



HOUGHTON MAIN RENEWABLE ENERGY CENTRE

TRANSPORT ASSESSMENT  
150202/SK21341TRR/TA02

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HOUGHTON MAIN  
RENEWABLE ENERGY CENTRE

TRANSPORT ASSESSMENT

**DOCUMENT CONTROL**

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## 1 INTRODUCTION

- 1.1 SK Transport Planning Ltd (SKTP) has been appointed by Peel Environmental Management (UK) Ltd to prepare a Transport Assessment (TA) in support of a planning application for the development of a renewable energy centre at Houghton Main in Barnsley.
- 1.2 The proposed development site is brownfield land and is allocated as an 'Employment Policy Area' and an 'Area of Investigation for Potential Employment Development' in the Barnsley Unitary Development Plan (2000, Saved Policies).
- 1.3 The proposal site benefits from planning consent for employment use. The approved scheme comprises 19 industrial units with a total GFA of 10,607sqm and 208 car parking spaces.
- 1.4 The proposed Renewable Energy Centre comprises a Timber Resource Recovery Centre, which will treat up to 150,000tpa of waste wood and virgin timber through a gasification process and will export over 20MW of renewable electrical power.
- 1.5 The TA has been produced in line with the Department for Transport's 'Guidance on Transport Assessment'. The scope for the TA was discussed with the local highway authority, Barnsley Metropolitan Borough Council (BMBC), in relation to the previous application for a larger renewable energy centre. The current proposal will result in a lower level of traffic generation and thus the previously agreed scope provides a robust means of assessing impact of the revised proposal. A copy of the scoping report is attached as **appendix a**.
- 1.6 The site is located on the south side of the A6195 Park Spring Road, west of the settlements of Little Houghton and Great Houghton and north of Darfield. The site benefits from an existing roundabout access junction shared with the ASOS Fulfilment Centre on the east side of Park Spring Road.
- 1.7 A Framework Travel Plan, attached as **appendix b**, has been prepared to support and promote sustainable access to the site, and identify measures that can be implemented to reduce the number of single occupancy car trips generated by the proposal.
- 1.8 The type of development proposed, whilst not generating substantial volumes of traffic, will include heavy vehicle (HV) traffic required for the transport of materials to the site, and to a lesser extent, exports from the site. The operator has control over these movements and has agreed to institute management strategies to minimise the impact of HV movements on residential amenity and highway operation during critical periods.
- 1.9 The TA considers the impact of the proposal on the A1695 Park Spring Road and site access. At the request of BMBC the traffic impact at the Broomhill and Cathill Roundabouts is also included within the TA. The TA shows that the development will have a minimal impact on surrounding highway network and will generate less traffic than that associated with the permitted site use.
- 1.10 To summarise, the TA considers the following study area:
  - Site Access/Park Spring Road
  - A6195 Park Spring link
  - A6195/A635 'Broomhill Roundabout'
  - A6195/Manvers Way/Highgate 'Cathill Roundabout'
- 1.11 The assessment concludes that the renewable energy centre will generate a low number of vehicle movements, substantially below the level that would be generated

by the consented industrial scheme, and that the proposed scheme will have a minimal effect on highway operation and safety.

- 1.12 Notwithstanding this, the operator has agreed to manage the timings of HV movements to avoid periods of congestion on the local highway network, and to manage the routes used by HV traffic accessing the site to reduce inconvenience to local communities.
- 1.13 The TA concludes that the proposal meets the requirements of local and national policy, and that the residual impact of the proposal will not be severe.

## **2 EXISTING SITUATION**

### **Site Location & Characteristics**

- 2.1 The site is located on the south side of the A6195 Park Spring Road just over 1km west of the settlements of Little Houghton and Great Houghton, some 6.5km east of the centre of Barnsley and 1.5km north of Darfield.
- 2.2 Vehicle access to the site is available via an existing roundabout on Park Spring Road, known as Houghton Main Colliery Roundabout. The junction also provides access to the ASOS Fulfilment Centre on the northern side of Park Spring Road.
- 2.3 The site forms part of the Houghton Main Colliery site (disused) and benefits from a live planning consent for the development of 19 industrial units with 208 parking spaces (application ref. 2008/1426). The planning consent, originally granted in 2008, was renewed in 2012 and remains a live permission.

