**WYG** Transport Planning

part of the **WYG** group

# Transport Assessment

## Barnsley College, Honeywell Campus
## Submission of Reserved Matters



**creative minds** safe hands

## REPORT CONTROL

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# 1 INTRODUCTION

1.1 WYG has been appointed by Barnsley College to produce a revised Transport Assessment in support of a Reserved Matters application for the site. This report updates a previous TA produced by RPS in August 2005 which supported an outline planning application for the redevelopment of the Honeywell and Belle Vue centres of Barnsley College.

1.2 This report considers the traffic impact of a mixed use scheme for the site. The original scheme was submitted for planning approval in August 2005. The scheme was granted outline planning approval on 10th May 2006 subject to a number of conditions.

1.3 The redevelopment consists of a mix of residential and office uses with a new sports hall and some improvements to other sports facilities for use by the College.

1.4 The site is located to the south of Honeywell Lane and is approximately 1km north of Barnsley town centre.

1.5 The scope of the RPS TA report was agreed with officers of Barnsley Metropolitan Borough Council (BMBC). Therefore, this report will adopt the same methodology.

1.6 This report has been prepared in accordance with the guidance set out in the DfT publication "Guidance on Transport Assessment".

## Purpose of the report

1.7 The purpose of this Transport Assessment is to update the TA produced for the Outline Planning Application. It will outline the current development proposals, assess their transport impacts and identify any improvements to the existing infrastructure that may be required in order to accommodate the revised traffic flows.

1.8 The remainder of this report is structured as follows:

- **Chapter 2** describes the existing conditions within the vicinity of the site;
- **Chapter 3** describes the operation of the existing highway network;
- **Chapter 4** outlines the development proposals;
- **Chapter 5** determines the traffic impact of the proposals; and
- **Chapter 6** provides a summary to the report and sets out the conclusions.

## 2 THE EXISTING SITE AND HIGHWAY NETWORK

### The Site

2.1 The site is approximately 800 metres north of Barnsley town centre and lies within a predominantly residential area.

2.2 It is bounded by Honeywell Lane to the north, the Leeds to Sheffield Railway line to the east, with the Huddersfield to Sheffield Railway line forming the southern boundary. To the west, the site is bound by Cockerham Lane.

2.3 The site is approximately 7.6 hectares in area and is currently occupied by Barnsley College.

2.4 There are currently 3 points of vehicular access to the site via simple priority junctions. One is located on Cockerham Lane, which provides access to the Belle Vue site. The other two accesses are on Honeywell Lane.

2.5 The primary access to the site is the eastern most gate which is centrally located on the site frontage along Honeywell Lane.

2.6 The location of the site in relation to the strategic highway network is shown on the drawing included at Appendix A.

### The Adjacent Highway Network

2.7 The main vehicular access route to and from the site is via the A635 Huddersfield Road and Cockerham Lane. This section of the A635 Huddersfield Road is a single carriageway road some 8.5 metres wide and is subject to significant volumes of traffic.

2.8 Cockerham Lane is the minor road at a simple priority junction with the A635 Huddersfield Road. Cockerham Lane distributes traffic in this area of Barnsley and is subject to moderate levels of traffic. At the junction with the A635 Huddersfield Road a 7.6 metre carriageway width is available. The junction is characterised by the acute angled minor road approach. Visibility to the left from the minor road is satisfactory, but to the right it is constrained by the adjacent properties.

2.9 Within the vicinity of the Belle Vue site access on Cockerham Lane, the carriageway width reduces to approximately 4.8 metres over a short length before widening to 7.7 metres at the Belle Vue access. There are double yellow lines prohibiting on-street parking on Cockerham Lane between the A635 Huddersfield Road and the Belle Vue Access.

2.10 Access to the Honeywell site is available via Cockerham Lane and Honeywell Lane. Honeywell Lane joins Cockerham Lane at a priority controlled cross-roads junction, with Cockerham Lane forming the priority route and Honeywell Lane and Lombard Close forming the minor roads.

2.11 The initial section of Honeywell Lane slopes sharply downhill from the junction with Cockerham Lane towards the Honeywell site access. As the Honeywell site is reached a much easier gradient is evident. Visibility at the main Honeywell access is somewhat restricted by railings along the site frontage.

2.12 Honeywell Lane is bridged by the Barnsley to Leeds railway lines approximately 150 metres east of the main College access. The width and headroom at the bridge restricts traffic movement to one-way working, with traffic signals to control these vehicular movements. With the exception of the College frontage, residential frontage development has taken place on Honeywell Lane. Most properties have the benefit of off-street parking facilities,

although properties nearest the railway do not and as a result, some on-street parking does take place in this section of Honeywell Lane.

2.13 Honeywell Lane is joined from the north by residential access roads, Allendale Road and Carrington Avenue, are simple priority junctions. The junction with Allendale Road is situated towards the western end of the College frontage to Honeywell Lane, whilst the junction with Carrington Avenue is located some 50 metres to the west of the College frontage.

2.14 The location of the site in relation to the local highway network is shown on the drawing included at Appendix B.

**Bus Services**

2.15 There are 3 bus stops locations within close proximity to the site which are summarised in Table 2.1. The plan included at Appendix C shows the stop locations.

| | Description / Facilities | Walk distance from site (metres) | Walk distance from site (minutes) |
|---|---|---|---|
| Huddersfield Road | Eastern side is a post and flag stop and the western side is a cantilever shelter with seating. Both bus stops have no road markings | 340m | 4 mins |
| Honeywell Street | There are two bus stops to the north and two to the south. They are all pole and flag stops except for the one to the south on the east side of the road which is a cantilever bus shelter. All the bus stops have no road marking | 380m | $4^1/_2$ mins |
| Eldon Street North | Both stops are poles and flag stops with no road markings | 650m | 8 mins |

**Table 2.1: Accessible Bus Stops**

2.16 There are currently 11 bus services operating from the 3 locations and these are summarised in Tables 2.2 (Huddersfield Road), 2.3 (Honeywell Street) and 2.4 (Eldon Street North).

| Service No. | Route Description | Frequency | | Hours of Operation |
|---|---|---|---|---|
| | | Mon - Fri | Sat | |
| 444 | Barnsley, Wilthorpe, Darton, Haigh, West Bretton, Wakefield, Hunslet, Leeds | 2 every hour | 2 every hour | 0512 - 2225 |
| 443 | Barnsley, Wilthorpe, Darton, Haigh, West Bretton, Wakefield, Hunslet, Leeds | 2 every hour | 2 every hour | 0512 - 2225 |

**Table 2.2: Summary of Bus Services along Huddersfield Road**

| Service No. | Route Description | Frequency | | |
|---|---|---|---|---|
| | | Mon - Fri | Sat | sun |
| 12 | Barnsley, Honeywell, Athersley South | Every 15 mins | Every 30 mins | Every 30 mins |

**Table 2.3: *Summary of Bus Services along Honeywell Street***

| Service No. | Route Description | Frequency | | |
|---|---|---|---|---|
| | | Mon - Fri | Sat | sun |
| 1 | Barnsley, Wakefield Road, Straincross | Every 15 mins | Every 30 mins | Every 30 mins |
| 11 | Barnsley, Wakefield Road, Athersley South | Every 10 mins | Every 30 mins | Every 30 mins |
| 12 | Barnsley, Honeywell, Athersley South | Every 15 mins | Every 30 mins | Every 30 mins |
| 31 | Barnsley, Bishops way, Monk Bretton, Cudworth, Crown Avenue | Every 60 mins | Every 60 mins | - |
| 33 | Barnsley, Shafton, South Hiendley | Every 15 mins | Every 30 mins | Every 30 mins |
| 57 | Barnsley, Monk Bretton, Carlton, Park View, Royston, Meadstead Drive | 4 per hour | - | - |
| 59 | Barnsley, Monk Bretton, Carlton, Cross Lane, Royston, Station Road (short journeys) | Every 60 mins | - | - |
| 94 | Infrequent hospital bus | - | - | - |

**Table 2.3: Summary of Bus Services along Eldon Street North**

2.17 All services into Barnsley that pass by the site stop at the recently constructed Barnsley Interchange. High quality pedestrian linkages from the bus terminal to Barnsley train station are in operation which further promotes the accessibility of bus services as part of a longer journey. Facilities for passengers at Barnsley Interchange include:

- Real-time bus information;
- commercial units including a newsagent, chemist and café;
- Information Centre and customer service points;
- offices and a meeting room;
- a secure, fully enclosed, high quality passenger concourse and waiting area;
- comfortable seating at every stand;
- public toilets;

- baby changing area;
- cash machine;
- public telephones;
- cycle racks; and
- luggage lockers.

2.18 Barnsley Bus Interchange is 810 metres from the development, or a 10 minute walk based on a typical walking speed of 1.4 metres per second. This takes the route from the centre of the site southwards to Old Mil Lane, along Old Mil Lane to County Way then along Regent Street then to the Interchange on Midland Street.

**Rail Services**

2.19 Barnsley Railway Station is located some 810 metres walk distance to the east of the proposed site. Both the Hallam and Peniston lines run through the station and provide frequent services to regional stations in the surrounding area. Other services to Leeds, Wakefield and Sheffield are also available from the station where services to the rest of the UK rail network operate.

2.20 In addition to the facilities at the Barnsley Interchange, the railway station also provides:

- drop off facilities;
- 74 standard parking spaces;
- 6 disabled parking spaces;
- 2 'parent and child' parking spaces;
- full accessibility for all users including those with mobility, hearing and visual impairments;
- 3 lifts, 2 escalators and ramps; and
- A footbridge connecting the concourse of the interchange with the rail station.

2.21 Suggested walk distances to bus stops are specified in the "Guidelines for Planning for Public Transport in Development" which recommends that new development should be less than 400 metres from a bus stop. The closest bus stops, on Huddersfield Road and Honeywell Street, are 340 metres and 380 metres from the site respectively. Therefore the proposed site provides an acceptable walking distance to the available bus stops.

2.22 The IHT publication "Guidelines for Providing for Journeys on Foot" contains suggested walking distances for different categories of pedestrians. The guidelines suggest that a walking distance of up to 1000m for school/commuting purposes is considered 'Acceptable'. Therefore the distance from the Barnsley Interchange to the proposed site is within an acceptable walking distance.

### Cycling Facilities

2.23 Cyclists currently use the existing highway network.

### Pedestrian Facilities

2.24 The highway network within the vicinity of the site benefits from being well lit and having footway along both sides of all roads and dropped kerbs at most crossing points.

### Road Safety

2.25 A review of the existing Personal Injury Accidents (PIA) in the vicinity of the site was undertaken in the previous TA for the 5 year period to 31 December 2004. The results of this review did not identify any significant trends and concluded that, whilst accident involving injury is a matter of concern, there was an average of only one slight injury accident per year.

2.26 Given that there have been no significant changes to the highway network in the vicinity of the site. It is assumed that the PIA record will not have changed significantly in the intervening period.

# 3 THE OPERATION OF THE EXISTING HIGHWAY NETWORK

## Existing Traffic Flows

3.1 Traffic surveys were undertaken for the original TA on Tuesday 11th January 2005 at the following junctions: -

- The existing College accesses on Honeywell Lane and Cockerham Lane;
- Junctions of Honeywell Lane / Cockerham Lane / Lombard Close; and
- Junction of Cockerham Lane / Huddersfield Road.

3.2 Therefore, for the purpose of this TA, the traffic flow data from the approved application submitted in August 2005 has been factored to provide 2009 flows.

3.3 Growth factors for this have been derived from the National Transport Model, Tables 1 and 2. These have then been adjusted to provide local growth factors using the Trip End Model Presentation Programme (TEMPRO) version 5.0. The resultant AM and PM peak hour growth factors are summarised in Table 3.1 and the detailed calculation is included at Appendix D.

| Scenario | Growth Factor |
|---|---|
| 2005-2009 Weekday AM Peak Growth Factor | 1.053 |
| 2005-2009 Weekday AM Peak Growth Factor | 1.052 |

**Table 3.1: Proposed Factors from 2005 to 2009**

## Assessment Periods

3.4 The traffic survey results were interrogated to identify the AM and PM peak hours for assessment. The AM peak hour occurred from 8:15am to 9:15am and the PM peak hour occurred from 4:30pm to 5:30pm.

3.5 The traffic flows used in the analyses are summarised in Table 3.2.

| Link | Movement | Morning Peak Hour | Evening Peak Hour |
|---|---|---|---|
| Honeywell Lane (between the College accesses | Eastbound vehicle flow | 146 | 98 |
| | Westbound vehicle flow | 101 | 100 |
| Cockerham Lane (between Belle Vue access and Huddersfield Road) | Northbound vehicle flow | 180 | 186 |
| | Southbound vehicle flow | 242 | 198 |
| Huddersfield Road (north of Cockerham Lane) | Northbound vehicle flow | 428 | 806 |
| | Southbound vehicle flow | 794 | 717 |

**Table 3.2: 2009 Existing Traffic Flows**

3.6 The traffic surveys also established that the current uses at the College generate a significant volume of traffic during the peak hours. These are summarised in Table 3.3.

| Access | Arrivals / Departures | Morning Peak Hour | Evening Peak Hour |
|---|---|---|---|
| Honeywell Lane (Main Eastern Access) | Arrivals (veh) | 131 | 27 |
| | Departures (veh) | 37 | 71 |
| Honeywell Lane (Western Access) | Arrivals (veh) | 13 | 0 |
| | Departures (veh) | 2 | 3 |

**Table 3.3: Existing Peak Hour Traffic Movements at the College Accesses**

# 4 THE PROPOSED DEVELOPMENT

## Overview

4.1 The proposed Masterplan for the site is included at Appendix E.

4.2 Proposals for the redevelopment of the Honeywell site include:

- 54 residential dwellings on the Honeywell Main Site;
- 9 residential dwellings on Honeywell Lane;
- a new sports hall and some improvements to other sports facilities for use by the College; and
- 2460sqm of B1 Office space.

4.3 The access arrangement for the Honeywell site will by directly onto Honeywell Lane in the form of a priority junction.

## Proposed Parking

4.4 Car Parking on the site will be provided in 4 distinct areas, as follows:

- The Main Honeywell Site;
- The residential dwellings on Honeywell Lane;
- The Office development; and
- The College Sports Facility.

