane/Pontefract Road junction, as described in Section 2.0 the minor road distribution of the visibility splay at this junction is restricted to 2.4 metres. The minor road distance of a visibility splay is a function of capacity and whilst 2.4 metres will permit an emerging driver to see an approaching vehicle and judge whether or not it is safe to proceed without encroaching onto the major road, it requires that the following driver will likewise stop and look. However, full development of the site would increase vehicles joining Pontefract Road at this junction by only 57 vehicles during the

morning peak, an average of only 1 per minute during the morning peak period and this is unlikely to change the existing operation of the junction or therefore existing levels of delay.

5.8 To illustrate this the likely future operation of the Tumbling Lane/Pontefract Road junction has also been assessed using PICADY/4 and the results of the analysis are attached at Appendix BGH10. This shows that the junction will also continue to operate efficiently with RFC values of 0.34 occurring during the morning peak period. Whilst this is an increase over the existing calculated RFC value of 0.12 the analysis also predicts that no significant queues will form at any time on Burton Road.

5.9 It is considered therefore that the existing geometry of Tumbling Lane is of adequate standard to accommodate traffic likely to be generated by full development of the application site, particularly in the short term pending construction of the By-pass. Again, in practice it is likely that only about half of the development will be complete on opening of the By-pass and therefore this level of operation for the Tumbling Lane/Pontefract Road junction is unlikely to occur.

6.0 CONCLUSIONS

- 6.1 The planning application by Ben Bailey Homes proposes the redevelopment of land to the south of Burton Road, West Green for a mixed development of detached, semi-detached, town houses and apartments totalling 228 units served by way of two points of access to Burton Road.
- 6.2 The highway and traffic impact of the development is influenced to a material degree by the proposed by-pass of Cudworth and West Green that will, on its completion, reduce the function of Burton Road within the road hierarchy to that of a local access road. A planning application for the By-pass is anticipated for August 2004 with construction beginning in March 2005.
- 6.3 The two new junctions with Burton Road serving the development site will be linked to form a network providing alternative routes to dwellings. The layout also develops a street hierarchy linking to the Public Open Space with the remaining network of shared surface roads in accordance with advice set out in Places Streets and Movement.
- 6.4 The proposed junctions with Burton Road provide for the widening of Burton Road in the immediate vicinity of the site access road junctions that will allow the offsetting of the centre line of Burton Road to provide for both on-street parking and eastbound through traffic movements within the eastbound lane and when parked vehicles are not present, would also allow through vehicles to

pass to the nearside of those right turners waiting within the centre of the major road. This form of access will also enable the introduction of any traffic management measures to enhance the general environment following the opening of the Cudworth and West Green By-pass, discourage through traffic on Burton Road and lower major road traffic speeds.

- 6.5 As regards the impact of development traffic prior to opening of the By-pass, it has been demonstrated that, even on the basis of full development of the application site in advance of the opening of the Cudworth and West Green By-pass, development traffic can be accommodated on the local highway network in both a safe and efficient manner without material prejudice to existing users of the network.
- 6.6 It is concluded therefore that the application proposals will not result in demonstrable harm to highway interests and that therefore, subject to other Policies of the Plan, planning permission should be granted.

