



Keepmoat Homes

Proposed Residential Development, Thurnscoe, Barnsley

Transport Assessment

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Transport Planning Specialists

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Contributor	PJW	Initialled:
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Review By	PJW	Initialled:
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1 INTRODUCTION

1.1 Introduction

1.1.1 Savell Bird & Axon have been instructed by Keepmoat Homes to advise on the traffic and transportation aspects of proposals to develop land for a proposed residential development in the village of Thurnscoe in the Borough of Barnsley.

1.1.2 This report provides information on the traffic and transportation aspects of the development and forms supplementary information to assist the forthcoming outline planning application for the development.

1.2 Development Site and Location

1.2.1 The development site is located in Thurnscoe which is approximately 10 kilometres east of Barnsley. The location of the development sites in relation to its surrounding area is indicated in **Plan 1**, with **Plan 2** showing the location of the site in a more local context.

1.2.2 *As can be seen from Plan 2 the development site is located to the north of Thurnscoe village centre. The application site is approximately 19.52 hectares and is bounded to the north by farmland, to the east by a railway track and to the south and west by residential properties.*

1.2.3 *The development site is split into three phases identified as 1A, 1B and 2.*

1.2.4 Phase 1A of the application site is located between the existing Reema Estate and the railway line to the east. Phase 1A is approximately 3.24 hectares and is currently undeveloped farmland.



1.2.5 Phase 1B of the application site is the part of the Reema Estate which is located within the application site. Phase 1B is approximately 6.15 hectares.

1.2.6 Phase 2 of the application site is located immediately north of Phase 1A and Phase 1B. Phase 2 is approximately 10.15 hectares and is currently undeveloped farmland.

1.2.7 Vehicular access to the Reema Estate is currently afforded in two locations, via School Street to the south and via Lingamore Leys to the west. Pedestrian access is afforded via routes within the Reema Estate and via a pedestrian bridge over the railway which bounds the site to the east.

1.3 Development Proposals

1.3.1 It is proposed to develop the site for residential use. It is proposed to demolish the existing 196 residential units located on the Reema Estate and replace them with new residential properties. As previously stated the development site is 19.52 hectares.

1.3.2 The density requirement of this site, as outlined in the draft Local Development Framework (LDF), is 45 dwellings per hectare, hence the resultant number of dwellings is 878 dwellings.

1.3.3 It is proposed that the development will incorporate a mixture of 2, 3 and 4 bedroom detached and semi-detached properties, 2 bed bungalows and apartments.



1.3.4 It is proposed to provide vehicular access to the development site in three locations. One access will be provided via the extension of School Street into the site while Lingamore Leys will also be extended into the site. In addition a new bridge will be constructed over the railway which bounds the site to the east in the same location as the existing pedestrian bridge. The bridge will link the development with Deighton Street and will connect the two areas of the village currently separated by the railway line. A more detailed description of the proposed access arrangements will be provided in Section 4 of the report.

1.3.5 A development Masterplan is contained shown in **Plan 3**.

1.4 Scope

1.4.1 The scope of this report has been discussed and agreed between Savell, Bird and Axon and the local highway authority, Barnsley Metropolitan Borough Council (MBC).

1.4.2 Following this introduction, Section 2 of the report will consider transport planning policies relevant to the proposed development whilst the accessibility of the site by sustainable modes of travel will be detailed in Section 3.

1.4.3 Vehicular access to the site will be considered in Section 4 and the impact of development traffic on the local highway network is described in Section 5. Section 6 of the report will draw together the conclusions.



2 TRANSPORT PLANNING CONSIDERATIONS

2.1 Introduction

2.1.1 The main source of national policy as regards the transport planning aspects of the proposed residential development can be found in the Office of the Deputy Prime Minister's Planning Policy Statement 1 (PPS1) and the former Department of the Environment, Transport and The Regions (DETR) Planning Policy Guidance (PPG) notes PPG3 and PPG13. Further guidance is provided in the DETR documents entitled 'The White Paper on the Future of Transport' published in July 1998 and 'A Strategy for Sustainable Development for the UK' published in May 1999.

2.1.2 Local planning policy consists of the South Yorkshire Local Transport Plan, Barnsley MBC's Unitary Development Plan and Supplementary Planning Guidance for Hattersley & Mottram.

2.2 National Planning Policy

Planning Policy Statement 1

2.2.1 Although the Planning Statement which will accompany this particular planning application will go into further details with regards to national planning policy it is worth noting a couple of key objectives from PPS1, which are as follows:



- Regional planning bodies and local planning authorities should ensure that development plans contribute to global sustainability by addressing the causes and potential impacts of climate change – through policies which reduce energy use, reduce emissions (for example, by encouraging patterns of development which reduce the need to travel by private car, or reduce the impact of moving freight, promote the development of renewable energy resources, and take climate change impacts into account in the location and design of development.
- Planning policies should promote high quality inclusive design in the layout of *new developments and individual buildings in terms of function and impact*, not just for the short term but also over the lifetime of the development. Design which fails to take the opportunities available for improving the character and quality of an area should not be accepted.

Planning Policy Guidance Note 13

2.2.2 PPG13 "Transport" was revised in March 2001. This document provides advice on how local authorities should integrate transport and land use planning for all types of development.

2.2.3 The key aim of PPG13 is to ensure that local authorities carry out their land use policies and transport programmes in ways which help to:

- Promote more sustainable transport choices for both people and for moving freight.
- Promote accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling
- Reduce the need to travel, especially by car.



2.2.4 Consideration of PPG13 is fundamental to development proposals and lies at the core of the government's commitments in the sustainable development strategy to reduce the need to travel with the overall aim of reducing the environmental impacts of transport.

2.2.5 In order to deliver the objectives of this guidance, when preparing development plans and considering planning applications, local authorities should, amongst other things:

- Actively manage the pattern of urban growth to make the fullest use of public transport, and focus major generators of travel demand in city, town or district centres and near to major public transport interchanges.
- Locate local and day-to-day facilities, which need to be near their clients in local centres so that they are accessible by walking and cycling.
- Accommodate housing principally within existing urban areas, planning for increased intensity of development for both housing and other uses at locations which are highly accessible by public transport, walking and cycling.

2.2.6 Paragraph 14 states that in identifying sites to be allocated for housing in local plans and UDP's, local planning authorities should:

'Follow a search sequence, starting with the re-use of previously developed land and building within urban areas, then urban extensions, and finally new development around nodes in good public transport corridors.'

2.2.7 A key planning objective of PPG13 is to ensure that jobs, shopping, leisure and services are all highly accessible by public transport, walking and cycling. This is important for all, but especially for those who do not have regular use of a car, thereby promoting social inclusion.



2.2.8 In preparing their development plans, local authorities should give particular emphasis to accessibility in identifying the preferred areas and sites where such land uses should be located, to ensure they will offer realistic, safe and easy access by a range of transport modes, and not exclusively by car.

2.2.9 With respect to public transport accessibility, paragraph 72 of PPG13 states that:

'The likely availability and use of public transport is a very important ingredient in determining locational policies designed to reduce the need to travel by car.'

2.2.10 In terms of walking PPG13 states that:

'Walking is the most important mode of travel at the local level and offers the greatest potential to replace short car trips, particularly those under 2 kilometres. Walking also forms an often forgotten part of all longer journeys by public transport and cars.'

2.2.11 In addition to walking, PPG13 states that cycling has the potential to substitute for short car trips, particularly those less than 5 kilometres, and to form part of a longer journey by public transport.

Planning Policy Guidance Note 3

2.2.12 PPG3 provides guidance on a range of issues relating to the provision of housing. A revised PPG3 document was published in March 2000. The following section considers pertinent issues contained in the current document.



2.2.13 The overall focus of PPG3 is explicitly stated as being to promote more sustainable patterns of development in part by making existing towns and cities the focus for new development.

2.2.14 PPG3 identifies a tiered approach to implementation in relation to new housing. For example guidance is provided on the internal design of new estates that are intended to place the needs of people before ease of traffic movement.

2.2.15 In terms of overall location PPG3 continues the guidance set out in PPG13 in that the re-use of existing land should be considered for new housing first with completion of urban areas and urban extensions then being considered. New development outside of urban areas should be considered after extensions to existing urban areas.

2.2.16 Paragraph 46 of PPG3 identifies the need to link residential development to public transport. It continues in paragraph 47 stating that;

'The Government places particular emphasis on the importance of integrating decisions on planning and transport in order to reduce the need for travel by car. Local planning authorities should therefore seek to exploit opportunities to locate larger housing development around major nodes along good quality public transport corridors, and to seek to ensure that all housing developments are accessible by a range of non-car modes.'

2.2.17 In terms of creating mixed communities the document states that local authorities should formulate plans that:

- *Secure an appropriate mix of dwelling size, type and affordability in both new developments and conversions to meet the changing composition of households in their area in the light of the likely assessed need;*



- *Encourage the provision of housing to meet the needs of specific groups;*
- *Avoid housing development which makes inefficient use of land and provide for more intensive housing development in and around existing centres and close to public transport nodes;*
- *Promote improved quality of developments which in their design, layout and allocation of space create a sense of community; and*

2.2.18 PPG3 promotes quality design for new housing developments. Local planning authorities should adopt policies which, amongst other things:

- *Create places and spaces with the needs of people in mind, which are attractive, have their own distinctive identity but respect and enhance local character;*
- *Promote designs and layouts which are safe and take account of public health, crime prevention and community safety considerations;*
- *Avoid inflexible planning standards and reduce road widths, traffic speeds and promote safer environments for pedestrians.*

1998 White Paper on the Future of Transport

2.2.19 The White Paper, published in 1998, expands and supports the advice relating to the transport consideration of development planning, which is contained in the now revised PPG13. The White Paper continues to represent the valid guidance document in this respect and developments should, therefore, properly be considered in the context of PPG13.



- 2.2.20 As the White Paper identifies, the government has revised PPG3 to provide an increased emphasis on accessibility to jobs, leisure and services by foot, cycle and public transport.
- 2.2.21 This includes the promotion of major development within areas where good public transport exists to support sustainable development.
- 2.2.22 The White Paper goes on to state that planning guidance in PPG's 6 and 13 both advocate a broader approach to appraisal to encompass the impact on overall travel and car use.

A Strategy for Sustainable Development in the UK

- 2.2.23 In May 1999 the Secretary of State for the then Environment, Transport and The Regions presented the White Paper on Sustainable Development to Parliament. With respect to transportation and access in relation to specific development proposals, the White Paper supports the policy objectives established in the Transport White Paper and in the subsequent revision of PPG13.
- 2.2.24 Reduced reliance on the private car is the fundamental principle of the transport strategy for sustainable developments, again stressing the need to locate major developments where good public transport exists or can be ensured.
- 2.2.25 The strategy continues by stating that many respondents to the consultation exercise carried out by the government's Urban Task Force identified neighbourhoods with easy access to services and a mix of uses as the basis for sustainable communities for the future. In order to create more sustainable patterns of development the document states that it is necessary to:
- Concentrate the majority of new development within existing urban areas.
 - Reduce the need to travel in planning the location of new development.



- Re-use previously developed land.

2.2.26 The documents reiterates the aspirations of PPG13 by stating that:

2.2.27 *'Land use planning policies should promote regeneration, social inclusion and more sustainable patterns of development. In particular, shopping, leisure, offices and other key town centre uses should be located within existing centres.'*

2.2.28 The document goes on to state that:

'The land use planning system will be used to promote safe and convenient links between jobs, homes, and facilities, by walking, cycling and public transport, and to encourage siting of high density developments near existing transport corridors...'

2.3 National Planning Policy Summary

2.3.1 The proposed development site supports the aims and objectives of PPS1, PPG's 3 and 13 and the two White Paper documents by being, partially, brownfield, located adjacent to an established residential area, by local amenities being easily accessible from the sites by non-car modes and by being highly accessible by sustainable modes of transport.

2.4 Local Planning Policy

South Yorkshire Local Transport Plan



2.4.1 The Local Transport Plan was adopted in the summer of 2000 and contains policies and objectives for the five-year life of the plan inclusive of 2001/2 to 2005/6.

2.4.2 The South Yorkshire LTP has been prepared within the current national policy framework for fully integrated transport as set out in the Government White Paper "A New Deal for Transport: Better for Everyone". The overall objectives within the LTP with regard to contributing to sustainable development as outlined in national policy are:

- a) Protecting and enhancing the built and natural environment.
- b) Improving safety for all travellers.
- c) Contributing to an efficient economy and supporting sustainable economic growth in appropriate locations.
- d) To promote accessibility to everyday facilities for all, especially those without a car.
- e) Promoting the integration of all forms of transport and land use planning, leading to a better, more efficient transport system.

Second South Yorkshire Local Transport Plan (Provisional) 2006-2011

2.4.3 The second LTP is currently in draft format and will cover the period 2006 to 2011. The schemes contained within the second LTP are intended to provide:

- Free flowing roads
- More, and more reliable buses



- Demand responsive transport services to provide accessibility to all areas and all communities
- The potential of existing and new technology
- Joined-up transport and land use planning which minimises congestion
- Increased use of school travel plans, workplace travel plans and personalised travel planning
- A culture, and an improved local environment, where cycling and walking are seen as attractive alternatives to car travel.

Barnsley Unitary Development Plan (UDP)

2.4.4 The Barnsley UDP was adopted in 2000, the main aims of the UDP are to increase job opportunities, to conserve and improve the environment and to revitalise communities.

2.4.5 The application site is identified on the proposals map as consisting of three separate areas. The area of existing residential development scheduled for demolition is identified in the proposals map as a "Housing Policy Area" while two sections of the undeveloped area of the application site are identified as a "Housing Proposal" and "Safeguarded Land".

2.4.6 Areas designated as "Housing Policy" areas are affected by policy H8 which states:

"Areas defined on the proposals map as housing policy areas will remain predominantly in residential use".



- 2.4.7 Areas designated as "Housing Proposal" areas are affected by policy H4 which states:

"The sites shown as housing proposals on the proposals maps will be developed primarily for residential purposes".

- 2.4.8 As previously stated an area of the application site is designated as "Safeguarded Land" on the proposals map. However it is understood that the land has now been designated for residential development in the draft Local Development Framework which is due to be submitted to the Secretary of State in the near future.

- 2.4.9 With respect to residential developments in general the objectives of the UDP include:

- Ensure that new housing is well located in terms of links to employment opportunities, transport routes, local services and facilities. New housing should relate well to existing settlements and promote sustainable development.

- 2.4.10 In terms of transport the UDP states that one of the main issues is how to stimulate regeneration by:

- Provision of improved local access within and between parts of the Borough is equally important, if the benefits of strategic accessibility are to be built upon.
- Access to employment, shopping, health, education and shopping opportunities is of increasing importance as settlement patterns and expectations evolve.



- Increased accessibility by the provision of improved and safer routes for walking and cycling is of growing significance.
- The role of public transport, in an area of still relatively low car ownership and in mounting environmental concern over the use of private vehicles, will be critical.

2.4.11 Based on the issues listed above a set of objectives aimed at addressing them were formulated, these include:

- To improve transport provision and services to areas of poor accessibility and job creation as an integral part of a coherent regeneration strategy.
- To provide genuine choices of travel mode as alternatives to the private car by assisting public transport operation, retention and development of the network, and development of facilities for cyclists and pedestrians.

2.4.12 With respect to the development of land policy T2 states that:

"Development will only be allowed if the additional demand for travel generated can be accommodated on the highway network without significant detriment to the environment or the safety and ease of movement of vehicles and pedestrians using the network, or through measures to assist public transport, cycling or walking".

2.4.13 With respect to the accessibility of developments by public transport policy T14 states that:



"Development proposals will be required to include measures to facilitate access to, and where appropriate, by public transport".

2.4.14 With respect to walking within the development policy T27 states that the

"The council will seek to encourage and support walking as a mode of transport and the design and layout of all development will be required to take account of the needs of pedestrians".

2.5 Local Planning Policy Summary

2.5.1 In conclusion, the proposed development sites accord with relevant local planning policies. The application site is located on land allocated for housing development and as will be demonstrated in subsequent sections of the report is highly accessible by non-car modes and will have a negligible impact on the local highway network.



3 NON-CAR ACCESSIBILITY OF THE SITE

3.1 Introduction

3.1.1 In order to accord with the aspirations of Planning Policy Guidance (PPG) Note 13, entitled 'Transport', any new proposals should extend the choice in transport and secure mobility in a way that supports sustainable development.

3.1.2 This section therefore considers access to the site by non-car travel modes, including by foot, cycle, bus and train.

3.2 Accessibility on Foot

3.2.1 Provision for pedestrians within the vicinity of the application site is good. As previously stated the application site is located on the boundary of an existing residential estate. As such provision for pedestrians within the vicinity of the site is good with an extensive network of footways linking the application site with the surrounding area which includes the retail centre of Thurnscoe which fronts onto the B6411 Houghton Road from the south.

3.2.2 In addition a bridge over the railway line to the east of the site currently provides pedestrian access to the residential estate located on the eastern side of the railway track. As part of the proposals it is intended to replace the existing bridge with one which will accommodate vehicular traffic as well as pedestrians.



- 3.2.3 Three public footpaths also provide pedestrian access to the site. One of the paths provides access to the site from the west before routing through the existing housing estate, the footpath then heads in a northerly direction where it links into the Barnsley Boundary Walk. A footpath also penetrates the site from the south where it routes along the edge of the railway line and provides access to Thurnscoe station and the B6411 Station Road. The final footpath provides pedestrian access to the site from the west via the existing bridge over the railway track. This footpath then routes north along the western edge of the railway before providing access to the Barnsley Boundary Walk.
- 3.2.4 Crossing facilities provided over the B6411 Houghton Road include pedestrian refuges with associated dropped kerbs and tactile paving at the Merrill Road/B6411 Houghton Road junction, a zebra crossing located adjacent to the Kingsway/Houghton Road junction, pedestrian refuges with associated dropped kerbs and tactile paving at the Merrill Road/Welfare Road junction and pedestrian refuges with associated dropped kerbs and tactile paving at the Merrill Road/School Street junction.
- 3.2.5 As previously stated a bridge over the railway line to the east of the site currently provides pedestrian access to the residential estate located on the eastern side of the railway track.
- 3.2.6 In order to assess the accessibility of the site a 2,000 metre pedestrian catchment has been prepared, this is displayed in **Plan 4**. The distance of 2 kilometres has been derived from the Institute of Highways of Transportation (IHT) document entitled 'Guidelines for Providing for Journeys on Foot' as a 'preferred maximum' distance for commuting, school and sight seeing journeys.
- 3.2.7 PPG13 also states that walking is the 'most important mode of travel at the local level and offers the greatest potential to replace short car journeys, particularly those under 2 kilometres.'



3.2.8 As can be seen from **Plan 4** the 2,000 metre catchment encompasses the retail centre of Thurnscoe which includes a HSBC bank, post office, doctors surgery, library and a Kwik Save Supermarket which is located approximately 700 metres from the application site. The catchment also includes Goose Acre Primary School and Thurnscoe railway station. Details of rail services accessible at the station will be provided later in this section. A more detailed list of the facilities and services accessible within a short distance of the site is provided in the Planning Statement.

3.2.9 In conclusion the proposed development site benefits from excellent accessibility *by foot with wide footways and pedestrian crossing facilities being provided in the sites locality.* In addition three footpaths penetrate the application site which further enhance pedestrian accessibility. A range of amenities are available within walking distance including access to public transport services, schools, health services, retail and employment opportunities, all of which will significantly *reduce dependence on the private car.*

3.2.10 In addition, although a footbridge exists between east and west Thurnscoe, the fact that the area will be developed and the bridge improved will be conducive to encouraging pedestrian movement across it. This is due to the improvement in people perceptions of how safe the bridge is due to it being likely that more people will use the bridge and it also being likely that the bridge will be overlooked by new residential properties.

3.3 Accessibility by Cycle

3.3.1 PPG13 emphasises that cycling has the potential to replace short car journeys, particularly those under 5 kilometres, as such a 5 kilometre catchment has been prepared and is displayed in **Plan 5**.



3.3.2 The cycle catchment encompasses Goldthorpe and the majority of Bolton-upon-Deerne. The cycle catchment therefore provides access to further employment, retail and educational opportunities including Deerne High School. Dearneside Leisure Centre is also included within the cycle catchment, facilities available at the Centre include a swimming pool, gymnasium and all-weather football pitches.

3.3.3 In summary the facilities which are accessible within cycling distance of the application site will further reduce dependence on the private car.

3.4 Accessibility by Bus

3.4.1 The development site is highly accessible by bus with bus stops being provided in the existing residential element Reema site. A plan showing the location of bus stops both within and in the vicinity of the site is provided in **Plan 6**. Three bus services are accessible from these stops, details of which are summarised in Table 3.1 below.

Service No.	Route	Frequency (services per hour)			
		Mon-Fri		Sat	Sun
		Peak	Off-peak		
203	Old Denaby-Mexborough-Bolton on Dearne-Thurnscoe-Doncaster	4 services per day 6			-
212	Thurnscoe-Great Houghton-Darfield-Barnsley	1	1	1	-
226	Thurnscoe-Bolton on Dearne-Manvers-Barnsley	2	2	1	1

Table 3.1 – Summary of Bus Services Operating close to Site

3.4.2 As Table 3.1 shows the site of the proposed development is well connected by frequent bus services to a number of destinations including Bolton on Deerne, Wath upon Deerne and Barnsley.



3.4.3 In order to further improve the accessibility of the proposed development by bus it is proposed to route bus services into the site. The potential for diverting existing bus routes into the development site has been discussed with the local bus operators who have agreed in principle to the diversion of services. It is likely that the services would route across the proposed bridge over the railway line which bounds the site to the east.

3.4.4 It can be concluded then that the proposed development site is highly accessible by bus with frequent connections to a variety of destinations being accessible via bus stops located in close proximity to the development sites. In addition accessibility by bus will be further improved by the routing of bus services into the proposed development.

3.5 Accessibility by Rail

3.5.1 The nearest railway station to the proposed development sites is Thurnscoe which is located off the B6411 Station Road. The station is located on the Sheffield to Leeds line, other stations served on the line include Meadowhall, Rotherham, and Wakefield.

3.5.2 The station is served by one train in either direction every hour Monday to Saturday. On Sundays the station is served by one train in either direction every two hours. Trips to Sheffield and Leeds from Thurnscoe take approximately 35 minutes and 42 minutes respectively.

3.5.3 Based on the above it can be concluded that the proposed development site is highly accessible by rail.



3.6 Summary

- 3.6.1 Provision for pedestrians is good with wide footways and pedestrian crossing facilities provided in the sites locality, access for pedestrians will be further improved by the construction of the new bridge over the railway line which bounds the site to the east. In addition there are a range of employment, educational, retail and leisure opportunities within walking distance of the site.
- 3.6.2 The cycle catchment extends the range of amenities accessible by non-car modes to include the local secondary school and *leisure centre*.
- 3.6.3 A number of bus services operate in the vicinity of the site and proposals to route services through the site will further improve the accessibility of the proposed development by this mode.
- 3.6.4 Thurnscoe train station is located a short walk from the site and provides access to frequent rapid services to the region's major centres.
- 3.6.5 The accessibility of the site, and also East Thurnscoe, will also be substantially improved for non-car travel modes by the implementation of the bridged link across the railway between East and West Thurnscoe.
- 3.6.6 The above has demonstrated that the proposed development is highly accessible by a range of sustainable travel modes.



4 VEHICULAR ACCESS & CAR PARKING PROVISION

4.1 Introduction

- 4.1.1 This section of the Report details the local highway network before considering vehicular access to the development sites and proposed car parking provision.

4.2 Local Highway Network

- 4.2.1 As previously stated vehicular access to the proposed development will be provided in three locations. School Street and Lingamore Leys will be extended *into the site and a new bridge will be constructed over the railway which bounds the site to the east which will link the development with Deightonby Street.*
- 4.2.2 Lingamore Leys is subject to a 30mph speed limit and provides access to Merrill Road via a priority junction which in turn provides access to the B6411 Houghton Road, again via a priority junction. The B6411 Houghton Road is subject to a 30mph speed limit and runs in an east-west alignment, to the west it provides access to routes to Bamsley while to the east it provides access to routes to Doncaster and the A1.
- 4.2.3 School Street runs in an approximate north-south alignment and provides access to the B6411 Houghton Road to the south via a priority junction approximately 500 metres east of the Merrill Road/B6411 Houghton Road junction.
- 4.2.4 Approximately 150 metres east of the School Street/B6411 Houghton Road junction the B6411 Houghton Road forms a 4-arm mini-roundabout junction with John Street and Shepherd Lane. John Street provides access to residential properties to the north while Shepherd Lane provides access to the A635 Doncaster Road to the south.



4.2.5 To the east of the aforementioned mini-roundabout the B6411 is known as Station Road and is subject to 20mph speed limit, speed cushions are interspersed along the B6411 Station Road.

4.2.6 As previously stated the proposed bridge over the railway line to the east will link the proposed development with Deightonby Road. Deightonby Road is subject to a 20mph speed limit and provides access to Windsor Street via a priority junction. Windsor Street is also subject to a 20mph speed limit with speed cushions interspersed along its length. Windsor Street provides access to the B6411 Station Road via a priority junction.

4.3 Vehicular Access to the Site

4.3.1 Vehicular access to the proposed development will be in accordance with the standards detailed in the "South Yorkshire Design Guide: Better Places to Live".