4.5 The main Honeywell site consists of 54 residential dwellings providing a total of 91 off-street parking opportunities.

4.6 The 9 Honeywell Lane residential dwellings will have 13 car parking opportunities, with 5 provided within the individual property curtilage and the remaining 8 in a parking court to the rear of the properties.

4.7 The Office development will provide a total of 82 standard parking spaces, with an additional 4 disabled spaces.

4.8 The College Sports Facility provides a total of 52 standard parking spaces and an additional 6 disabled spaces.

# 5 THE TRAFFIC IMPACT OF THE DEVELOPMENT

## Generated Traffic

5.1 The Trip Rate Information and Calculation System (TRICS) version 2008b database was interrogated to derive 85th percentile trip rates for the proposed development.

5.2 It is considered that the new sports hall and some improvements to other sports facilities for use by the College will not generate any traffic during the AM and PM peak hours.

5.3 The calculation of the generated traffic is detailed in Appendix F and is summarised in Table 5.1.

| | Houses (63) | | Total |
|---|---|---|---|
| | Trips Rates per HH | Trips | |
| AM Arrivals | 0.161 | 10 | **36** |
| AM Departures | 0.414 | 26 | |
| PM Arrivals | 0.402 | 25 | **41** |
| PM Departures | 0.247 | 16 | |
| | Office (2460sqm) | | Total |
| | Trips Rates per HH | Trips | |
| AM Arrivals | 1.81 | 45 | **51** |
| AM Departures | 0.25 | 6 | |
| PM Arrivals | 0.27 | 7 | **42** |
| PM Departures | 1.39 | 35 | |
| | Total Generated Trips | | Total |
| Total AM Arrivals | 55 | | **87** |
| Total AM Departures | 32 | | |
| Total PM Arrivals | 32 | | **83** |
| Total PM Departures | 51 | | |

**Table 5.1: Proposed Residential Development Generated Traffic**

5.4 The analysis shows that the proposals will generate: -

- 55 arrivals and 32 departures in the AM peak period; and
- 32 arrivals and 51 departures in the PM peak period.

### Traffic Impact

5.5 It is the nett traffic impact which is the critical issue when considering the potential impact of the development. This is the difference between the traffic generated by the existing site use and the traffic generated by the proposals.

5.6 For comparison purposes, the traffic generated from the existing site use at the Honeywell Lane entrance has been extracted from traffic surveys undertaken previously. This data is summarised in Table 5.2.

| | Total Generated Trips | Total |
|---|---|---|
| Total AM Arrivals | 144 | **183** |
| Total AM Departures | 39 | |
| Total PM Arrivals | 27 | **98** |
| Total PM Departures | 74 | |

**Table 5.2: Surveyed Existing Generated Traffic**

5.7 It is estimated that the proposed development will generate a total of 87 trips in the AM peak period and 83 trips in the PM peak period. The traffic flows associated with the existing College use has a total of 183 trips in the AM peak period and 98 trips in the PM peak period.

5.8 Therefore, the proposed development will represent a significant reduction in the traffic flows associated with the site. These reductions are 52.4% in the AM peak period and 15.3% in the PM peak period.

5.9 Therefore, the development will have a beneficial traffic impact with significantly reduced flows on the local highway network.

### Distribution of the Generated Traffic

5.10 The distribution of the generated traffic for the proposed development has been based on the turning proportions of the existing traffic flows on Honeywell Lane. The resultant distributed development generated traffic flows are included at Appendix G.

### Traffic Growth

5.11 For the purpose of this assessment, future year scenarios for junction analysis have been determined in accordance with the Department for Transport publication "Guidance on Transport Assessment" which recommends that assessments should be carried out in the year of registration of the application and then no less than five years after the registration.

5.12 Therefore, for this assessment, analysis will be undertaken for:

- 2009 – year of registration; and
- 2014 – five years after registration.

5.13 In order to predict the future year traffic flows, growth factors have been derived from the National Transport Model Tables 1 and 2 which are adjusted to provide local growth factors using the Trip End Model Presentation Programme (Tempro) version 5.0.

5.14 The resultant central growth factors for the Yorkshire region and principal road type are detailed in Appendix H and are summarised in Table 5.3.

| Year | Growth Factor |
|---|---|
| 2005-2014 AM Weekday Growth Factor | 1.115 |
| 2005-2014 PM Weekday Growth Factor | 1.119 |

**Table 5.3: Proposed Factors from 2005 to 2014**

### Honeywell Site Access

5.15 The proposed development will be served by one access onto Honeywell Lane. This access will replace the primary existing access into the site.

5.16 A visibility splay of 2.4m x 43m is provided which is in accordance with the guidance in the Department for Transport publication"Manual for Streets" (MfS). The "Y' value of 43m provides a safe stopping distance for vehicles travelling at 30mph.

5.17 The site access will provide a 6.0 metre wide carriageway with 2 metre wide footways on either side. The site access will also provide a gradient of 1 in 20 some 20 metres back from Honeywell Lane and there after a maximum gradient of 1 in 12.

5.18 This is a significant improvement over the existing primary access, as two-way traffic movements can be accommodated simultaneously.

5.19 The existing secondary access from Honeywell Lane will be is to be used for pedestrians and cyclists only.

5.20 An assessment of the proposed site access junction has been undertaken using the computer programme PICADY 5. to ascertain its operational capacity in the following scenarios: -

- 2009 Base plus development generated traffic flows; and
- 2014 Base plus development generated traffic flows.

### 2009 Base plus Generated Traffic Flows

5.21 These flows are the existing 2005 surveyed traffic flows factored to 2009 and include the traffic associated with the proposed development. The resultant 2009 Base plus Generated traffic flows are shown on the drawing included at Appendix I.

5.22 Table 5.4 summarises the results of the analysis and the full output is included at Appendix J.

| Movement | Weekday AM Peak Hour | | Weekday PM Peak Hour | |
|---|---|---|---|---|
| | RFC | Queue (Vehs) | RFC | Queue (Vehs) |
| From Site Access turning left and right onto Honeywell Lane | 0.063 | 0.07 | 0.100 | 0.11 |
| From Honeywell Lane west turning right into Site Access and straight to Honeywell Lane east | 0.055 | 0.07 | 0.032 | 0.04 |

**Table 5.4: Summary of 2009 Existing Traffic Flows plus development Generated flows**

5.23 This analysis shows that the junction will operate satisfactorily during the AM and PM peak periods in 2009 for this scenario, with RFC's well below the recommended 0.850 threshold for junction capacity.

**2014 Base plus Generated Traffic Flows**

5.24 These flows are the existing 2005 surveyed traffic flows factored to 2014 and include the traffic associated with the proposed development. The resultant 2014 Base plus Generated traffic flows are detailed in the drawings at Appendix K.

5.25 The results of the analysis are summarised in Table 5.5 and the full output is included at Appendix L.

| Movement | Weekday AM Peak Hour | | Weekday PM Peak Hour | |
|---|---|---|---|---|
| | RFC | Queue (Vehs) | RFC | Queue (Vehs) |
| From Site Access turning left and right onto Honeywell Lane | 0.063 | 0.07 | 0.100 | 0.11 |
| From Honeywell Lane west turning right into Site Access and straight to Honeywell Lane east | 0.056 | 0.07 | 0.032 | 0.04 |

**Table 5.5: Summary of 2014 Base Traffic Flows plus development Generated flows**

5.26 The analysis shows that the junction will continue to operate satisfactorily during the AM and PM peak periods even in the design year of 2014 with the addition of the development generated traffic.

## 6 SUMMARY AND CONCLUSIONS

6.1 This Transport Assessment has dealt with the highways and traffic issues raised by proposals to redevelop the former Barnsley College site in Barnsley, South Yorkshire and responds to the conditions set out in the Outline Planning approval granted for the site in 2006. This update to an original TA is submitted in support of a Reserved Matters application for the site.

6.2 The highway network in the vicinity of the site has been described in detail and it has been demonstrated that it is very well served by public transport.

6.3 The proposal is to provide 63 residential units and a total GFA of 2460sqm of office in the form of three blocks. The report also addresses the impact of the College Sports Facilities that have been provided on the site.

6.4 The operation of the existing highway network has been considered and analysis has shown that it is operating satisfactorily.

6.5 The existing main site access has been revised to accommodate the traffic movements associated with the development proposals. The visibility that can be achieved at this junction is 2.4 metres by 43 metres which complies fully with current guidance in terms of layout and visibility requirements.

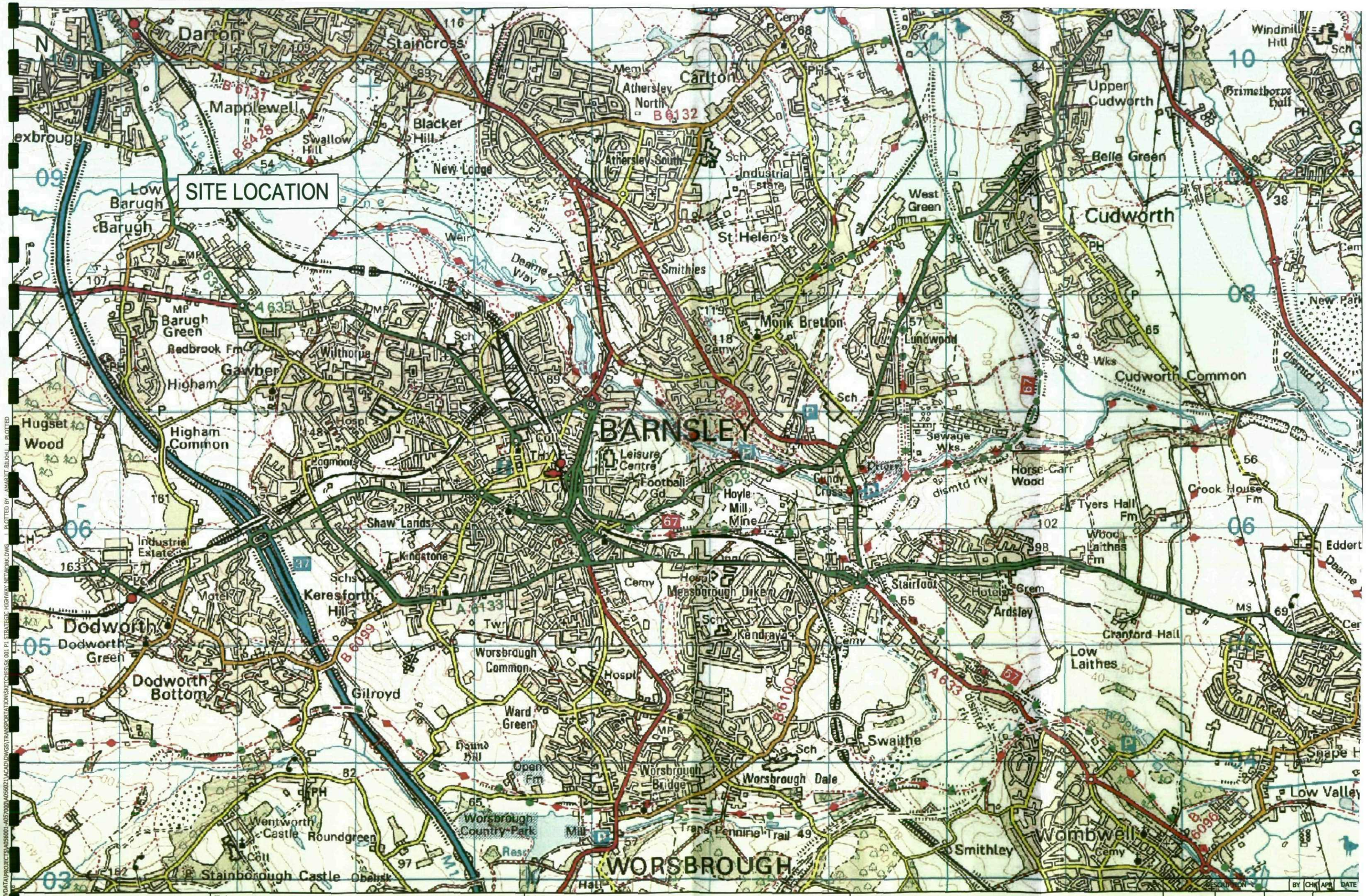
6.6 In addition, the vertical alignment will also be improved by providing a 1 in 20 gradient from Honeywell Lane for some 20 metres and thereafter a maximum gradient of 1 in 12.

6.7 The trips associated with the existing Barnsley College site were extracted from the traffic surveys for comparison purposes. This showed that the site formerly generated some 52.4% more traffic in the AM peak and 15.3% in the PM peak. This represents a positive impact on the surrounding highway network.

6.8 The site access has been analysed for the Year of Registration (2009) and 5 years after registration (2014) with the additional flows from the development. The analysis shows that, even in the forecast year of 2014 and with the trips associated with the proposed development, the modified site access junction can accommodate the traffic flows satisfactorily.

6.9 Therefore there are no highway related issues that would prevent the Reserved Matters Application for the development from being approved.