### **Local Highway Network**

- 2.4 The A6195 Park Spring Road is a single carriageway road subject to national speed limit. The road is of relatively recent construction and is of a high standard. The route is a bus corridor with typical service provision of two buses per hour in each direction during the day. Bus stops with good standard shelters are located on Park Spring Road adjacent to the site, footway connections to these are provided from the Houghton Main Colliery Roundabout.
- 2.5 The site relates well to the strategic highway network, with both the A1(M) and M1 approximately 9km to the east and west of the site, respectively. Access to strategic routes and the local area can be gained via the A6195 and other A class routes including the A635 which routes east-west between the M1 and A1(M) via Barnsley town centre, and meets the A6195 at the Cathill Roundabout some 2.5km south-east of the site.
- 2.6 The TA shows that the proposal will generate considerably less traffic than that already permitted for the site, and also that the new proposal will have an insignificant impact when compared to baseline traffic conditions. Despite this the Cathill Roundabout and Broomhill Roundabout have been included in the study area for the TA, to accord with a request from BMBC.
- 2.7 The Cathill Roundabout connects the A6195 with the A635, the Broomhill Roundabout is the next junction to the south on the A6195, 2km south of the Cathill Roundabout, and provides access to Broomhill via Highgate and areas of Brampton and Wath Upon Dearne via Manvers Way.

### **Existing Study Area Traffic Flows**

- 2.8 Surveys of existing peak hour turning movements have been undertaken at the site access junction and the Cathill and Broomhill Roundabouts. Additional automatic

traffic count (ATC) data has been collected on Park Spring Road to the north and south of the site access, including vehicle speed data.

- 2.9 A summary of the traffic survey data is provided in **appendix c**. The peak hours at each of the junctions are identified in **table 2.1**.

Junction	AM Peak Hour	PM Peak Hour
Houghton Main Colliery Roundabout (site access)	07.30 – 08.30	16.15 – 17.15
Cathill Roundabout/Broomhill Roundabout	07.30-08.30	16.45-17.45

**Table 2.1:** Study Area Peak Hour Calculation  
[source: Traffic Sense ATC/MCTC]

- 2.10 **Table 2.2** shows existing AM and PM peak total link flows on the A1695 Park Spring Road.

Link Flows	AM Peak Hour	PM Peak Hour	Daily Total Traffic Flows (AADT)	Daily HV Flows (AADT)	% HV
A1695 N Park Spring Road	908	1084	8946	1086	12%
A1695 S Parking Spring Road	918	1095	9171	1175	13%

**Table 2.2:** 2014 Site Access Daily Link Flows (in veh)  
[source: Traffic Sense ATC/MCTC]

- 2.11 AADT link traffic flows have also been taken from the DfT database for the wider network. A summary of this data is provided in **table 2.3**.

Link Flows	Daily Total Traffic Flows (AADT)	Daily HV Flows (AADT)	% HV
A635 W Doncaster Road	16095	515	3%
A635 E Doncaster Road	12445	1113	9%
A6195 S	22163	1033	5%

**Table 2.3:** 2012 AADT Wider Network Daily Link Flows (in veh)  
[source: DfT Database 2014]

### Existing Traffic Speeds

- 2.12 Traffic speeds on Park Spring Road to the north and south of the site access junction are indicated in **table 2.4**.

	Speed Limit (mph)	Mean Speed (mph)	85%ile Speed (mph)
A6195 N (northbound)	60	39.7	45.4
A6195 N (southbound)	60	45.5	52.7
A6195 S (northbound)	60	46.0	53.0
A6195 S (southbound)	60	39.7	45.3

**Table 2.4:** Surveyed Speeds  
[source: Traffic Sense ATC 7 day speeds]

- 2.13 The traffic speeds recorded on Park Spring Road are commensurate with the existing road class and speed restriction.