APPENDIX BGH 1



Rev.		By	Amendments	Date
A	SC		Let it all out on West Green Link added	17/03

Scale	Drawn	Checked	Date
1:2500	HL		Sept. 2002

Drawing No.	Revision	Date
NO/0116.1/ADCH		16/06/11

BARNSELEY
Metropolitan Borough Council

Project
Cudworth and West Green
By-pass

**Indicative Alignment
for information only**

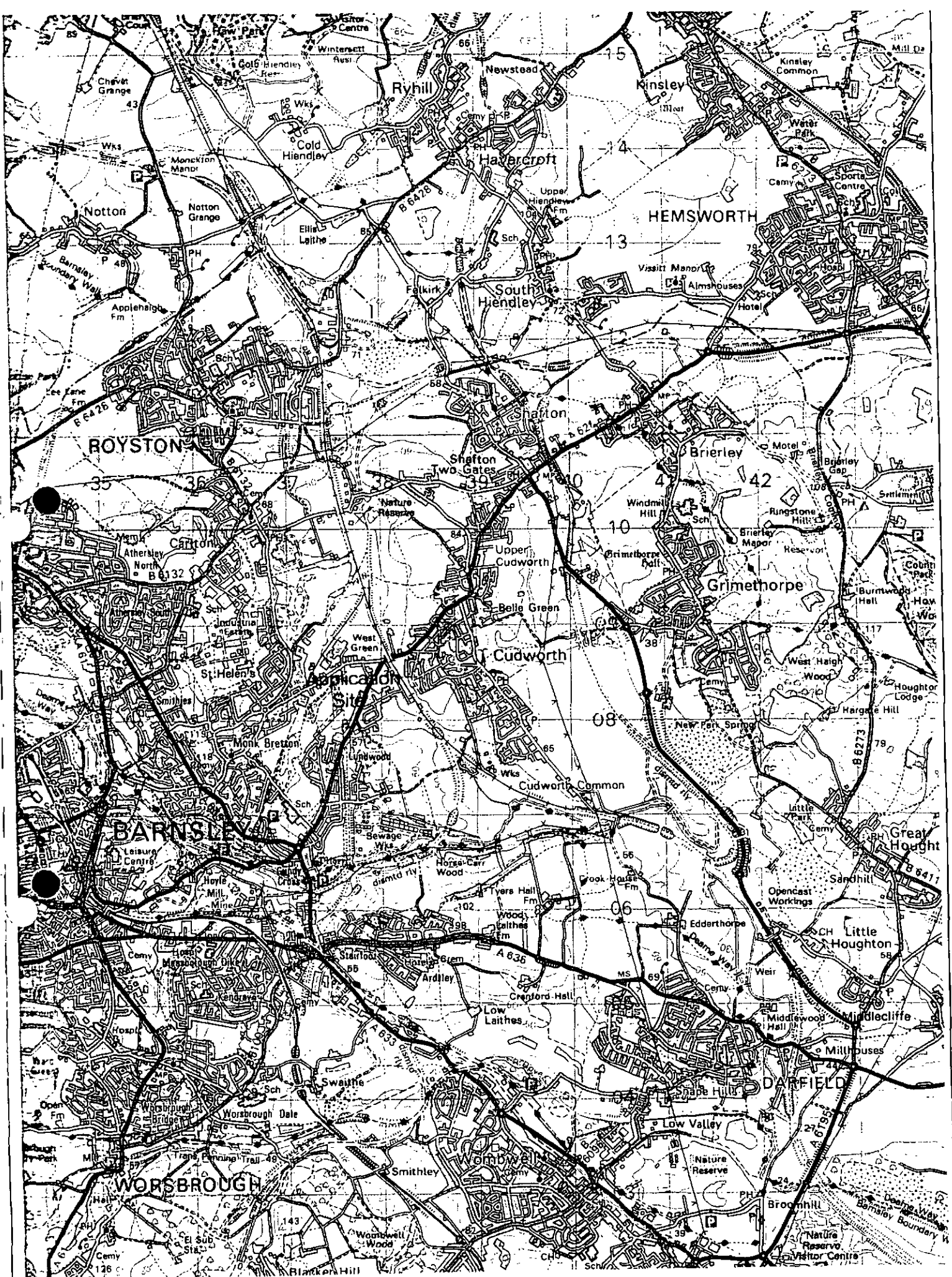
C. J. Bratt, BSc (Hons), CEng, MICE,
Assistant Director, Highways, Engineering & Waste
Central Offices, Kendry Street,
Barnsley S70 2TN.



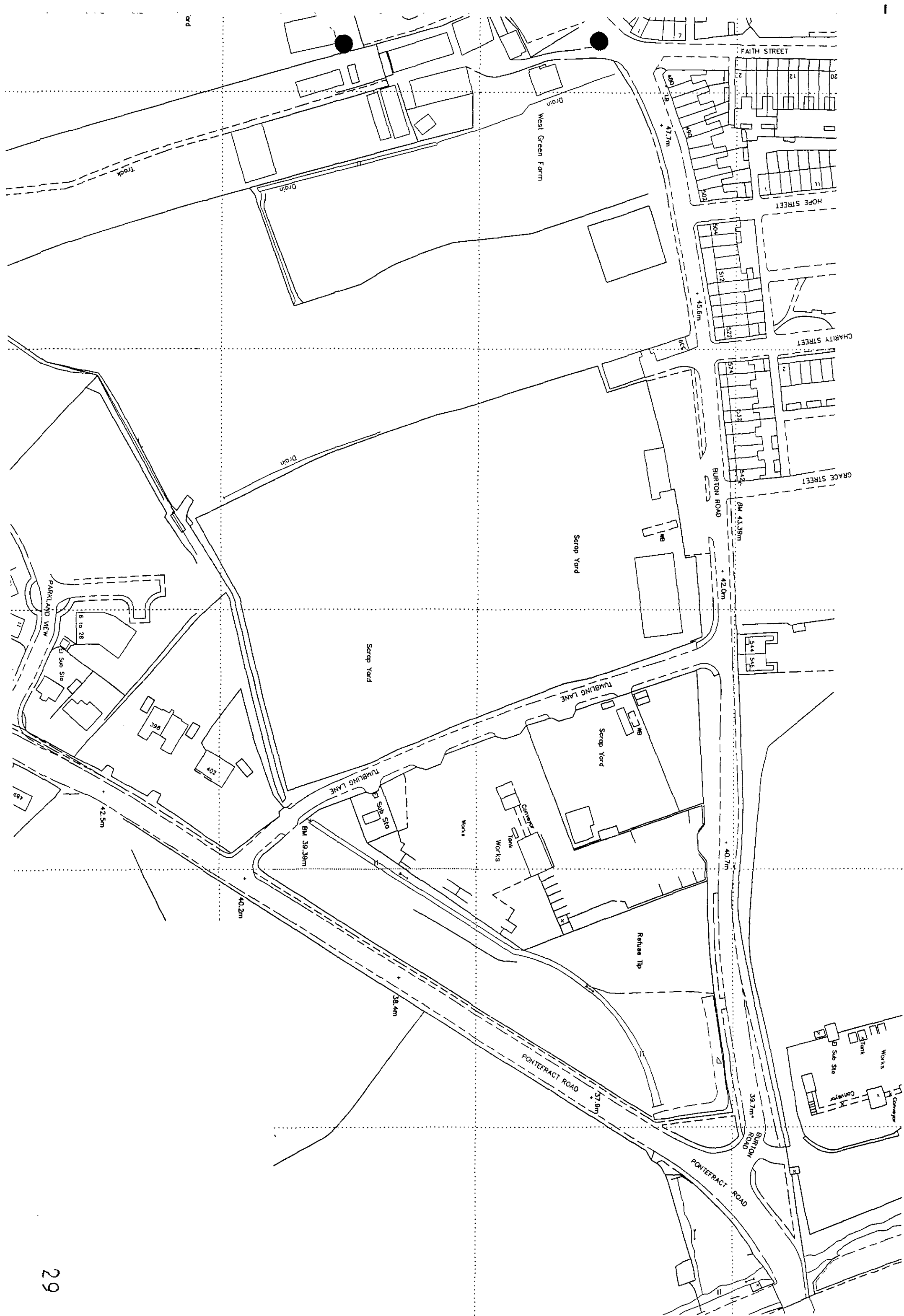
HD/BN16.1

G. J. Birkett, BTech (Hons), C.Eng., M.I.C.E.
Assistant Director, Highways, Engineering & Waste
Central Offices, Kendray Street,
Barnsley S70 2TN.
Tel. (01226) 770770 Fax. (01226) 772222