# Appendix A




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BARNSLEY COLLEGE
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SUBMISSION OF RESERVED MATTERS

Drawing Title:
STRATEGIC HIGHWAY NETWORK

| Scale @ ## | Drawn | Date | Checked | Date | Approved | Date |
|---|---|---|---|---|---|---|
| NTS | AB | APRIL 09 | | | | |

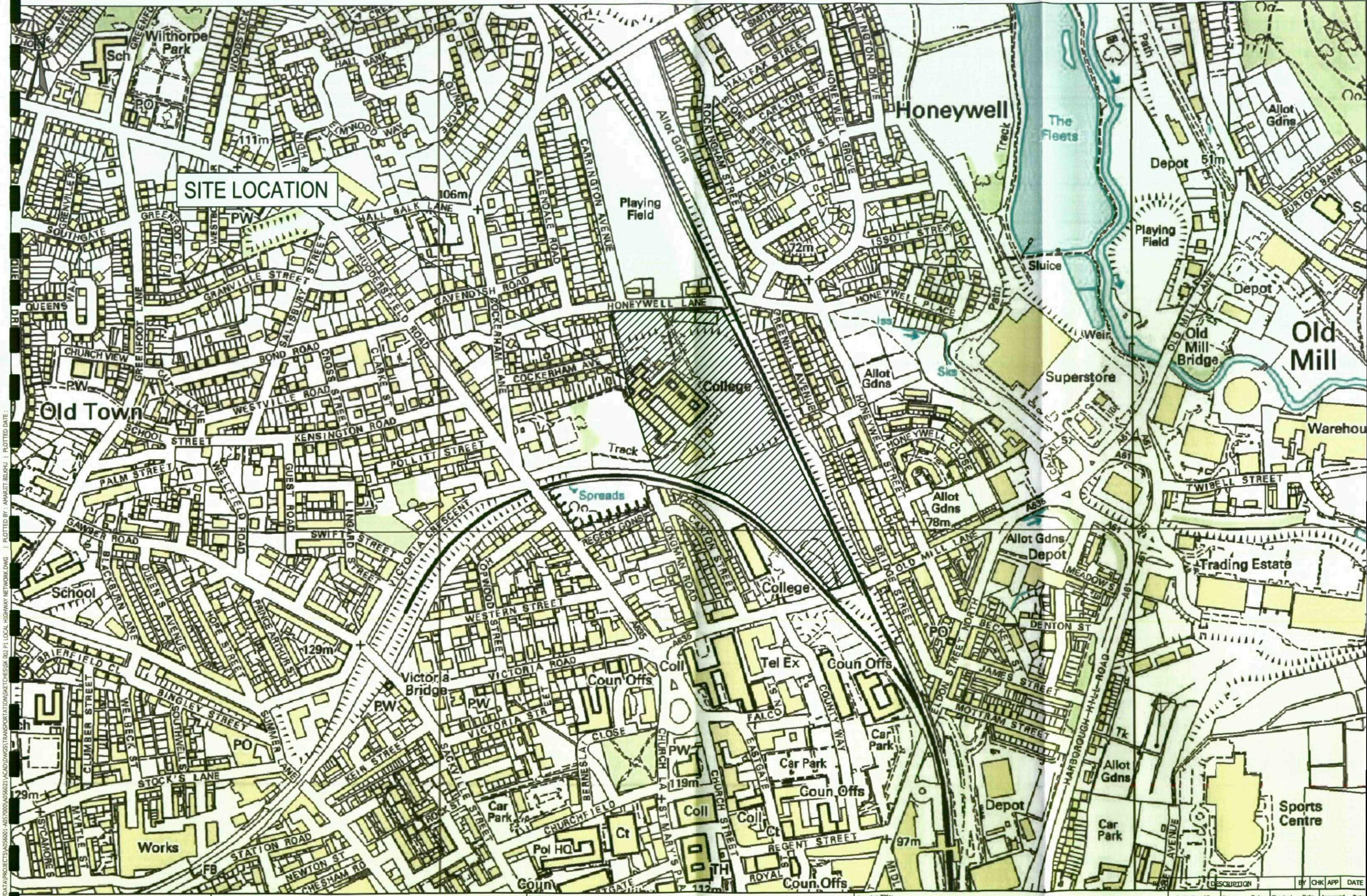
| Project No. | Office | Type | Drawing No. | Revision |
|---|---|---|---|---|
| A056021 | 21 | EPT | SK 001 | P1 |

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FILENAME : \\LEEDS2\ENVDATA\PROJECTS\A056001-A057000\A056021\CAD\DWGS\TRANSPORTATION\SKETCHES\SK 001 P1 STRATEGIC HIGHWAY NETWORK.DWG PLOTTED BY : AMARJIT BILKHU PLOTTED : 20 May

# Appendix B




| DESCRIPTION | BY | CHK | APP | DATE |
|---|---|---|---|---|


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Project:
BARNSLEY COLLEGE
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SUBMISSION OF RESERVED MATTERS

Drawing Title:
LOCAL HIGHWAY NETWORK

| Scale @ A3 | Drawn | Date | Checked | Date | Approved | Date |
|---|---|---|---|---|---|---|
| NTS | AB | APRIL 09 | | | | |

| Project No. | Office | Type | Drawing No. | Revision |
|---|---|---|---|---|
| A056021 | 21 | EPT | SK 002 | P1 |

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FILENAME : \\LEEDS2\ENVDATA\PROJECTS\A056001-A057000\A056021\ACAD\DWGS\TRANSPORTATION\SKETCHES\SK 002 P1 LOCAL HIGHWAY NETWORK.DWG | PLOTTED BY : AMARJIT.BILKHU | PLOTTED DATE :

# Appendix C

SITE LOCATION

443-444

1-11-31-57-59

12

12

33

Honeywell

Old Mill

Old Town

Wilthorpe Park

Playing Field

Playing Field

College

College

Trading Estate

Sports Centre

Superstore

Depot

Depot

Depot

Allot Gdns

Allot Gdns

Allot Gdns

Allot Gdns

Allot Gdns

Old Mill Bridge

Victoria Bridge

Coun Offs

Coun Offs

Coun.Offs

Tel Ex

Car Park

Car Park

Car Park

Pol HQ

Coll

Coll

Coll

Ct

Ct

Works

School

Spreads

Track

Track

Sluice

Weir

Sks

PO

PO

PW

PW

PW

PW

PW

FB

TH

Tk

HONEYWELL LANE

HONEYWELL PLACE

HONEYWELL CLOSE

HALIFAX STREET

CARLTON ST

CLARRICARDE ST

ISSOTT STREET

CANAL ST

TWIBELL STREET

DENTON ST

JAMES STREET

MOTTRAM STREET

MEADOWS

BECKETT

HARBOROUGH HILL ROAD

BURTON BANK RD

CARRINGTON AVENUE

ALLENDALE ROAD

COCKERHAM AVE

COCKERHAM LANE

GREENHILL AVENUE

HALL BANK

HALL BALK LANE

CAVENDISH ROAD

GRANVILLE STREET

SALISBURY STREET

WESTBOURNE GR

GREENFIELD

SOUTHGATE

QUEENS

CHURCH VIEW

GREENHOOD LANE

BOND ROAD

CROSS

CLARE ST

WESTVILLE ROAD

KENSINGTON ROAD

SCHOOL STREET

PALM STREET

POLLITT STREET

GUEST ROAD

WELLFIELD ROAD

GAMBER ROAD

BLACKBURN LANE

QUEEN'S AVENUE

HOPE STREET

PRINCE ARTHUR ST

SWIFT STREET

VICTORIA CRESCENT

LINGARD STREET

WESTERN STREET

WOODSTOCK STREET

LONDON ROAD

CARLTON STREET

VICTORIA ROAD

VICTORIA STR

BRIERFIELD CT

BINGLEY STREET

CLUMBER STREET

WEBBECK

SOUTHWELL

SUMMER LANE

STOCK'S LANE

KEIR STREET

ROCKLEY ROAD

BEANESLAY CLOSE

CHURCHFIELD

STATION ROAD

NEWTON ST

FRESHAM RD

SHEFFIELD ROAD

SHEFFIELD GATE

COUNTY WAY

FALCO

REGENT STREET

ROYAL

ST MARYS GATE

ST MARYS ROAD

OLD MILL LANE

ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ

TEL: +44 (0)113 278 7111
FAX: +44 (0)113 278 3487
e-mail: leeds@wyg.com

Client: BARNSLEY College

Project:
BARNSLEY COLLEGE
HONEYWELL CAMPUS
SUBMISSION OF RESERVED MATTERS

Drawing Title:
BUS STOP LOCATIONS AND ROUTES

| DESCRIPTION | BY | CHK | APP | DATE |
|---|---|---|---|---|

| Scale @ A3 | Drawn | Date | Checked | Date | Approved | Date |
|---|---|---|---|---|---|---|
| NTS | AB | APRIL 09 | | | | |

| Project No. | Office | Type | Drawing No. | Revision |
|---|---|---|---|---|
| A056021 | 21 | EPT | SK 003 | P1 |

FILENAME: \\LEEDS2\ENDATA\PROJECTS\A056021-A057000\A056021\ACAD\DWGS\TRANSPORTATION\SKETCHES\SK 003 P1 BUS STOP LOCATIONS.DWG | PLOTTED BY: AMARJIT BILOKU | PLOTTED DATE: 06

# Appendix D

Growth Factor 2005 to 2009

TEMPRO 5.0 Results Screen

Results Actions View Help

**Calculate Result Type**
- (•) Trip Ends by Time Period
- ( ) Trip Ends by Car Availability
- ( ) Car Ownership Data
- ( ) Planning Data

**Data Type**
- (•) Growth Factors
- ( ) Future Year - Base Year
- ( ) Base Year Data
- ( ) Future Year Data

☐ View Study Area Definitions
☐ Apply Alternative Assumptions

**Analysis Selection**
Base Year selected: 2005
Future Year selected: 2009
Time Period selected: Weekday AM peak period (0700 - 0959)

**Dataset Version:**
Version 5.3 - All Datasets.

Car driver | Combined Modes |

| | Car driver | |
|---|---|---|
| | ALL | |
| **Area** | **Production** | **Attraction** |
| GB | 1.042 | 1.042 |
| YH (REGION) | 1.045 | 1.045 |
| SOUTH YORKSHIRE (COUNTY) | 1.043 | 1.043 |
| BARNSLEY (AUTHORITY) | 1.051 | 1.046 |

**TEMPRO AM WEEKDAY**

| | Production | Attraction | Average | |
|---|---|---|---|---|
| AM Barnsley | 1.051 | 1.046 | 1.049 | **B** |
| Yorkshire Region | 1.046 | 1.046 | 1.046 | **C** |
| 2005 to 2009 | 1.050 | | | **A** |

| | A (B/C) |
|---|---|
| WEEKDAY AM TEMPRO ADJUSTED | **1.053** |

TEMPRO 5.0 Results Screen

Results Actions View Help

**Calculate Result Type**
- (•) Trip Ends by Time Period
- ( ) Trip Ends by Car Availability
- ( ) Car Ownership Data
- ( ) Planning Data

**Data Type**
- (•) Growth Factors
- ( ) Future Year - Base Year
- ( ) Base Year Data
- ( ) Future Year Data

☐ View Study Area Definitions
☐ Apply Alternative Assumptions

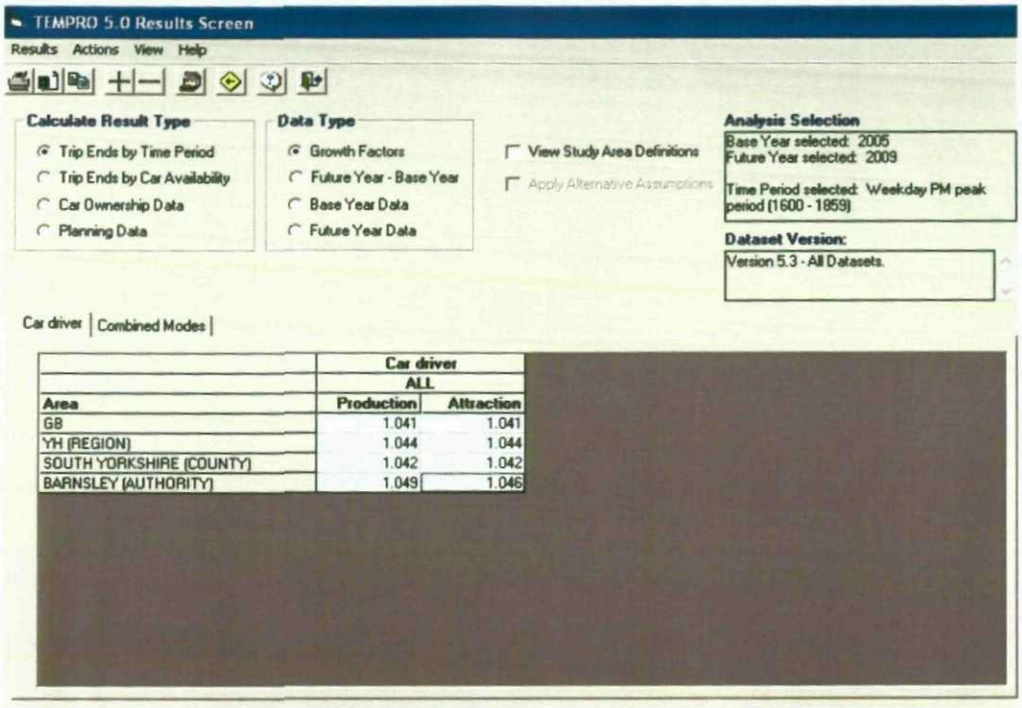
**Analysis Selection**
Base Year selected: 2005
Future Year selected: 2009
Time Period selected: Average weekday

**Dataset Version:**
Version 5.3 - All Datasets.

Car driver | Combined Modes |

| | Car driver | |
|---|---|---|
| | ALL | |
| **Area** | **Production** | **Attraction** |
| GB | 1.043 | 1.043 |
| YH (REGION) | 1.046 | 1.046 |
| SOUTH YORKSHIRE (COUNTY) | 1.043 | 1.043 |
| BARNSLEY (AUTHORITY) | 1.051 | 1.047 |