4.3.2 As previously stated it is proposed to provide vehicular access to the development in three locations. School Street and Lingamore Leys are to be extended into the site while a new bridge is to be constructed over the railway line to the east which will link the site with Deightonby Street.

4.3.3 The three new access routes will be constructed in accordance with the standard details for "Collector Streets" as specified in the "South Yorkshire Design Guide: Better Places to Live". Technical Appendix 1 of the aforementioned document states in paragraph 22.3 that:

"Collector Streets are the main routes within a residential area for all modes of movement, including buses. They will generally provide a link between Main Roads and Local Streets".



- 4.3.4 Collector Streets can serve up to a 750 dwellings and require a 5.5 metre carriageway (6 metres where a bus route is provided) with 2 metre wide footways either side of the carriageway.
- 4.3.5 School Street incorporates a 7.3 metre wide carriageway with 2 metre wide footways on either side, School Street therefore fulfils the requirements for a Collector Street.
- 4.3.6 Lingamore Leys incorporates a 7.3 metre wide carriageway with 2 metre wide footways on either side, Lingamore Leys therefore also fulfils the requirements for a Collector Street. Merrill Road which links Lingamore Leys with the B6411 Houghton Road incorporates a 7.4 metre wide carriageway with 2 metre wide footways on either side, Merrill Road therefore again fulfils the requirements for a Collector Street. The aforementioned route from the B6411 Houghton Road to the proposed development will form the primary access route.
- 4.3.7 The Lingamore Leys/Merrill Road route into the proposed development will serve approximately 372 existing residential properties in addition to the proposed development. The School Street route into the proposed development will serve approximately 43 existing residential properties in addition to the proposed development.
- 4.3.8 As previously stated the proposed development will consist of approximately 878 dwellings, the total number of dwellings which the Lingamore Leys/Merrill Road route and the School Street route may potentially serve is therefore approximately 1,293. As previously stated both routes fulfil the requirements for a Collector Street which can potentially serve up to 750 dwellings each, both routes together could therefore potentially serve 1,500 dwellings.



- 4.3.9 The number of dwellings which will be served after the construction of the proposed development is *therefore* 207 less than the number which could potentially be served using the aforementioned two routes. It is considered therefore that vehicular access to the proposed development could be adequately provided using the School Street and Lingamore Leys/Merrill Road routes.



- 4.3.10 As such, the bridge link over the railway is more of a desirable element to enhance the non-car accessibility of the site, and East Thurnscoe, rather than a necessity in terms of highway geometry or capacity.
- 4.3.11 As previously stated however it is proposed to provide a new bridge over the railway will link the proposed development with Deightonby Street and the eastern elements of Thurnscoe. Deightonby Street and Windsor Road will link the proposed bridge with the B6411 Station Road.
- 4.3.12 Deightonby Street incorporates a narrower carriageway and footways than Windsor Road. At its narrowest the carriageway on Deightonby Road is 6 metres wide while the western footway is 1.8 metres wide and the eastern footway is 1.6 metres wide. In addition it is understood that there are not any issues concerning pedestrian accessibility in the locality of Deightonby Street.
- 4.3.13 Vehicular access to the farm located to the north of the application site will be maintained throughout the construction period of the proposed development and continue to be provided thereafter.

4.4 Car Parking Provision

- 4.4.1 Car parking will be provided in accordance with the standards detailed in Barnsley MBCs Supplementary Planning Document 32 "Parking, Transport Assessments and Travel Plans".
- 4.4.2 The aforementioned document states that for houses a maximum of 1.5 spaces should be provided per dwelling while the equivalent figure for flats is generally 1 space per dwelling.



5 TRAFFIC IMPACT ASSESSMENT

5.1 Introduction

5.1.1 Having established that the proposed residential development is acceptable in terms of non-car accessibility and vehicular access, the following section of the report considers the impact of the development proposals on the local highway network.

5.1.2 The scope of the traffic impact assessment has been agreed with Barnsley MBC, the local highway authority.

5.2 Traffic Surveys

5.2.1 In order to establish base traffic flow on the local highway network traffic surveys were undertaken in the weekday AM and PM peak at the following three junctions:

- B6411 Station Road/Shepherd Lane/John Street
- B6411 Houghton Road/School Street
- B6411 Houghton Road/Lorne Road/Merrill Road

5.2.2 The AM peak hour was identified as 08:00 to 09:00 and the PM peak hour was identified as 16:30 to 17:30.

5.2.3 **Figures 1 & 2** display the survey data for the AM and PM peak hours respectively in terms of number of vehicles whilst **Figures 3 & 4** display the data in terms of PCU's. The full survey data is contained in **Appendix 1**.



5.2.4 In order to factor the survey data to future assessment years the volume of traffic which could potentially be generated by the residential units currently located on the application site first had to be removed. This is detailed in the following section.

5.3 Existing Site Uses

5.3.1 As previously stated 196 units are currently located on the application site, it has been assumed that 85% of the units are currently occupied.

5.3.2 In order to estimate the volume of trips which could be generated by the occupied residential units currently the TRICS 2006(a) database was utilised. Trip rates were obtained for all developments in the field "Mixed Private/Non-Private Housing". Table 5.1 below shows the resultant trip rates and the subsequent trip generation, the full TRICS output is contained within **Appendix 2**.

Peak	Trip Rates		No. of Trips	
	Arr	Dep	Arr	Dep
AM (0800 – 0900)	0.1	0.23	17	38
PM (1630 – 1730)	0.21	0.14	35	23

Table 5.1: Summary of Trip Generations from Existing Site

5.3.3 As shown in Table 5.1 the existing residential units are estimated to generate a 2-way total of 55 trips in the AM peak and 58 trips in the PM peak.

5.3.4 Trips forecast to be generated by the existing residential units were assigned to the local highway network in accordance with observed turning movements.



5.3.5 **Figures 5 & 6** show traffic forecast to be generated by the existing residential units assigned to the local highway network.

5.3.6 As previously stated it has been assumed that 85% of the existing 196 units are currently occupied. However, clearly were the entire 196 units to be occupied they could potentially generate a greater number of trips. The number of trips which the development could potentially generate are shown in Table 5.2 below using the same trip rates as used previously.

Peak	Trip Rates		No. of Trips	
	Arr	Dep	Arr	Dep
AM (0800 – 0900)	0.1	0.23	20	45
PM (1630 – 1730)	0.21	0.14	41	27

Table 5.2: Summary of Potential Trip Generations from Existing Site

5.3.7 As shown in Table 5.2 if all the existing residential units were occupied they could potentially generate a 2-way total of 65 trips in the AM peak and 69 trips in the PM peak.³

5.3.8 Trips which could potentially be generated by the existing residential units were assigned to the local highway network in accordance with observed turning movements.

5.3.9 **Figures 7 & 8** show traffic forecast to be generated by the existing residential units assigned to the local highway network.



5.4 Base Traffic Flow

5.4.1 In order to factor surveyed traffic flows to future assessment years traffic forecast to be generated by the existing residential units was subtracted from the surveyed traffic flow. This was calculated by subtracting **Figures 5 & 6** from **Figures 3 & 4**, the resultant flows are shown in **Figures 9 & 10**.

5.4.2 In order to factor **Figures 9 & 10** to the proposed opening year of 2014 a National Road Traffic Forecast (NRTF) low growth factor was applied.

5.4.3 **Figures 11 & 12** show the 2014 factored survey flows for the AM and PM peak respectively.

5.4.4 In order to calculate the 2014 Base Flows traffic which could potentially be generated by the residential properties currently located on the application as shown in **Figures 7 & 8** was added to **Figures 11 & 12**. The resultant 2014 Base Flows are shown in **Figures 13 & 14**.

5.5 Proposed Residential Development

5.5.1 As previously stated it is proposed to develop the application site to accommodate 878 dwellings. However, for robustness this traffic impact assessment has assumed that the development will consist of 900 dwellings.

5.5.2 In order to forecast the volume of trips which could potentially be generated by the proposed development the TRICS 2006(a) database was utilised. Trip rates were again obtained for all developments in the field "Mixed Private/Non-Private Housing".



- 5.5.3 Table 5.2 summarises the trip rates and forecast trip generation for the proposed development. The full TRICS output is contained within **Appendix 2**.

Peak	Trip Rates		No. of Trips	
	Arr	Dep	Arr	Dep
AM (0800 – 0900)	0.1	0.23	90	207
PM (1630 – 1730)	0.21	0.14	189	126

Table 5.2: Summary of Trip Generations from Proposed Development

- 5.5.4 Table 5.2 shows that the proposed development is forecast to generate a 2-way total of 297 trips in the AM peak and 315 in the PM peak.

5.6 Distribution & Assignment of Proposed Trip Attractions

- 5.6.1 In order to assign traffic forecast to be generated by the proposed development to the local highway network a distribution based on observed turning movements was calculated. For robustness it was assumed that all traffic would approach and depart the development via School Street or Merrill Road. It was further assumed that 70% of traffic approaching and departing the site would do so via Merrill Road and 30% via School Street.
- 5.6.2 The resultant distributions for the AM & PM peaks are shown in **Figures 15 & 16** respectively.
- 5.6.3 Traffic forecast to be generated by the proposed development is shown assigned to the network in **Figures 17 & 18** for the AM & PM peaks respectively.



5.7 Assessment Flows

- 5.7.1 In order to calculate the 2014 Assessment flows the factored 2014 survey flows shown in **Figures 11 & 12** were added to the forecast development flows contained in **Figures 17 & 18**. The resultant 2014 Assessment Flows are shown in **Figures 19 & 20** for the AM & PM peaks respectively.

5.8 Traffic Impact Analysis

- 5.8.1 A traffic impact analysis was initially undertaken in order to assess the percentage impact of the development on the local highway network in the proposed opening year of 2014. This was calculated by dividing the 2014 Assessment Flows contained in **Figures 19 & 20** by the 2014 Base Flows contained in **Figure 13 & 14**. The resultant percentage impact is displayed in **Figures 21 & 22** for the AM & PM peaks respectively.

- 5.8.2 As **Figures 21 & 22** show the proportional impact of traffic forecast to be generated by the proposed development is relatively significant at all three junctions in both the AM and the PM peak periods. The *minimum* impact of development traffic on base traffic flow occurs at the Station Road/Shepherd Lane mini-roundabout junction where the impact is 11% in the PM peak.

- 5.8.3 Capacity assessments were therefore undertaken at the three junctions considered, these assessments are detailed below.

B6411 Houghton Road/Merrill Road Priority Junction

- 5.8.4 In order to assess capacity at the above mentioned junction the TRL program PICADY 5 was used. Capacity assessments were undertaken in the Base and Assessment scenario in the AM and the PM peak.



5.8.5 Table 5.3 presents the results of the capacity assessments with the full PICADY results contained in **Appendix 3**.

Arm	Base Flows				Assessment Flows			
	AM		PM		AM		PM	
	RFC	Max Q	RFC	Max Q	RFC	Max Q	RFC	Max Q
Merrill Road	0.168	0	0.189	0	0.385	1	0.338	1
B6411 Houghton Road (west)	0.004	0	0.024	0	0.004	0	0.026	0
Lorne Road	0.110	0	0.116	0	0.125	0	0.137	0
B6411 Houghton Road (east)	0.137	0	0.248	0	0.197	0	0.407	1

Table 5.3 - Summary of PICADY Output at the B6411 Houghton Road/Merrill Road Priority Junction

5.8.6 As Table 5.3 shows the PICADY results indicate that the assessed junction will operate well within capacity in the Assessment scenario in both the AM and PM peaks.

B6411 Houghton Road/School Street Priority Junction

5.8.7 In order to assess capacity at the above mentioned junction the TRL program PICADY 5 was used. Capacity assessments were undertaken in the Base and Assessment scenarios in the AM and the PM peak.

5.8.8 Table 5.4 presents the results of the capacity assessments with the full PICADY results contained in **Appendix 4**.



Arm	Base Flows				Assessment Flows			
	AM		PM		AM		PM	
	RFC	Max Q	RFC	Max Q	RFC	Max Q	RFC	Max Q
School Street	0.299	0	0.279	0	0.408	1	0.366	1
B6411 Houghton Road	0.136	0	0.162	0	0.163	0	0.224	0

Table 5.4 - Summary of PICADY Output at the B6411 Houghton Road/Merrill Road Priority Junction

5.8.9 As Table 5.4 shows the PICADY results indicate that the assessed junction will operate well within capacity in the Assessment scenario in both the AM and PM peaks.

B6411 Station Road/Shepherd Lane Mini-Roundabout Junction

5.8.10 In order to assess capacity at the above mentioned junction the TRL program ARCADY 6 was used. Capacity assessments were undertaken in the Base and Assessment scenarios in the AM and the PM peak.

5.8.11 Table 5.5 presents the results of the capacity assessments with the full ARCADY results contained in **Appendix 5**.



Arm	Base Flows				Assessment Flows			
	AM		PM		AM		PM	
	RFC	Max Q	RFC	Max Q	RFC	Max Q	RFC	Max Q
John Street	0.054	0	0.106	0	0.068	0	0.121	0
B6411 Station Road (east)	0.337	1	0.550	1	0.373	1	0.637	2
Shepherd Lane	0.358	1	0.511	1	0.390	1	0.601	2
B6411 Station Road (west)	0.391	1	0.386	1	0.474	1	0.438	1

Table 5.5 - Summary of ARCADY Output at the B6411 Station Road/Shepherd Lane Mini-roundabout Junction

5.8.12 As Table 5.5 shows the ARCADY results indicate that the assessed junction will operate well within capacity in the Assessment scenario in both the AM and PM peaks.

5.9 Summary

5.9.1 This section of the report has considered the impact of traffic forecast to be generated by the proposed development on the local highway network.

5.9.2 A percentage impact assessment indicated that the minimum impact of traffic forecast to be generated by the proposed development on the three junctions under consideration was 11%.



- 5.9.3 Capacity assessments were undertaken which indicated that all three junctions would operate within capacity in the future assessment year of 2014 in both the AM and the PM peak.
- 5.9.4 For robustness the traffic impact assessment that all traffic would approach and depart the development via either the Lingamore Leys/Merrill Road route or the School Street. As all junctions assessed were forecast to operate within capacity after the development was constructed it is not considered that the proposed new bridge is necessary in terms of network capacity.



6 CONCLUSIONS

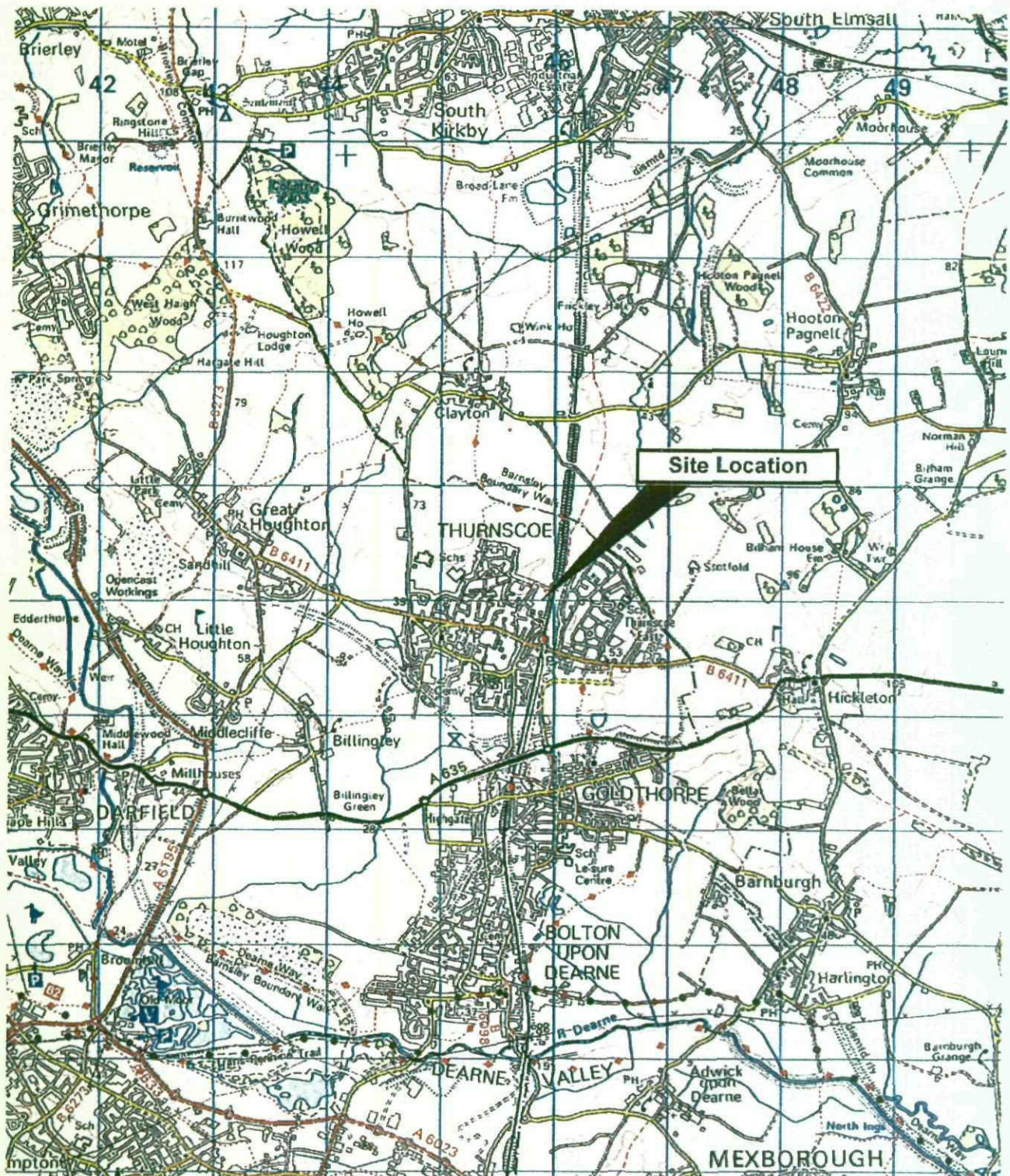
6.1.1 This report has considered the implications of proposals to develop a site in the village of Thurnscoe in the district of Barnsley for residential use.

6.1.2 The report has made a number of conclusions, namely:

- The proposed development fully accords with local and national transport planning policy.
- The site is highly accessible by sustainable modes of travel. There is extensive provision for pedestrians within the locality of the site, bus services operate within close proximity of the site and Thurnscoe Train Station is located within walking distance.
- The proposed site access arrangement will provide a safe and efficient access arrangement for both pedestrians and vehicles. In addition the proposed improved bridge will improve accessibility in the vicinity of the site for all road users.
- Capacity assessments indicate that the local highway network will operate well within capacity following the opening of the development.
- The existing highway infrastructure is sufficient to cater for the proposed additional development.

6.1.3 As such, there should be no objections to the proposed development on highways and transportation grounds.

PLANS



Barnsley MBC

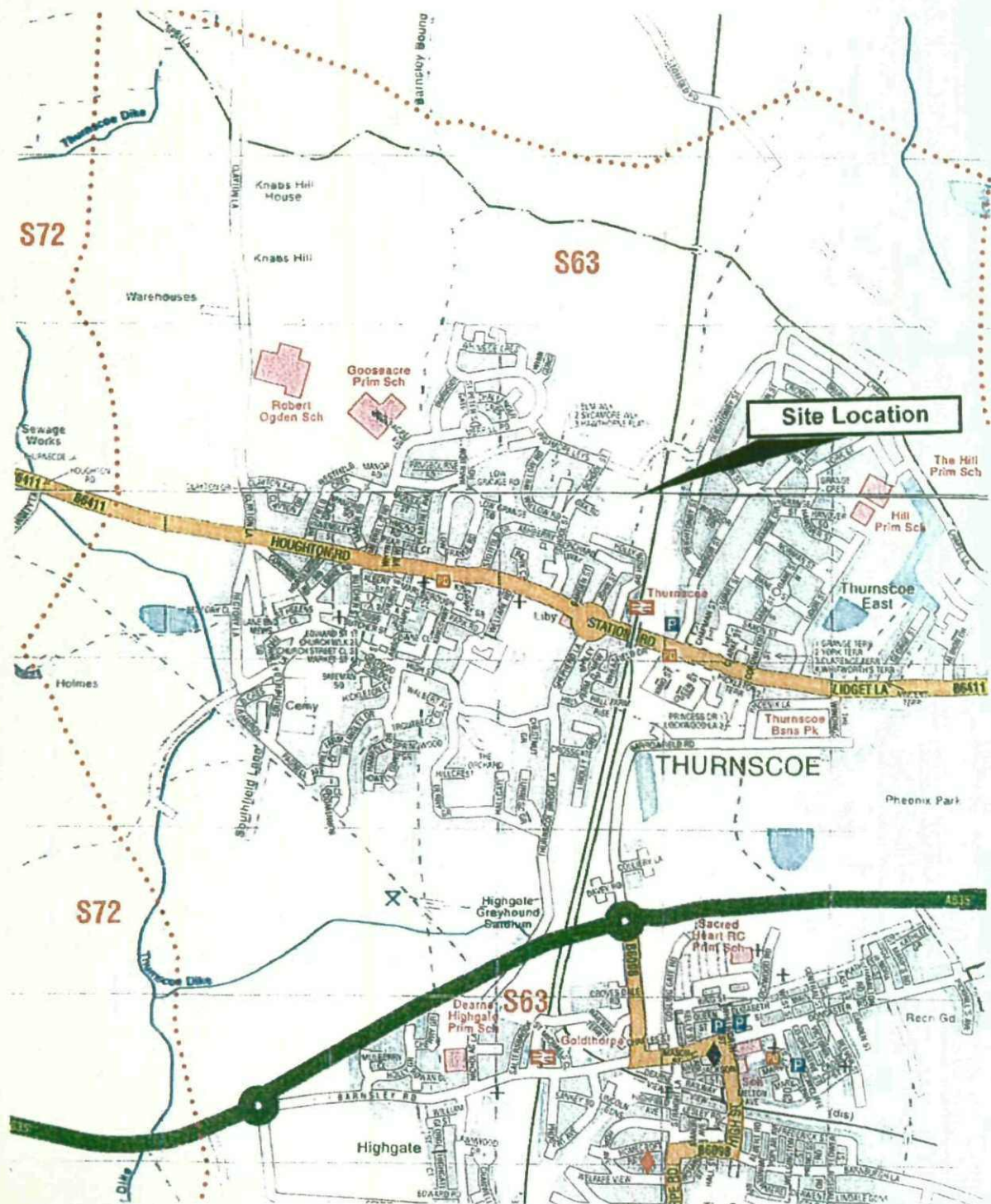
Thurnscoe
Site Location

SAVELL BIRD & AXON

4th Floor, Croxley House,
14 Lloyd St, Manchester, M2 5ND
Tel: 0161 835 2400,
Fax: 0161 835 3400
email: sba@sbax-man.co.uk
web: www.sbax-man.co.uk

DRAWN: CP	DATE: July 06	CHECKED: IEI	DATE: July 06	SCALE: 1:50000
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DRAWING NUMBER: N60745/01	REVISION:
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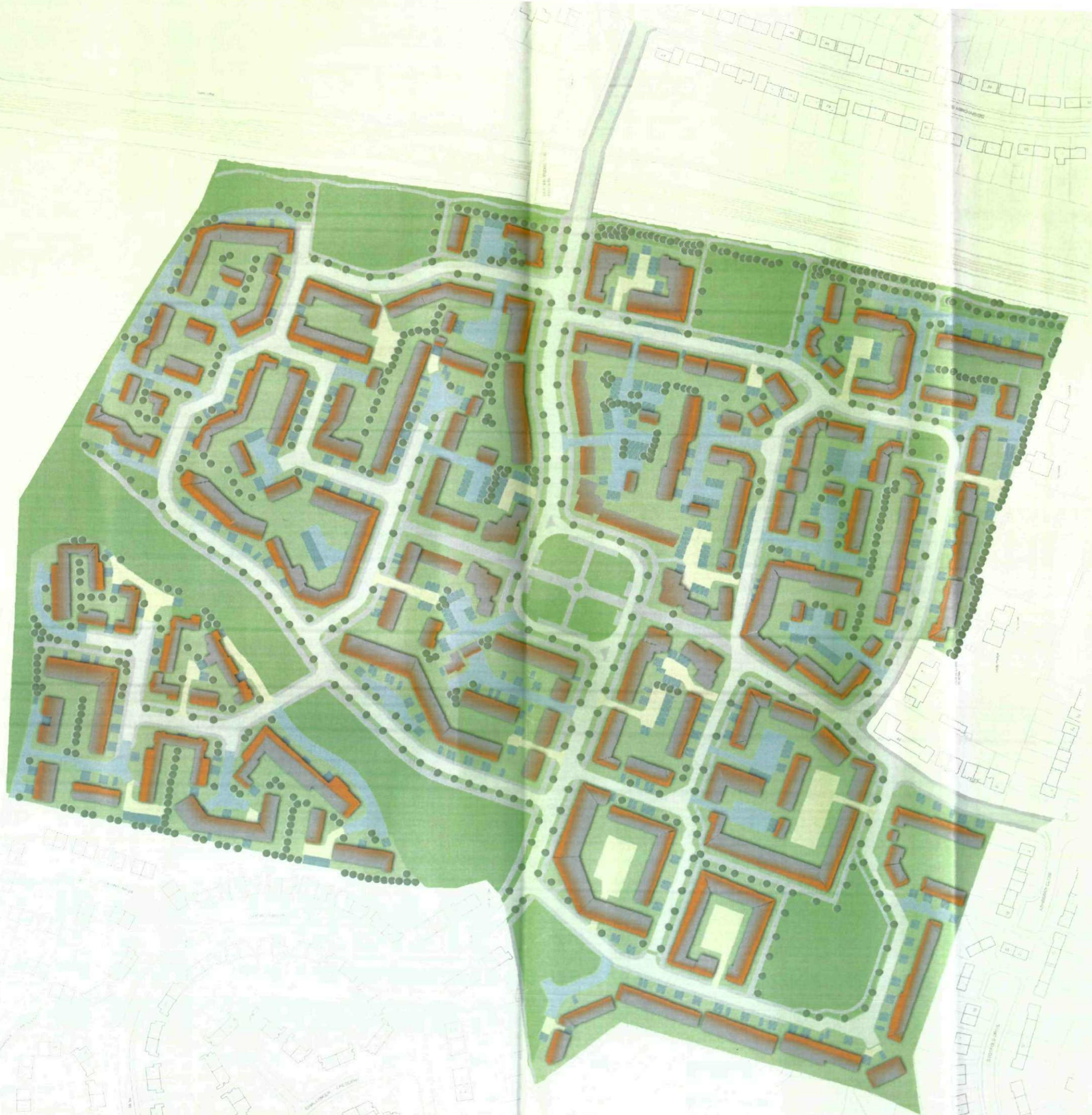
Barnsley MBC