APPENDIX BGH 2



APPENDIX BGH 3



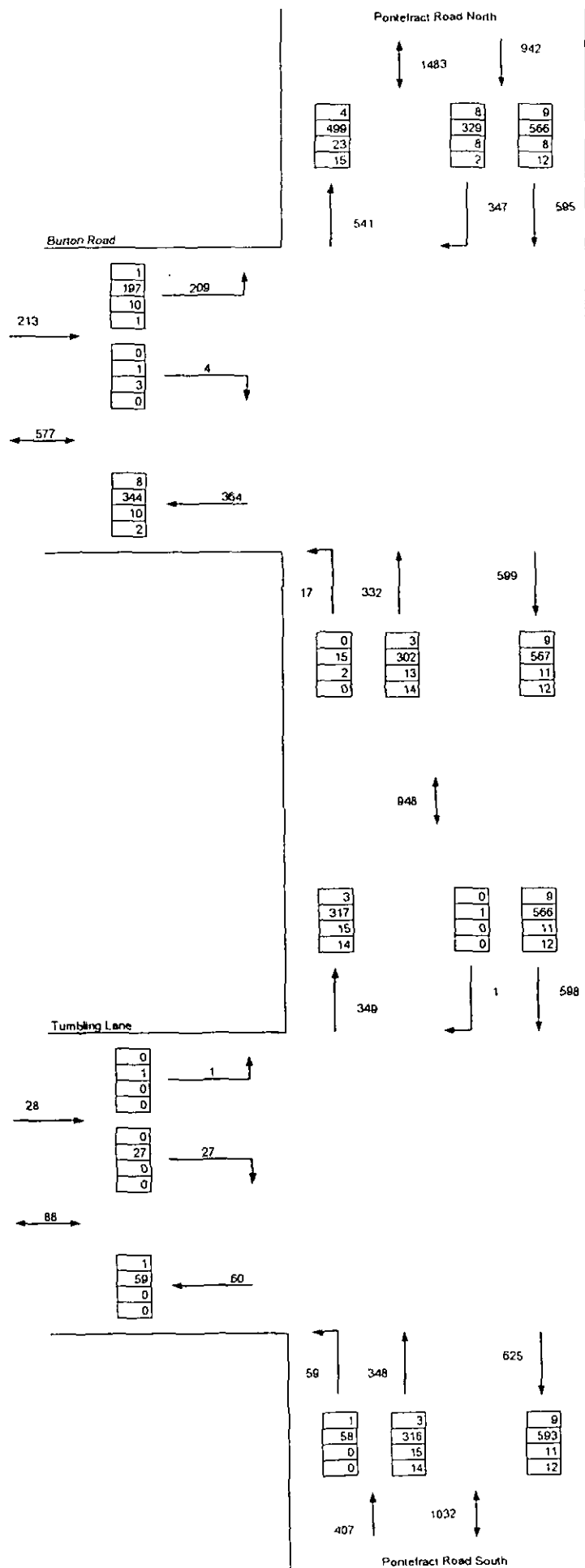
APPENDIX BGH 4

**PUBLIC TRANSPORT AVAILABILITY
BURTON ROAD AND A628, WEST GREEN**

Service Number	Route	Via	Weekday and Saturday Daytime Frequency	Other Comments
Burton Road services				
30	Barnsley to Shafton	Monk Bretton, West Green , Cudworth	Hourly	06:00 – 22:55 with additional bus at 07:30.
31	Barnsley to Cudworth	Monk Bretton, West Green	Hourly	09:20 – 17:20
A628 services				
32	Barnsley to Cudworth	Lundwood, West Green	30 minutes	
34	Barnsley to Shafton	Stairfoot, Lundwood, West Green , Cudworth	Hourly	
36 / 37 / 38	Barnsley to Grimethorpe	Lundwood, West Green , Cudworth, Shafton	Hourly	
66A	Barnsley to Barnsley	Cudworth, West Green , Lundwood	Hourly	
211	Barnsley to Doncaster	Lundwood, West Green , Cudworth	Hourly	
244 / 245 / 246	Barnsley to Pontefract	Lundwood, West Green , Cudworth	Hourly	
247	Barnsley to Upton (Circle)	Lundwood, West Green , Cudworth	Hourly	
341	Barnsley to Shafton	Hoyle Mill, Lundwood, West Green , Cudworth	Hourly	