Growth Factor 2005 to 2009



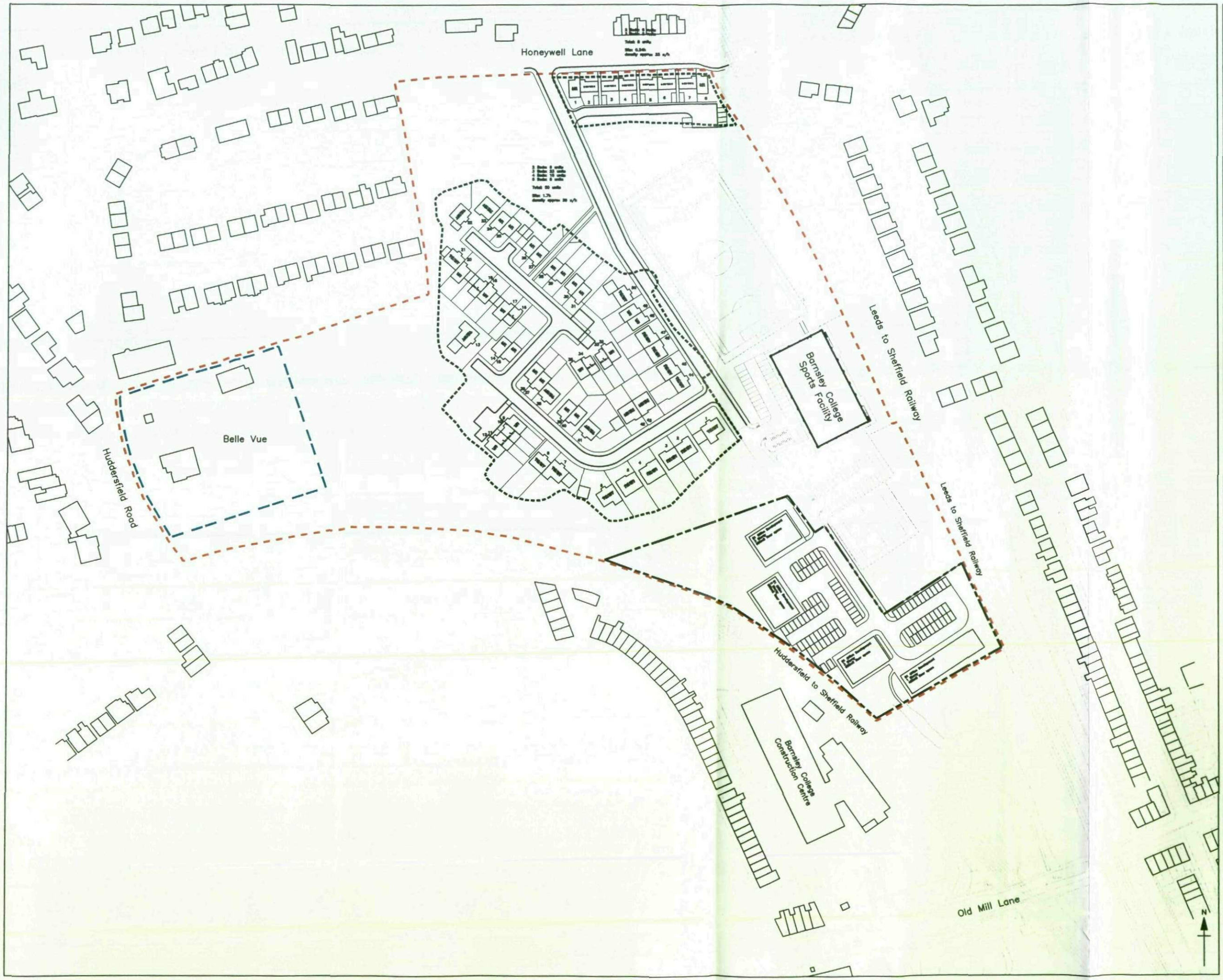

| | Car driver | |
|---|---|---|
| | ALL | |
| Area | Production | Attraction |
| GB | 1.041 | 1.041 |
| YH (REGION) | 1.044 | 1.044 |
| SOUTH YORKSHIRE (COUNTY) | 1.042 | 1.042 |
| BARNSLEY (AUTHORITY) | 1.049 | 1.046 |

**TEMPRO PM WEEKDAY**

| | Production | Attraction | Average | |
|---|---|---|---|---|
| PM Barnsley | 1.049 | 1.046 | 1.048 | **B** |
| Yorkshire Region | 1.046 | 1.046 | 1.046 | **C** |
| 2005 to 2009 | 1.050 | | | **A** |

| | A (B/C) |
|---|---|
| WEEKDAY PM TEMPRO ADJUSTED | **1.052** |

# Appendix E




Do not scale from this drawing
The contractor is to check all dimensions on site and report any discrepancies to the architect
All rights described in chapter IV of the copyright, designs and patents act 1988 have been generally asserted

This drawing is based on:

- Topographical survey provided by Malcolm Hughes Land Surveyors, 65 Cross Street, Sales, Manchester, M33 7HF, Tel: 0161 9051265 Email: survey@mhls.co.uk Their drawing no: 9839/1-6 dated March 2006
- Illustrative Built Form Masterplan by RPS Ltd, approved by Barnsley Metropolitan Borough Council on the 10th May 2006, drawing no: DP1089-05-01
- Sports Facility Site Plan by Jefferson Sheard Architects, drawing no: 3371-006revQ 'as built'
- Location Plan with boundaries of outline planning permission by Jefferson Sheard Architects, drawing no: 4116_A_0001_revA
- Ordnance Survey data © Crown Copyright 2009. All rights reserved. Licence number 100020449
- Housing to Main Site & House Types by Jefferson Sheard Architects, drawing no: 4116_A_2002_RevA
- Housing to Honeywell Lane Site Plan & Example of Elevation by Jefferson Sheard Architects, drawing no: 4116_A_2004_RevA
- Proposed Office Development Outline Plan by Jefferson Sheard Architects, drawing no: 4116_A_2100_revB

Legend

- Extent of residential development
- Extent of B1 commercial development
- Boundary of outline permission
- Belle Vue, seperate application and excluded from reserved matters

All boundaries drawn from DP1089-05-01 'Illustrative Built Form Masterplan' by RPS Ltd, approved by Barnsley Metropolitan Borough Council on the 10th May 2006.

| | | | |
|---|---|---|---|
| A | 29/04/2009 | Drawn: AG | Check: PS |

Initial Issue

The Hacienda
21 Albion Street
Manchester M1 5DA

Telephone +44(0)1612006370
Facsimile +44(0)1612369896
Website www.jeffersonsheard.com

Jefferson Sheard Architects

| | |
|---|---|
| Drawn AG | Check PS |

Project
**Barnsley Honeywell Housing**

Drawing
**Location Plan with proposed development**

| | | |
|---|---|---|
| Scale 1:1250@A2 | Date 29/04/2009 | |
| Ref. 4116 | Number 2001 | Rev. A |

# Appendix F

| HONEYWELL SITE |
|---|

**Average Trips for dwellings**

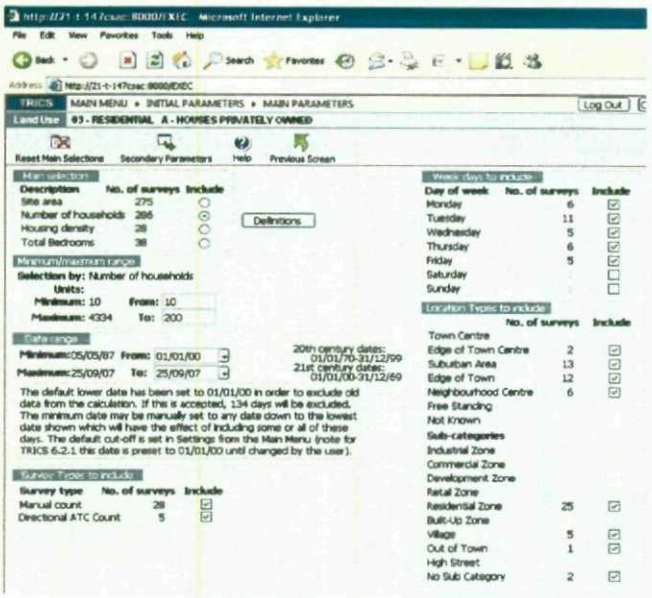
| | Trip Rate / HH | HH | Trips | Total |
|---|---|---|---|---|
| AM arrivals | 0.161 | 63 | 10 | |
| AM Departures | 0.414 | 63 | 26 | 36 |
| PM arrivals | 0.402 | 63 | 25 | |
| PM Departures | 0.247 | 63 | 16 | 41 |

**Average Trips for office**

| | Trip Rate per 100sqm | GFA /100 sqm | Trips | Total |
|---|---|---|---|---|
| AM arrivals | 1.81 | 25 | 45 | |
| AM Departures | 0.25 | 25 | 6 | 51 |
| PM arrivals | 0.27 | 25 | 7 | |
| PM Departures | 1.39 | 25 | 35 | 42 |

**Total Trip Generation for Honeywell Site**

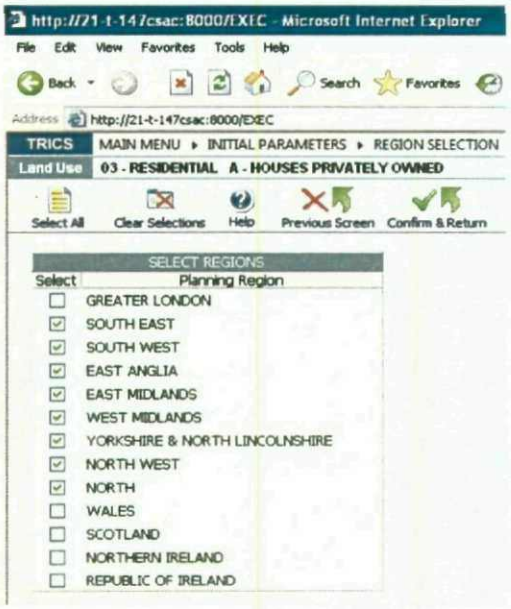
| | Total Trips | Total |
|---|---|---|
| AM arrivals | 55 | |
| AM Departures | 32 | 88 |
| PM arrivals | 32 | |
| PM Departures | 50 | 83 |




**Average Trips for dwellings**

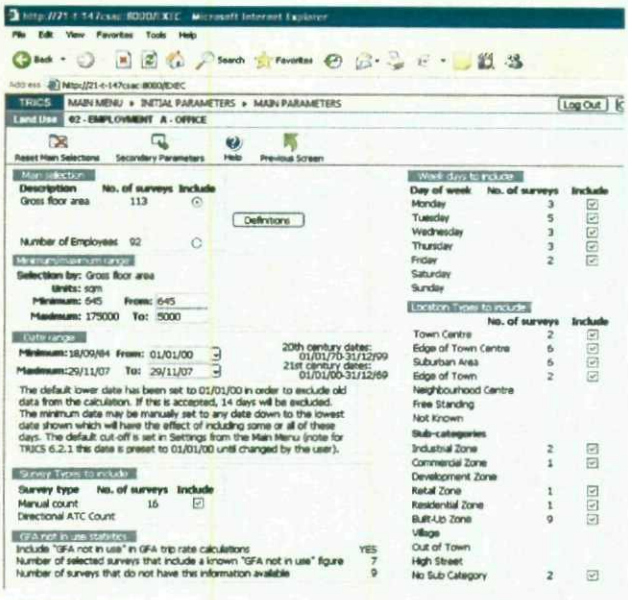
| | Trip Rate / HH | HH | Trips | Total |
|---|---|---|---|---|
| AM arrivals | 0.161 | 63 | 10 | |
| AM Departures | 0.414 | 63 | 26 | 36 |
| PM arrivals | 0.402 | 63 | 25 | |
| PM Departures | 0.247 | 63 | 16 | 41 |

| | |
|---|---|
| 63 | No. HH |



TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
Calculation Factor: 1 HHOLDS

| | ARRIVALS | | | DEPARTURES | | | TOTALS | | |
|---|---|---|---|---|---|---|---|---|---|
| Time Range | No. Days | Ave. HHOLDS | Trip Rate | No. Days | Ave. HHOLDS | Trip Rate | No. Days | Ave. HHOLDS | Trip Rate |
| 00:00-01:00 | 1 | 90 | 0.022 | 1 | 90 | 0 | 1 | 90 | 0.022 |
| 01:00-02:00 | 1 | 90 | 0 | 1 | 90 | 0 | 1 | 90 | 0 |
| 02:00-03:00 | 1 | 90 | 0 | 1 | 90 | 0 | 1 | 90 | 0 |
| 03:00-04:00 | 1 | 90 | 0.011 | 1 | 90 | 0.022 | 1 | 90 | 0.033 |
| 04:00-05:00 | 1 | 90 | 0 | 1 | 90 | 0 | 1 | 90 | 0 |
| 05:00-06:00 | 1 | 90 | 0.011 | 1 | 90 | 0.033 | 1 | 90 | 0.044 |
| 06:00-07:00 | 1 | 90 | 0.011 | 1 | 90 | 0.111 | 1 | 90 | 0.122 |
| 07:00-08:00 | 29 | 85 | 0.078 | 29 | 85 | 0.286 | 29 | 85 | 0.364 |
| **08:00-09:00** | 29 | 85 | **0.161** | 29 | 85 | **0.414** | 29 | 85 | 0.575 |
| 09:00-10:00 | 29 | 85 | 0.19 | 29 | 85 | 0.244 | 29 | 85 | 0.434 |
| 10:00-11:00 | 29 | 85 | 0.161 | 29 | 85 | 0.198 | 29 | 85 | 0.359 |
| 11:00-12:00 | 29 | 85 | 0.209 | 29 | 85 | 0.187 | 29 | 85 | 0.396 |
| 12:00-13:00 | 29 | 85 | 0.237 | 29 | 85 | 0.204 | 29 | 85 | 0.441 |
| 13:00-14:00 | 29 | 85 | 0.208 | 29 | 85 | 0.202 | 29 | 85 | 0.41 |
| 14:00-15:00 | 29 | 85 | 0.218 | 29 | 85 | 0.208 | 29 | 85 | 0.426 |
| 15:00-16:00 | 29 | 85 | 0.307 | 29 | 85 | 0.243 | 29 | 85 | 0.55 |
| 16:00-17:00 | 29 | 85 | 0.36 | 29 | 85 | 0.225 | 29 | 85 | 0.585 |
| **17:00-18:00** | 29 | 85 | **0.402** | 29 | 85 | **0.247** | 29 | 85 | 0.649 |
| 18:00-19:00 | 29 | 85 | 0.298 | 29 | 85 | 0.257 | 29 | 85 | 0.555 |
| 19:00-20:00 | 1 | 90 | 0.133 | 1 | 90 | 0.2 | 1 | 90 | 0.333 |
| 20:00-21:00 | 1 | 90 | 0.144 | 1 | 90 | 0.144 | 1 | 90 | 0.288 |
| 21:00-22:00 | 1 | 90 | 0.133 | 1 | 90 | 0.056 | 1 | 90 | 0.189 |
| 22:00-23:00 | 1 | 90 | 0.122 | 1 | 90 | 0.022 | 1 | 90 | 0.144 |
| 23:00-24:00 | 1 | 90 | 0.056 | 1 | 90 | 0.033 | 1 | 90 | 0.089 |
| Daily Trip Rates: | | | 3.472 | | | 3.536 | | | 7.008 |