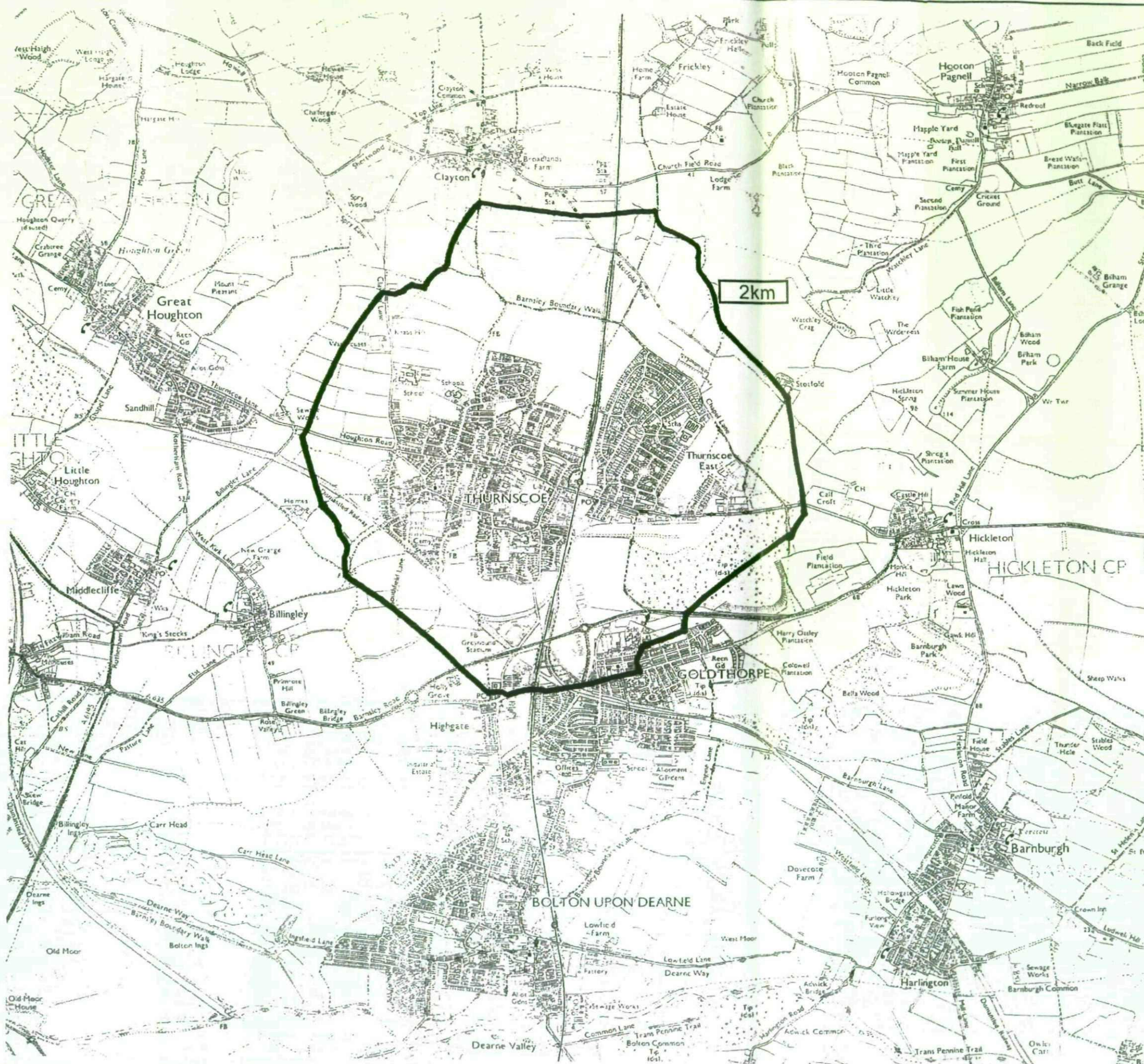
Thurnscoe
Site Location (Local Context)

SAVELL BIRD & AXON

4th Floor, Croxley House,
14 Lloyd St, Manchester, M2 5ND
Tel: 0161 835 2400,
Fax: 0161 835 3400
email: sba@sbax-man.co.uk
web: www.sbx-man.co.uk

DRAWN CP	DATE July 06	CHECKED IEI	DATE July 06	SCALES N.T.S.	DRAWING NUMBER N60745/02	REVISION
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Notes:

Plan 4

REV.	DETAILS	DRAWN	CHECKED	DATE

CLIENT:

Barnsley MBC

PROJECT:

Thurnscoe

DRAWING TITLE:

2km Pedestrian Catchment

SCALE:

1:25000

DRAWN:

CP

CHECKED:

PJW

DATE:

April 06

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4th Floor, Croxley House,
14 Lloyd St, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400
email: sba@sbax-man.co.uk
web: www.sbax-man.co.uk

DRAWING NUMBER:

N60745

REVISION:



Notes:

Plan 5

REV	DETAILS	DRAWN	CHECKED	DATE

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Barnsley MBC

PROJECT:
Thurnscoe

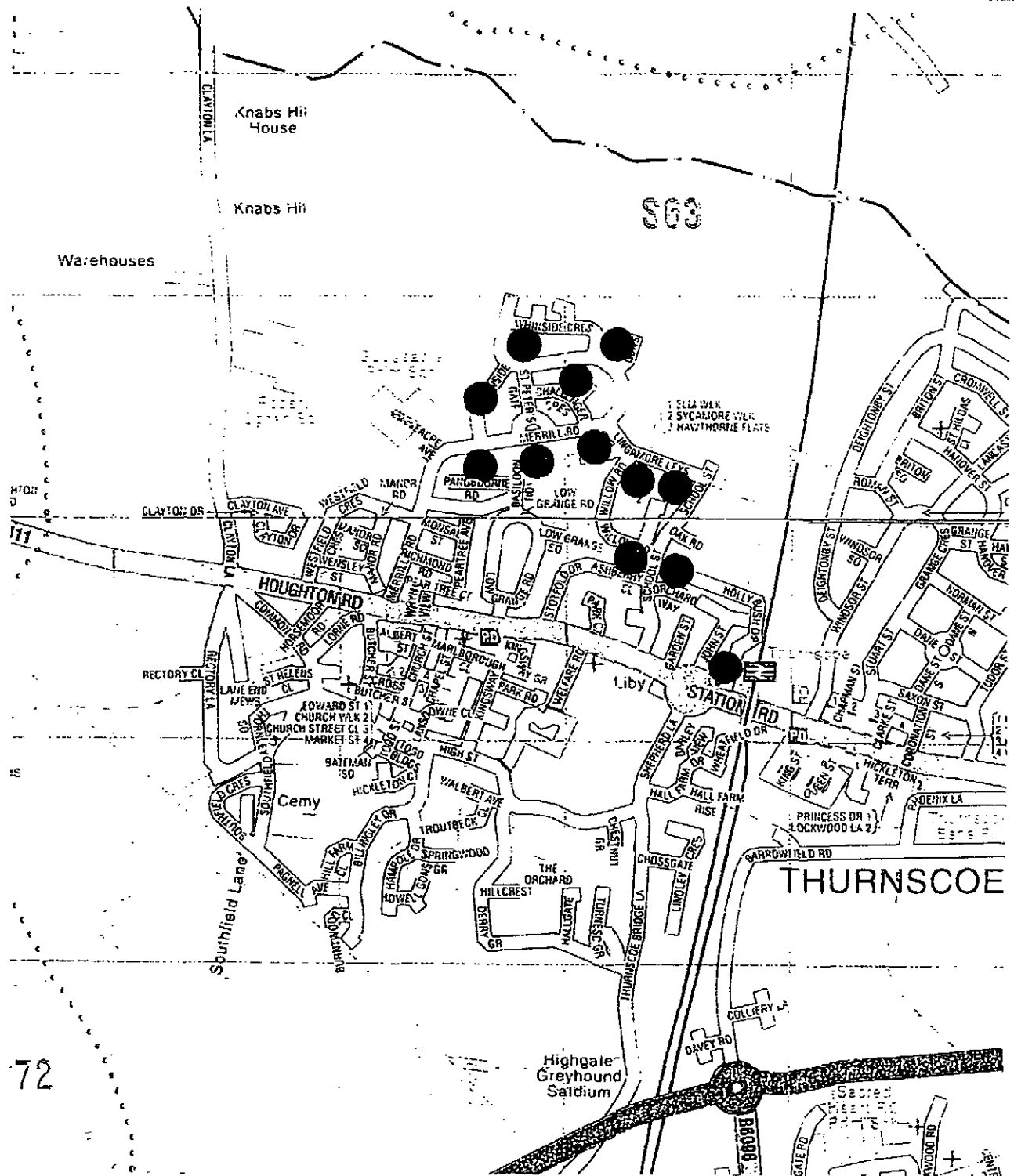
DRAWING TITLE:
5km Cycle Catchment

SCALE:
1:50000

DRAWN: CP CHECKED: PJW DATE: April 06

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email: sba@sba-man.co.uk
web: www.sba-man.co.uk

DRAWING NUMBER: **N60745** REVISION: .



Bus Stop Locations ●

Barnsley MBC

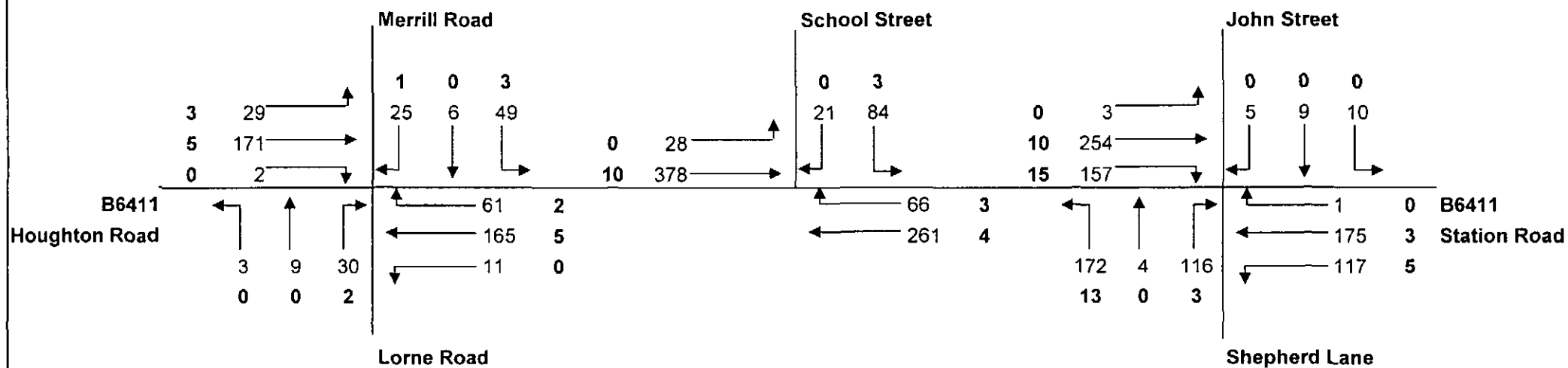
Thurnscoe Bus Stop Location Plan

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4th Floor, Croxley House,
14 Lloyd St, Manchester, M2 5ND
Tel: 0161 835 2400,
Fax: 0161 835 3400
email: sba@sba-man.co.uk
web: www.sba-man.co.uk

DRAWN	DATE	CHECKED	DATE	SCALE	DRAWING NUMBER	REVISION
CP	July 06	IEI	July 06	N.T.S.	N60745/06	

FIGURES



XX Lights
XX Heavies

Figure 1 - 2006 Survey Flows, AM Peak (08:00-09:00)

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14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

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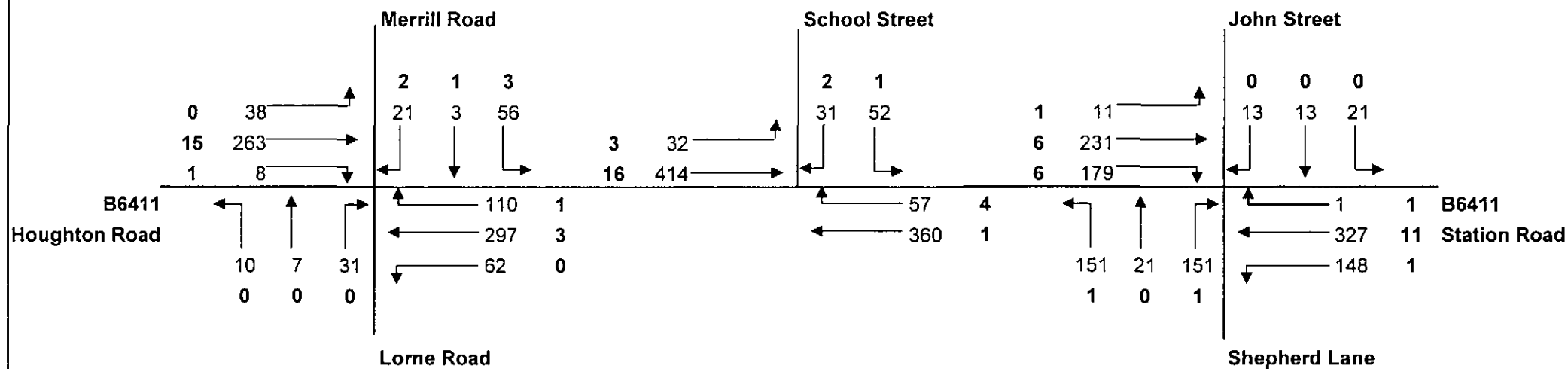


Figure 2 - 2006 Survey Flows, PM Peak (16:30-17:30) Number of Vehicles

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Email: sba@sbax-man.co.uk

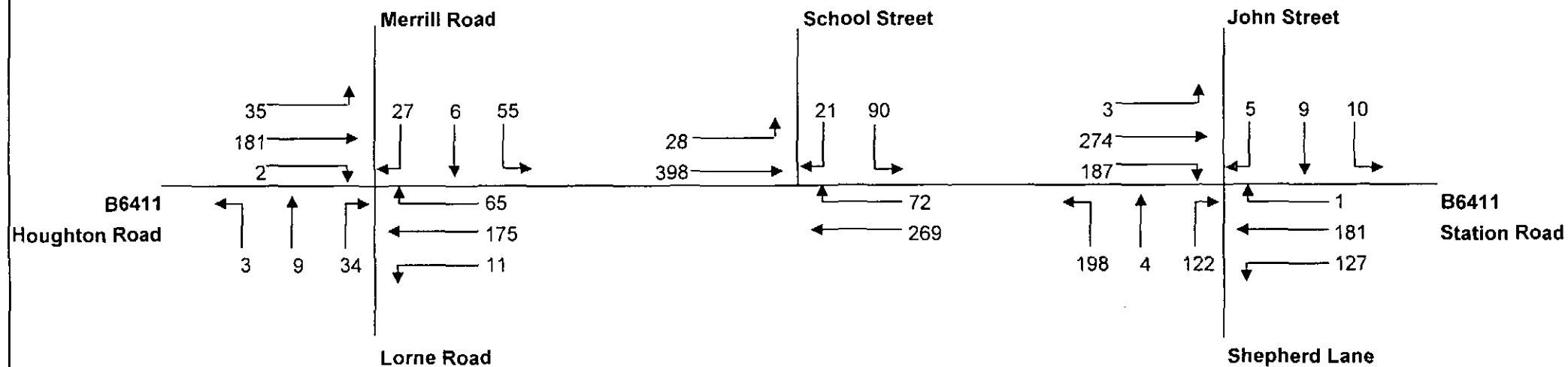


Figure 3 - 2006 Survey Flows, AM Peak (08:00-09:00) PCUs

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 14 Lloyd Street, Manchester, M2 5ND
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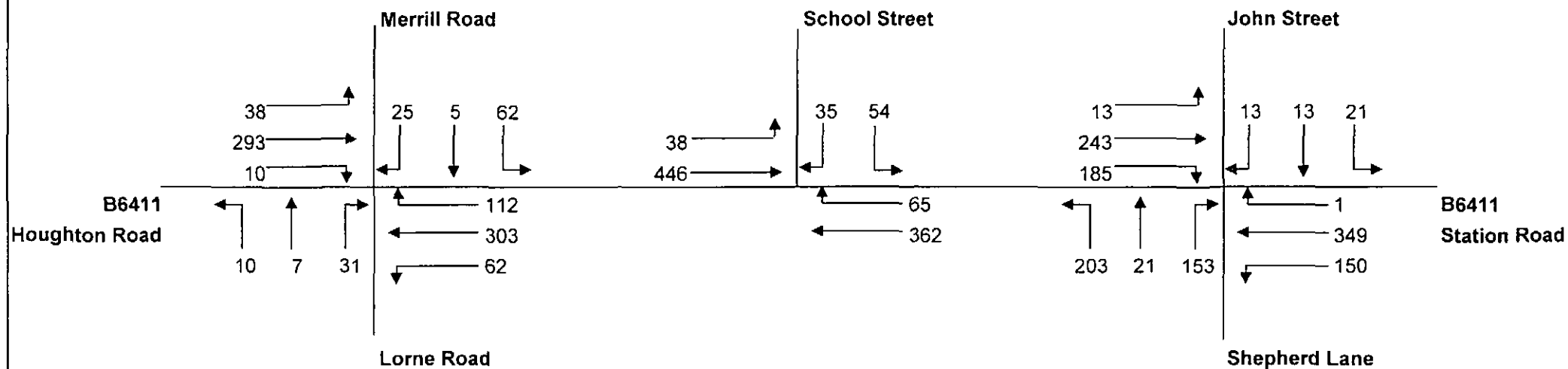


Figure 4 - 2006 Survey Flows, PM Peak (16:30-17:30) PCUs

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4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

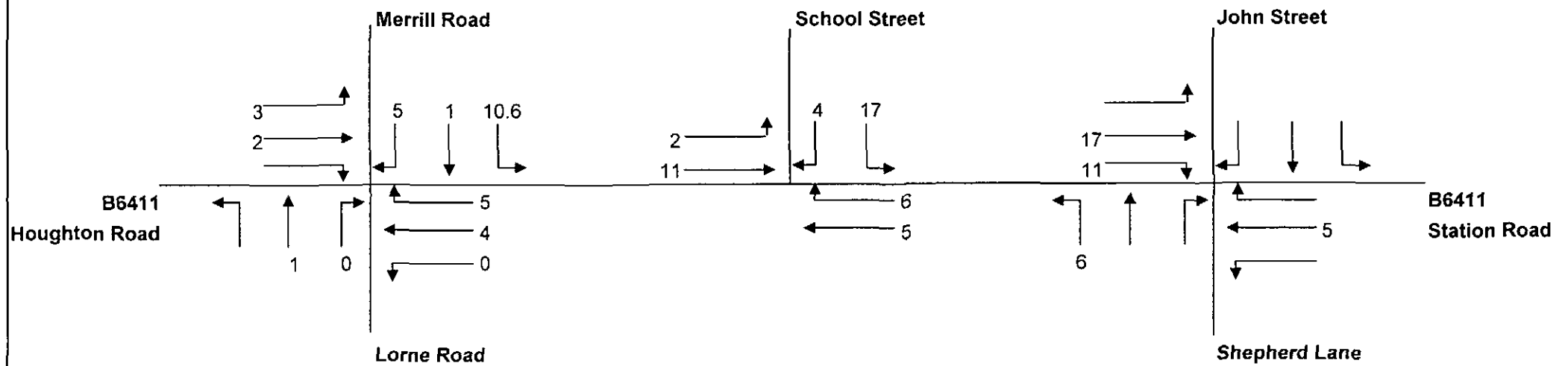


Figure 5 - Traffic Forecast to be Generated by Units Scheduled for Demolition, AM Peak (08:00-09:00)

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 14 Lloyd Street, Manchester, M2 5ND
 Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sba-man.co.uk

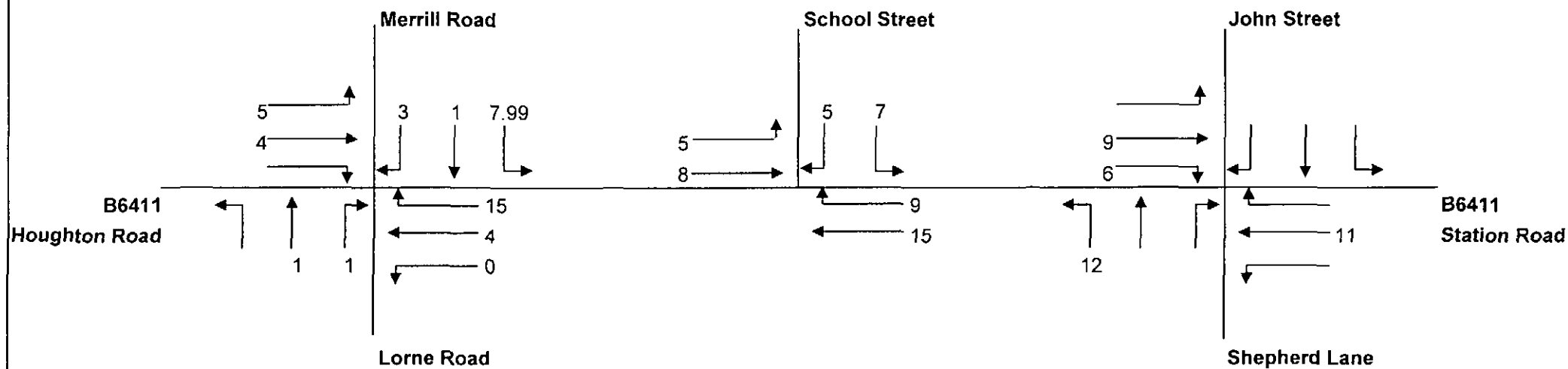


Figure 6 - Traffic Forecast to be Generated by Units Scheduled for Demolition, PM Peak (16:30-17:30)

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 14 Lloyd Street, Manchester, M2 5ND
 Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

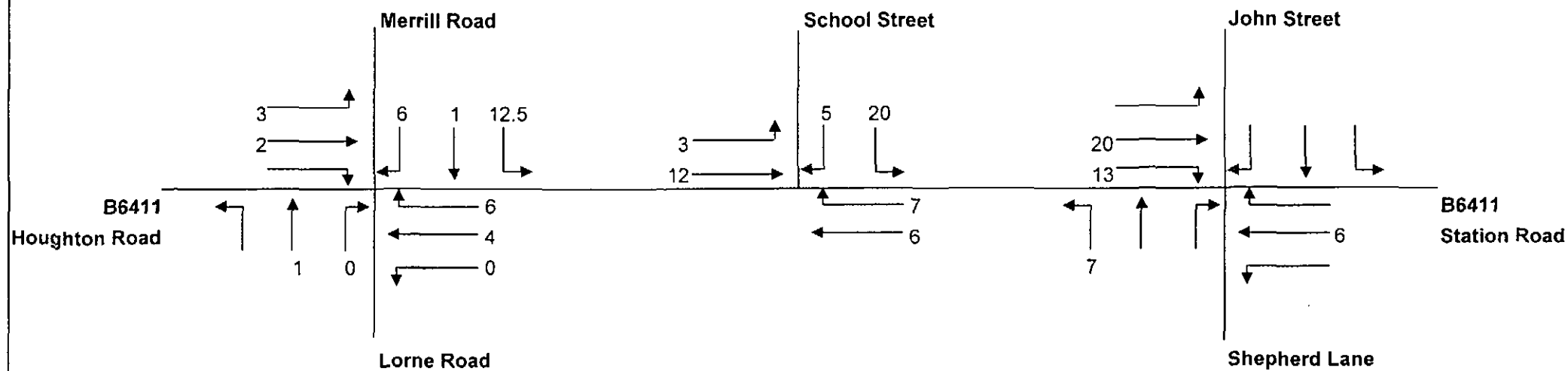


Figure 7 - Traffic Which Could Potentially be Generated by Units Scheduled for Demolition, AM Peak (08:00-09:00)

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Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