APPENDIX BGH 5

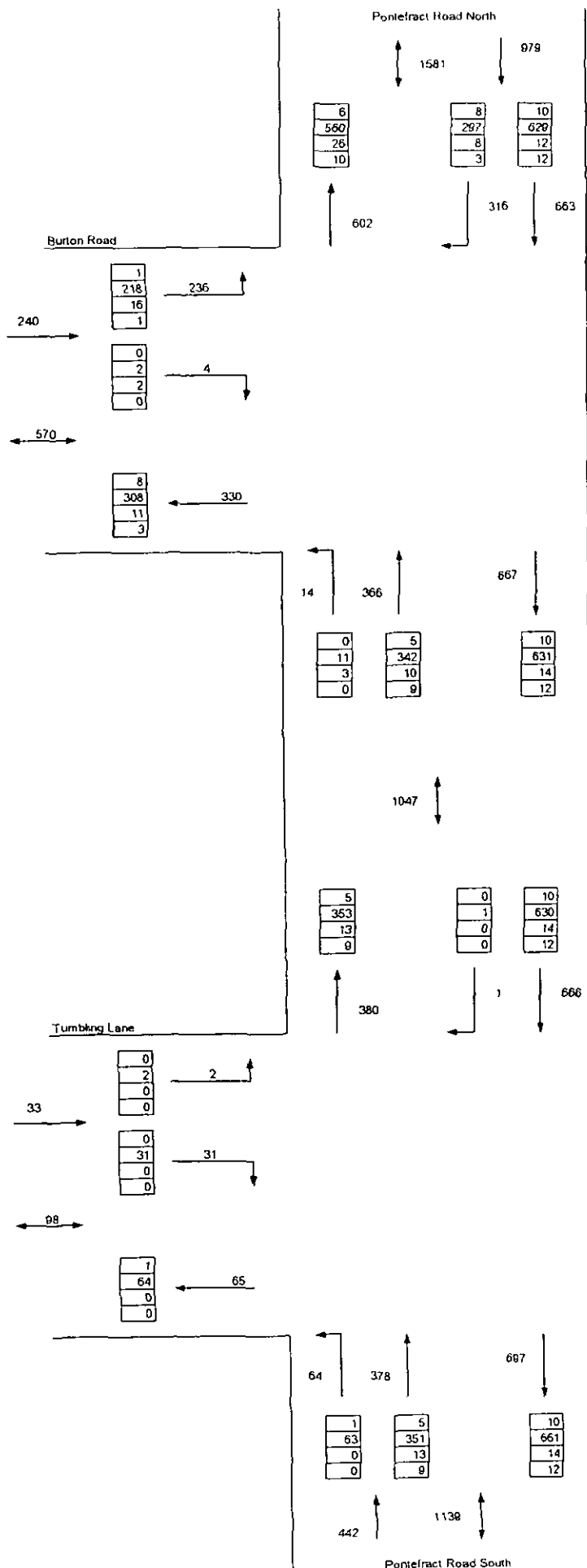
EXISTING VEHICULAR FLOWS
PONTEFRACT ROAD
TUESDAY 23 MARCH 2004
7:30 am - 8:30 am



Vehicular Flows

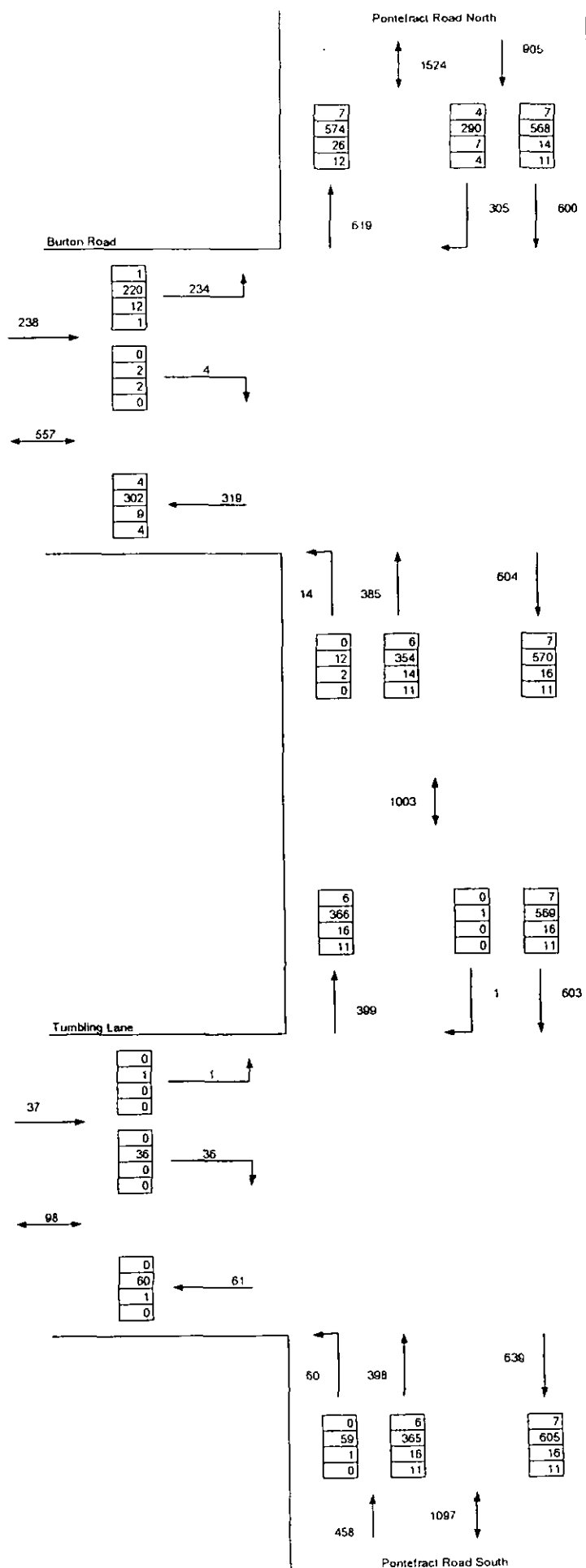
- Motor cycles and pedal cycles
- Cars and light goods vehicles
- Heavy goods vehicles
- Buses