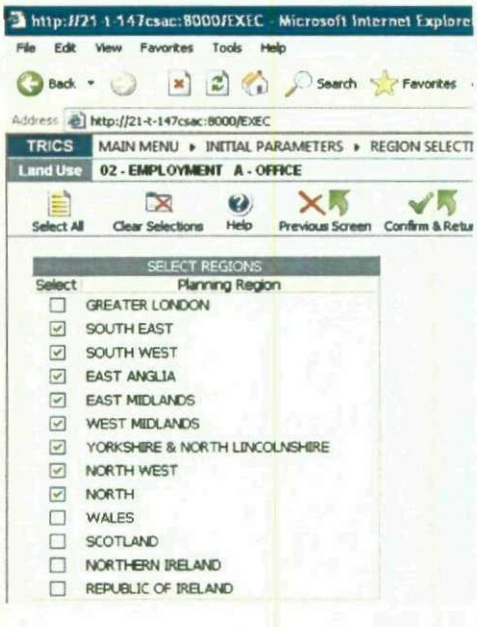



**Average Trips for office**

| | Trip Rate per 100sqm | GFA /100 sqm | Trips | Total |
|---|---|---|---|---|
| AM arrivals | 1.811 | 25 | 45 | |
| AM Departures | 0.248 | 25 | 6 | 51 |
| PM arrivals | 0.274 | 25 | 7 | |
| PM Departures | 1.394 | 25 | 35 | 42 |

| | |
|---|---|
| 25 | /100sqm |

2500 sqm



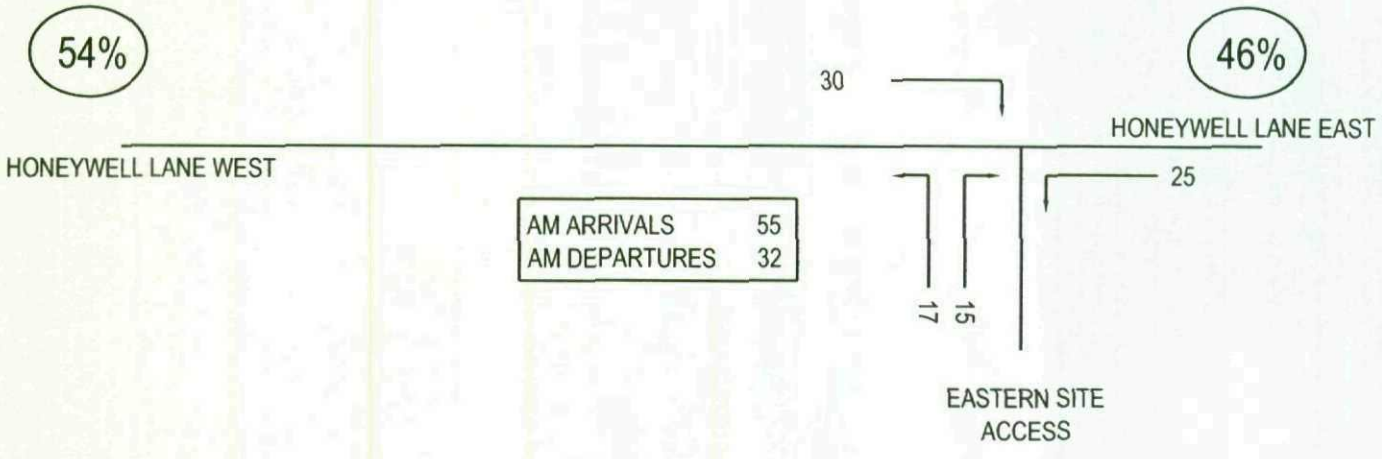
TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
Calculation Factor: 100 sqm

| | ARRIVALS | | | DEPARTURES | | | TOTALS | | |
|---|---|---|---|---|---|---|---|---|---|
| Time Range | No. Days | Ave. GFA | Trip Rate | No. Days | Ave. GFA | Trip Rate | No. Days | Ave. GFA | Trip Rate |
| 00:00-00:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 00:30-01:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:00-01:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 01:30-02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:00-02:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 02:30-03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00-03:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:30-04:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:00-04:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:30-05:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:00-05:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:30-06:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:00-06:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:30-07:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:00-07:30 | 15 | 2897 | 0.202 | 15 | 2897 | 0.055 | 15 | 2897 | 0.257 |
| 07:30-08:00 | 15 | 2897 | 0.527 | 15 | 2897 | 0.064 | 15 | 2897 | 0.591 |
| **08:00-08:30** | 15 | 2897 | **0.794** | 15 | 2897 | **0.124** | 15 | 2897 | 0.918 |
| **08:30-09:00** | 15 | 2897 | **1.017** | 15 | 2897 | **0.124** | 15 | 2897 | 1.141 |
| 09:00-09:30 | 16 | 2779 | 0.785 | 16 | 2779 | 0.198 | 16 | 2779 | 0.983 |
| 09:30-10:00 | 16 | 2779 | 0.502 | 16 | 2779 | 0.297 | 16 | 2779 | 0.799 |
| 10:00-10:30 | 16 | 2779 | 0.297 | 16 | 2779 | 0.25 | 16 | 2779 | 0.547 |
| 10:30-11:00 | 16 | 2779 | 0.317 | 16 | 2779 | 0.256 | 16 | 2779 | 0.573 |
| 11:00-11:30 | 16 | 2779 | 0.306 | 16 | 2779 | 0.245 | 16 | 2779 | 0.551 |
| 11:30-12:00 | 16 | 2779 | 0.349 | 16 | 2779 | 0.328 | 16 | 2779 | 0.677 |
| 12:00-12:30 | 16 | 2779 | 0.254 | 16 | 2779 | 0.43 | 16 | 2779 | 0.684 |
| 12:30-13:00 | 16 | 2779 | 0.353 | 16 | 2779 | 0.389 | 16 | 2779 | 0.742 |
| 13:00-13:30 | 16 | 2779 | 0.389 | 16 | 2779 | 0.439 | 16 | 2779 | 0.828 |
| 13:30-14:00 | 16 | 2779 | 0.412 | 16 | 2779 | 0.281 | 16 | 2779 | 0.693 |
| 14:00-14:30 | 16 | 2779 | 0.4 | 16 | 2779 | 0.351 | 16 | 2779 | 0.751 |
| 14:30-15:00 | 16 | 2779 | 0.243 | 16 | 2779 | 0.387 | 16 | 2779 | 0.63 |
| 15:00-15:30 | 16 | 2779 | 0.25 | 16 | 2779 | 0.308 | 16 | 2779 | 0.558 |
| 15:30-16:00 | 16 | 2779 | 0.268 | 16 | 2779 | 0.373 | 16 | 2779 | 0.641 |
| 16:00-16:30 | 16 | 2779 | 0.205 | 16 | 2779 | 0.603 | 16 | 2779 | 0.808 |
| 16:30-17:00 | 16 | 2779 | 0.189 | 16 | 2779 | 0.646 | 16 | 2779 | 0.835 |
| **17:00-17:30** | 15 | 2897 | **0.17** | 15 | 2897 | **0.95** | 15 | 2897 | 1.12 |
| **17:30-18:00** | 15 | 2897 | **0.104** | 15 | 2897 | **0.444** | 15 | 2897 | 0.548 |
| 18:00-18:30 | 15 | 2897 | 0.039 | 15 | 2897 | 0.232 | 15 | 2897 | 0.271 |
| 18:30-19:00 | 15 | 2897 | 0.023 | 15 | 2897 | 0.143 | 15 | 2897 | 0.166 |
| 19:00-19:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19:30-20:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:00-20:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20:30-21:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:00-21:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21:30-22:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:00-22:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22:30-23:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:00-23:30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23:30-24:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Daily Trip Rates: | | | 8.395 | | | 7.917 | | | 16.312 |

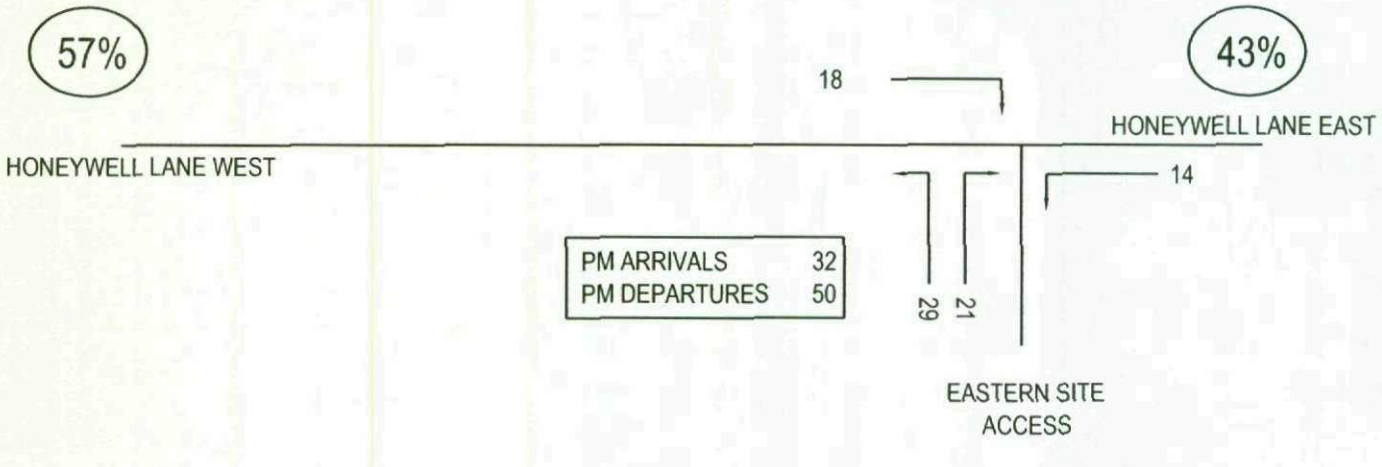
# Appendix G




## AM DISTRIBUTION PATTERN AND DISTRIBUTED DEVELOPMENT FLOWS




## PM DISTRIBUTION PATTERN AND DISTRIBUTED DEVELOPMENT FLOWS




| REV | DESCRIPTION | BY | CHK | APP | DATE |
|---|---|---|---|---|---|

ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ
TEL: +44 (0)113 278 7111
FAX: +44 (0)113 278 3487
e-mail: leeds@wyg.com

Client: BARNSLEY

Project: BARNSLEY COLLEGE HONEYWELL CAMPUS SUBMISSION OF RESERVED MATTERS

Drawing Title: AM / PM DISTRIBUTION PATTERN AND DISTRIBUTED DEVELOPMENT FLOWS

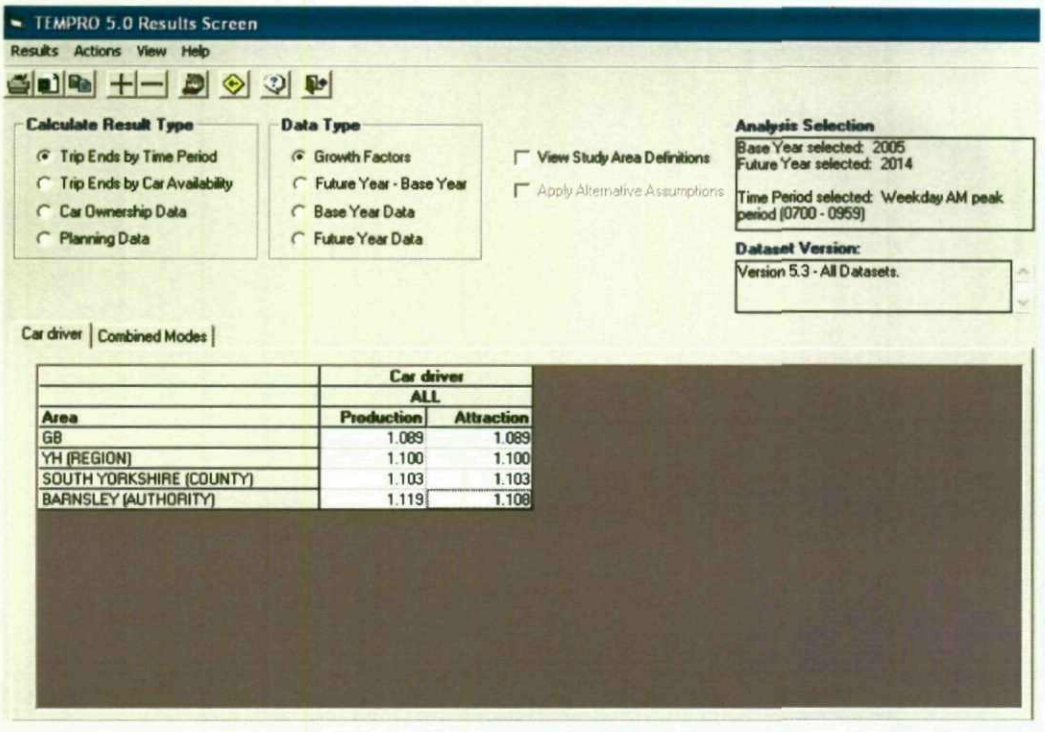
| Scale @ A4 | Drawn | Date | Checked | Date | Approved | Date |
|---|---|---|---|---|---|---|
| NTS | AB | APRIL 09 | | | | |

| Project No. | Office | Type | Drawing No. | Revision |
|---|---|---|---|---|
| A056021 | 21 | EPT | SK 007 | P1 |