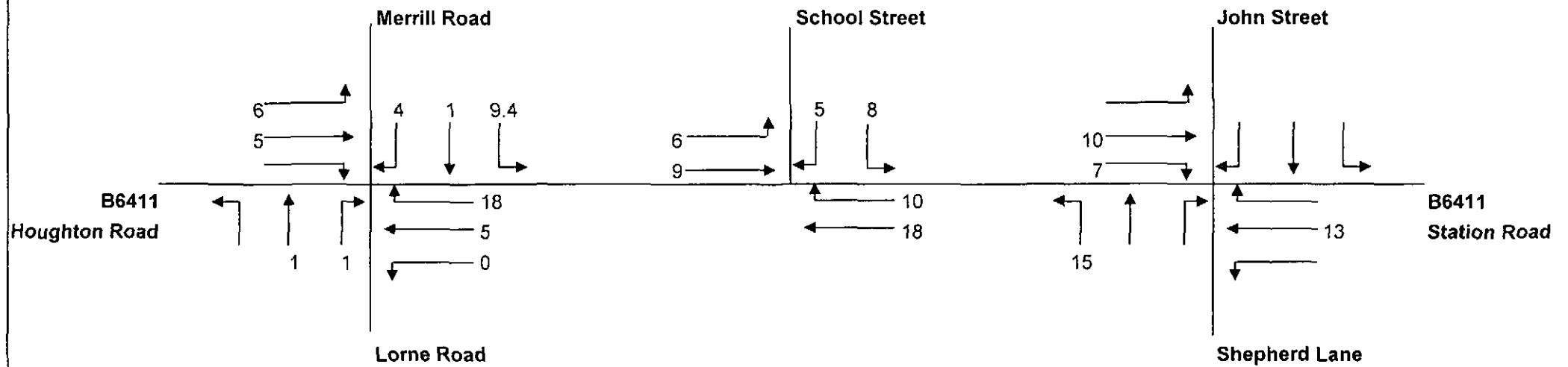


Figure 8 - Traffic Which Could Potentially be Generated by Units Scheduled for Demolition, PM Peak (16:30-17:30)

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Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

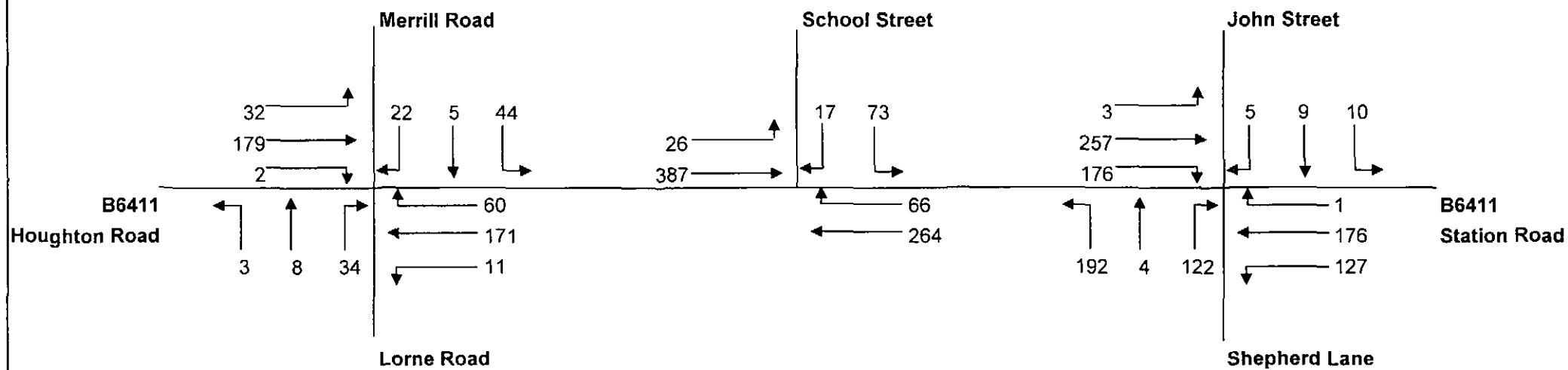


Figure 9 - Survey Flows Minus Existing Development, AM Peak (08:00-09:00)

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 14 Lloyd Street, Manchester, M2 5ND
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Email: sba@sbax-man.co.uk

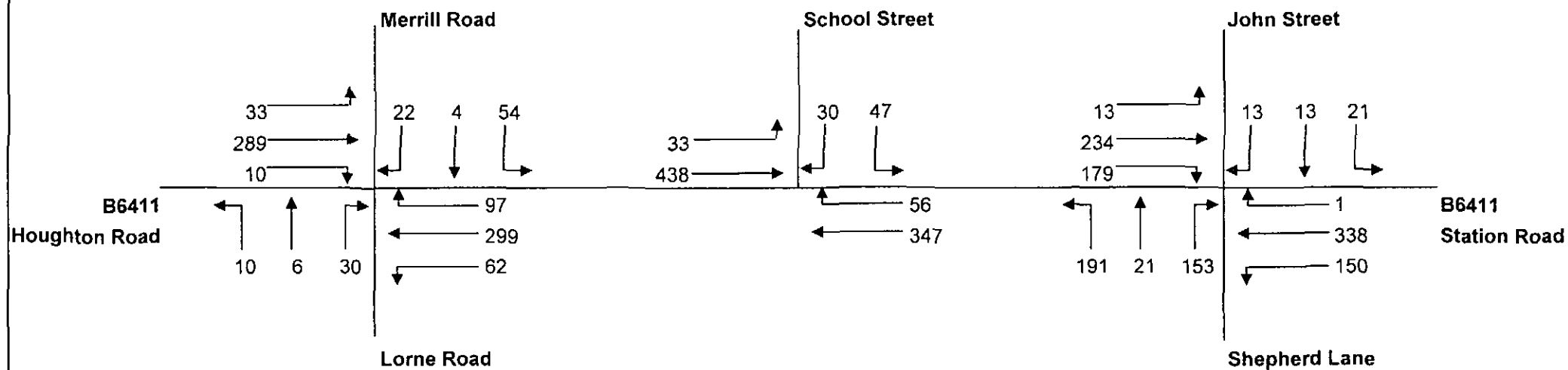
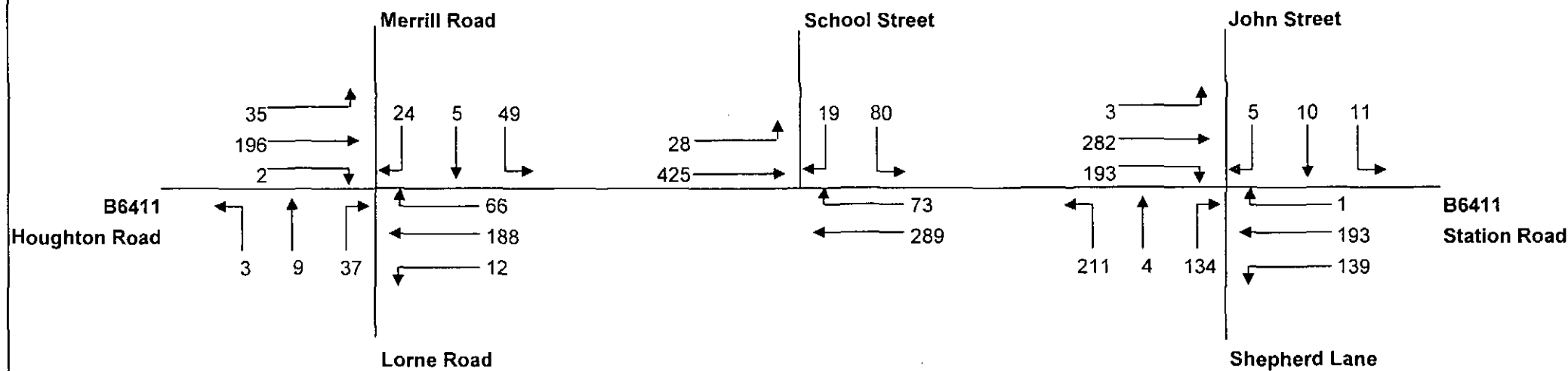


Figure 10 - Survey Flows Minus Existing Development, PM Peak (16:30-17:30)

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Traffic & Transport Consultants
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Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk



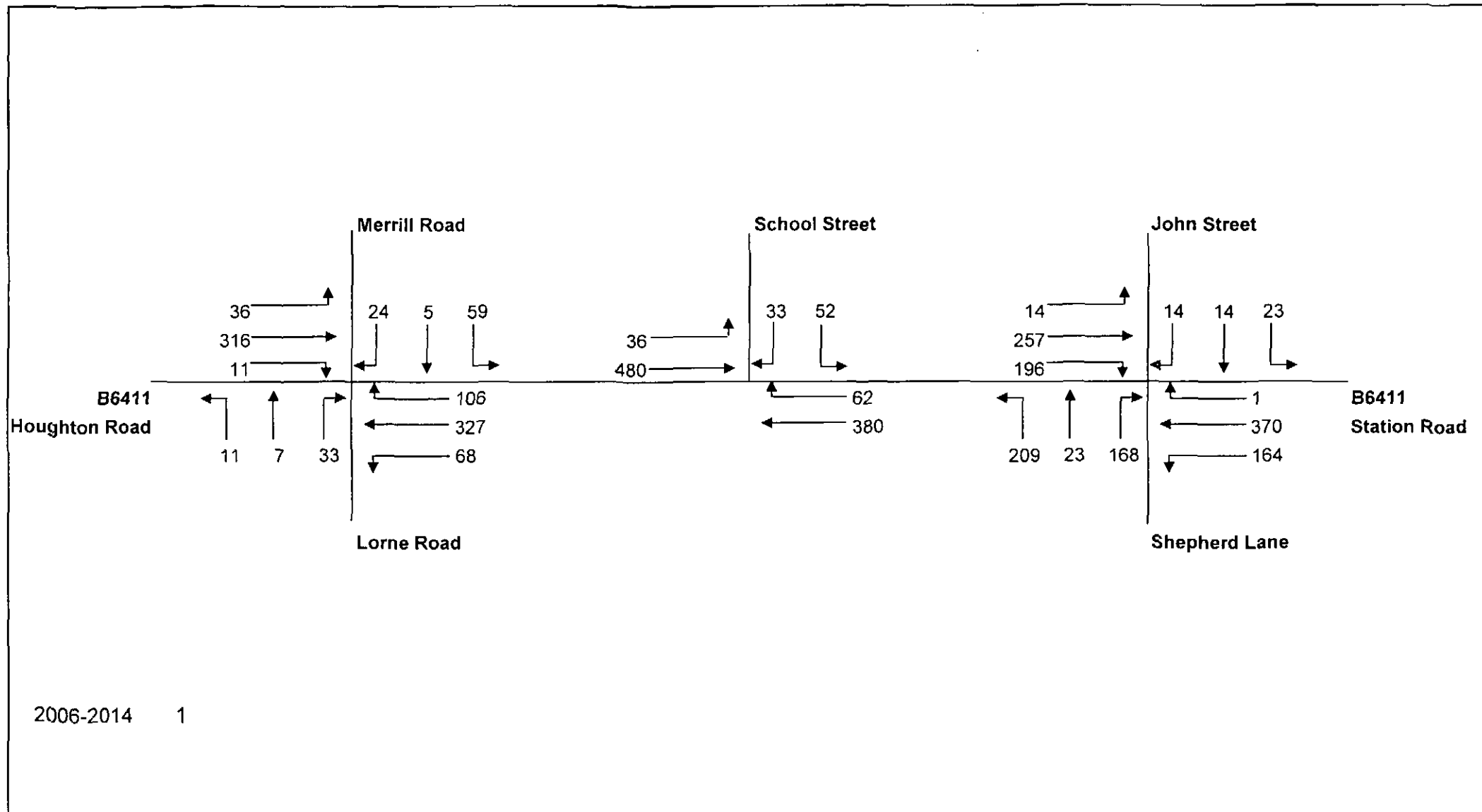
2006-2014 1

Figure 11 - 2014 Factored Survey Flows, AM Peak (08:00-09:00)

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Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk



2006-2014 1

Figure 12 - 2014 Factored Survey Flows, PM Peak (16:30-17:30)

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Email: sba@sbax-man.co.uk

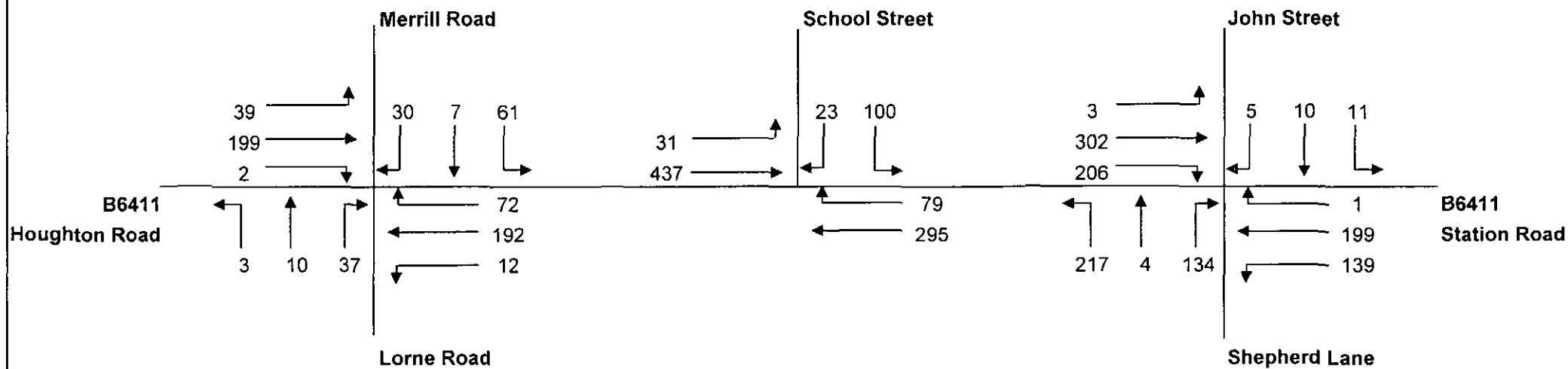


Figure 13 - 2014 Base Flows, AM Peak (08:00-09:00)

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Traffic & Transport Consultants
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 14 Lloyd Street, Manchester, M2 5ND
 Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

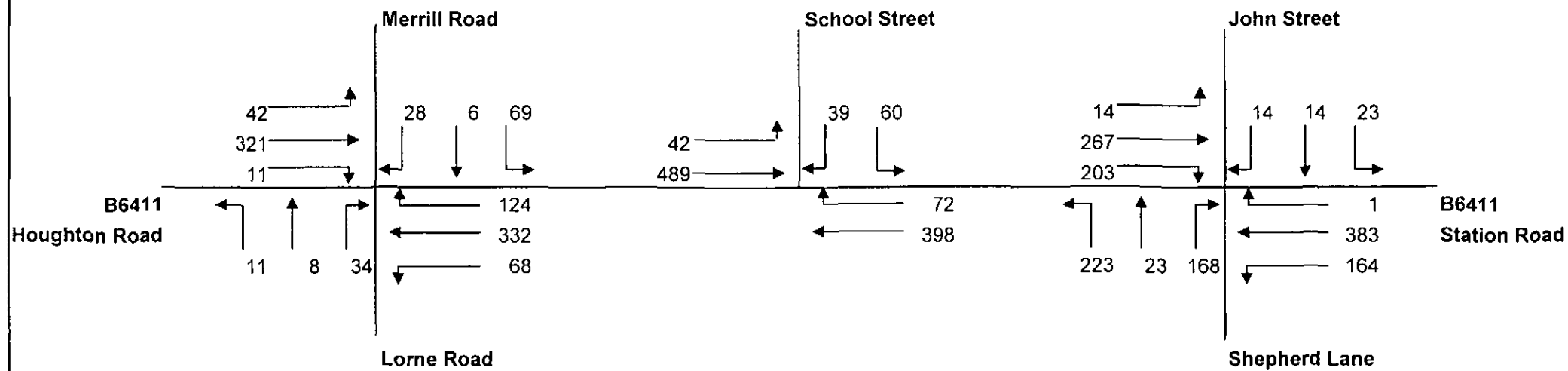


Figure 14 - 2014 Base Flows, PM Peak (16:30-17:30)

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14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

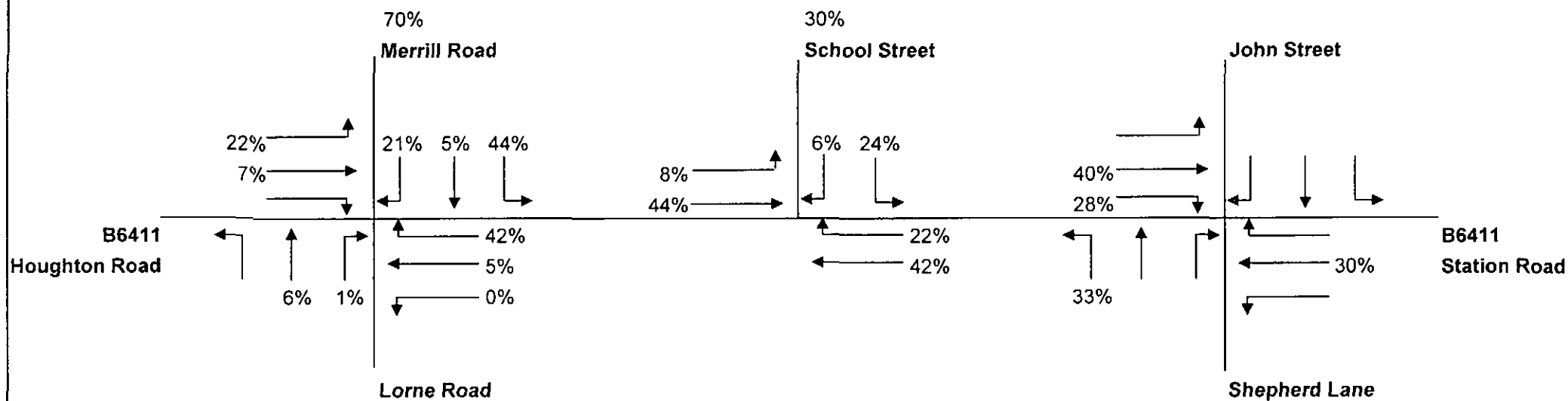


Figure 15 - Distribution of Traffic Forecast to be Generated by the Proposed Development, AM Peak (08:00-09:00)

Savell Bird & Axon

Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

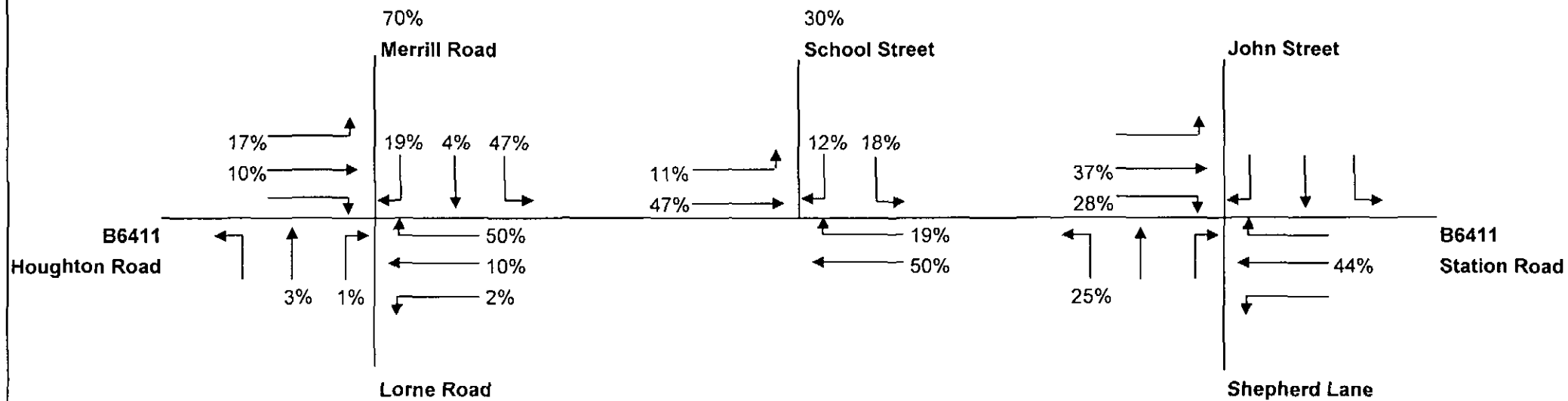


Figure 16 - Distribution of Traffic Forecast to be Generated by the Proposed Development, PM Peak (16:30-17:30)

Savell Bird & Axon

Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbox-man.co.uk

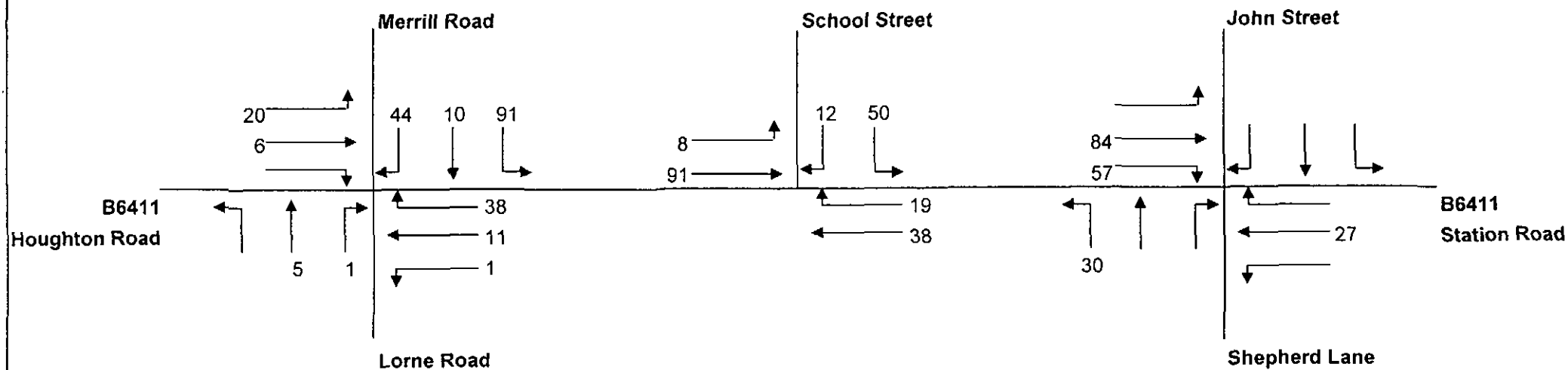


Figure 17 - Development Generated Trips, AM Peak (08:00-09:00)

Savell Bird & Axon

Traffic & Transport Consultants
 4th Floor, Croxley House
 14 Lloyd Street, Manchester, M2 5ND
 Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

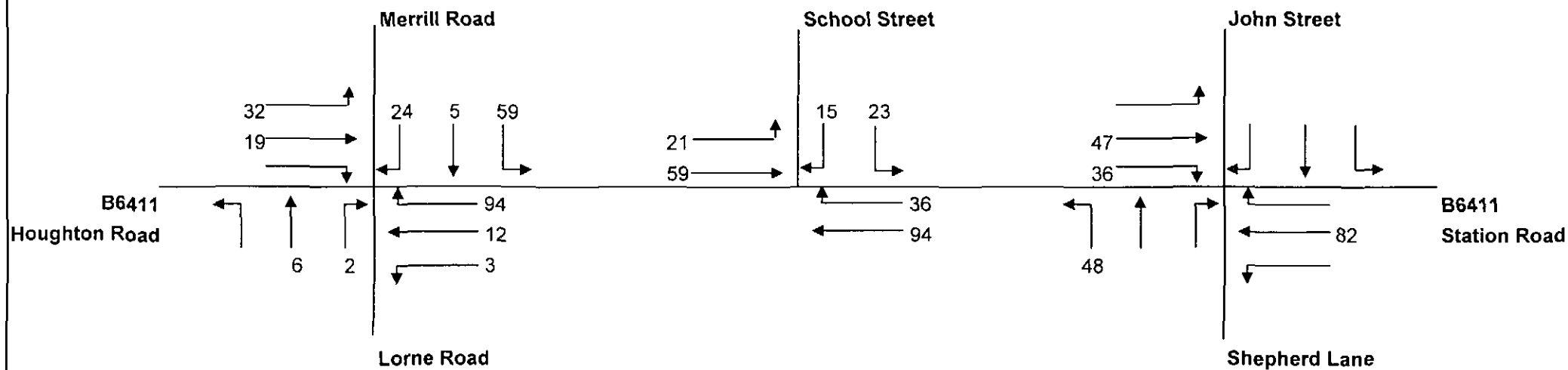


Figure 18 - Development Generated Trips, PM Peak (16:30-17:30)