EXISTING VEHICULAR FLOWS
PONTEFRACT ROAD
TUESDAY 23 MARCH 2004
8:00 am - 9:00 am



Vehicular Flows
 Motor cycles and pedAN cycles
 Cars and light goods vehicles
 Heavy goods vehicles
 Buses

EXISTING VEHICULAR FLOWS
PONTEFRAC T ROAD
TUESDAY 23 MARCH 2004
8:30 am - 9:30 am



Vehicular Flows

- Motor cycles and pedAP cycles
- Cars and light goods vehicles
- Heavy goods vehicles
- Buses

APPENDIX BGH 6

TRL LIMITED

(C) COPYRIGHT 2001

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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 3.0 (MAY 2001)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
BY PERMISSION OF THE CONTROLLER OF HMSO

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

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

Run with file:-

"e:\04-101 to 04-125\04-115 West Green Barnsley\04-115 Pontefract Road - Burton Road Ex am.vpi"
(drive on the left) at 14:28:14 on Wednesday, 24 March 2004

TITLE

Pontefract Road / Burton Road - Existing Operation 8.00-9.00am Morning Peak

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

MAJOR ROAD (ARM C) ----- MAJOR ROAD (ARM A)

I
I
I
I
I
I
I

MINOR ROAD (ARM B)

ARM A IS Pontefract Road South
ARM B IS Burton Road
ARM C IS Pontefract Road North

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) 11.70 M.	I
I	CENTRAL RESERVE WIDTH	I	(WCR) 0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	(WC-B) 3.70 M.	I
I	- VISIBILITY	I	(VC-B) 120.0 M.	I
I	- BLOCKS TRAFFIC	I	NO	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 103.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 44.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) 4.98 M.	I
I	- LANE 2 WIDTH	I	(WB-A) 0.00 M.	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
	FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	4.75	7.13	4.75
ARM B	15.00	45.00	75.00	3.00	4.50	3.00
ARM C	15.00	45.00	75.00	12.24	18.36	12.24

TIME	FROM/TO	TURNING PROPORTIONS			TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)					
		ARM A	ARM B	ARM C			
07.45 - 09.15	ARM A	0.000	0.037	0.963	0.0	14.0	366.0
		(0.0)	(21.4)	(2.7)			
	ARM B	0.017	0.000	0.983	4.0	0.0	236.0
		(50.0)	(0.0)	(6.8)			
	ARM C	0.677	0.323	0.000	663.0	316.0	0.0
		(1.8)	(2.5)	(0.0)			

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00								
B-AC	3.00	10.92	0.275		0.0	0.4	5.4	
C-A	8.29							
C-B	3.95	11.13	0.355		0.0	0.5	7.8	
A-B	0.17							
A-C	4.57							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-AC	3.58	10.69	0.335		0.4	0.5	7.2	
C-A	9.90							
C-B	4.72	10.92	0.432		0.5	0.7	10.8	
A-B	0.21							
A-C	5.46							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-AC	4.39	10.36	0.423		0.5	0.7	10.4	
C-A	12.12							
C-B	5.78	10.64	0.543		0.7	1.2	16.4	
A-B	0.26							
A-C	6.69							

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)
08.30-08.45								
B-AC	4.39	10.36	0.423		0.7	0.7	10.9	
C-A	12.12							
C-B	5.78	10.64	0.543		1.2	1.2	17.5	
A-B	0.26							
A-C	6.69							

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)
08.45-09.00								
B-AC	3.58	10.69	0.335		0.7	0.5	7.9	
C-A	9.90							
C-B	4.72	10.92	0.432		1.2	0.8	12.1	
A-B	0.21							
A-C	5.46							

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)
09.00-09.15								
B-AC	3.00	10.92	0.275		0.5	0.4	5.9	
C-A	8.29							
C-B	3.95	11.13	0.355		0.8	0.6	8.7	
A-B	0.17							
A-C	4.57							

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.4
08.15	0.5
08.30	0.7 *
08.45	0.7 *
09.00	0.5 *
09.15	0.4

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.5 *
08.15	0.7 *
08.30	1.2 *
08.45	1.2 *
09.00	0.8 *
09.15	0.6 *

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND	* QUEUEING *	* INCLUSIVE QUEUEING *
		DELAY	DELAY
(VEH)	(VEH/H)	(MIN)	(MIN/VEH)
B-AC	329.1	219.4	47.8
C-A	909.1	606.1	1
C-B	433.3	288.9	73.2
A-B	19.2	12.8	1
A-C	501.9	334.6	1
ALL	2192.6	1461.7	121.0

* 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 JOB

*** PICADY 4 run completed.

===== end of file =====

[Printed at 14:28:28 on 24/03/2004]

APPENDIX BGH 7

TRL LIMITED

(C) COPYRIGHT 2001

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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 3.0 (MAY 2001)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
BY PERMISSION OF THE CONTROLLER OF HMSO

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

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

Run with file:-

"e:\2004\04-101 to 04-125\04-115 West Green Barnsley\04-115 Pontefract Road - Tumbling Lane Ex am.vpi"
(drive on the left) at 12:54:40 on Thursday, 25 March 2004

✓ TITLE

Pontefract Road / Tumbling Lane - Existing Operation 8.00-9.00am Morning Peak

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

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

ARM A IS Pontefract Road South
ARM B IS Tumbling Lane
ARM C IS Pontefract Road North