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# Appendix H

Growth Factor 2005 to 2014

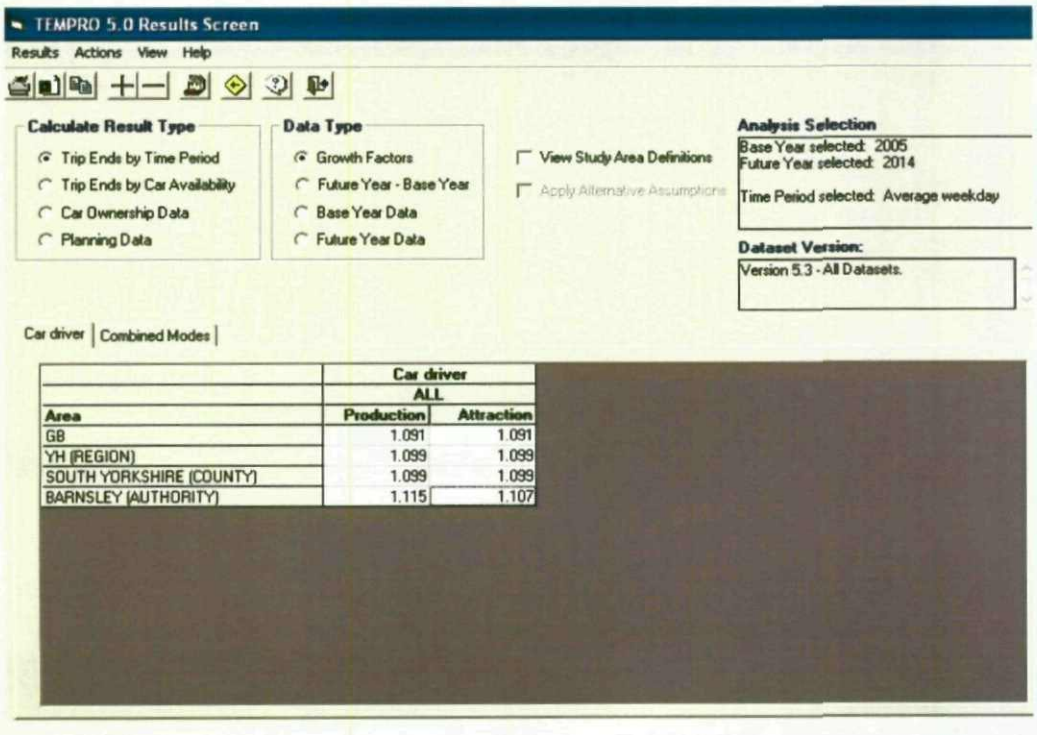



| | Car driver | |
|---|---|---|
| | ALL | |
| Area | Production | Attraction |
| GB | 1.089 | 1.089 |
| YH (REGION) | 1.100 | 1.100 |
| SOUTH YORKSHIRE (COUNTY) | 1.103 | 1.103 |
| BARNSLEY (AUTHORITY) | 1.119 | 1.108 |

**TEMPRO AM WEEKDAY**

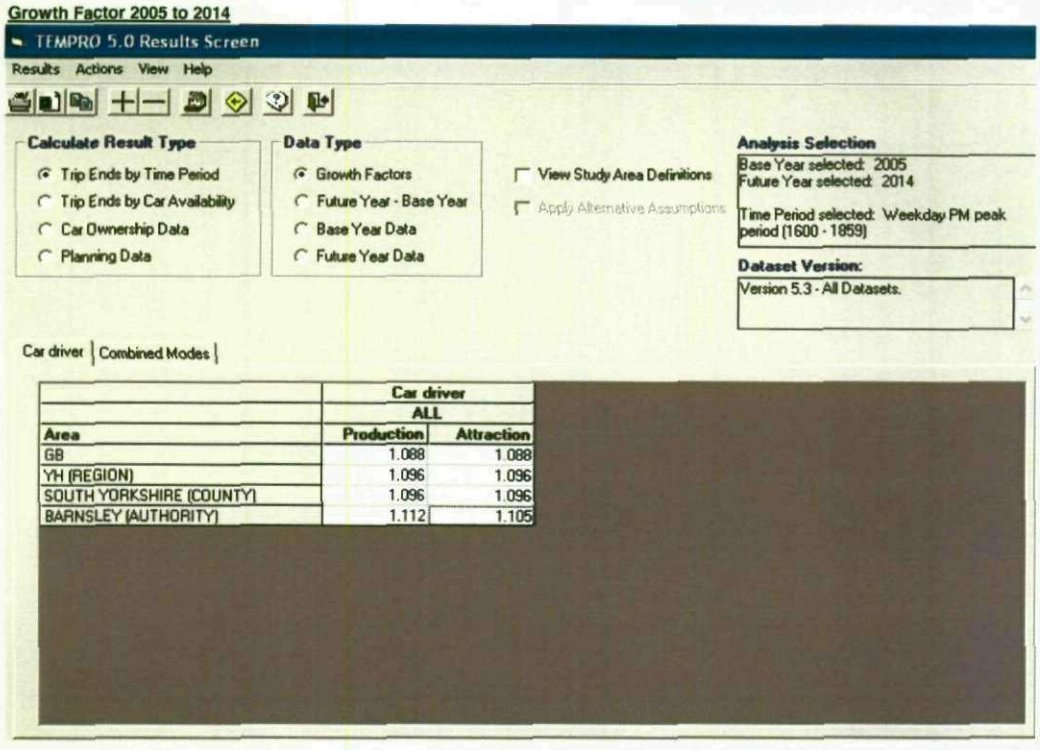
| | Production | Attraction | Average | |
|---|---|---|---|---|
| AM Barnsley | 1.119 | 1.089 | 1.104 | B |
| Yorkshire Region | 1.099 | 1.099 | 1.099 | C |
| 2005 to 2014 | 1.109 | | | A |

| | A (B/C) |
|---|---|
| WEEKDAY AM TEMPRO ADJUSTED | 1.115 |




| | Car driver | |
|---|---|---|
| | ALL | |
| Area | Production | Attraction |
| GB | 1.091 | 1.091 |
| YH (REGION) | 1.099 | 1.099 |
| SOUTH YORKSHIRE (COUNTY) | 1.099 | 1.099 |
| BARNSLEY (AUTHORITY) | 1.115 | 1.107 |

Growth Factor 2005 to 2014




| | Car driver | |
|---|---|---|
| | ALL | |
| Area | Production | Attraction |
| GB | 1.088 | 1.088 |
| YH (REGION) | 1.096 | 1.096 |
| SOUTH YORKSHIRE (COUNTY) | 1.096 | 1.096 |
| BARNSLEY (AUTHORITY) | 1.112 | 1.105 |

**TEMPRO PM WEEKDAY**

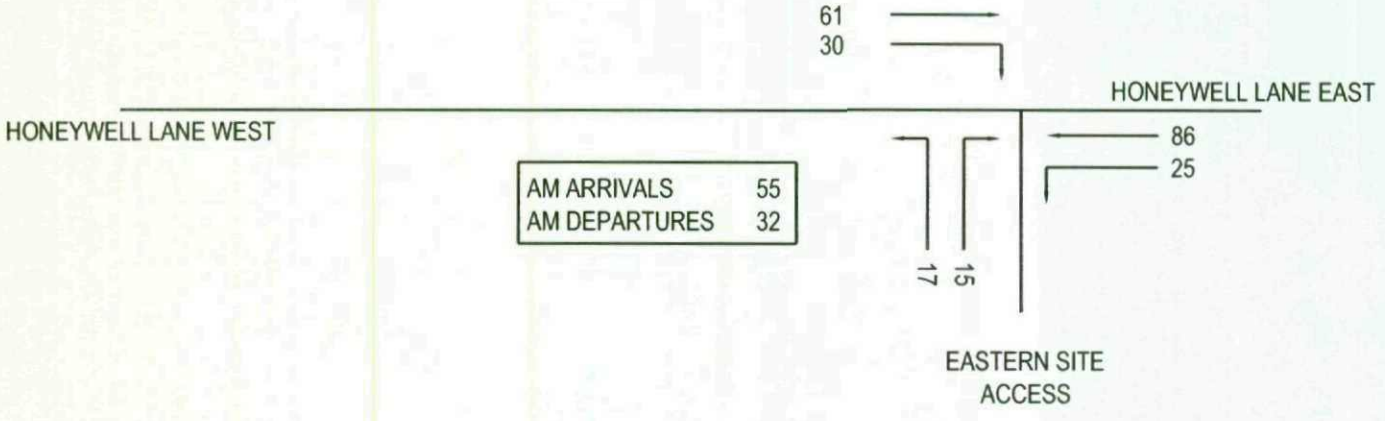
| | Production | Attraction | Average | |
|---|---|---|---|---|
| AM Barnsley | 1.112 | 1.105 | 1.109 | **B** |
| Yorkshire Region | 1.099 | 1.099 | 1.099 | **C** |
| 2005 to 2014 | 1.109 | | | **A** |

| | A (B/C) |
|---|---|
| WEEKDAY PM TEMPRO ADJUSTED | 1.119 |

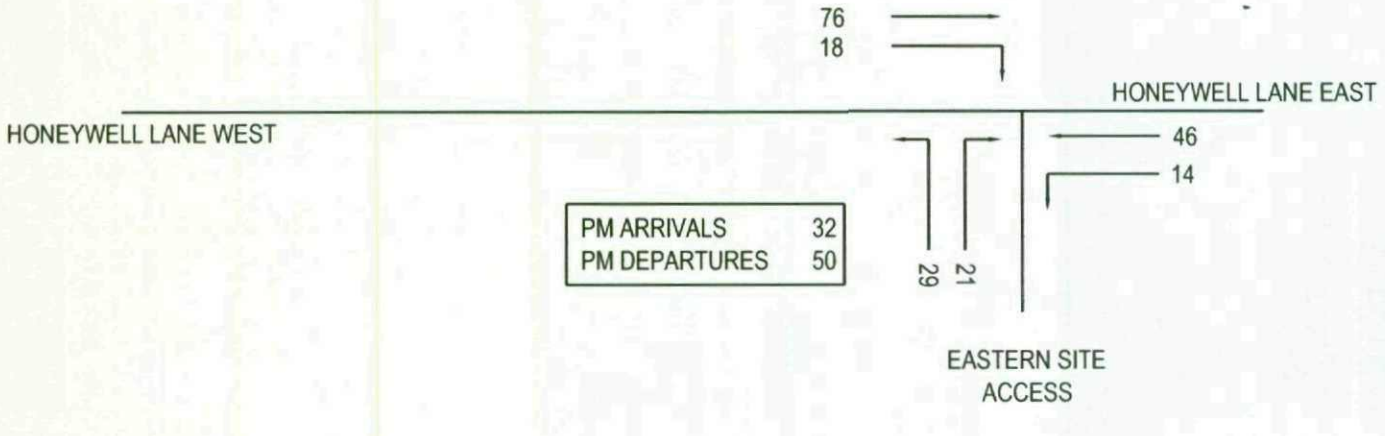
# Appendix I




# AM PEAK 2009 FLOWS PLUS DEVELOPMENT GENERATED TRAFFIC




# PM PEAK 2009 FLOWS PLUS DEVELOPMENT GENERATED TRAFFIC




| REV | DESCRIPTION | BY | CHK | APP | DATE |
|---|---|---|---|---|---|

ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ
TEL: +44 (0)113 278 7111
FAX: +44 (0)113 278 3487
e-mail: leeds@wyg.com

Client: BARNSLEY

Project: BARNSLEY COLLEGE HONEYWELL CAMPUS SUBMISSION OF RESERVED MATTERS

Drawing Title: AM / PM 2009 BASE FLOWS PLUS DEVELOPMENT FLOWS

| Scale @ A4 | Drawn | Date | Checked | Date | Approved | Date |
|---|---|---|---|---|---|---|
| NTS | AB | APRIL 08 | | | | |

| Project No | Office | Type | Drawing No. | Revision |
|---|---|---|---|---|
| A056021 | 21 | EPT | SK 008 | P1 |

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# Appendix J

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 3.0 (JUNE 2006)

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TRL SOFTWARE BUREAU
TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

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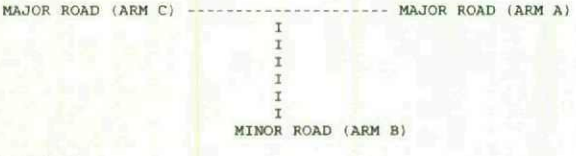
Run with file:-
*\\Leeds2\envdata\Projects\A056001-A057000\A056021\calculations\Transportation\Junction Analysis\
AM 2009 Existing + Dev.vpi*
(drive-on-the-left ) at 14:21:53 on Wednesday, 29 April 2009

RUN INFORMATION

RUN TITLE: AM 2009 Existing + Development
LOCATION: Barnsley
DATE: 29/04/09
CLIENT: Barnsley College
ENUMERATOR: amarjit.bilkhu [21-T-147CSAC]
JOB NUMBER:
STATUS: Preliminary
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA




ARM A IS Honeywell Lane east
ARM B IS Site Access
ARM C IS Honeywell Lane west

STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

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

ETC.