Savell Bird & Axon

Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

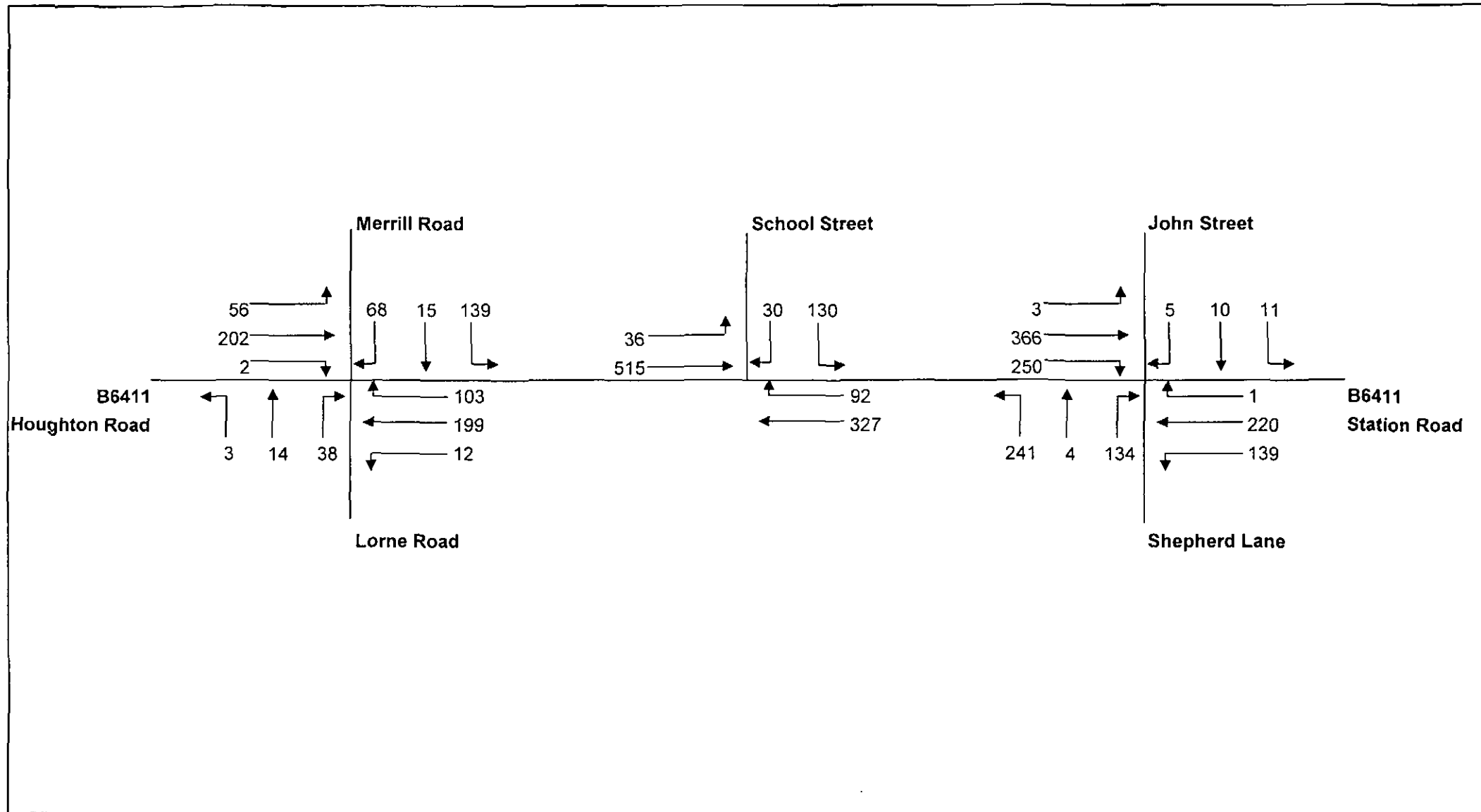


Figure 19 - 2014 Assessment Flows, AM Peak (08:00-09:00)

Savell Bird & Axon

Traffic & Transport Consultants
 4th Floor, Croxley House
 14 Lloyd Street, Manchester, M2 5ND
 Tel: 0161 835 2400, Fax: 0161 835 3400
 Email: sba@sbax-man.co.uk

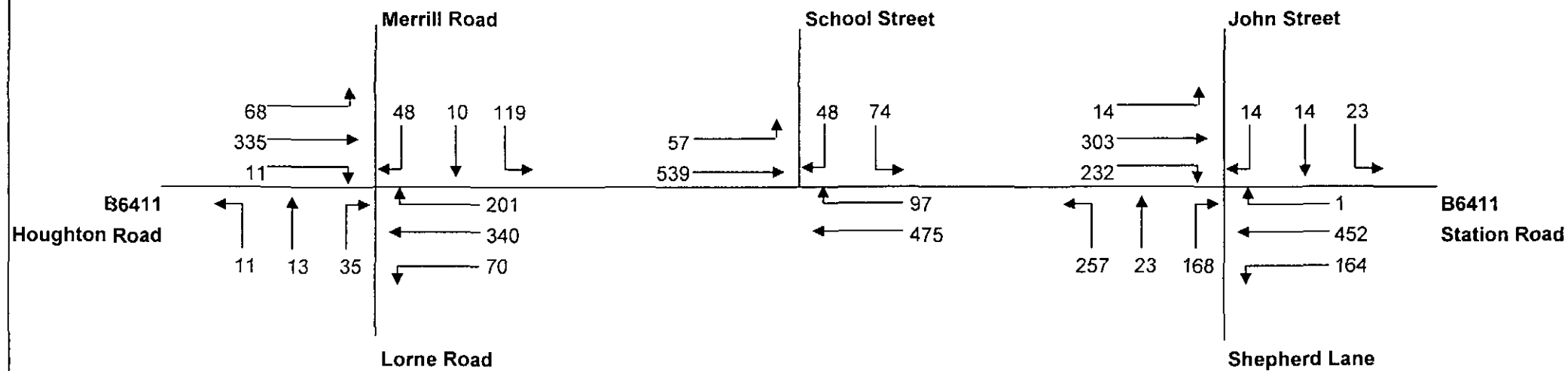


Figure 20 - 2014 Assessment Flows, PM Peak (16:30-17:30)

Savell Bird & Axon

Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

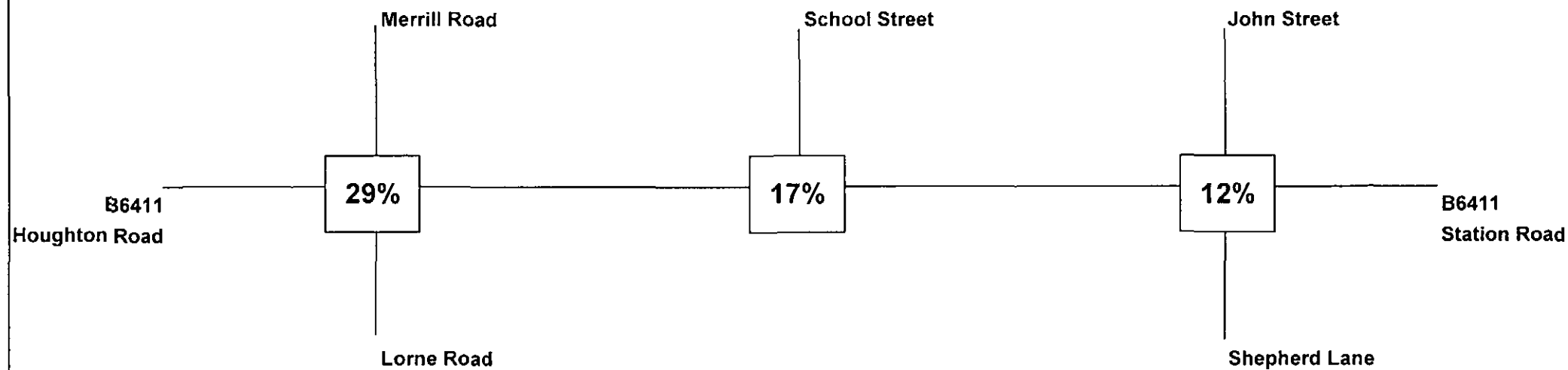


Figure 21 - Percentage Impact Assessment, AM Peak (08:00-09:00)

Savell Bird & Axon

Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sba-man.co.uk

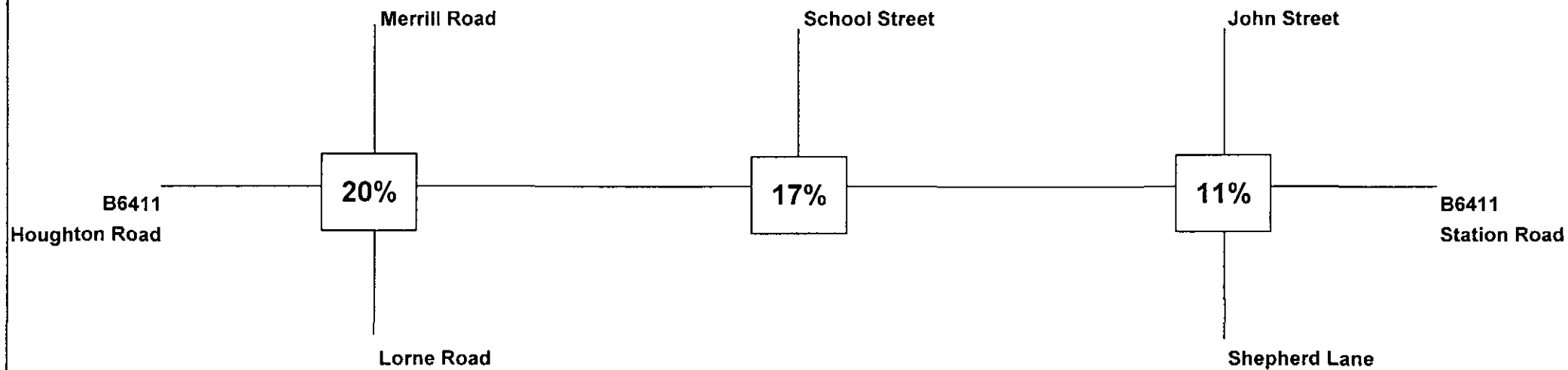


Figure 22 - Percentage Impact Assessment, PM Peak (16:30-17:30)

Savell Bird & Axon

Traffic & Transport Consultants
4th Floor, Croxley House
14 Lloyd Street, Manchester, M2 5ND
Tel: 0161 835 2400, Fax: 0161 835 3400

Email: sba@sbax-man.co.uk

APPENDICES

Appendix 1

Traffic Survey Data

Report Date: Tue, 30 May, 2006 07:31:04

Serial Number:	1190	County Number:	1000
Site Number:	60076 - 20060076	Count Type:	TURNING
Census Number:	1000	Weather:	Not Entered
Approach Dir From:	Leaving Thurnscoe	Period:	07:00 to 19:00
Start Date:	03/05/06	Last Entry:	18:59
Count Start:	Wed, 07:23		

	Into Estate A1						To Station Road A2						To Goldthorpe A3					
	<----- LEFT ----->						<----- AHEAD ----->						<----- RIGHT ----->					
TIME	MCL	CAR	LGV	GV1	GV2	BUS	MCL	CAR	LGV	GV1	GV2	BUS	MCL	CAR	LGV	GV1	GV2	BUS
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	1	0	0	0	0	0	41	10	1	0	1	1	44	2	2	0	0
07:45	0	0	0	0	0	0	0	48	11	3	0	0	1	32	3	1	0	3
Hr/Total	0	1	0	0	0	0	0	89	21	4	0	1	2	76	5	3	0	3
08:00	0	0	0	0	0	0	1	43	7	1	0	1	0	42	6	5	0	1
08:15	0	0	0	0	0	0	1	39	9	5	0	0	0	41	9	1	0	1
08:30	0	1	0	0	0	0	0	57	7	1	0	0	0	38	3	3	0	3
08:45	0	1	0	0	0	0	1	76	13	0	0	2	0	26	6	2	0	2
Hr/Total	0	2	0	0	0	0	3	215	36	7	0	3	0	147	24	11	0	7
09:00	0	1	0	0	0	0	1	44	6	2	0	0	0	31	3	2	0	1
09:15	0	2	0	0	0	0	0	45	4	3	0	0	1	24	1	0	1	2
09:30	0	0	0	0	0	0	0	54	4	5	0	1	0	23	3	1	0	2
09:45	0	0	0	0	0	0	0	47	5	0	0	1	0	26	5	0	1	1
Hr/Total	0	3	0	0	0	0	1	190	19	10	0	2	1	104	12	3	2	6
10:00	0	3	0	0	0	0	0	41	7	2	0	0	0	30	4	2	0	1

10:15	0	1	0	0	0	0	1	41	6	3	0	0	2	28	6	0	0	1
10:30	0	0	0	0	0	0	1	35	8	2	0	0	0	18	5	0	0	2
10:45	0	1	0	1	0	0	1	44	4	0	0	1	0	21	3	2	0	0
Hr/Total	0	5	0	1	0	0	3	161	25	7	0	1	2	97	18	4	0	4
11:00	0	1	0	0	0	0	0	49	5	1	1	0	0	32	2	2	0	0
11:15	0	2	0	0	0	0	1	35	8	2	0	0	0	30	3	3	0	2
11:30	0	2	0	0	0	0	1	38	10	2	0	0	0	33	2	0	0	0
11:45	0	3	0	0	0	0	0	61	6	3	1	0	0	28	3	0	0	1
Hr/Total	0	8	0	0	0	0	2	183	29	8	2	0	0	123	10	5	0	3
12:00	0	2	0	0	0	0	0	31	6	1	0	0	0	28	3	0	0	1
12:15	0	0	0	0	0	0	0	39	8	2	0	0	1	31	4	1	0	1
12:30	0	3	0	0	0	0	1	38	6	1	0	0	0	25	6	1	0	1
12:45	0	0	0	0	0	0	2	37	12	2	0	1	0	30	3	0	0	1
Hr/Total	0	5	0	0	0	0	3	145	32	6	0	1	1	114	16	2	0	4
13:00	0	4	0	0	0	0	1	49	3	0	0	0	0	31	3	0	0	2
13:15	0	1	0	0	0	0	1	32	4	3	0	0	0	27	4	0	0	2
13:30	0	1	0	0	0	0	2	32	5	2	0	2	0	22	3	1	0	0
13:45	0	2	0	0	0	0	1	48	5	4	1	1	0	20	2	0	0	1
Hr/Total	0	8	0	0	0	0	5	161	17	9	1	3	0	100	12	1	0	5
14:00	0	5	1	0	0	0	0	43	5	5	0	0	1	17	1	3	0	1
14:15	1	3	0	0	0	0	1	30	8	1	0	0	0	29	0	1	0	1
14:30	0	1	0	0	0	0	2	43	8	1	0	0	1	26	4	4	0	0
14:45	0	3	0	0	0	0	0	42	6	0	0	1	1	35	1	1	0	2
Hr/Total	1	12	1	0	0	0	3	158	27	7	0	1	3	107	6	9	0	4
15:00	0	3	0	0	0	0	2	59	5	5	1	0	1	22	6	0	0	1
15:15	0	0	1	0	0	0	0	57	11	2	0	0	0	37	2	0	0	2
15:30	0	3	1	0	0	0	0	33	6	2	0	0	0	28	3	0	0	2
15:45	0	0	0	0	0	0	1	48	8	2	0	2	1	35	3	0	0	2

Hr/Total	0	6	2	0	0	0	3	197	30	11	1	2	2	122	14	0	0	7
16:00	0	2	0	0	0	0	1	61	11	1	0	1	0	36	2	0	0	0
16:15	1	2	1	0	0	0	2	43	11	1	0	0	1	33	5	0	1	2
16:30	0	2	0	0	0	0	0	63	7	4	0	0	0	42	2	0	0	2
16:45	0	3	1	1	0	0	0	54	9	1	0	0	0	39	7	0	0	0
Hr/Total	1	9	2	1	0	0	3	221	38	7	0	1	1	150	16	0	1	4
17:00	0	1	0	0	0	0	0	54	8	1	0	0	0	28	7	2	1	2
17:15	0	5	0	0	0	0	4	42	9	3	0	0	0	41	3	0	0	1
17:30	0	1	0	0	0	0	1	45	5	1	0	0	0	51	3	0	0	0
17:45	0	0	0	0	0	0	5	51	7	1	0	1	0	35	2	1	0	1
Hr/Total	0	7	0	0	0	0	10	192	29	6	0	1	0	155	15	3	1	4
18:00	0	2	0	0	0	0	2	50	2	0	1	1	0	33	1	1	0	0
18:15	0	4	0	0	0	0	3	36	5	0	0	0	0	38	3	0	0	1
18:30	0	6	0	0	0	0	1	39	6	0	0	0	1	24	1	0	0	0
18:45	0	2	0	0	0	0	3	34	0	1	0	1	1	29	2	1	0	1
Hr/Total	0	14	0	0	0	0	9	159	13	1	1	2	2	124	7	2	0	2
Total	2	80	5	2	0	0	45	2071	316	83	5	18	14	1419	155	43	4	53

Report Date: Tue, 30 May, 2006 07:31:54

Serial Number:	1190	County Number:	1000
Site Number:	60077 - 20060077	Count Type:	TURNING
Census Number:	1000	Weather:	Not Entered
Approach Dir From:	WEST	Period:	07:00 to 19:00
Start Date:	03/05/06	Last Entry:	18:50
Count Start:	Wed, 07:01		

A1 Out of Merril Rd Left

A2 Out of Merril Rd Straight

A3 Out of Merril Rd Right

	<----- LEFT ----->						<----- AHEAD ----->						<----- RIGHT ----->					
TIME	MCL	CAR	LGV	GV1	GV2	BUS	MCL	CAR	LGV	GV1	GV2	BUS	MCL	CAR	LGV	GV1	GV2	BUS
07:00	0	7	3	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0
07:15	0	5	0	1	0	0	0	0	0	0	0	0	0	4	1	0	0	0
07:30	0	12	2	0	0	0	0	0	0	0	0	0	1	2	5	0	0	0
07:45	0	12	1	0	0	2	0	0	0	0	0	1	0	2	1	0	0	0
Hr/Total	0	36	6	1	0	2	0	1	0	0	0	1	1	8	10	0	0	0
08:00	0	9	1	0	0	0	0	1	0	0	0	0	0	7	1	0	0	1
08:15	0	10	4	2	0	0	0	1	0	0	0	0	0	3	0	0	0	0
08:30	0	13	2	0	0	0	0	1	0	0	0	0	0	7	0	0	0	0
08:45	0	9	1	0	0	1	0	2	1	0	0	0	1	6	0	0	0	0
Hr/Total	0	41	8	2	0	1	0	5	1	0	0	0	1	23	1	0	0	1
09:00	0	28	1	0	0	1	0	0	0	0	0	0	0	11	0	0	0	0
09:15	0	6	1	2	0	1	0	3	0	0	0	0	0	5	3	3	0	1
09:30	0	7	2	0	0	0	0	1	0	0	0	0	0	3	2	1	0	0
09:45	0	10	1	0	0	1	0	1	0	0	0	0	0	8	1	0	0	0
Hr/Total	0	51	5	2	0	3	0	5	0	0	0	0	0	27	6	4	0	1

10:00	0	7	3	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0
10:15	0	8	1	1	0	1	0	1	0	0	0	0	0	4	1	1	0	1
10:30	0	13	1	0	0	0	0	1	0	1	0	0	0	2	1	3	0	0
10:45	0	14	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0
Hr/Total	0	42	6	1	0	1	0	2	0	1	0	0	0	12	3	5	0	1
11:00	1	6	2	2	0	0	0	0	0	0	0	0	0	1	0	1	0	0
11:15	0	14	2	2	0	0	0	0	0	0	0	0	0	2	2	0	0	0
11:30	0	11	0	0	0	0	0	1	0	0	0	1	0	6	0	0	0	1
11:45	0	11	2	0	0	1	0	1	0	0	0	0	0	3	0	1	0	1
Hr/Total	1	42	6	4	0	1	0	2	0	0	0	1	0	12	2	2	0	2
12:00	0	7	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0
12:15	1	10	2	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1
12:30	0	8	2	1	0	0	0	3	0	0	0	0	0	6	0	0	0	0
12:45	0	8	0	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0
Hr/Total	1	33	5	1	0	1	0	4	0	1	0	0	0	17	1	0	0	1
13:00	1	12	1	0	0	0	0	2	0	0	0	0	0	5	0	0	0	0
13:15	0	5	0	0	0	0	0	2	0	0	1	0	0	2	0	0	0	1
13:30	1	8	0	0	0	1	0	1	0	0	0	0	0	6	0	0	0	0
13:45	0	6	2	0	0	1	0	1	0	0	0	0	0	4	0	0	0	0
Hr/Total	2	31	3	0	0	2	0	6	0	0	1	0	0	17	0	0	0	1
14:00	0	11	1	0	0	0	0	1	0	0	0	0	0	6	0	1	0	0
14:15	0	8	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	1
14:30	0	10	1	0	0	0	0	0	0	0	0	0	0	1	4	0	0	0
14:45	0	4	0	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0
Hr/Total	0	33	2	0	0	0	0	2	0	0	0	0	0	18	4	2	0	1
15:00	1	17	1	1	0	1	0	4	0	0	0	0	0	6	0	1	0	0
15:15	0	14	1	1	0	0	0	2	0	0	0	0	0	5	0	0	0	0
15:30	0	10	3	0	0	1	0	1	0	0	0	0	0	6	2	0	0	0

15:45	0	9	0	1	0	0	0	0	0	0	0	0	0	5	0	2	0	1
Hr/Total	1	50	5	3	0	2	0	7	0	0	0	0	0	22	2	3	0	1
16:00	0	13	0	0	0	1	0	2	0	0	0	1	0	9	0	0	0	0
16:15	1	13	1	0	0	1	0	3	0	0	0	0	0	6	0	1	0	1
16:30	0	10	2	1	0	1	0	0	0	0	0	0	0	2	0	1	0	0
16:45	0	19	3	0	0	0	0	0	0	0	0	1	0	7	0	0	0	0
Hr/Total	1	55	6	1	0	3	0	5	0	0	0	2	0	24	0	2	0	1
17:00	0	8	0	0	0	1	0	0	1	0	0	0	0	6	1	0	0	0
17:15	0	12	2	0	0	0	0	1	1	0	0	0	0	4	1	0	0	1
17:30	0	20	2	0	0	0	0	0	0	1	1	0	0	9	0	0	0	0
17:45	0	17	1	0	0	1	0	3	1	0	0	0	0	5	1	0	0	0
Hr/Total	0	57	5	0	0	2	0	4	3	1	1	0	0	24	3	0	0	1
18:00	0	21	0	0	0	0	0	1	0	0	0	0	0	5	0	0	0	0
18:15	0	9	0	0	0	0	0	1	0	0	0	0	0	7	0	0	0	1
18:30	0	9	1	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0
18:45	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hr/Total	0	45	1	0	0	0	0	2	0	0	0	0	0	17	1	0	0	1
Total	6	516	58	15	0	18	0	45	4	3	2	4	2	221	33	18	0	12

[illegible]

	A1 Left out of School Street	A3 Right Out of School Street
Time	MC Car LGV MGV HGV PSV	MC Car LGV MGV HGV PSV
10:30 - 10:45		
10:45 - 11:00		
11:00 - 11:15		
11:15 - 11:30		
11:30 - 11:45		
11:45 - 12:00		
12:00 - 12:15		
12:15 - 12:30		
12:30 - 12:45		
12:45 - 13:00		
13:00 - 13:15		
13:15 - 13:30		
13:30 - 13:45		
13:45 - 14:00		

	A1 Left out of School Street						A3 Right Out of School Street					
Time	MC	Car	LGV	MGV	HGV	PSV	MC	Car	LGV	MGV	HGV	PSV
14:00 - 14:15												
14:15 - 14:30												
14:30 - 14:45												
14:45 - 15:00												
15:00 - 15:15	1	12	2	2				12	1			
15:15 - 15:30		22	2			2		7				
15:30 - 15:45		16				1		5				
15:45 - 16:00		10	1	1		2		2				
16:00 - 16:15		12	2									
16:15 - 16:30		7	4					7	4			
16:30 - 16:45		10	2			1		4				
16:45 - 17:00		9	4					8	2	2		
17:00 - 17:15		14	2					6				
17:15 - 17:30	1	15	4			1	1	5				

[illegible]

	B1 Out of Thurnscoe turning Left into school St	B2 Out of Thurnscoe Straight on Houghton Rd
Time	MC Car LGV MGW HGV PSV	MC Car LGV MGW HGV PSV
7:00 - 7:15		
7:15 - 7:30		
7:30 - 7:45	1	34 3
7:45 - 8:00	2	65 10 2 2
8:00 - 8:15	4	94 8 2 1
8:15 - 8:30	2	72 14 4
8:30 - 8:45	8	82 12 1 1
8:45 - 9:00	13 1	86 10 1
9:00 - 9:15	3	66 5 3 1
9:15 - 9:30	5 4	62 6 3 1
9:30 - 9:45		
9:45 - 10:00		
10:00 - 10:15		
10:15 - 10:30		

[illegible]

	B1 Out of Thurnscoe turning Left into school St						B2 Out of Thurnscoe Straight on Houghton Rd					
Time	MC	Car	LGV	MGV	HGV	PSV	MC	Car	LGV	MGV	HGV	PSV
14:00 - 14:15												
14:15 - 14:30												
14:30 - 14:45												
14:45 - 15:00												
15:00 - 15:15		8					1	97	7	1		2
15:15 - 15:30		6	2				1	79	6	1	2	
15:30 - 15:45		4						84	9	1	3	3
15:45 - 16:00	2	7	4	1			1	90	14	3	1	2
16:00 - 16:15		6					2	82	21			
16:15 - 16:30		8	2			1	3	76	8		1	2
16:30 - 16:45		2		1				97	12	1	3	1
16:45 - 17:00		14	2	2				91	19	6		
17:00 - 17:15			6					86	16		1	2
17:15 - 17:30		1	7				2	79	12	1	1	

[illegible]

[illegible]