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)	7.90 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)	120.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I (VB-C)	15.0 M.	I
I	- VISIBILITY TO RIGHT	I (VB-A)	15.0 M.	I
I	- LANE 1 WIDTH	I (WB-C)	2.70 M.	I
I	- LANE 2 WIDTH	I (WB-A)	0.00 M.	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 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	NUMBER OF MINUTES FROM START WHEN FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	RATE OF FLOW (VEH/MIN) AT TOP OF PEAK	RATE OF FLOW (VEH/MIN) AFTER PEAK
ARM A	15.00	45.00	75.00	5.53	8.29	5.53
ARM B	15.00	45.00	75.00	0.41	0.62	0.41
ARM C	15.00	45.00	75.00	8.34	12.51	8.34

TIME	FROM/TO	TURNING PROPORTIONS		
		TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)		
		ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.145	0.855
		0.0	64.0	378.0
		(0.0)	(0.0)	(3.4)
	ARM B	0.939	0.000	0.061
		31.0	0.0	2.0
		(0.0)	(0.0)	(0.0)
	ARM C	0.999	0.001	0.000
		666.0	1.0	0.0
		(2.1)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00								
B-AC	0.41	5.93	0.070		0.0	0.1	1.1	
C-AB	0.03	14.75	0.002		0.0	0.0	0.0	
C-A	8.31							
A-B	0.80							
A-C	4.72							

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-AC	0.49	5.52	0.089		0.1	0.1	1.4	
C-AB	0.03	15.48	0.002		0.0	0.0	0.0	
C-A	9.92							
A-B	0.96							
A-C	5.64							

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.15-08.30									I
I	B-AC	0.60	4.95	0.122		0.1	0.1	2.0		I
I	C-AB	0.05	16.43	0.003		0.0	0.0	0.0		I
I	C-A	12.15								I
I	A-B	1.17								I
I	A-C	6.91								I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.30-08.45									I
I	B-AC	0.60	4.95	0.122		0.1	0.1	2.1		I
I	C-AB	0.05	16.43	0.003		0.0	0.0	0.0		I
I	C-A	12.15								I
I	A-B	1.17								I
I	A-C	6.91								I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.45-09.00									I
I	B-AC	0.49	5.52	0.089		0.1	0.1	1.5		I
I	C-AB	0.03	15.48	0.002		0.0	0.0	0.0		I
I	C-A	9.92								I
I	A-B	0.96								I
I	A-C	5.64								I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	09.00-09.15									I
I	B-AC	0.41	5.93	0.070		0.1	0.1	1.2		I
I	C-AB	0.03	14.75	0.002		0.0	0.0	0.0		I
I	C-A	8.31								I
I	A-B	0.80								I
I	A-C	4.72								I

ARNING* NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND	* QUEUEING *	* INCLUSIVE QUEUEING *
		* DELAY *	* DELAY *
(VEH)	(VEH/H)	(MIN)	(MIN/VEH)
B-AC	45.2	9.2	0.20
C-AB	3.2	0.2	0.07
C-A	911.4		
A-B	87.8		
A-C	518.3		
ALL	1565.9	9.4	0.01

* 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

PICADY 4 run completed.
===== end of file =====

[Printed at 12:54:47 on 25/03/2004]

APPENDIX BGH 8

TRIP RATE for Land Use 03 - RESIDENTIAL/K - MIXED PRIVATE HOUSING

Calculation Factor: 1 HHOLDS**BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. HHOLDS	Trip Rate	No. Days	Ave. HHOLDS	Trip Rate	No. Days	Ave. HHOLDS	Trip Rate
00:00 - 01:00	17	148	0.02	17	148	0.02	17	148	0.04
01:00 - 02:00	17	148	0.01	17	148	0.00	17	148	0.02
02:00 - 03:00	17	148	0.01	17	148	0.01	17	148	0.01
03:00 - 04:00	17	148	0.01	17	148	0.01	17	148	0.02
04:00 - 05:00	17	148	0.01	17	148	0.01	17	148	0.02
05:00 - 06:00	17	148	0.01	17	148	0.04	17	148	0.05
06:00 - 07:00	23	161	0.04	23	161	0.11	23	161	0.15
07:00 - 08:00	46	151	0.07	46	151	0.31	46	151	0.38
08:00 - 09:00	46	151	0.12	46	151	0.50	46	151	0.63
09:00 - 10:00	46	151	0.15	46	151	0.21	46	151	0.36
10:00 - 11:00	46	151	0.13	46	151	0.16	46	151	0.29
11:00 - 12:00	46	151	0.15	46	151	0.15	46	151	0.30
12:00 - 13:00	46	151	0.18	46	151	0.15	46	151	0.33
13:00 - 14:00	46	151	0.17	46	151	0.17	46	151	0.34
14:00 - 15:00	46	151	0.17	46	151	0.17	46	151	0.34
15:00 - 16:00	46	151	0.26	46	151	0.20	46	151	0.46
16:00 - 17:00	46	151	0.31	46	151	0.18	46	151	0.49
17:00 - 18:00	46	151	0.43	46	151	0.20	46	151	0.63
18:00 - 19:00	46	151	0.35	46	151	0.24	46	151	0.59
19:00 - 20:00	23	161	0.32	23	161	0.26	23	161	0.58
20:00 - 21:00	23	161	0.25	23	161	0.21	23	161	0.46
21:00 - 22:00	23	161	0.19	23	161	0.13	23	161	0.32
22:00 - 23:00	17	148	0.13	17	148	0.06	17	148	0.18
23:00 - 24:00	17	148	0.08	17	148	0.04	17	148	0.13
Daily Trip Rates:			3.58				3.54	7.12	