### Road Safety

- 2.14 Latest available road collision data for the local study area was requested from BMBC in March 2014. BMBC has provided data for the most current three year period. Data has been analysed that has occurred in the agreed TA study area, namely the A6195 adjacent to the site (including the site access), and accidents occurring at Broomhill and Cathill Roundabouts. The data is attached as **appendix c** and a summary is provided below.
- 2.15 The data shows that there have been a total of 20 collisions in the study area, the causes and contributing factors to the accidents have been fully reviewed using DfT Stats20.
- 2.16 Of the 20 accidents a number were caused by occurrences of non-standard driver behaviour, for example: an accident caused by horses roaming in the carriageway at 4am; a tire blow-out; and, a driver with cramp. Seven of these anomalous accidents have been removed.
- 2.17 A number of the remaining accidents were caused by illegal or irregular driver behaviour noted by the attending police officer, such as speeding and aggressive behaviour. However, these accidents have been retained in the analysis for robustness.
- 2.18 Following adjustment of the data to remove the declared anomalies, the total number of accidents in the study area is 13, of which three were classed as serious and the rest as slight.

#### *Site Access & A6195 North & South:*

- 2.19 A total of five accidents have occurred in the immediate local highway network, defined as the Park Spring Road from Springvale, north of the site, to and including the junction with Rotherham Road in south-east.
- 2.20 There have been no recorded collisions at or on immediate approach to the site access roundabout in the preceding three years.
- 2.21 Three accidents have occurred at on the A6195 Park Spring Road to the north and south of the site, of which two were classified as slight and one was classified as serious.

- 2.22 The serious accident occurred on Park Spring Road (N) at 7am and was the result of a head-on collision of two vehicles travelling in opposite directions. The attending police officer noted that the cause of the accident was 'unknown at this time', but the officer did note that contributory factors to the accident included aggressive driving behaviour.
- 2.23 The slight accident also occurred on Park Spring Road (N), further north on the link than the serious collision. This accident was the result of a vehicle trying to overtake a vehicle travelling in front and the vehicle in front pulling out into the first vehicle's path. The attending officer attributed the accident to aggressive driving.
- 2.24 The other slight accident occurred at Park Spring Road (S). The accident was caused by a vehicle suddenly braking due to traffic conditions and the vehicle behind failing to stop.
- 2.25 Further to the north of the site, one slight accident has occurred at the junction of Park Spring Road/Springvale. A driver losing control and hitting an oncoming vehicle in the roundabout caused this collision.
- 2.26 Further to the south of the site, one slight accident has occurred at the junction of Park Spring Road/Rotherham Road. This collision was caused by a driver overtaking another vehicle at speed and failing to see an oncoming vehicle.
- 2.27 The number and severity of accidents in the highway network immediately adjacent to the site is below that typically expected of a road of the character, speed and traffic volume of the A6195. None of the accidents have occurred at the same location and none of the accidents have been caused by the highway layout.

*Broomhill & Cathill Roundabouts:*

- 2.28 Although the development proposal will not have a significant impact at Broomhill and Cathill Roundabouts, BMBC has requested that consideration is given in the TA to traffic conditions at these junctions. For completeness, accidents occurring at, or on immediate approach, to these junctions are included within the safety analysis.
- 2.29 One slight accident occurred at the Broomhill Roundabout during the assessment period. A driver failing to stop at the give-way and entering the roundabout without looking caused this accident.
- 2.30 Seven slight accidents occurred at the Cathill Roundabout. The Cathill Roundabout is a busy junction with frequent incidence of queuing traffic at peak periods. Most of the accidents (six) at this location relate to rear shunts and stationary traffic conditions. In a number of these accidents included drivers failing to drive appropriately for prevailing conditions, drivers travelling to close and drivers failing to look.
- 2.31 The remaining accident was caused by a vehicle travelling in excess of the speed limit and resulted in the driver losing control at the roundabout.
- 2.32 Although all accidents are regrettable, the number, nature and severity of collisions at Broomhill and Cathill Roundabouts are typical of busy roundabout junctions with queuing traffic at key periods.