10:30 - 10:45

10:45 - 11:00

11:00 - 11:15

11:15 - 11:30

11:30 - 11:45

11:45 - 12:00

12:00 - 12:15

12:15 - 12:30

12:30 - 12:45

12:45 - 13:00

13:00 - 13:15

13:15 - 13:30

13:30 - 13:45

13:45 - 14:00

14:00 - 14:15												
14:15 - 14:30												
14:30 - 14:45												
14:45 - 15:00												
15:00 - 15:15		87	11	2		1	1	6				
15:15 - 15:30	2	112	6		1	1		13				
15:30 - 15:45		86	13	5		1		10				1
15:45 - 16:00	2	93	10	6		3		9	2	2		1
16:00 - 16:15	2	80	14	2				7	4			
16:15 - 16:30	1	58	6	2	1	2		9	3	1		
16:30 - 16:45	2	67	12	1				10	4			
16:45 - 17:00	2	80	20	1				11	3			3
17:00 - 17:15		88	13					14				
17:15 - 17:30		68	8			1		14	1			1

[illegible]

Appendix 2

TRICS Output: Residential Development

SBA Lloyd Street Manchester

Licence No: 711102

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : M - MIXED PRIVATE/NON-PRIVATE HOUSING
VEHICLES

Selected regions and areas:

02	SOUTH EAST	
	ES EAST SUSSEX	1 days
	HF HERTFORDSHIRE	2 days
	WS WEST SUSSEX	1 days
06	WEST MIDLANDS	
	WO WORCESTERSHIRE	2 days
08	NORTH WEST	
	LC LANCASHIRE	1 days
09	NORTH	
	CB CUMBRIA	2 days
	DH DURHAM	1 days
10	WALES	
	WR WREXHAM	1 days
11	SCOTLAND	
	AD ABERDEEN CITY	1 days
	HI HIGHLAND	3 days
14	REPUBLIC OF IRELAND	
	IR REPUBLIC OF IRELAND	1 days

Main parameter selection:

Parameter: Number of households
Range: 32 to 1874 (units:)

Date Range: 01/01/97 to 20/06/05

Selected survey days:

Monday	5 days
Tuesday	4 days
Wednesday	4 days
Thursday	2 days
Friday	1 days

Selected survey types:

Manual count	13 days
Directional ATC Count	3 days

TRIP RATE for Land Use 03 - RESIDENTIAL/M - MIXED PRIVATE/NON-PRIVATE HOUSING
VEHICLES

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	3	62	0.01	3	62	0.00	3	62	0.01
01:00 - 02:00	3	62	0.02	3	62	0.01	3	62	0.03
02:00 - 03:00	3	62	0.01	3	62	0.00	3	62	0.01
03:00 - 04:00	3	62	0.01	3	62	0.00	3	62	0.01
04:00 - 05:00	3	62	0.01	3	62	0.01	3	62	0.02
05:00 - 06:00	3	62	0.00	3	62	0.01	3	62	0.01
06:00 - 07:00	3	62	0.01	3	62	0.03	3	62	0.04
07:00 - 08:00	16	210	0.05	16	210	0.15	16	210	0.20
08:00 - 09:00	16	210	0.10	16	210	0.23	16	210	0.33
09:00 - 10:00	16	210	0.11	16	210	0.13	16	210	0.24
10:00 - 11:00	16	210	0.08	16	210	0.10	16	210	0.18
11:00 - 12:00	16	210	0.10	16	210	0.10	16	210	0.20
12:00 - 13:00	16	210	0.12	16	210	0.10	16	210	0.22
13:00 - 14:00	16	210	0.11	16	210	0.12	16	210	0.23
14:00 - 15:00	16	210	0.11	16	210	0.12	16	210	0.23
15:00 - 16:00	16	210	0.17	16	210	0.14	16	210	0.31
16:00 - 17:00	16	210	0.19	16	210	0.14	16	210	0.33
17:00 - 18:00	16	210	0.23	16	210	0.14	16	210	0.37
18:00 - 19:00	16	210	0.19	16	210	0.16	16	210	0.35
19:00 - 20:00	3	62	0.20	3	62	0.20	3	62	0.40
20:00 - 21:00	3	62	0.17	3	62	0.11	3	62	0.28
21:00 - 22:00	3	62	0.10	3	62	0.11	3	62	0.21
22:00 - 23:00	3	62	0.10	3	62	0.07	3	62	0.17
23:00 - 24:00	3	62	0.04	3	62	0.03	3	62	0.07
Daily Trip Rates:			2.23						4.45

Parameter summary

Trip rate parameter range selected: 32 - 1874 (units:)
 Survey date date range: 01/01/97 - 20/06/05
 Number of weekdays (Monday-Friday): 16
 Number of Saturdays: 0
 Number of Sundays: 0
 Optional parameters used in selection: NO
 Surveys manually removed from selection: 0

Appendix 3

PICADY Output: B6411 Houghton Road/Merrill Road

TRL LIMITED

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 1.0 (JAN 2006)

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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:- "j:\2006\N60745\Picady\Merril Road Junction\AM.vpi" (drive-on-the-left) at 09:53:40 on Wednesday, 21

RUN INFORMATION

RUN TITLE: Merril Road Junction
LOCATION: Thurnscoe
DATE: 02/06/06
CLIENT: Chevin Homes
ENUMERATOR: tbentley [MANLAPTOP1]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:

MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

```

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

```

ARM A IS B6411 Houghton Road (w)
ARM B IS Merrill Road
ARM C IS B6411 Houghton Road (e)
ARM D IS Lorne Road

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	MINOR ROAD D	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I	(W) 11.50 M.	I	(W) 11.50 M.	I
I	CENTRAL RESERVE WIDTH	I	(WCR) 2.00 M.	I	(WCR) 2.00 M.	I
I		I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	(WC-B) 2.50 M.	I	(WA-D) 2.20 M.	I
I	- VISIBILITY	I	(VC-B) 60.0 M.	I	(VA-D) 60.0 M.	I
I	- BLOCKS TRAFFIC	I	NO	I	NO	I
I		I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 45.0 M.	I	(VD-A) 45.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 50.0 M.	I	(VD-C) 50.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) 5.00 M.	I	(WD-A) 2.30 M.	I
I	- LANE 2 WIDTH	I	(WB-A) 0.00 M.	I	(WD-C) 2.30 M.	I

SLOPES AND INTERCPET

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

B-C Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	786.65	0.23	0.09			I

D-A Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream D-A	Stream	C-A	Stream	C-D	I
I	609.48	0.18	0.07			I

B-A Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-D	Stream	D-A	I
I	648.05	0.22	0.22	0.22	0.22	0.22		I

I	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream	A-B	Stream	C-A	Stream	C-B	Stream	D-C	I
I		0.09		0.14		0.31		0.11	I

D-C Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream D-C	Stream	C-A	Stream	C-B	Stream	B-C	I
I	502.09	0.17	0.17	0.17	0.17	0.17		I

I	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream	C-D	Stream	A-C	Stream	A-D	Stream	B-A	I
I		0.07		0.11		0.24		0.08	I

C-B Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream C-B	Stream	A-C	Stream	A-D	I
I	628.58	0.19	0.26			I

A-D Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream A-D	Stream C-A	Stream C-B	I
I	608.71	0.19	0.26	I

B-D Stream From Left Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream B-D	Stream A-C	Stream A-D	Stream A-B	Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I

I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream C-A	Stream C-D			I
I		0.14	0.14			I

B-D Stream From Right Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream B-D	Stream A-C	Stream A-D	Stream A-B	Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I

I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream C-A	Stream C-D			I
I		0.14	0.14			I

D-B Stream From Left Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream D-B	Stream C-A	Stream C-B	Stream D-C	Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I

I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream A-C	Stream A-B			I
I		0.11	0.11			I

D-B Stream From Right Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream D-B	Stream C-A	Stream C-B	Stream C-D	Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I

I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream A-C	Stream A-B			I
I		0.11	0.11			I

TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I

I A	I	100	I
I B	I	100	I
I C	I	100	I
I D	I	100	I

Demand set: AM Base

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	ARM	I	FLOW STARTS	I	TOP OF PEAK	I	FLOW STOPS	I	BEFORE	I	AT TOP	I	AFTER
I		I	TO RISE	I	IS REACHED	I	FALLING	I	PEAK	I	OF PEAK	I	PEAK
I	ARM A	I	15.00	I	45.00	I	75.00	I	3.00	I	4.50	I	3.00
I	ARM B	I	15.00	I	45.00	I	75.00	I	1.23	I	1.84	I	1.23
I	ARM C	I	15.00	I	45.00	I	75.00	I	3.45	I	5.18	I	3.45
I	ARM D	I	15.00	I	45.00	I	75.00	I	0.63	I	0.94	I	0.63

		TURNING PROPORTIONS				
		TURNING COUNTS (VEH/HR)				
		(PERCENTAGE OF H.V.S)				
TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D	
07.45 - 09.15	ARM A	0.000	0.162	0.829	0.008	
		0.0	39.0	199.0	2.0	
		(0.0)	(0.0)	(0.0)	(0.0)	
	ARM B	0.306	0.000	0.622	0.071	
		30.0	0.0	61.0	7.0	
		(0.0)	(0.0)	(0.0)	(0.0)	
	ARM C	0.696	0.261	0.000	0.043	
		192.0	72.0	0.0	12.0	
		(0.0)	(0.0)	(0.0)	(0.0)	
	ARM D	0.060	0.200	0.740	0.000	
		3.0	10.0	37.0	0.0	
		(0.0)	(0.0)	(0.0)	(0.0)	

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET AM Base
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-ACD	1.23	11.18	0.110		0.00	0.12	1.8		0.10
A-B	0.49								
A-C	2.50								
A-D	0.03	9.45	0.003		0.00	0.00	0.0		0.11
D-AB	0.10	8.01	0.013		0.00	0.01	0.2		0.13
D-BC	0.52	7.37	0.071		0.00	0.08	1.1		0.15
C-D	0.15								
C-A	2.41								
C-B	0.90	9.92	0.091		0.00	0.10	1.4		0.11

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RPC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.00-08.15										I
I	B-ACD	1.47	10.98	0.134		0.12	0.15	2.3		0.11	I
I	A-B	0.58									I
I	A-C	2.98									I
I	A-D	0.03	9.32	0.003		0.00	0.00	0.0		0.11	I
I	D-AB	0.13	7.82	0.016		0.01	0.02	0.2		0.13	I
I	D-BC	0.62	7.17	0.087		0.08	0.09	1.4		0.15	I
I	C-D	0.18									I
I	C-A	2.88									I
I	C-B	1.08	9.81	0.110		0.10	0.12	1.8		0.11	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RPC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.15-08.30										I
I	B-ACD	1.80	10.72	0.168		0.15	0.20	2.9		0.11	I
I	A-B	0.72									I
I	A-C	3.65									I
I	A-D	0.04	9.13	0.004		0.00	0.00	0.1		0.11	I
I	D-AB	0.16	7.55	0.021		0.02	0.02	0.3		0.14	I
I	D-BC	0.76	6.90	0.110		0.09	0.12	1.8		0.16	I
I	C-D	0.22									I
I	C-A	3.52									I
I	C-B	1.32	9.66	0.137		0.12	0.16	2.3		0.12	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RPC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.30-08.45										I
I	B-ACD	1.80	10.72	0.168		0.20	0.20	3.0		0.11	I
I	A-B	0.72									I
I	A-C	3.65									I
I	A-D	0.04	9.13	0.004		0.00	0.00	0.1		0.11	I
I	D-AB	0.16	7.55	0.021		0.02	0.02	0.3		0.14	I
I	D-BC	0.76	6.90	0.110		0.12	0.12	1.8		0.16	I
I	C-D	0.22									I
I	C-A	3.52									I
I	C-B	1.32	9.66	0.137		0.16	0.16	2.4		0.12	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RPC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.45-09.00										I
I	B-ACD	1.47	10.98	0.134		0.20	0.16	2.4		0.11	I
I	A-B	0.58									I
I	A-C	2.98									I
I	A-D	0.03	9.32	0.003		0.00	0.00	0.0		0.11	I
I	D-AB	0.13	7.82	0.016		0.02	0.02	0.3		0.13	I
I	D-BC	0.62	7.17	0.087		0.12	0.10	1.5		0.15	I
I	C-D	0.18									I
I	C-A	2.88									I
I	C-B	1.08	9.81	0.110		0.16	0.12	1.9		0.11	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	09.00-09.15										I
I	B-ACD	1.23	11.17	0.110		0.16	0.12	1.9		0.10	I
I	A-B	0.49									I
I	A-C	2.50									I
I	A-D	0.03	9.45	0.003		0.00	0.00	0.0		0.11	I
I	D-AB	0.10	8.01	0.013		0.02	0.01	0.2		0.13	I
I	D-BC	0.52	7.37	0.071		0.10	0.08	1.2		0.15	I
I	C-D	0.15									I
I	C-A	2.41									I
I	C-B	0.90	9.92	0.091		0.12	0.10	1.5		0.11	I

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.1

QUEUE FOR STREAM A-D

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

QUEUE FOR STREAM D-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

QUEUE FOR STREAM D-BC

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-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.2
08.45	0.2
09.00	0.1
09.15	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I
I	I	I	I		I	* DELAY *		I	* DELAY *		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-ACD	I	134.9	I 89.9	I	14.3	I 0.11	I	14.3	I 0.11	I
I	A-B	I	53.7	I 35.8	I		I	I		I	I
I	A-C	I	273.9	I 182.6	I		I	I		I	I
I	A-D	I	2.8	I 1.8	I	0.3	I 0.11	I	0.3	I 0.11	I
I	D-AB	I	11.6	I 7.7	I	1.5	I 0.13	I	1.5	I 0.13	I
I	D-BC	I	57.2	I 38.2	I	8.8	I 0.15	I	8.8	I 0.15	I
I	C-D	I	16.5	I 11.0	I		I	I		I	I
I	C-A	I	264.3	I 176.2	I		I	I		I	I
I	C-B	I	99.1	I 66.1	I	11.4	I 0.11	I	11.4	I 0.11	I
I	ALL	I	913.9	I 609.3	I	36.2	I 0.04	I	36.2	I 0.04	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

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

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

END OF JOB

SLOPES AND INTERCPET

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

will be adjusted)

B-C Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream B-C	Stream A-C	Stream A-B	I
I	786.65	0.23	0.09	I

D-A Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream D-A	Stream C-A	Stream C-D	I
I	609.48	0.18	0.07	I

B-A Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream B-A	Stream A-C	Stream A-D	Stream D-A	Stream D-B	I
I	648.05	0.22	0.22	0.22	0.22	I

I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream A-B	Stream C-A	Stream C-B	Stream D-C	I
I		0.09	0.14	0.31	0.11	I

D-C Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream D-C	Stream C-A	Stream C-B	Stream B-C	Stream B-D	I
I	502.09	0.17	0.17	0.17	0.17	I

I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream C-D	Stream A-C	Stream A-D	Stream B-A	I
I		0.07	0.11	0.24	0.08	I

C-B Stream

I	Intercept For Stream C-B	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	I
I	628.58	0.19	0.26	I

A-D Stream

I	Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	I
I	608.71	0.19	0.26	I

B-D Stream From Left Hand Lane

I	Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I
I		Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I		0.14	0.14			I

B-D Stream From Right Hand Lane

I	Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I
I		Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I		0.14	0.14			I

D-B Stream From Left Hand Lane

I	Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I
I		Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D	I
I		0.11	0.11			I

D-B Stream From Right Hand Lane

I	Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I
I		Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D	I
I		0.11	0.11			I

TRAFFIC DEMAND DATA

ARM FLOW SCALE(%)

A	100
B	100
C	100
D	100

Demand set: AM Assessment

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	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	3.25	4.88	3.25
ARM B	15.00	45.00	75.00	2.78	4.16	2.78
ARM C	15.00	45.00	75.00	3.92	5.89	3.92
ARM D	15.00	45.00	75.00	0.69	1.03	0.69

		TURNING PROPORTIONS TURNING COUNTS (VEH/HR) (PERCENTAGE OF H.V.S)			
TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
07.45 - 09.15	ARM A	0.000	0.215	0.777	0.008
		0.0	56.0	202.0	2.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.306	0.000	0.626	0.068
		68.0	0.0	139.0	15.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.634	0.328	0.000	0.038
		199.0	103.0	0.0	12.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.055	0.255	0.691	0.000
		3.0	14.0	38.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET AM Assessment
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.45-08.00									
B-ACD	2.79	11.09	0.251		0.00	0.33	4.8		0.12
A-B	0.70								
A-C	2.53								
A-D	0.03	9.34	0.003		0.00	0.00	0.0		0.11
D-AB	0.13	7.76	0.017		0.00	0.02	0.2		0.13
D-BC	0.56	7.09	0.079		0.00	0.08	1.2		0.15
C-D	0.15								
C-A	2.50								
C-B	1.29	9.87	0.131		0.00	0.15	2.2		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.00-08.15									
B-ACD	3.33	10.87	0.306		0.33	0.44	6.4		0.13
A-B	0.84								
A-C	3.03								
A-D	0.03	9.18	0.003		0.00	0.00	0.0		0.11
D-AB	0.16	7.54	0.021		0.02	0.02	0.3		0.14
D-BC	0.67	6.84	0.097		0.08	0.11	1.6		0.16
C-D	0.18								
C-A	2.98								
C-B	1.54	9.75	0.158		0.15	0.19	2.7		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-ACD	4.07	10.58	0.385		0.44	0.62	8.9		0.15
A-B	1.03								
A-C	3.71								
A-D	0.04	8.96	0.004		0.00	0.00	0.1		0.11
D-AB	0.20	7.24	0.027		0.02	0.03	0.4		0.14
D-BC	0.81	6.50	0.125		0.11	0.14	2.1		0.18
C-D	0.22								
C-A	3.65								
C-B	1.89	9.59	0.197		0.19	0.24	3.6		0.13

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-ACD	4.07	10.58	0.385		0.62	0.62	9.3		0.15
A-B	1.03								
A-C	3.71								
A-D	0.04	8.96	0.004		0.00	0.00	0.1		0.11
D-AB	0.20	7.24	0.027		0.03	0.03	0.4		0.14
D-BC	0.81	6.49	0.125		0.14	0.14	2.1		0.18
C-D	0.22								
C-A	3.65								
C-B	1.89	9.59	0.197		0.24	0.24	3.7		0.13

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-ACD	3.33	10.87	0.306		0.62	0.45	6.9		0.13
A-B	0.84								
A-C	3.03								
A-D	0.03	9.18	0.003		0.00	0.00	0.1		0.11
D-AB	0.16	7.54	0.021		0.03	0.02	0.3		0.14
D-BC	0.67	6.84	0.097		0.14	0.11	1.7		0.16
C-D	0.18								
C-A	2.98								
C-B	1.54	9.75	0.158		0.24	0.19	2.9		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-ACD	2.79	11.08	0.251		0.45	0.34	5.2		0.12
A-B	0.70								
A-C	2.53								
A-D	0.03	9.34	0.003		0.00	0.00	0.0		0.11
D-AB	0.13	7.76	0.017		0.02	0.02	0.3		0.13
D-BC	0.56	7.09	0.079		0.11	0.09	1.3		0.15
C-D	0.15								
C-A	2.50								
C-B	1.29	9.87	0.131		0.19	0.15	2.3		0.12

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.4
08.30	0.6 *
08.45	0.6 *
09.00	0.4
09.15	0.3

QUEUE FOR STREAM A-D

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

QUEUE FOR STREAM D-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

QUEUE FOR STREAM D-BC

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-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND	* QUEUEING *	* INCLUSIVE QUEUEING *
		* DELAY *	* DELAY *
(VEH)	(VEH/H)	(MIN)	(MIN/VEH)
B-ACD	305.6	41.5	0.14
A-B	77.1		
A-C	278.0		
A-D	2.8	0.3	0.11
D-AB	14.6	2.0	0.14
D-BC	61.1	10.0	0.16
C-D	16.5		
C-A	273.9		
C-B	141.8	17.4	0.12
ALL	1171.3	71.1	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

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

[Printed at 09:53:57 on 21/06/2006]

TRL LIMITED

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 1.0 (JAN 2006)

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Run with file:- "j:\2006\N60745\Picady\Merril Road Junction\PM.vpi" (drive-on-the-left) at 10:02:33 on Wednesday, 21

RUN INFORMATION

RUN TITLE: Merrill Road Junction
LOCATION: Thurnscoe
DATE: 02/06/06
CLIENT: Chevin Homes
ENUMERATOR: tbentley [MANLAPTOP1]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:
MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

```

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

```

ARM A IS B6411 Houghton Road (w)
ARM B IS Merrill Road
ARM C IS B6411 Houghton Road (e)
ARM D IS Lorne Road

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	MINOR ROAD D	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I	(W) 11.50 M.	I	(W) 11.50 M.	I
I	CENTRAL RESERVE WIDTH	I	(WCR) 2.00 M.	I	(WCR) 2.00 M.	I
I		I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	(WC-B) 2.50 M.	I	(WA-D) 2.20 M.	I
I	- VISIBILITY	I	(VC-B) 60.0 M.	I	(VA-D) 60.0 M.	I
I	- BLOCKS TRAFFIC	I	NO	I	NO	I
I		I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 45.0 M.	I	(VD-A) 45.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 50.0 M.	I	(VD-C) 50.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) 5.00 M.	I	(WD-A) 2.30 M.	I
I	- LANE 2 WIDTH	I	(WB-A) 0.00 M.	I	(WD-C) 2.30 M.	I

SLOPES AND INTERCET

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

B-C Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	786.65	0.23	0.09			I

D-A Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream D-A	Stream	C-A	Stream	C-D	I
I	609.48	0.18	0.07			I

B-A Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-D	Stream	D-A	I
I	648.05	0.22	0.22	0.22	0.22	0.22		I

I	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream	A-B	Stream	C-A	Stream	C-B	Stream	D-C	I
I		0.09	0.14	0.31	0.11				I

D-C Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream D-C	Stream	C-A	Stream	C-B	Stream	B-C	I
I	502.09	0.17	0.17	0.17	0.17			I

I	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream	C-D	Stream	A-C	Stream	A-D	Stream	B-A	I
I		0.07	0.11	0.24	0.08				I

C-B Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream C-B	Stream	A-C	Stream	A-D	I
I	628.58	0.19	0.26			I

A-D Stream

I	Intercept For Stream A-D	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	I
I	608.71	0.19	0.26	I

B-D Stream From Left Hand Lane

I	Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I

I	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I	0.14	0.14			I

B-D Stream From Right Hand Lane

I	Intercept For Stream B-D	Slope For Opposing Stream A-C	Slope For Opposing Stream A-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I

I	Slope For Opposing Stream C-A	Slope For Opposing Stream C-D	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	I
I	0.14	0.14			I

D-B Stream From Left Hand Lane

I	Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream D-C	Slope For Opposing Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I

I	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	Slope For Opposing Stream A-D	I
I	0.11	0.11			I

D-B Stream From Right Hand Lane

I	Intercept For Stream D-B	Slope For Opposing Stream C-A	Slope For Opposing Stream C-B	Slope For Opposing Stream C-D	Slope For Opposing Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I

I	Slope For Opposing Stream A-C	Slope For Opposing Stream A-B	Slope For Opposing Stream C-B	Slope For Opposing Stream A-D	I
I	0.11	0.11			I

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: PM Base

TIME PERIOD BEGINS 16.15 AND ENDS 17.45

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	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	4.68	7.01	4.68
ARM B	15.00	45.00	75.00	1.29	1.93	1.29
ARM C	15.00	45.00	75.00	6.55	9.83	6.55
ARM D	15.00	45.00	75.00	0.66	0.99	0.66

TIME	TURNING PROPORTIONS				
	FROM/TO	ARM A	ARM B	ARM C	ARM D
16.15 - 17.45	ARM A	0.000	0.112	0.858	0.029
		0.0	42.0	321.0	11.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.272	0.000	0.670	0.058
		28.0	0.0	69.0	6.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.634	0.237	0.000	0.130
		332.0	124.0	0.0	68.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.208	0.151	0.642	0.000
		11.0	8.0	34.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET PM Base
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.15-16.30									
B-ACD	1.29	10.73	0.120		0.00	0.14	2.0		0.11
A-B	0.53								
A-C	4.03								
A-D	0.14	8.85	0.016		0.00	0.02	0.2		0.11
D-AB	0.19	8.33	0.023		0.00	0.02	0.3		0.12
D-BC	0.47	6.71	0.071		0.00	0.08	1.1		0.16
C-D	0.85								
C-A	4.17								
C-B	1.56	9.60	0.162		0.00	0.19	2.8		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.30-16.45									
B-ACD	1.54	10.42	0.148		0.14	0.17	2.5		0.11
A-B	0.63								
A-C	4.81								
A-D	0.16	8.59	0.019		0.02	0.02	0.3		0.12
D-AB	0.23	8.06	0.028		0.02	0.03	0.4		0.13
D-BC	0.56	6.39	0.088		0.08	0.10	1.4		0.17
C-D	1.02								
C-A	4.97								
C-B	1.86	9.42	0.197		0.19	0.24	3.6		0.13

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-ACD	1.89	9.98	0.189		0.17	0.23	3.4		0.12
A-B	0.77								
A-C	5.89								
A-D	0.20	8.24	0.024		0.02	0.02	0.4		0.12
D-AB	0.28	7.68	0.037		0.03	0.04	0.6		0.14
D-BC	0.69	5.94	0.116		0.10	0.13	1.9		0.19
C-D	1.25								
C-A	6.09								
C-B	2.28	9.19	0.248		0.24	0.33	4.7		0.14