Parameter Summary

Trip Rate Parameter Range Selected: 11 - 491 (units:)
 Survey Date Range: 01/01/95 - 03/06/03
 Number of Weekdays (Monday-Friday): 46
 Number of Saturdays: 0
 Number of Sundays: 0
 Optional Parameters Used in Selection: NO
 Surveys Manually Removed from Selection: 0

APPENDIX BGH 9

TRL LIMITED

(C) COPYRIGHT 2001

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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 3.0 (MAY 2001)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
BY PERMISSION OF THE CONTROLLER OF HMSO

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

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

Run with file:-
"e:\2004\04-101 to 04-125\04-115 West Green Barnsley\04-115 Pontefract Road - Burton Road Pre am.vpi"
(drive on-the-left) at 12:20:30 on Thursday, 25 March 2004

RUN TITLE

Pontefract Road / Burton Road - Predicted Operation 8.00-9.00am Morning Peak

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 Pontefract Road South
ARM B IS Burton Road
ARM C IS Pontefract Road North

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

DATA ITEM	I	MINOR ROAD B	I
TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I { W }	11.70 M.	I
CENTRAL RESERVE WIDTH	I (WCR)	0.00 M.	I
	I		I
MAJOR ROAD RIGHT TURN - WIDTH	I (WC-B)	3.70 M.	I
- VISIBILITY	I (VC-B)	120.0 M.	I
- BLOCKS TRAFFIC	I	NO	I
	I		I
MINOR ROAD - VISIBILITY TO LEFT	I (VB-C)	103.0 M.	I
- VISIBILITY TO RIGHT	I (VB-A)	44.0 M.	I
- LANE 1 WIDTH	I (WB-C)	4.98 M.	I
- LANE 2 WIDTH	I (WB-A)	0.00 M.	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

LENGTH OF TIME PERIOD - 90 MINUTES.

LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

ARM	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
	FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	4.75	7.13	4.75
ARM B	15.00	45.00	75.00	3.29	4.93	3.29
ARM C	15.00	45.00	75.00	12.34	18.51	12.34

		TURNING PROPORTIONS		
		TURNING COUNTS (VEH/HR)		
		(PERCENTAGE OF H.V.S)		
TIME	FROM/TO	ARM A	ARM B	ARM C
07.45 - 09.15	ARM A	0.000	0.037	0.963
		0.0	14.0	366.0
		(0.0)	(21.4)	(2.7)
	ARM B	0.015	0.000	0.985
		4.0	0.0	259.0
		(50.0)	(0.0)	(6.2)
	ARM C	0.672	0.328	0.000
		663.0	324.0	0.0
		(1.8)	(2.5)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
07.45-08.00	B-AC	3.29	11.00	0.299	0.0	0.4	6.1	
	C-A	8.29						
	C-B	4.05	11.13	0.364	0.0	0.6	8.1	
	A-B	0.17						
	A-C	4.57						

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15	B-AC	3.93	10.77	0.364	0.4	0.6	8.2	
	C-A	9.90						
	C-B	4.84	10.92	0.443	0.6	0.8	11.3	
	A-B	0.21						
	A-C	5.46						

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.15-08.30									I
I	B-AC	4.81	10.44	0.460		0.6	0.8	12.0		I
I	C-A	12.12								I
I	C-B	5.92	10.64	0.557		0.8	1.2	17.3		I
I	A-B	0.26								I
I	A-C	6.69								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.30-08.45									I
I	B-AC	4.81	10.44	0.460		0.8	0.8	12.6		I
I	C-A	12.12								I
I	C-B	5.92	10.64	0.557		1.2	1.2	18.4		I
I	A-B	0.26								I
I	A-C	6.69								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.45-09.00									I
I	B-AC	3.93	10.77	0.364		0.8	0.6	9.1		I
I	C-A	9.90								I
I	C-B	4.84	10.92	0.443		1.2	0.8	12.7		I
I	A-B	0.21								I
I	A-C	5.46								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	09.00-09.15									I
I	B-AC	3.29	11.00	0.299		0.6	0.4	6.7		I
I	C-A	8.29								I
I	C-B	4.05	11.13	0.364		0.8	0.6	9.0		I
I	A-B	0.17								I
I	A-C	4.57								I
I										I

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.4	
08.15	0.6	*
08.30	0.8	*
08.45	0.8	*
09.00	0.6	*
09.15	0.4	

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
08.00	0.6	*
08.15	0.8	*
08.30	1.2	*
08.45	1.2	*
09.00	0.8	*
09.15	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I	
			I	I		* DELAY *			* DELAY *			
I	I	I			I			I			I	
I	I	I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I	
I	B-AC	I	360.6	I	240.4	I	54.6	I	54.6	I	0.15	I
I	C-A	I	909.1	I	606.1	I	I	I	I	I	I	I
I	C-B	I	444.3	I	296.2	I	76.8	I	76.8	I	0.17	I
I	A-B	I	19.2	I	12.8	I	I	I	I	I	I	I
I	A-C	I	501.9	I	334.6	I	I	I	I	I	I	I
I	ALL	I	2235.1	I	1490.0	I	131.4	I	131.4	I	0.06	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

*** PICADY 4 run completed.
===== end of file =====

[Printed at 12:20:56 on 25/03/2004]

APPENDIX BGH 10

TRL LIMITED

(C) COPYRIGHT 2001

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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 3.0 (MAY 2001)