**Existing Local Area Travel Patterns**

- 2.33 Mode share information for work trips undertaken in the area around the site has been obtained from the 2011 Census.

Single Occupancy Car	71%
Sustainable Modes	29%

**Table 2.5:** Existing Barnsley Travel to Work Mode Share  
*[source: 2011 ONS Census data – Barnsley]*

2.34 The existing travel pattern suggests there are opportunities in relation to the proposal site to build on bus use, cycle use and car sharing in order to minimise car trips for staff. This opportunity is borne out by a staff travel survey undertaken at the adjacent ASOS Fulfilment Centre as part of the recent expansion proposals. The ASOS survey showed that staff travel by single occupancy car is 51%, rather than the 71% Barnsley authority average.

### **Accessibility by Non-Car Modes**

2.35 The opportunities for walking, cycling and public transport for access to the site have been considered. Use of these modes offers the opportunity to reduce the amount of traffic generated by the proposal thereby minimising the negative effects of traffic associated with the scheme.

### **Walking**

2.36 Walking offers a realistic alternative to car trips of up to 2km. The settlements of Little Houghton, Great Houghton & Middlecliffe lie within the accepted maximum walking distance of 2km for commuting trips and footpath connections exist between Middlecliffe Lane and the A6195, just north of the proposal site, and to Great Houghton via Chapel Lane.

2.37 The northern part of Darfield is also within 2km of the site and footpath connections are again present between Darfield and the A6195 via Ings Lane, to the south of the proposal site.

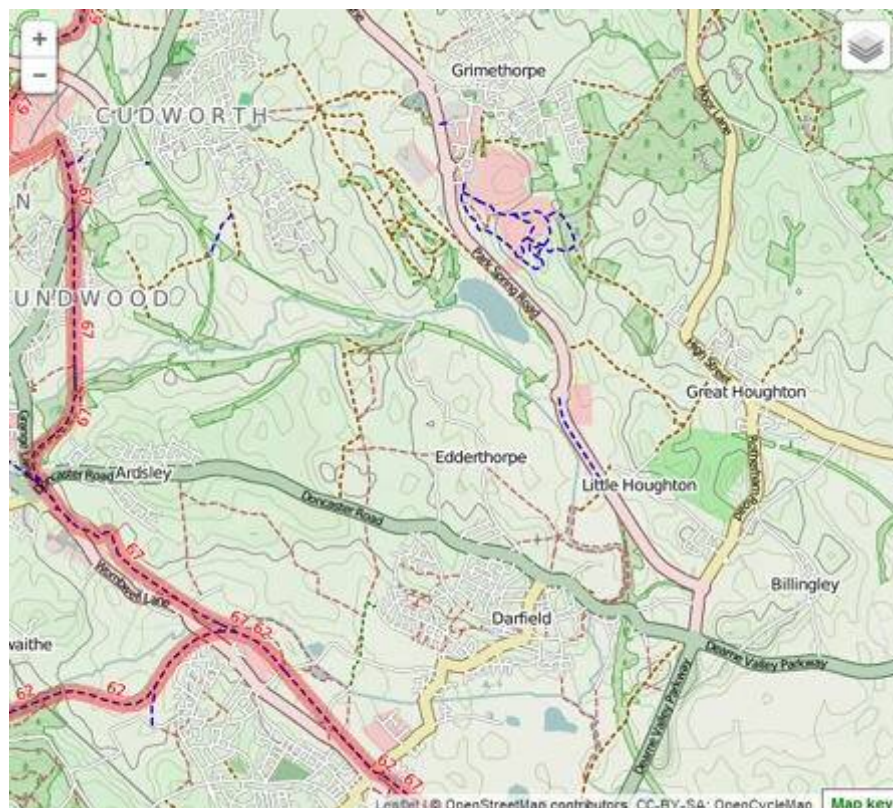
2.38 Given the limited population within an acceptable walking distance of the site it is considered that walking is unlikely to make a significant contribution to travel to the site, but routes are available from the nearest settlement areas.