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-ACD	1.89	9.98	0.189		0.23	0.23	3.5		0.12
A-B	0.77								
A-C	5.89								
A-D	0.20	8.24	0.024		0.02	0.03	0.4		0.12
D-AB	0.28	7.68	0.037		0.04	0.04	0.6		0.14
D-BC	0.69	5.94	0.116		0.13	0.13	2.0		0.19
C-D	1.25								
C-A	6.09								
C-B	2.28	9.19	0.248		0.33	0.33	4.9		0.14

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-ACD	1.54	10.42	0.148		0.23	0.18	2.7		0.11
A-B	0.63								
A-C	4.81								
A-D	0.16	8.59	0.019		0.03	0.02	0.3		0.12
D-AB	0.23	8.06	0.028		0.04	0.03	0.5		0.13
D-BC	0.56	6.39	0.088		0.13	0.10	1.5		0.17
C-D	1.02								
C-A	4.97								
C-B	1.86	9.42	0.197		0.33	0.25	3.8		0.13

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.30-17.45										I
I	B-ACD	1.29	10.73	0.120		0.18	0.14	2.1		0.11	I
I	A-B	0.53									I
I	A-C	4.03									I
I	A-D	0.14	8.84	0.016		0.02	0.02	0.2		0.11	I
I	D-AB	0.19	8.32	0.023		0.03	0.02	0.4		0.12	I
I	D-BC	0.47	6.71	0.071		0.10	0.08	1.2		0.16	I
I	C-D	0.85									I
I	C-A	4.17									I
I	C-B	1.56	9.60	0.162		0.25	0.20	3.0		0.12	I

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.1
16.45	0.2
17.00	0.2
17.15	0.2
17.30	0.2
17.45	0.1

QUEUE FOR STREAM A-D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0

QUEUE FOR STREAM D-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0

QUEUE FOR STREAM D-BC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.2
16.45	0.2
17.00	0.3
17.15	0.3
17.30	0.2
17.45	0.2

 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I
I	I	I	I		I	* DELAY *		I	* DELAY *		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-ACD	I	141.8	I 94.5	I	16.2	I 0.11	I	16.2	I 0.11	I
I	A-B	I	57.8	I 38.5	I		I	I		I	I
I	A-C	I	441.8	I 294.6	I		I	I		I	I
I	A-D	I	15.1	I 10.1	I	1.8	I 0.12	I	1.8	I 0.12	I
I	D-AB	I	21.1	I 14.1	I	2.7	I 0.13	I	2.7	I 0.13	I
I	D-BC	I	51.8	I 34.6	I	9.0	I 0.17	I	9.0	I 0.17	I
I	C-D	I	93.6	I 62.4	I		I	I		I	I
I	C-A	I	457.0	I 304.6	I		I	I		I	I
I	C-B	I	170.7	I 113.8	I	22.8	I 0.13	I	22.8	I 0.13	I
I	ALL	I	1450.8	I 967.2	I	52.5	I 0.04	I	52.5	I 0.04	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

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

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

END OF JOB

SLOPES AND INTERCPET

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

will be adjusted)

B-C Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	786.65		0.23		0.09	I

D-A Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream D-A	Stream	C-A	Stream	C-D	I
I	609.48		0.18		0.07	I

B-A Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-D	Stream	D-A	Stream	D-B	I
I	648.05		0.22		0.22		0.22		0.22	I

I	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream A-B	Stream C-A	Stream C-B	Stream D-C	I
I	0.09	0.14	0.31	0.11	I

D-C Stream

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream D-C	Stream	C-A	Stream	C-B	Stream	B-C	Stream	B-D	I
I	502.09		0.17		0.17		0.17		0.17	I

I	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream C-D	Stream A-C	Stream A-D	Stream B-A	I
I	0.07	0.11	0.24	0.08	I

C-B Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream C-B	Stream A-C	Stream A-D	I
I	628.58	0.19	0.26	I

A-D Stream

I	Intercept For	Slope For Opposing	Slope For Opposing	I
I	Stream A-D	Stream C-A	Stream C-B	I
I	608.71	0.19	0.26	I

B-D Stream From Left Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream B-D	Stream A-C	Stream A-D	Stream A-B	Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I
I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream C-A	Stream C-D			I
I		0.14	0.14			I

B-D Stream From Right Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream B-D	Stream A-C	Stream A-D	Stream A-B	Stream C-B	I
I	648.05	0.22	0.22	0.09	0.31	I
I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream C-A	Stream C-D			I
I		0.14	0.14			I

D-B Stream From Left Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream D-B	Stream C-A	Stream C-B	Stream D-C	Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I
I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream A-C	Stream A-B			I
I		0.11	0.11			I

D-B Stream From Right Hand Lane

I	Intercept For	Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I	Stream D-B	Stream C-A	Stream C-B	Stream C-D	Stream A-D	I
I	502.09	0.17	0.17	0.07	0.24	I
I		Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing	I
I		Stream A-C	Stream A-B			I
I		0.11	0.11			I

TRAFFIC DEMAND DATA

ARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

Demand set: PM Assessment

TIME PERIOD BEGINS 16.15 AND ENDS 17.45

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	FLOW STOPS FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00	5.18	7.76	5.18
ARM B	15.00	45.00	75.00	2.21	3.32	2.21
ARM C	15.00	45.00	75.00	7.64	11.46	7.64
ARM D	15.00	45.00	75.00	0.74	1.11	0.74

	TURNING PROPORTIONS							
	TURNING COUNTS (VEH/HR)							
	(PERCENTAGE OF H.V.S)							
TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D			
16.15 - 17.45								
	ARM A	0.000	0.164	0.809	0.027			
		0.0	68.0	335.0	11.0			
		(0.0)	(0.0)	(0.0)	(0.0)			
	ARM B	0.271	0.000	0.672	0.056			
		48.0	0.0	119.0	10.0			
		(0.0)	(0.0)	(0.0)	(0.0)			
	ARM C	0.556	0.329	0.000	0.115			
		340.0	201.0	0.0	70.0			
		(0.0)	(0.0)	(0.0)	(0.0)			
	ARM D	0.186	0.220	0.593	0.000			
		11.0	13.0	35.0	0.0			
		(0.0)	(0.0)	(0.0)	(0.0)			

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR DEMAND SET PM Assessment
AND FOR TIME PERIOD 1

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.15-16.30									
B-ACD	2.22	10.50	0.211		0.00	0.27	3.8		0.12
A-B	0.85								
A-C	4.20								
A-D	0.14	8.58	0.016		0.00	0.02	0.2		0.12
D-AB	0.23	7.88	0.029		0.00	0.03	0.4		0.13
D-BC	0.52	6.40	0.080		0.00	0.09	1.2		0.17
C-D	0.88								
C-A	4.27								
C-B	2.52	9.50	0.265		0.00	0.36	5.1		0.14

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.30-16.45										I
I	B-ACD	2.65	10.13	0.262		0.27	0.35	5.1		0.13	I
I	A-B	1.02									I
I	A-C	5.02									I
I	A-D	0.16	8.27	0.020		0.02	0.02	0.3		0.12	I
I	D-AB	0.27	7.55	0.036		0.03	0.04	0.5		0.14	I
I	D-BC	0.61	6.01	0.102		0.09	0.11	1.6		0.19	I
I	C-D	1.05									I
I	C-A	5.09									I
I	C-B	3.01	9.31	0.323		0.36	0.47	6.8		0.16	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.45-17.00										I
I	B-ACD	3.25	9.61	0.338		0.35	0.50	7.3		0.16	I
I	A-B	1.25									I
I	A-C	6.15									I
I	A-D	0.20	7.84	0.026		0.02	0.03	0.4		0.13	I
I	D-AB	0.34	7.09	0.047		0.04	0.05	0.7		0.15	I
I	D-BC	0.75	5.48	0.136		0.11	0.16	2.3		0.21	I
I	C-D	1.28									I
I	C-A	6.24									I
I	C-B	3.69	9.05	0.407		0.47	0.67	9.7		0.19	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.00-17.15										I
I	B-ACD	3.25	9.61	0.338		0.50	0.51	7.6		0.16	I
I	A-B	1.25									I
I	A-C	6.15									I
I	A-D	0.20	7.84	0.026		0.03	0.03	0.4		0.13	I
I	D-AB	0.34	7.08	0.047		0.05	0.05	0.7		0.15	I
I	D-BC	0.75	5.47	0.137		0.16	0.16	2.3		0.21	I
I	C-D	1.28									I
I	C-A	6.24									I
I	C-B	3.69	9.05	0.407		0.67	0.68	10.2		0.19	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.15-17.30										I
I	B-ACD	2.65	10.13	0.262		0.51	0.36	5.5		0.13	I
I	A-B	1.02									I
I	A-C	5.02									I
I	A-D	0.16	8.26	0.020		0.03	0.02	0.3		0.12	I
I	D-AB	0.27	7.55	0.036		0.05	0.04	0.6		0.14	I
I	D-BC	0.61	6.00	0.102		0.16	0.12	1.8		0.19	I
I	C-D	1.05									I
I	C-A	5.09									I
I	C-B	3.01	9.31	0.323		0.68	0.49	7.5		0.16	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.30-17.45										I
I	B-ACD	2.22	10.50	0.212		0.36	0.27	4.2		0.12	I
I	A-B	0.85									I
I	A-C	4.20									I
I	A-D	0.14	8.57	0.016		0.02	0.02	0.3		0.12	I
I	D-AB	0.23	7.87	0.029		0.04	0.03	0.5		0.13	I
I	D-BC	0.52	6.39	0.081		0.12	0.09	1.4		0.17	I
I	C-D	0.88									I
I	C-A	4.27									I
I	C-B	2.52	9.50	0.265		0.49	0.37	5.7		0.14	I

QUEUE FOR STREAM B-ACD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.3
16.45	0.4
17.00	0.5 *
17.15	0.5 *
17.30	0.4
17.45	0.3

QUEUE FOR STREAM A-D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0

QUEUE FOR STREAM D-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0

QUEUE FOR STREAM D-BC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.1
16.45	0.1
17.00	0.2
17.15	0.2
17.30	0.1
17.45	0.1

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.4
16.45	0.5
17.00	0.7 *
17.15	0.7 *
17.30	0.5
17.45	0.4

 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND		* QUEUEING * * DELAY *		* INCLUSIVE QUEUEING * * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
B-ACD	243.6	162.4	33.5	0.14	33.5	0.14
A-B	93.6	62.4				
A-C	461.1	307.4				
A-D	15.1	10.1	1.9	0.12	1.9	0.12
D-AB	24.9	16.6	3.5	0.14	3.5	0.14
D-BC	56.3	37.5	10.6	0.19	10.6	0.19
C-D	96.3	64.2				
C-A	468.0	312.0				
C-B	276.7	184.4	45.1	0.16	45.1	0.16
ALL	1735.7	1157.1	94.6	0.05	94.6	0.05

* 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

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

[Printed at 10:02:53 on 21/06/2006]

Appendix 4

PICADY Output: B6411 Houghton Road/School Street

TRL LIMITED

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 1.0 (JAN 2006)

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

Run with file:- "j:\2006\N60745\Picady\Houghton Road.School Street\Am.vpi" (drive-on-the-left) at 10:16:57 on Wednesd

RUN INFORMATION

RUN TITLE: Houghton Road/School Street
LOCATION: Thurnscoe
DATE: 02/06/06
CLIENT: Chevin Homes
ENUMERATOR: tbentley [MANLAPTOP1]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:

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 B6411 Houghton Road (West)
ARM B IS School Street
ARM C IS B6411 Houghton Road (East)

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) 10.00 M.	I
I	CENTRAL RESERVE WIDTH	I	(WCR) 0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	(WC-B) 2.20 M.	I
I	- VISIBILITY	I	(VC-B) 50.0 M.	I
I	- BLOCKS TRAFFIC	I	NO	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 35.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 35.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) 2.20 M.	I
I	- LANE 2 WIDTH	I	(WB-A) 0.00 M.	I

SLOPES AND INTERCEPT

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

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	594.23	0.19		0.08		I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-B	Stream	C-A	I
I	465.60	0.18		0.07		0.11	0.25	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream C-B	Stream	A-C	Stream	A-B	I
I	602.92	0.19		0.19		I

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	2.26	7.54	0.299		0.30	0.42	6.1		0.19
C-A	5.41								
C-B	1.45	8.39	0.173		0.16	0.21	3.0		0.14
A-B	0.57								
A-C	8.02								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	2.26	7.54	0.299		0.42	0.42	6.3		0.19
C-A	5.41								
C-B	1.45	8.39	0.173		0.21	0.21	3.1		0.14
A-B	0.57								
A-C	8.02								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	1.84	7.89	0.233		0.42	0.31	4.8		0.17
C-A	4.42								
C-B	1.18	8.70	0.136		0.21	0.16	2.4		0.13
A-B	0.46								
A-C	6.55								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	1.54	8.15	0.189		0.31	0.24	3.6		0.15
C-A	3.70								
C-B	0.99	8.92	0.111		0.16	0.13	1.9		0.13
A-B	0.39								
A-C	5.48								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.2
08.15	0.3
08.30	0.4
08.45	0.4
09.00	0.3
09.15	0.2

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.2
08.30	0.2
08.45	0.2
09.00	0.2
09.15	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

STREAM	TOTAL DEMAND	* QUEUEING *	* INCLUSIVE QUEUEING *
(VEH)	(VEH/H)	(MIN)	(MIN)
(VEH/H)	(VEH/H)	(MIN/VEH)	(MIN/VEH)
B-AC	169.3	112.9	28.5
C-A	406.0	270.7	0.17
C-B	108.7	72.5	14.6
A-B	42.7	28.4	0.13
A-C	601.5	401.0	I
ALL	1328.3	885.5	43.1

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

END OF JOB

SLOPES AND INTERCEPT

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

Intercept For Slope For Opposing	Slope For Opposing
Stream B-C Stream A-C	Stream A-B
\$94.23 0.19	0.08

Intercept For Slope For Opposing	Slope For Opposing	Slope For Opposing	Slope For Opposing
Stream B-A Stream A-C	Stream A-B	Stream C-A	Stream C-B
465.60 0.18	0.07	0.11	0.25

Intercept For Slope For Opposing	Slope For Opposing
Stream C-B Stream A-C	Stream A-B
602.92 0.19	0.19

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
B-AC	2.94	7.21	0.407		0.45	0.67	9.6		0.23
C-A	6.00								
C-B	1.69	8.10	0.208		0.19	0.26	3.8		0.16
A-B	0.66								
A-C	9.45								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-AC	2.94	7.20	0.408		0.67	0.68	10.1		0.23
C-A	6.00								
C-B	1.69	8.10	0.208		0.26	0.26	3.9		0.16
A-B	0.66								
A-C	9.45								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-AC	2.40	7.63	0.314		0.68	0.47	7.3		0.19
C-A	4.90								
C-B	1.38	8.46	0.163		0.26	0.20	3.0		0.14
A-B	0.54								
A-C	7.72								

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)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-AC	2.01	7.93	0.253		0.47	0.34	5.3		0.17
C-A	4.10								
C-B	1.15	8.71	0.132		0.20	0.15	2.4		0.13
A-B	0.45								
A-C	6.46								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.5
08.30	0.7 *
08.45	0.7 *
09.00	0.5
09.15	0.3

QUEUE FOR STREAM C-B

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

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	I	I	* DELAY *	I	* DELAY *	I
I	I	I	I	I	I	I	I	I
I	I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
I	B-AC	I	220.2	I	146.8	I	43.7	I
I	C-A	I	450.1	I	300.1	I	I	I
I	C-B	I	126.6	I	84.4	I	18.1	I
I	A-B	I	49.6	I	33.0	I	I	I
I	A-C	I	708.9	I	472.6	I	I	I
I	ALL	I	1555.4	I	1036.9	I	61.8	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

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

END OF JOB

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

[Printed at 10:17:10 on 21/06/2006]

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 1.0 (JAN 2006)

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Run with file:- "j:\2006\N60745\Picady\Houghton Road.School Street\PM.vpi" (drive-on-the-left) at 10:18:06 on Wednesd

RUN INFORMATION

RUN TITLE: Houghton Road/School Street
LOCATION: Thurnscoe
DATE: 02/06/06
CLIENT: Chevin Homes
ENUMERATOR: tbentley [MANLAPTOP1]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:

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 B6411 Houghton Road (West)
ARM B IS School Street
ARM C IS B6411 Houghton Road (East)

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) 10.00 M.	I
I	CENTRAL RESERVE WIDTH	I	(WCR) 0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I	(WC-B) 2.20 M.	I
I	- VISIBILITY	I	(VC-B) 50.0 M.	I
I	- BLOCKS TRAFFIC	I	NO	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 35.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 35.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) 2.20 M.	I
I	- LANE 2 WIDTH	I	(WB-A) 0.00 M.	I

SLOPES AND INTERCEPT

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

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	594.23		0.19		0.08	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-B	Stream	C-A	I
I	465.60		0.18		0.07		0.11	I
							0.25	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream C-B	Stream	A-C	Stream	A-B	I
I	602.92		0.19		0.19	I

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-AC	1.82	6.50	0.279		0.27	0.38	5.5		0.21
C-A	7.30								
C-B	1.32	8.17	0.162		0.14	0.19	2.8		0.15
A-B	0.77								
A-C	8.97								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	1.82	6.50	0.279		0.38	0.38	5.7		0.21
C-A	7.30								
C-B	1.32	8.17	0.162		0.19	0.19	2.9		0.15
A-B	0.77								
A-C	8.97								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	1.48	6.97	0.213		0.38	0.27	4.3		0.18
C-A	5.96								
C-B	1.08	8.51	0.127		0.19	0.15	2.3		0.13
A-B	0.63								
A-C	7.33								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	1.24	7.30	0.170		0.27	0.21	3.2		0.17
C-A	4.99								
C-B	0.90	8.76	0.103		0.15	0.12	1.8		0.13
A-B	0.53								
A-C	6.14								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.2
16.45	0.3
17.00	0.4
17.15	0.4
17.30	0.3
17.45	0.2

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.1
16.45	0.1
17.00	0.2
17.15	0.2
17.30	0.1
17.45	0.1

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I
I	I	I	I		I	* DELAY *		I	* DELAY *		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	136.3	I 90.8	I	25.5	I 0.19	I	25.5	I 0.19	I
I	C-A	I	547.8	I 365.2	I	I	I	I	I	I	I
I	C-B	I	99.1	I 66.1	I	13.5	I 0.14	I	13.5	I 0.14	I
I	A-B	I	57.8	I 38.5	I	I	I	I	I	I	I
I	A-C	I	673.1	I 448.7	I	I	I	I	I	I	I
I	ALL	I	1514.1	I 1009.4	I	38.9	I 0.03	I	38.9	I 0.03	I

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD .

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

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

END OF JOB

.SLOPES AND INTERCEPT

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

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-C	Stream	A-C	Stream	A-B	I
I	594.23		0.19		0.08	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	Slope For	Opposing	I
I	Stream B-A	Stream	A-C	Stream	A-B	Stream	C-A	I
I	465.60		0.18		0.07		0.11	I
							0.25	I

I	Intercept For	Slope For	Opposing	Slope For	Opposing	I
I	Stream C-B	Stream	A-C	Stream	A-B	I
I	602.92		0.19		0.19	I

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-AC	2.24	6.11	0.366		0.37	0.56	8.0		0.26
C-A	8.72								
C-B	1.78	7.94	0.224		0.21	0.29	4.2		0.16
A-B	1.05								
A-C	9.89								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-AC	2.24	6.11	0.366		0.56	0.57	8.5		0.26
C-A	8.72								
C-B	1.78	7.94	0.224		0.29	0.29	4.3		0.16
A-B	1.05								
A-C	9.89								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-AC	1.83	6.66	0.274		0.57	0.39	6.0		0.21
C-A	7.12								
C-B	1.45	8.33	0.175		0.29	0.21	3.3		0.15
A-B	0.85								
A-C	8.08								

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-AC	1.53	7.05	0.217		0.39	0.28	4.4		0.18
C-A	5.96								
C-B	1.22	8.61	0.141		0.21	0.17	2.6		0.14
A-B	0.72								
A-C	6.76								

QUEUE FOR STREAM B-AC

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.3
16.45	0.4
17.00	0.6 *
17.15	0.6 *
17.30	0.4
17.45	0.3

QUEUE FOR STREAM C-B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.2
16.45	0.2
17.00	0.3
17.15	0.3
17.30	0.2
17.45	0.2

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I
I		I			I	* DELAY *		I	* DELAY *		I
I		I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I
I	B-AC	I	167.9	I 111.9	I	36.2	I 0.22	I	36.2	I 0.22	I
I	C-A	I	653.8	I 435.9	I		I	I		I	I
I	C-B	I	133.5	I 89.0	I	19.7	I 0.15	I	19.7	I 0.15	I
I	A-B	I	78.5	I 52.3	I		I	I		I	I
I	A-C	I	741.9	I 494.6	I		I	I		I	I
I	ALL	I	1775.6	I 1183.7	I	56.0	I 0.03	I	56.0	I 0.03	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

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

{Printed at 10:18:22 on 21/06/2006}

Appendix 5

ARCADY Output: B6411 Station Road/Shepherd Lane

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 2.0 (MAR 2005)

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TRL Limited Tel: +44 (0) 1344 770018
Crowthorne House Fax: +44 (0) 1344 770864
Nine Mile Ride Email: softwarebureau@trl.co.uk
Wokingham, Berks. Web: www.trlsoftware.co.uk
RG40 3GA, UK

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

Run with file:- "j:\2006\N60745\Arcady\14BAM.vai" (drive-on-the-left) at 11:24:33 on Tuesday, 4 July 2006

FILE PROPERTIES

RUN TITLE: B6411 Station Road/Shepherd Lane Mini-roundabout
LOCATION: Thurnscoe
DATE: 14/06/2006
CLIENT:
ENUMERATOR: iinglis [HP26531102756]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:

INPUT DATA

ARM A - John Street
ARM B - B6411 Station Road (east)
ARM C - Shepherd Lane
ARM D - B6411 Station Road (west)

MINI-ROUNDABOUT GEOMETRIC DATA

LIGHTING CONDITIONS : NORMAL

ROAD SURFACE CONDITION: NORMAL

I ARM	I	V (m)	I	E (m)	I	Lm(M)	I	Vm(M)	I	A (M)	I	K (M)	I	G (%)	I	SLOPE	I	INTERCEPT (PCU/MIN)
I ARM A	I	3.95	I	3.95	I	0.00	I	3.95	I	10.00	I	3.50	I	7.00	I	0.902	I	19.321
I ARM B	I	4.00	I	5.10	I	0.00	I	4.00	I	11.20	I	5.00	I	7.00	I	0.960	I	22.274
I ARM C	I	3.50	I	4.80	I	0.00	I	3.50	I	14.10	I	5.60	I	7.00	I	0.945	I	21.690
I ARM D	I	4.10	I	5.90	I	0.00	I	4.10	I	14.60	I	5.40	I	7.00	I	1.000	I	26.414

V = approach half-width
E = entry width

Lm = effective flare length
Vm = minimum approach half-width

A = distance between arms
K = entry corner kerb line
G = gradient over 50m

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

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

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

DEMAND SET TITLE: B6411 Station Road/Shepherd La

I	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)			I
		I	I	I	I	I	I	
I	ARM	FLOW STARTS TO RISE	TOP OF PEAK IS REACHED	IF FLOW STOPS FALLING	BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK	I
I	ARM A	I 15.00	I 45.00	I 75.00	I 0.32	I 0.49	I 0.32	I
I	ARM B	I 15.00	I 45.00	I 75.00	I 4.24	I 6.36	I 4.24	I
I	ARM C	I 15.00	I 45.00	I 75.00	I 4.44	I 6.66	I 4.44	I
I	ARM D	I 15.00	I 45.00	I 75.00	I 6.39	I 9.58	I 6.39	I

DEMAND SET TITLE: B6411 Station Road/Shepherd La

		TURNING PROPORTIONS						
		TURNING COUNTS (VEH/HR)						
		(PERCENTAGE OF H.V.S)						
	TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D		
	07.45 - 09.15							
		ARM A	0.000	0.423	0.385	0.192		
			0.0	11.0	10.0	5.0		
			(0.0)	(0.0)	(0.0)	(0.0)		
		ARM B	0.003	0.000	0.410	0.587		
			1.0	0.0	139.0	199.0		
			(0.0)	(0.0)	(0.0)	(0.0)		
		ARM C	0.011	0.377	0.000	0.611		
			4.0	134.0	0.0	217.0		
			(0.0)	(0.0)	(0.0)	(0.0)		
		ARM D	0.006	0.591	0.403	0.000		
			3.0	302.0	206.0	0.0		
			(0.0)	(0.0)	(0.0)	(0.0)		

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I CROSSING USE PER MIN	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/ TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	07.45-08.00									I
I	ARM A	0.32	12.11	0.027		0.0	0.0	0.4	0.08	I
I	ARM B	4.24	19.63	0.216		0.0	0.3	4.0	0.06	I
I	ARM C	4.44	19.28	0.230		0.0	0.3	4.4	0.07	I
I	ARM D	6.39	24.68	0.259		0.0	0.3	5.1	0.05	I

I	TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I CROSSING USE PER MIN	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/ TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.00-08.15									I
I	ARM A	0.39	10.68	0.036		0.0	0.0	0.6	0.10	I
I	ARM B	5.06	19.11	0.265		0.3	0.4	5.3	0.07	I
I	ARM C	5.30	18.80	0.282		0.3	0.4	5.7	0.07	I
I	ARM D	7.63	24.34	0.313		0.3	0.5	6.7	0.06	I