ADAPTED FROM PICADY/3 WHICH IS CROWN COPYRIGHT
BY PERMISSION OF THE CONTROLLER OF HMSO

FOR SALES AND DISTRIBUTION INFORMATION,
PROGRAM ADVICE AND MAINTENANCE CONTACT:
TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

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

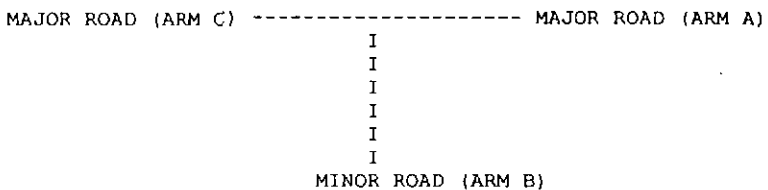
Run with file:-
"e:\2004\04-101 to 04-125\04-115 West Green Barnsley\04-115 Pontefract Road - Tumbling Lane Pre am.vpi"
(drive on-the-left) at 12:47:09 on Thursday, 25 March 2004

IN TITLE

Pontefract Road / Tumbling Lane - Predicted Operation 8.00-9.00am Morning Peak

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA



ARM A IS Pontefract Road South
ARM B IS Tumbling Lane
ARM C IS Pontefract Road North

STREET 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

DATA ITEM		I	MINOR ROAD B	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I (W)	7.90 M.	I
I	CENTRAL RESERVE WIDTH	I (WCR)	0.00 M.	I
		I		I
	MAJOR ROAD RIGHT TURN - WIDTH	I (WC-B)	2.20 M.	I
I	- VISIBILITY	I (VC-B)	120.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
		I		I
	MINOR ROAD - VISIBILITY TO LEFT	I (VB-C)	15.0 M.	I
	- VISIBILITY TO RIGHT	I (VB-A)	15.0 M.	I
I	- LANE 1 WIDTH	I (WB-C)	2.70 M.	I
I	- LANE 2 WIDTH	I (WB-A)	0.00 M.	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

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			RATE OF FLOW (VEH/MIN)			I
		I	I	I	I	I	I	
I	ARM	FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER	I
I	I	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK	I
I	ARM A	15.00	45.00	75.00	5.76	8.64	5.76	I
I	ARM B	15.00	45.00	75.00	1.13	1.69	1.13	I
I	ARM C	15.00	45.00	75.00	8.34	12.51	8.34	I

		I	TURNING PROPORTIONS				I			
		I	TURNING COUNTS (VEH/HR)				I			
		I	(PERCENTAGE OF H.V.S)				I			
	TIME	I	FROM/TO	I	ARM A	I	ARM B	I	ARM C	I
I	07.45 - 09.15	I		I		I		I		I
I		I	ARM A	I	0.000	I	0.180	I	0.820	I
I		I		I	0.0	I	83.0	I	378.0	I
I		I		I	(0.0)	I	(0.0)	I	(3.4)	I
I		I		I		I		I		I
I		I	ARM B	I	0.978	I	0.000	I	0.022	I
I		I		I	88.0	I	0.0	I	2.0	I
I		I		I	(0.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I
I		I	ARM C	I	0.999	I	0.001	I	0.000	I
I		I		I	666.0	I	1.0	I	0.0	I
I		I		I	(2.1)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

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)	I
07.45-08.00									I
B-AC	1.13	5.83	0.193		0.0	0.2	3.3		I
C-AB	0.03	14.71	0.002		0.0	0.0	0.0		I
C-A	8.31								I
A-B	1.04								I
A-C	4.72								I

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
08.00-08.15									I
B-AC	1.34	5.41	0.248		0.2	0.3	4.7		I
C-AB	0.03	15.44	0.002		0.0	0.0	0.0		I
C-A	9.92								I
A-B	1.24								I
A-C	5.64								I

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.15-08.30								
B-AC	1.65	4.84	0.340		0.3	0.5	7.1	
C-AB	0.05	16.38	0.003		0.0	0.0	0.0	
C-A	12.14							
A-B	1.52							
A-C	6.91							

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)
08.30-08.45								
B-AC	1.65	4.84	0.340		0.5	0.5	7.6	
C-AB	0.05	16.38	0.003		0.0	0.0	0.0	
C-A	12.14							
A-B	1.52							
A-C	6.91							

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)
08.45-09.00								
B-AC	1.34	5.41	0.248		0.5	0.3	5.3	
C-AB	0.03	15.44	0.002		0.0	0.0	0.0	
C-A	9.92							
A-B	1.24							
A-C	5.64							

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)
09.00-09.15								
B-AC	1.13	5.83	0.193		0.3	0.2	3.8	
C-AB	0.03	14.72	0.002		0.0	0.0	0.0	
C-A	8.31							
A-B	1.04							
A-C	4.72							

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.3
08.30	0.5
08.45	0.5
09.00	0.3
09.15	0.2

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I
I		I			I			I			I
I		I			I			I			I
I		I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I
I	B-AC	I	123.4	I 82.3	I	31.8	I 0.26	I	31.8	I 0.26	I
I	C-AB	I	3.2	I 2.2	I	0.2	I 0.07	I	0.2	I 0.07	I
I	C-A	I	911.4	I 607.6	I			I			I
I	A-B	I	113.8	I 75.9	I			I			I
I	A-C	I	518.3	I 345.5	I			I			I
I	ALL	I	1670.1	I 1113.4	I	32.0	I 0.02	I	32.0	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

*** PICADY 4 run completed.
===== end of file =====

[Printed at 12:47:59 on 25/03/2004]