GEOMETRIC DATA

| DATA ITEM | | MINOR ROAD B |
|---|---|---|
| TOTAL MAJOR ROAD CARRIAGEWAY WIDTH | ( W ) | 7.30 M. |
| CENTRAL RESERVE WIDTH | (WCR ) | 0.00 M. |
| MAJOR ROAD RIGHT TURN - WIDTH | (WC-B) | 2.20 M. |
| - VISIBILITY | (VC-B) | 90.0 M. |
| - BLOCKS TRAFFIC | | YES |
| MINOR ROAD - VISIBILITY TO LEFT | (VB-C) | 19.0 M. |
| - VISIBILITY TO RIGHT | (VB-A) | 15.0 M. |
| - LANE 1 WIDTH | (WB-C) | 3.00 M. |
| - LANE 2 WIDTH | (WB-A) | 0.00 M. |

.SLOPES AND INTERCEPT

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

will be adjusted )

| Intercept For Stream B-C | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 633.38 | 0.23 | 0.09 |

| Intercept For Stream B-A | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B | Slope For Opposing Stream C-A | Slope For Opposing Stream C-B |
|---|---|---|---|---|
| 491.16 | 0.21 | 0.08 | 0.13 | 0.30 |

| Intercept For Stream C-B | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 626.08 | 0.23 | 0.23 |

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

| ARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |

Demand set: AM 2009 Existing + Development

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 | 1.39 | 2.08 | 1.39 |
| ARM B | 15.00 | 45.00 | 75.00 | 0.38 | 0.56 | 0.38 |
| ARM C | 15.00 | 45.00 | 75.00 | 1.13 | 1.69 | 1.13 |

| TIME | FROM/TO | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 07.45 - 09.15 | | | | |
| | ARM A | 0.000 | 0.225 | 0.775 |
| | | 0.0 | 25.0 | 86.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM B | 0.467 | 0.000 | 0.533 |
| | | 14.0 | 0.0 | 16.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM C | 0.678 | 0.322 | 0.000 |
| | | 61.0 | 29.0 | 0.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| STREAM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| B-AC | 41.3 | 27.5 | 4.9 | 0.12 | 4.9 | 0.12 |
| C-AB | 43.8 | 29.2 | 5.0 | 0.11 | 5.0 | 0.11 |
| C-A | 80.1 | 53.4 | | | | |
| A-B | 34.4 | 22.9 | | | | |
| A-C | 118.4 | 78.9 | | | | |
| ALL | 318.0 | 212.0 | 9.9 | 0.03 | 9.9 | 0.03 |

* 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 14:22:04 on 29/04/2009]

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

PICADY 5.0 ANALYSIS PROGRAM
RELEASE 3.0 (JUNE 2006)

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TEL: CROWTHORNE (01344) 770758, FAX: 770864
EMAIL: SoftwareBureau@trl.co.uk

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

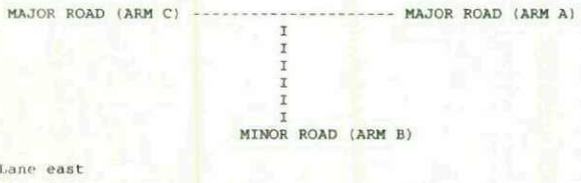
Run with file:-
"\\Leeds2\envdata\Projects\A056001-A057000\A056021\calculations\Transportation\Junction Analysis\
PM 2009 Existing + Dev.vpi"
(drive-on-the-left ) at 14:29:39 on Wednesday, 29 April 2009

RUN INFORMATION

RUN TITLE: PM 2009 Existing + Development
LOCATION: Barnsley
DATE: 29/04/09
CLIENT: Barnsley College
ENUMERATOR: amarjit.bilkhu [21-T-147CSAC]
JOB NUMBER:
STATUS: Preliminary
DESCRIPTION:

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA




ARM A IS Honeywell Lane east
ARM B IS Site Access
ARM C IS Honeywell Lane west

STREAM LABELLING CONVENTION

STREAM A B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

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

ETC.

GEOMETRIC DATA

| DATA ITEM | | MINOR ROAD B | |
|---|---|---|---|
| TOTAL MAJOR ROAD CARRIAGEWAY WIDTH | ( W ) | 7.30 M. | |
| CENTRAL RESERVE WIDTH | (WCR ) | 0.00 M. | |
| MAJOR ROAD RIGHT TURN - WIDTH | (WC-B) | 2.20 M. | |
| - VISIBILITY | (VC-B) | 90.0 M. | |
| - BLOCKS TRAFFIC | | YES | |
| MINOR ROAD - VISIBILITY TO LEFT | (VB-C) | 19.0 M. | |
| - VISIBILITY TO RIGHT | (VB-A) | 15.0 M. | |
| - LANE 1 WIDTH | (WB-C) | 3.00 M. | |
| - LANE 2 WIDTH | (WB-A) | 0.00 M. | |

.SLOPES AND INTERCEPT

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

will be adjusted )

| Intercept For Stream B-C | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 633.38 | 0.23 | 0.09 |

| Intercept For Stream B-A | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B | Slope For Opposing Stream C-A | Slope For Opposing Stream C-B |
|---|---|---|---|---|
| 491.16 | 0.21 | 0.08 | 0.13 | 0.30 |

| Intercept For Stream C-B | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 626.08 | 0.23 | 0.23 |

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

| ARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |

Demand set: PM 2009 Existing + Development

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

| ARM | FLOW STARTS TO RISE | NUMBER OF MINUTES FROM START WHEN 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 | 0.74 | 1.11 | 0.74 |
| ARM B | 15.00 | 45.00 | 75.00 | 0.61 | 0.92 | 0.61 |
| ARM C | 15.00 | 45.00 | 75.00 | 1.16 | 1.74 | 1.16 |

| TIME | FROM/TO | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 16.45 - 18.15 | | | | |
| | ARM A | 0.000 | 0.220 | 0.780 |
| | | 0.0 | 13.0 | 46.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM B | 0.429 | 0.000 | 0.571 |
| | | 21.0 | 0.0 | 28.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM C | 0.817 | 0.183 | 0.000 |
| | | 76.0 | 17.0 | 0.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
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) |
|---|---|---|---|---|---|---|---|---|---|
| 16.45-17.00 | | | | | | | | | |
| B-AC | 0.61 | 9.14 | 0.067 | | 0.00 | 0.07 | 1.0 | | 0.12 |
| C-AB | 0.23 | 10.89 | 0.021 | | 0.00 | 0.03 | 0.4 | | 0.09 |
| C-A | 0.93 | | | | | | | | |
| A-B | 0.16 | | | | | | | | |
| A-C | 0.58 | | | | | | | | |

| 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 | 0.73 | 9.09 | 0.081 | | 0.07 | 0.09 | 1.3 | | 0.12 |
| C-AB | 0.28 | 10.98 | 0.026 | | 0.03 | 0.03 | 0.5 | | 0.09 |
| C-A | 1.11 | | | | | | | | |
| A-B | 0.19 | | | | | | | | |
| A-C | 0.69 | | | | | | | | |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 17.15-17.30 | | | | | | | | | |
| B-AC | 0.90 | 9.02 | 0.100 | | 0.09 | 0.11 | 1.6 | | 0.12 |
| C-AB | 0.36 | 11.11 | 0.032 | | 0.03 | 0.04 | 0.6 | | 0.09 |
| C-A | 1.35 | | | | | | | | |
| A-B | 0.24 | | | | | | | | |
| A-C | 0.84 | | | | | | | | |

| 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 | 0.90 | 9.02 | 0.100 | | 0.11 | 0.11 | 1.7 | | 0.12 |
| C-AB | 0.36 | 11.11 | 0.032 | | 0.04 | 0.04 | 0.6 | | 0.09 |
| C-A | 1.35 | | | | | | | | |
| A-B | 0.24 | | | | | | | | |
| A-C | 0.84 | | | | | | | | |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| 17.45-18.00 | | | | | | | | | |
| B-AC | 0.73 | 9.09 | 0.081 | | 0.11 | 0.09 | 1.4 | | 0.12 |
| C-AB | 0.28 | 10.98 | 0.026 | | 0.04 | 0.03 | 0.5 | | 0.09 |
| C-A | 1.11 | | | | | | | | |
| A-B | 0.19 | | | | | | | | |
| A-C | 0.69 | | | | | | | | |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| B-AC | 0.61 | 9.14 | 0.067 | | 0.09 | 0.07 | 1.1 | | 0.12 |
| C-AB | 0.23 | 10.89 | 0.021 | | 0.03 | 0.03 | 0.4 | | 0.09 |
| C-A | 0.93 | | | | | | | | |
| A-B | 0.16 | | | | | | | | |
| A-C | 0.58 | | | | | | | | |

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

QUEUE FOR STREAM B-AC

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 17.00 | 0.1 |
| 17.15 | 0.1 |
| 17.30 | 0.1 |
| 17.45 | 0.1 |
| 18.00 | 0.1 |
| 18.15 | 0.1 |

QUEUE FOR STREAM C-AB

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 17.00 | 0.0 |
| 17.15 | 0.0 |
| 17.30 | 0.0 |
| 17.45 | 0.0 |
| 18.00 | 0.0 |
| 18.15 | 0.0 |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| STREAM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| B-AC | 67.4 | 45.0 | 8.1 | 0.12 | 8.1 | 0.12 |
| C-AB | 26.2 | 17.5 | 3.0 | 0.11 | 3.0 | 0.11 |
| C-A | 101.8 | 67.9 | | | | |
| A-B | 17.9 | 11.9 | | | | |
| A-C | 63.3 | 42.2 | | | | |
| ALL | 276.7 | 184.4 | 11.1 | 0.04 | 11.1 | 0.04 |

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

END OF JOB

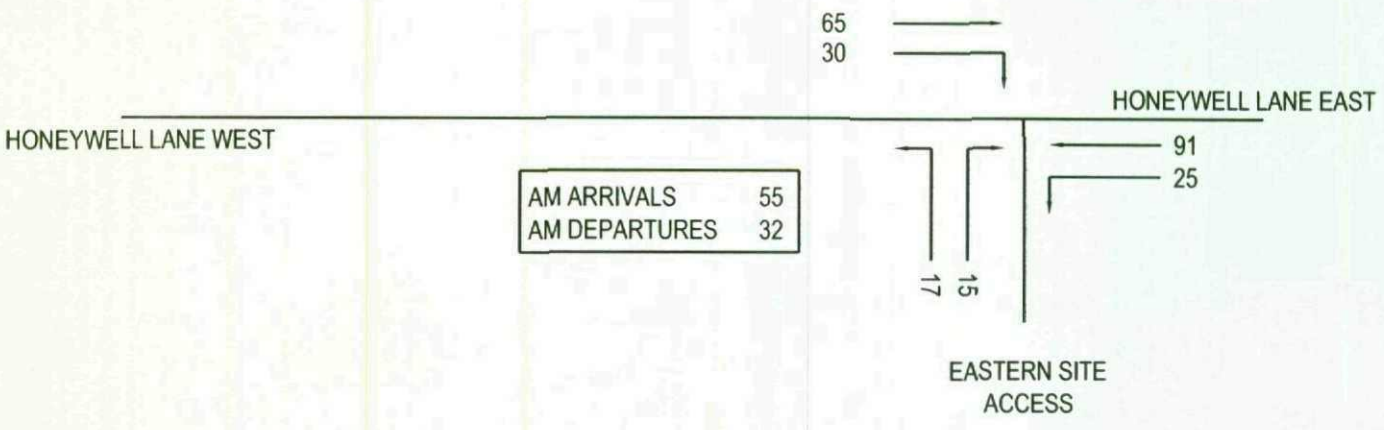
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[Printed at 14:29:45 on 29/04/2009]

# Appendix K

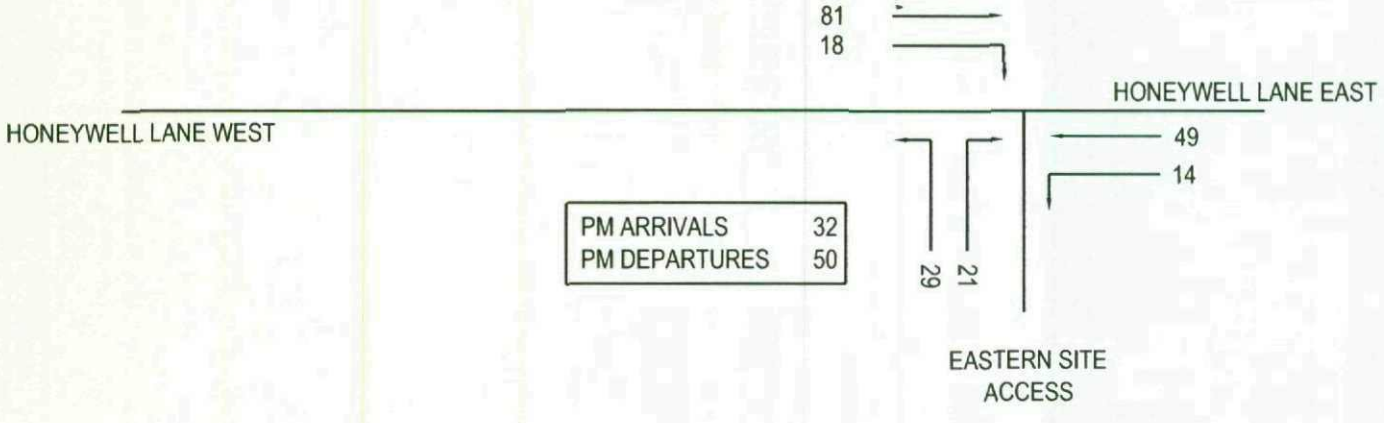
N

# AM PEAK 2014 FLOWS PLUS DEVELOPMENT GENERATED TRAFFIC




| | |
|---|---|
| AM ARRIVALS | 55 |
| AM DEPARTURES | 32 |

# PM PEAK 2014 FLOWS PLUS DEVELOPMENT GENERATED TRAFFIC




| | |
|---|---|
| PM ARRIVALS | 32 |
| PM DEPARTURES | 50 |

| REV | DESCRIPTION | BY | CHK | APP | DATE |
|---|---|---|---|---|---|


ARNDALE COURT
HEADINGLEY
LEEDS
LS6 2UJ

TEL: +44 (0)113 278 7111
FAX: +44 (0)113 278 3467
e-mail: leeds@wyg.com


Client: BARNSLEY

Project: BARNSLEY COLLEGE HONEYWELL CAMPUS SUBMISSION OF RESERVED MATTERS

Drawing Title: AM / PM 2014 BASE FLOWS PLUS DEVELOPMENT FLOWS

| Scale @ A4 | Drawn | Date | Checked | Date | Approved | Date |
|---|---|---|---|---|---|---|
| NTS | AB | APRIL 09 | | | | |

| Project No. | Office | Type | Drawing No. | Revision |
|---|---|---|---|---|
| A056021 | 21 | EPT | SK 009 | P1 |

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# Appendix L

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

PICADY 5.0 *ANALYSIS PROGRAM*
RELEASE 3.0 (JUNE 2006)

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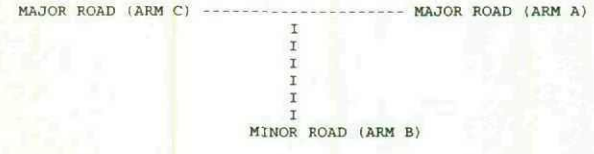
Run with file:-
"\\Leeds2\envdata\Projects\A056001-A057000\A056021\calculations\Transportation\Junction Analysis\
AM 2014 Base + Dev.vpi"
(*drive-on-the-left* ) at 14:25:28 on Wednesday, 29 April 2009

## RUN INFORMATION

RUN TITLE: AM 2014 Base + Development
LOCATION: Barnsley
DATE: 29/04/09
CLIENT: Barnsley College
ENUMERATOR: amarjit.bilkhu [21-T-147CSAC]
JOB NUMBER:
STATUS: Preliminary
DESCRIPTION:

## MAJOR/MINOR JUNCTION CAPACITY AND DELAY

### INPUT DATA




ARM A IS Honeywell Lane east
ARM B IS Site Access
ARM C IS Honeywell Lane west

### STREAM LABELLING CONVENTION

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

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

ETC.