I	TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I CROSSING USE PER MIN	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/ TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.15-08.30									I
I	ARM A	0.48	8.75	0.054		0.0	0.1	0.8	0.12	I
I	ARM B	6.20	18.40	0.337		0.4	0.5	7.4	0.08	I
I	ARM C	6.49	18.15	0.357		0.4	0.6	8.1	0.09	I
I	ARM D	9.34	23.88	0.391		0.5	0.6	9.4	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.30-08.45									I
I	ARM A	0.48	8.73	0.054		0.1	0.1	0.9	0.12	I
I	ARM B	6.20	18.40	0.337		0.5	0.5	7.6	0.08	I
I	ARM C	6.49	18.15	0.358		0.6	0.6	8.3	0.09	I
I	ARM D	9.34	23.87	0.391		0.6	0.6	9.6	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.45-09.00									I
I	ARM A	0.39	10.66	0.036		0.1	0.0	0.6	0.10	I
I	ARM B	5.06	19.10	0.265		0.5	0.4	5.5	0.07	I
I	ARM C	5.30	18.79	0.282		0.6	0.4	6.1	0.07	I
I	ARM D	7.63	24.34	0.313		0.6	0.5	7.0	0.06	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	09.00-09.15									I
I	ARM A	0.32	12.07	0.027		0.0	0.0	0.4	0.09	I
I	ARM B	4.24	19.62	0.216		0.4	0.3	4.2	0.07	I
I	ARM C	4.44	19.26	0.230		0.4	0.3	4.6	0.07	I
I	ARM D	6.39	24.67	0.259		0.5	0.4	5.3	0.05	I

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.0
09.15	0.0

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.4
08.30	0.5 *
08.45	0.5 *
09.00	0.4
09.15	0.3

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.4
08.30	0.6 *
08.45	0.6 *
09.00	0.4
09.15	0.3

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
------------------------	--------------------------------

08.00	0.3
08.15	0.5
08.30	0.6 *
08.45	0.6 *
09.00	0.5
09.15	0.4

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	DEMAND (VEH/H)	* QUEUEING * * DELAY * (MIN)	* INCLUSIVE QUEUEING * * DELAY * (MIN)
A	35.7	23.8	3.7	3.7
B	464.8	309.9	34.0	34.0
C	486.8	324.5	37.1	37.1
D	700.7	467.1	43.1	43.1
ALL	1688.0	1125.3	117.9	117.9

* 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

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

[Printed at 11:27:22 on 04/07/2006]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 2.0 (MAR 2005)

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For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770018
Crowthorne House Fax: +44 (0) 1344 770864
Nine Mile Ride Email: softwarebureau@trl.co.uk
Wokingham, Berks. web: www.trlsoftware.co.uk
RG40 3GA, UK

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

Run with file:- "j:\2006\N60745\Arcady\14BPM.vai" (drive-on-the-left) at 11:27:29 on Tuesday, 4 July 2006

FILE PROPERTIES

RUN TITLE: B6411 Station Road/Shepherd Lane Mini-roundabout

LOCATION: Thurnscope

DATE: 14/06/2006

CLIENT:

ENUMERATOR: iinglis [HP26531102756]

JOB NUMBER: N60745

STATUS:

DESCRIPTION:

INPUT DATA

ARM A - John Street

ARM B - B6411 Station Road (east)

ARM C - Shepherd Lane

ARM D - B6411 Station Road (west)

MINI-ROUNDABOUT GEOMETRIC DATA

LIGHTING CONDITIONS : NORMAL

ROAD SURFACE CONDITION: NORMAL

I	ARM	I	V (m)	I	E (m)	I	Lm(M)	I	Vm(M)	I	A (M)	I	K (M)	I	G (%)	I	SLOPE	I	INTERCEPT
I	I			I		I		I		I		I		I		I		I	(PCU/MIN)
I	ARM A	I	3.95	I	3.95	I	0.00	I	3.95	I	10.00	I	3.50	I	7.00	I	0.902	I	19.321
I	ARM B	I	4.00	I	5.10	I	0.00	I	4.00	I	11.20	I	5.00	I	7.00	I	0.960	I	22.274
I	ARM C	I	3.50	I	4.80	I	0.00	I	3.50	I	14.10	I	5.60	I	7.00	I	0.945	I	21.690
I	ARM D	I	4.10	I	5.90	I	0.00	I	4.10	I	14.60	I	5.40	I	7.00	I	1.000	I	26.414

V = approach half-width

E = entry width

Lm = effective flare length

Vm = minimum approach half-width

A = distance between arms

K = entry corner kerb line

G = gradient over 50m

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

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

TIME PERIOD BEGINS 16.15 AND ENDS 17.45

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: B6411 Station Road/Shepherd La

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	IF FALLING	PEAK	OF PEAK	PEAK	I
I	ARM A	I 15.00	I 45.00	I 75.00	I 0.64	I 0.96	I 0.64	I
I	ARM B	I 15.00	I 45.00	I 75.00	I 6.85	I 10.27	I 6.85	I
I	ARM C	I 15.00	I 45.00	I 75.00	I 5.18	I 7.76	I 5.18	I
I	ARM D	I 15.00	I 45.00	I 75.00	I 6.05	I 9.08	I 6.05	I

DEMAND SET TITLE: B6411 Station Road/Shepherd La

TIME	TURNING PROPORTIONS							
	TURNING COUNTS (VEH/HR)							
	(PERCENTAGE OF H.V.S)							
	FROM/TO	ARM A	ARM B	ARM C	ARM D			
16.15 - 17.45	ARM A	0.000	0.451	0.275	0.275			
		0.0	23.0	14.0	14.0			
		(0.0)	(0.0)	(0.0)	(0.0)			
	ARM B	0.002	0.000	0.299	0.699			
		1.0	0.0	164.0	383.0			
		(0.0)	(0.0)	(0.0)	(0.0)			
	ARM C	0.056	0.406	0.000	0.539			
		23.0	168.0	0.0	223.0			
		(0.0)	(0.0)	(0.0)	(0.0)			
	ARM D	0.029	0.552	0.419	0.000			
		14.0	267.0	203.0	0.0			
		(0.0)	(0.0)	(0.0)	(0.0)			

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.15-16.30									I
I	ARM A	0.64	12.15	0.052		0.0	0.1	0.8	0.09	I
I	ARM B	6.85	19.51	0.351		0.0	0.5	7.8	0.08	I
I	ARM C	5.18	17.01	0.304		0.0	0.4	6.3	0.08	I
I	ARM D	6.05	24.03	0.252		0.0	0.3	4.9	0.06	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.30-16.45									I
I	ARM A	0.76	10.74	0.071		0.1	0.1	1.1	0.10	I
I	ARM B	8.18	18.97	0.431		0.5	0.8	11.0	0.09	I
I	ARM C	6.18	16.08	0.384		0.4	0.6	9.0	0.10	I
I	ARM D	7.22	23.55	0.307		0.3	0.4	6.5	0.06	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	16.45-17.00									I
I	ARM A	0.93	8.82	0.106		0.1	0.1	1.7	0.13	I
I	ARM B	10.02	18.23	0.550		0.8	1.2	17.3	0.12	I
I	ARM C	7.57	14.83	0.510		0.6	1.0	14.7	0.14	I
I	ARM D	8.85	22.92	0.386		0.4	0.6	9.2	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.00-17.15									I
I	ARM A	0.93	8.80	0.106		0.1	0.1	1.8	0.13	I
I	ARM B	10.02	18.22	0.550		1.2	1.2	18.1	0.12	I
I	ARM C	7.57	14.81	0.511		1.0	1.0	15.5	0.14	I
I	ARM D	8.85	22.90	0.386		0.6	0.6	9.4	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.15-17.30									I
I	ARM A	0.76	10.71	0.071		0.1	0.1	1.2	0.10	I
I	ARM B	8.18	18.96	0.431		1.2	0.8	11.9	0.09	I
I	ARM C	6.18	16.05	0.385		1.0	0.6	9.8	0.10	I
I	ARM D	7.22	23.54	0.307		0.6	0.4	6.8	0.06	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.30-17.45									I
I	ARM A	0.64	12.11	0.053		0.1	0.1	0.9	0.09	I
I	ARM B	6.85	19.50	0.351		0.8	0.5	8.4	0.08	I
I	ARM C	5.18	16.98	0.305		0.6	0.4	6.8	0.08	I
I	ARM D	6.05	24.01	0.252		0.4	0.3	5.2	0.06	I

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.5 *
16.45	0.8 *
17.00	1.2 *
17.15	1.2 *
17.30	0.8 *
17.45	0.5 *

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.4
16.45	0.6 *
17.00	1.0 *
17.15	1.0 *
17.30	0.6 *
17.45	0.4

QUEUE AT ARM D

TIME SEGMENT NO. OF
ENDING VEHICLES
IN QUEUE

16.30	0.3
16.45	0.4
17.00	0.6 *
17.15	0.6 *
17.30	0.4
17.45	0.3

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND	* QUEUEING * * DELAY *	* INCLUSIVE QUEUEING * * DELAY *
(VEH)	(VEH/H)	(MIN)	(MIN/VEH)
A	69.9	46.6	7.4
B	751.4	500.9	74.4
C	567.7	378.5	62.1
D	663.7	442.4	41.9
ALL	2052.7	1368.5	185.9

* 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

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

[Printed at 11:27:41 on 04/07/2006]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 2.0 (MAR 2005)

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program advice and maintenance, contact:

TRL Limited	Tel: +44 (0) 1344 770018
Crowthorne House	Fax: +44 (0) 1344 770864
Nine Mile Ride	Email: softwarebureau@trl.co.uk
Wokingham, Berks.	Web: www.trlsoftware.co.uk
RG40 3GA, UK	

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

Run with file:- "j:\2006\N60745\Arcady\14AAM.vai" (drive-on-the-left) at 11:27:50 on Tuesday, 4 July 2006

FILE PROPERTIES

RUN TITLE: B6411 Station Road/Shepherd Lane Mini-roundabout
LOCATION: Thurnscoe
DATE: 14/06/2006
CLIENT:
ENUMERATOR: iinglis [HP26531102756]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:

INPUT DATA

ARM A - John Street
ARM B - B6411 Station Road (east)
ARM C - Shepherd Lane
ARM D - B6411 Station Road (west)

MINI-ROUNDABOUT GEOMETRIC DATA

LIGHTING CONDITIONS : NORMAL

ROAD SURFACE CONDITION: NORMAL

I	ARM	I	V (m)	I	E (m)	I	Lm(M)	I	Vm(M)	I	A (M)	I	K (M)	I	G (%)	I	SLOPE	I	INTERCEPT (PCU/MIN)
I	ARM A	I	3.95	I	3.95	I	0.00	I	3.95	I	10.00	I	3.50	I	7.00	I	0.902	I	19.321
I	ARM B	I	4.00	I	5.10	I	0.00	I	4.00	I	11.20	I	5.00	I	7.00	I	0.960	I	22.274
I	ARM C	I	3.50	I	4.80	I	0.00	I	3.50	I	14.10	I	5.60	I	7.00	I	0.945	I	21.690
I	ARM D	I	4.10	I	5.90	I	0.00	I	4.10	I	14.60	I	5.40	I	7.00	I	1.000	I	26.414

V = approach half-width
E = entry width

Lm = effective flare length
Vm = minimum approach half-width

A = distance between arms
K = entry corner kerb line
G = gradient over 50m

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

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

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

DEMAND SET TITLE: B6411 Station Road/Shepherd La

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	IF FALLING	PEAK	OF PEAK	PEAK	I
I	ARM A	I 15.00	I 45.00	I 75.00	I 0.32	I 0.49	I 0.32	I
I	ARM B	I 15.00	I 45.00	I 75.00	I 4.50	I 6.75	I 4.50	I
I	ARM C	I 15.00	I 45.00	I 75.00	I 4.74	I 7.11	I 4.74	I
I	ARM D	I 15.00	I 45.00	I 75.00	I 7.74	I 11.61	I 7.74	I

DEMAND SET TITLE: B6411 Station Road/Shepherd La

		TURNING PROPORTIONS						
		TURNING COUNTS (VEH/HR)						
		(PERCENTAGE OF H.V.S)						
	TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D		
	07.45 - 09.15							
		ARM A	0.000	0.423	0.385	0.192		
			0.0	11.0	10.0	5.0		
			(0.0)	(0.0)	(0.0)	(0.0)		
		ARM B	0.003	0.000	0.386	0.611		
			1.0	0.0	139.0	220.0		
			(0.0)	(0.0)	(0.0)	(0.0)		
		ARM C	0.011	0.354	0.000	0.636		
			4.0	134.0	0.0	241.0		
			(0.0)	(0.0)	(0.0)	(0.0)		
		ARM D	0.005	0.591	0.404	0.000		
			3.0	366.0	250.0	0.0		
			(0.0)	(0.0)	(0.0)	(0.0)		

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	07.45-08.00									I
I	ARM A	0.32	10.90	0.030		0.0	0.0	0.4	0.09	I
I	ARM B	4.50	19.11	0.236		0.0	0.3	4.5	0.07	I
I	ARM C	4.74	19.03	0.249		0.0	0.3	4.8	0.07	I
I	ARM D	7.74	24.68	0.313		0.0	0.5	6.7	0.06	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.00-08.15									I
I	ARM A	0.39	9.23	0.042		0.0	0.0	0.6	0.11	I
I	ARM B	5.37	18.48	0.291		0.3	0.4	6.0	0.08	I
I	ARM C	5.66	18.51	0.306		0.3	0.4	6.4	0.08	I
I	ARM D	9.24	24.34	0.380		0.5	0.6	8.9	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.15-08.30									I
I	ARM A	0.48	6.97	0.068		0.0	0.1	1.1	0.15	I
I	ARM B	6.58	17.63	0.373		0.4	0.6	8.6	0.09	I
I	ARM C	6.93	17.79	0.389		0.4	0.6	9.2	0.09	I
I	ARM D	11.32	23.88	0.474		0.6	0.9	13.0	0.08	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.30-08.45									I
I	ARM A	0.48	6.95	0.068		0.1	0.1	1.1	0.15	I
I	ARM B	6.58	17.62	0.373		0.6	0.6	8.9	0.09	I
I	ARM C	6.93	17.79	0.390		0.6	0.6	9.5	0.09	I
I	ARM D	11.32	23.87	0.474		0.9	0.9	13.4	0.08	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	08.45-09.00									I
I	ARM A	0.39	9.20	0.042		0.1	0.0	0.7	0.11	I
I	ARM B	5.37	18.47	0.291		0.6	0.4	6.3	0.08	I
I	ARM C	5.66	18.49	0.306		0.6	0.4	6.8	0.08	I
I	ARM D	9.24	24.33	0.380		0.9	0.6	9.5	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	09.00-09.15									I
I	ARM A	0.32	10.85	0.030		0.0	0.0	0.5	0.09	I
I	ARM B	4.50	19.09	0.236		0.4	0.3	4.7	0.07	I
I	ARM C	4.74	19.02	0.249		0.4	0.3	5.1	0.07	I
I	ARM D	7.74	24.67	0.314		0.6	0.5	7.0	0.06	I

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.0
09.15	0.0

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.4
08.30	0.6 *
08.45	0.6 *
09.00	0.4
09.15	0.3

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.3
08.15	0.4
08.30	0.6 *
08.45	0.6 *
09.00	0.4
09.15	0.3

QUEUE AT ARM D

TIME SEGMENT NO. OF
ENDING VEHICLES
IN QUEUE

08.00	0.5
08.15	0.6 *
08.30	0.9 *
08.45	0.9 *
09.00	0.6 *
09.15	0.5

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND	* QUEUEING * * DELAY *	* INCLUSIVE QUEUEING * * DELAY *
(VEH)	(VEH/H)	(MIN)	(MIN/VEH)
A	35.7	23.8	4.4
B	493.6	329.1	39.1
C	519.7	346.5	41.9
D	848.8	565.9	58.5
ALL	1897.8	1265.2	143.9

* 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

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

[Printed at 11:28:01 on 04/07/2006]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 2.0 (MAR 2005)

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For sales and distribution information,
program advice and maintenance, contact:

TRL Limited Tel: +44 (0) 1344 770018
Crowthorne House Fax: +44 (0) 1344 770864
Nine Mile Ride Email: softwarebureau@trl.co.uk
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RG40 3GA, UK

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Run with file:- "j:\2006\N60745\Arcady\14APM.vai" (drive-on-the-left) at 11:28:10 on Tuesday, 4 July 2006

FILE PROPERTIES

RUN TITLE: B6411 Station Road/Shepherd Lane Mini-roundabout
LOCATION: Thurnscoe
DATE: 14/06/2006
CLIENT:
ENUMERATOR: iinglis [HP26531102756]
JOB NUMBER: N60745
STATUS:
DESCRIPTION:

INPUT DATA

ARM A - John Street
ARM B - B6411 Station Road (east)
ARM C - Shepherd Lane
ARM D - B6411 Station Road (west)

MINI-ROUNDABOUT GEOMETRIC DATA

LIGHTING CONDITIONS : NORMAL

ROAD SURFACE CONDITION: NORMAL

I	ARM	I	V (m)	I	E (m)	I	Lm(M)	I	Vm(M)	I	A (M)	I	K (M)	I	G (%)	I	SLOPE	I	INTERCEPT (PCU/MIN)
I		I		I		I		I		I		I		I		I		I	
I	ARM A	I	3.95	I	3.95	I	0.00	I	3.95	I	10.00	I	3.50	I	7.00	I	0.902	I	19.321
I	ARM B	I	4.00	I	5.10	I	0.00	I	4.00	I	11.20	I	5.00	I	7.00	I	0.960	I	22.274
I	ARM C	I	3.50	I	4.80	I	0.00	I	3.50	I	14.10	I	5.60	I	7.00	I	0.945	I	21.690
I	ARM D	I	4.10	I	5.90	I	0.00	I	4.10	I	14.60	I	5.40	I	7.00	I	1.000	I	26.414

V = approach half-width
E = entry width

Lm = effective flare length
Vm = minimum approach half-width

A = distance between arms
K = entry corner kerb line
G = gradient over 50m

TRAFFIC DEMAND DATA

(Only sets included in the current run are shown)

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

TIME PERIOD BEGINS 16.15 AND ENDS 17.45

LENGTH OF TIME PERIOD - 90 MINUTES.
LENGTH OF TIME SEGMENT - 15 MINUTES.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

DEMAND SET TITLE: B6411 Station Road/Shepherd La

I	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)			I
		I	I	I	I	I	I	
I	ARM	I	FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER
I	I	I	TO RISE	IS REACHED	IF FALLING	PEAK	OF PEAK	PEAK
I	ARM A	I	15.00	I	45.00	I	75.00	I
I	ARM B	I	15.00	I	45.00	I	75.00	I
I	ARM C	I	15.00	I	45.00	I	75.00	I
I	ARM D	I	15.00	I	45.00	I	75.00	I

DEMAND SET TITLE: B6411 Station Road/Shepherd La

		TURNING PROPORTIONS								
		TURNING COUNTS (VEH/HR)								
		(PERCENTAGE OF H.V.S)								
	TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D				
	16.15 - 17.45									
		ARM A	0.000	0.451	0.275	0.275				
			0.0	23.0	14.0	14.0				
			(0.0)	(0.0)	(0.0)	(0.0)				
		ARM B	0.002	0.000	0.266	0.733				
			1.0	0.0	164.0	452.0				
			(0.0)	(0.0)	(0.0)	(0.0)				
		ARM C	0.051	0.375	0.000	0.574				
			23.0	168.0	0.0	257.0				
			(0.0)	(0.0)	(0.0)	(0.0)				
		ARM D	0.026	0.552	0.423	0.000				
			14.0	303.0	232.0	0.0				
			(0.0)	(0.0)	(0.0)	(0.0)				

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

I	TIME	I	DEMAND	I	CAPACITY	I	DEMAND/	I	CROSSING	I	START	I	END	I	DELAY	I	AVERAGE DELAY	I
I		I	(VEH/MIN)	I	(VEH/MIN)	I	CAPACITY	I	USE	I	QUEUE	I	QUEUE	I	(VEH.MIN/	I	PER ARRIVING	I
I		I		I		I	(RFC)	I	PER MIN	I	(VEHS)	I	(VEHS)	I	TIME SEGMENT)	I	VEHICLE (MIN)	I
I	16.15-16.30	I		I		I		I		I		I		I		I		I
I	ARM A	I	0.64	I	11.43	I	0.056	I		I	0.0	I	0.1	I	0.9	I	0.09	I
I	ARM B	I	7.71	I	19.17	I	0.402	I		I	0.0	I	0.7	I	9.7	I	0.09	I
I	ARM C	I	5.60	I	16.20	I	0.346	I		I	0.0	I	0.5	I	7.6	I	0.09	I
I	ARM D	I	6.86	I	24.03	I	0.286	I		I	0.0	I	0.4	I	5.8	I	0.06	I

I	TIME	I	DEMAND	I	CAPACITY	I	DEMAND/	I	CROSSING	I	START	I	END	I	DELAY	I	AVERAGE DELAY	I
I		I	(VEH/MIN)	I	(VEH/MIN)	I	CAPACITY	I	USE	I	QUEUE	I	QUEUE	I	(VEH.MIN/	I	PER ARRIVING	I
I		I		I		I	(RFC)	I	PER MIN	I	(VEHS)	I	(VEHS)	I	TIME SEGMENT)	I	VEHICLE (MIN)	I
I	16.30-16.45	I		I		I		I		I		I		I		I		I
I	ARM A	I	0.76	I	9.87	I	0.077	I		I	0.1	I	0.1	I	1.2	I	0.11	I
I	ARM B	I	9.21	I	18.55	I	0.496	I		I	0.7	I	1.0	I	14.1	I	0.11	I
I	ARM C	I	6.69	I	15.12	I	0.442	I		I	0.5	I	0.8	I	11.4	I	0.12	I
I	ARM D	I	8.19	I	23.56	I	0.348	I		I	0.4	I	0.5	I	7.8	I	0.07	I

I	TIME	I	DEMAND	I	CAPACITY	I	DEMAND/	I	CROSSING	I	START	I	END	I	DELAY	I	AVERAGE DELAY	I
I		I	(VEH/MIN)	I	(VEH/MIN)	I	CAPACITY	I	USE	I	QUEUE	I	QUEUE	I	(VEH.MIN/	I	PER ARRIVING	I
I		I		I		I	(RFC)	I	PER MIN	I	(VEHS)	I	(VEHS)	I	TIME SEGMENT)	I	VEHICLE (MIN)	I
I	16.45-17.00	I		I		I		I		I		I		I		I		I
I	ARM A	I	0.93	I	7.75	I	0.120	I		I	0.1	I	0.1	I	2.0	I	0.15	I
I	ARM B	I	11.28	I	17.72	I	0.637	I		I	1.0	I	1.7	I	24.2	I	0.15	I
I	ARM C	I	8.19	I	13.66	I	0.600	I		I	0.8	I	1.5	I	20.6	I	0.18	I
I	ARM D	I	10.04	I	22.92	I	0.438	I		I	0.5	I	0.8	I	11.3	I	0.08	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.00-17.15									I
I	ARM A	0.93	7.73	0.121		0.1	0.1	2.0	0.15	I
I	ARM B	11.28	17.71	0.637		1.7	1.7	25.8	0.16	I
I	ARM C	8.19	13.62	0.601		1.5	1.5	22.1	0.18	I
I	ARM D	10.04	22.91	0.438		0.8	0.8	11.6	0.08	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.15-17.30									I
I	ARM A	0.76	9.82	0.077		0.1	0.1	1.3	0.11	I
I	ARM B	9.21	18.54	0.497		1.7	1.0	15.6	0.11	I
I	ARM C	6.69	15.07	0.444		1.5	0.8	12.6	0.12	I
I	ARM D	8.19	23.53	0.348		0.8	0.5	8.2	0.07	I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	CROSSING USE PER MIN	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)	I
I	17.30-17.45									I
I	ARM A	0.64	11.38	0.056		0.1	0.1	0.9	0.09	I
I	ARM B	7.71	19.15	0.403		1.0	0.7	10.5	0.09	I
I	ARM C	5.60	16.16	0.347		0.8	0.5	8.3	0.10	I
I	ARM D	6.86	24.01	0.286		0.5	0.4	6.1	0.06	I

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.1
17.45	0.1

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.7 *
16.45	1.0 *
17.00	1.7 **
17.15	1.7 **
17.30	1.0 *
17.45	0.7 *

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.5 *
16.45	0.8 *
17.00	1.5 *
17.15	1.5 *
17.30	0.8 *
17.45	0.5 *

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.30	0.4
16.45	0.5 *
17.00	0.8 *
17.15	0.8 *
17.30	0.5 *
17.45	0.4

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	I	I	* DELAY *	I	* DELAY *	I
I	I	I	I	I	I	I	I	I
I	I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
I	A	I	69.9	I 46.6	I 8.3	I 0.12	I 8.3	I 0.12
I	B	I	846.0	I 564.0	I 99.9	I 0.12	I 99.9	I 0.12
I	C	I	614.3	I 409.5	I 82.5	I 0.13	I 82.5	I 0.13
I	D	I	752.8	I 501.9	I 50.9	I 0.07	I 50.9	I 0.07
I	ALL	I	2283.1	I 1522.0	I 241.7	I 0.11	I 241.7	I 0.11

* 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

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

[Printed at 11:28:21 on 04/07/2006]