GEOMETRIC DATA

| DATA ITEM | | | |
|---|---|---|---|
| TOTAL MAJOR ROAD CARRIAGEWAY WIDTH | ( W ) | 7.30 M. | |
| CENTRAL RESERVE WIDTH | (WCR ) | 0.00 M. | |
| MAJOR ROAD RIGHT TURN - WIDTH | (WC-B) | 2.20 M. | |
| - VISIBILITY | (VC-B) | 90.0 M. | |
| - BLOCKS TRAFFIC | | YES | |
| MINOR ROAD - VISIBILITY TO LEFT | (VB-C) | 19.0 M. | |
| - VISIBILITY TO RIGHT | (VB-A) | 15.0 M. | |
| - LANE 1 WIDTH | (WB-C) | 3.00 M. | |
| - LANE 2 WIDTH | (WB-A) | 0.00 M. | |

.SLOPES AND INTERCEPT

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

will be adjusted )

| Intercept For Stream B-C | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 633.38 | 0.23 | 0.09 |

| Intercept For Stream B-A | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B | Slope For Opposing Stream C-A | Slope For Opposing Stream C-B |
|---|---|---|---|---|
| 491.16 | 0.21 | 0.08 | 0.13 | 0.30 |

| Intercept For Stream C-B | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 626.08 | 0.23 | 0.23 |

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

| ARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |

Demand set: AM 2014 Base + Development

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 | 1.45 | 2.18 | 1.45 |
| ARM B | 15.00 | 45.00 | 75.00 | 0.38 | 0.56 | 0.38 |
| ARM C | 15.00 | 45.00 | 75.00 | 1.17 | 1.76 | 1.17 |

| *TIME* | FROM/TO | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 07.45 - 09.15 | ARM A | 0.000 | 0.216 | 0.784 |
| | | 0.0 | 25.0 | 91.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM B | 0.467 | 0.000 | 0.533 |
| | | 14.0 | 0.0 | 16.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM C | 0.691 | 0.309 | 0.000 |
| | | 65.0 | 29.0 | 0.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
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-AC | 0.38 | 8.88 | 0.042 | | 0.00 | 0.04 | 0.6 | | 0.12 |
| C-AB | 0.39 | 10.64 | 0.037 | | 0.00 | 0.04 | 0.6 | | 0.10 |
| C-A | 0.79 | | | | | | | | |
| A-B | 0.31 | | | | | | | | |
| A-C | 1.14 | | | | | | | | |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 08.00-08.15 | | | | | | | | | |
| B-AC | 0.45 | 8.80 | 0.051 | | 0.04 | 0.05 | 0.8 | | 0.12 |
| C-AB | 0.48 | 10.68 | 0.045 | | 0.04 | 0.05 | 0.8 | | 0.10 |
| C-A | 0.93 | | | | | | | | |
| A-B | 0.37 | | | | | | | | |
| A-C | 1.36 | | | | | | | | |

| 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 | 0.55 | 8.68 | 0.063 | | 0.05 | 0.07 | 1.0 | | 0.12 |
| C-AB | 0.60 | 10.74 | 0.056 | | 0.05 | 0.07 | 1.0 | | 0.10 |
| C-A | 1.13 | | | | | | | | |
| A-B | 0.46 | | | | | | | | |
| A-C | 1.67 | | | | | | | | |

| 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 | 0.55 | 8.68 | 0.063 | | 0.07 | 0.07 | 1.0 | | 0.12 |
| C-AB | 0.60 | 10.74 | 0.056 | | 0.07 | 0.07 | 1.0 | | 0.10 |
| C-A | 1.13 | | | | | | | | |
| A-B | 0.46 | | | | | | | | |
| A-C | 1.67 | | | | | | | | |

| 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 | 0.45 | 8.80 | 0.051 | | 0.07 | 0.05 | 0.8 | | 0.12 |
| C-AB | 0.48 | 10.68 | 0.045 | | 0.07 | 0.05 | 0.8 | | 0.10 |
| C-A | 0.93 | | | | | | | | |
| A-B | 0.37 | | | | | | | | |
| A-C | 1.36 | | | | | | | | |

| 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 | 0.38 | 8.88 | 0.042 | | 0.05 | 0.04 | 0.7 | | 0.12 |
| C-AB | 0.39 | 10.64 | 0.037 | | 0.05 | 0.04 | 0.7 | | 0.10 |
| C-A | 0.79 | | | | | | | | |
| A-B | 0.31 | | | | | | | | |
| A-C | 1.14 | | | | | | | | |

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

QUEUE FOR STREAM B-AC

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

QUEUE FOR STREAM C-AB

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

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| STREAM | TOTAL DEMAND (VEH) | TOTAL DEMAND (VEH/H) | * QUEUEING * DELAY * (MIN) | * QUEUEING * DELAY * (MIN/VEH) | * INCLUSIVE QUEUEING * DELAY * (MIN) | * INCLUSIVE QUEUEING * DELAY * (MIN/VEH) |
|---|---|---|---|---|---|---|
| B-AC | 41.3 | 27.5 | 4.9 | 0.12 | 4.9 | 0.12 |
| C-AB | 44.1 | 29.4 | 5.0 | 0.11 | 5.0 | 0.11 |
| C-A | 85.3 | 56.9 | | | | |
| A-B | 34.4 | 22.9 | | | | |
| A-C | 125.3 | 83.5 | | | | |
| ALL | 330.3 | 220.2 | 10.0 | 0.03 | 10.0 | 0.03 |

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

END OF JOB

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

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RELEASE 3.0 (JUNE 2006)

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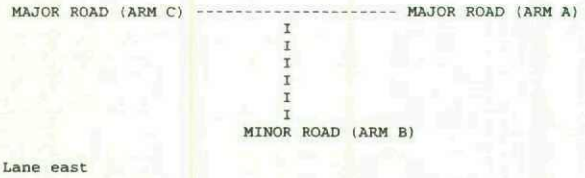
Run with file:-
"\\Leeds2\envdata\Projects\A056001-A057000\A056021\calculations\Transportation\Junction Analysis\
PM 2014 Base + Dev.vpi"
(drive-on-the-left ) at 14:31:20 on Wednesday, 29 April 2009

RUN INFORMATION
**********

RUN TITLE: PM 2014 Base + Development
LOCATION: Barnsley
DATE: 29/04/09
CLIENT: Barnsley College
ENUMERATOR: amarjit.bilkhu [21-T-147CSAC]
JOB NUMBER:
STATUS: Preliminary
DESCRIPTION:

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

INPUT DATA
---




ARM A IS Honeywell Lane east
ARM B IS Site Access
ARM C IS Honeywell Lane west

STREAM LABELLING CONVENTION
---

STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B

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

ETC.

GEOMETRIC DATA

| DATA ITEM | | MINOR ROAD B |
|---|---|---|
| TOTAL MAJOR ROAD CARRIAGEWAY WIDTH | ( W ) | 7.30 M. |
| CENTRAL RESERVE WIDTH | (WCR ) | 0.00 M. |
| MAJOR ROAD RIGHT TURN - WIDTH | (WC-B) | 2.20 M. |
| - VISIBILITY | (VC-B) | 90.0 M. |
| - BLOCKS TRAFFIC | | YES |
| MINOR ROAD - VISIBILITY TO LEFT | (VB-C) | 19.0 M. |
| - VISIBILITY TO RIGHT | (VB-A) | 15.0 M. |
| - LANE 1 WIDTH | (WB-C) | 3.00 M. |
| - LANE 2 WIDTH | (WB-A) | 0.00 M. |

.SLOPES AND INTERCEPT

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

will be adjusted )

| Intercept For Stream B-C | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 633.38 | 0.23 | 0.09 |

| Intercept For Stream B-A | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B | Slope For Opposing Stream C-A | Slope For Opposing Stream C-B |
|---|---|---|---|---|
| 491.16 | 0.21 | 0.08 | 0.13 | 0.30 |

| Intercept For Stream C-B | Slope For Opposing Stream A-C | Slope For Opposing Stream A-B |
|---|---|---|
| 626.08 | 0.23 | 0.23 |

NB These values do not allow for any site specific corrections

TRAFFIC DEMAND DATA

| ARM | FLOW SCALE(%) |
|---|---|
| A | 100 |
| B | 100 |
| C | 100 |

Demand set: PM 2014 Base + Development

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

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 | 0.77 | 1.16 | 0.77 |
| ARM B | 15.00 | 45.00 | 75.00 | 0.61 | 0.92 | 0.61 |
| ARM C | 15.00 | 45.00 | 75.00 | 1.23 | 1.84 | 1.23 |

| TIME | FROM/TO | ARM A | ARM B | ARM C |
|---|---|---|---|---|
| 16.45 - 18.15 | | TURNING PROPORTIONS | | |
| | | TURNING COUNTS (VEH/HR) | | |
| | | (PERCENTAGE OF H.V.S) | | |
| | ARM A | 0.000 | 0.210 | 0.790 |
| | | 0.0 | 13.0 | 49.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM B | 0.429 | 0.000 | 0.571 |
| | | 21.0 | 0.0 | 28.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |
| | ARM C | 0.827 | 0.173 | 0.000 |
| | | 81.0 | 17.0 | 0.0 |
| | | ( 0.0) | ( 0.0) | ( 0.0) |

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

FOR COMBINED DEMAND SETS
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) |
|---|---|---|---|---|---|---|---|---|---|
| 16.45-17.00 | | | | | | | | | |
| B-AC | 0.61 | 9.12 | 0.067 | | 0.00 | 0.07 | 1.0 | | 0.12 |
| C-AB | 0.23 | 10.92 | 0.022 | | 0.00 | 0.03 | 0.4 | | 0.09 |
| C-A | 0.99 | | | | | | | | |
| A-B | 0.16 | | | | | | | | |
| A-C | 0.61 | | | | | | | | |

| 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 | 0.73 | 9.07 | 0.081 | | 0.07 | 0.09 | 1.3 | | 0.12 |
| C-AB | 0.29 | 11.02 | 0.026 | | 0.03 | 0.03 | 0.5 | | 0.09 |
| C-A | 1.18 | | | | | | | | |
| A-B | 0.19 | | | | | | | | |
| A-C | 0.73 | | | | | | | | |

| 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 | 0.90 | 9.00 | 0.100 | | 0.09 | 0.11 | 1.6 | | 0.12 |
| C-AB | 0.36 | 11.15 | 0.032 | | 0.03 | 0.04 | 0.6 | | 0.09 |
| C-A | 1.44 | | | | | | | | |
| A-B | 0.24 | | | | | | | | |
| A-C | 0.90 | | | | | | | | |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 17.30-17.45 | | | | | | | | | |
| B-AC | 0.90 | 9.00 | 0.100 | | 0.11 | 0.11 | 1.7 | | 0.12 |
| C-AB | 0.36 | 11.15 | 0.032 | | 0.04 | 0.04 | 0.6 | | 0.09 |
| C-A | 1.44 | | | | | | | | |
| A-B | 0.24 | | | | | | | | |
| A-C | 0.90 | | | | | | | | |

| TIME | DEMAND (VEH/MIN) | CAPACITY (VEH/MIN) | DEMAND/ CAPACITY (RFC) | PEDESTRIAN FLOW (PEDS/MIN) | START QUEUE (VEHS) | END QUEUE (VEHS) | DELAY (VEH.MIN/ TIME SEGMENT) | GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT) | AVERAGE DELAY PER ARRIVING VEHICLE (MIN) |
|---|---|---|---|---|---|---|---|---|---|
| 17.45-18.00 | | | | | | | | | |
| B-AC | 0.73 | 9.07 | 0.081 | | 0.11 | 0.09 | 1.4 | | 0.12 |
| C-AB | 0.29 | 11.02 | 0.026 | | 0.04 | 0.03 | 0.5 | | 0.09 |
| C-A | 1.18 | | | | | | | | |
| A-B | 0.19 | | | | | | | | |
| A-C | 0.73 | | | | | | | | |

| 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) |
|---|---|---|---|---|---|---|---|---|---|
| 18.00-18.15 | | | | | | | | | |
| B-AC | 0.61 | 9.12 | 0.067 | | 0.09 | 0.07 | 1.1 | | 0.12 |
| C-AB | 0.24 | 10.92 | 0.022 | | 0.03 | 0.03 | 0.4 | | 0.09 |
| C-A | 0.99 | | | | | | | | |
| A-B | 0.16 | | | | | | | | |
| A-C | 0.61 | | | | | | | | |

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

QUEUE FOR STREAM B-AC

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 17.00 | 0.1 |
| 17.15 | 0.1 |
| 17.30 | 0.1 |
| 17.45 | 0.1 |
| 18.00 | 0.1 |
| 18.15 | 0.1 |

QUEUE FOR STREAM C-AB

| TIME SEGMENT ENDING | NO. OF VEHICLES IN QUEUE |
|---|---|
| 17.00 | 0.0 |
| 17.15 | 0.0 |
| 17.30 | 0.0 |
| 17.45 | 0.0 |
| 18.00 | 0.0 |
| 18.15 | 0.0 |

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

| STREAM | TOTAL DEMAND | | * QUEUEING * DELAY * | | * INCLUSIVE QUEUEING * DELAY * | |
|---|---|---|---|---|---|---|
| | (VEH) | (VEH/H) | (MIN) | (MIN/VEH) | (MIN) | (MIN/VEH) |
| B-AC | 67.4 | 45.0 | 8.1 | 0.12 | 8.1 | 0.12 |
| C-AB | 26.4 | 17.6 | 3.0 | 0.12 | 3.0 | 0.12 |
| C-A | 108.5 | 72.3 | | | | |
| A-B | 17.9 | 11.9 | | | | |
| A-C | 67.4 | 45.0 | | | | |
| ALL | 287.7 | 191.8 | 11.1 | 0.04 | 11.1 | 0.04 |

* 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 14:31:25 on 29/04/2009]