### **Cycling**

2.39 Cycling offers a realistic alternative to car trips up to 5km. The area from which employees could reasonably be expected to cycle extends to the residential areas of Darfield, Cudworth and Grimethorpe and includes areas of Goldthorpe, Thirnscoe and the eastern fringe of Barnsley,

2.40 The section of Park Spring Road between the site access junction and Ings Lane is designated as part of the local cycle network with a cycle connection available to Middlecliff Lane. To the north of the site further off-road cycle connections are available from the A6195 to Great Houghton and Cudworth.

2.41 The cycle links in the vicinity of the site are shown in **figure 2.1**.



**Figure 2.1:** Local Cycle Network

[source: *cyclestreets.net* © *OpenStreetMap contributors*]

2.42 National cycle network routes 62 and 67 run to the west and south of the site.

### **Public Transport**

2.43 Bus stops are available on both sides of Park Spring Road adjacent to the site. These are of a good standard with shelters, timetable information and footway connections.

2.44 A number of bus services currently use the stops adjacent to the site. These are summarised in **table 2.6**.

Stop	Service No.	Route	First Bus	Last Bus	Frequency
Both	26/X26	Barnsley – Cudworth – Grimethorpe – Great Houghton – Middlecliff – Darfield – Wombwell – Brampton	05.52	23.14	Hourly in each direction
Both	28/28A	Barnsley – Shafton – Grimethorpe – Park Spring Road	05.36	23.18	Hourly
Southbound	29/29A	Barnsley – Shafton – Park Spring Road – Grimethorpe – Hemsworth – South Elmsall – Upton	14.25	23.18	Limited service
Northbound	30A	Barnsley – Cudworth – Grimethorpe – Brierley	-	-	One service to each terminus 22.40 to Barnsley & 23.26 to Brierley
Both	216	Wombwell – Wath upon Dearne – Goldthorpe – Thurnscoe – Little Houghton – Grimethorpe	06.38	23.15	3 per day in each direction
Both	X27	Barnsley – Cudworth – Shafton – Grimethorpe – Goldthorpe	06.15	17.22	Hourly in each direction

**Table 2.6:** Existing Bus Services

*[source: Travel South Yorkshire new service timetables as of 24.01.15]*

- 2.45 The existing bus services offer a good level of coverage and timings for access to the site by bus. Services are available between the site and the major local centres of population. The timings of the services will cover the proposed shift patterns at each facility and regular services are available during the day.
- 2.46 The number and frequency of existing bus services currently available offer a realistic option for travel to the site.

### **3 TRANSPORT POLICY**

- 3.1 This section outlines the local and national policy guidelines that will govern the future development of the site.
- 3.2 In 2011 Government published a new transport White Paper ('Creating Growth, Cutting Carbon'). This White Paper outlines the Government's vision for sustainable local transport systems that support local economic growth, whilst achieving a reduction in carbon emissions. The document sets out where transport fits in the localism agenda and changes proposed to direct support and central government funding, including details of the new Local Sustainable Transport Fund and the Regional Growth Fund.
- 3.3 The White Paper echoes the findings of recent DfT studies and research, which concluded that significant behavioural change could be achieved through localised smart travel planning. The Paper hails the success of the Sustainable Towns initiative and suggests that local transport measures should be based on these proven measures. The White Paper recognises that these measures work best for short trips in urban areas. However, as two-thirds of all journeys in the UK are under-five miles,

it is the short distance trip where the biggest opportunity exists for people to make sustainable travel choices and to make a real difference to their local environment.

- 3.4 The NPPF, published in 2012, consolidates previous national planning policy guidance into one document. The document sets the 12 principles of planning, including the need to:

‘actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant developments in locations which are or can be made sustainable’

- 3.5 The NPPF refers to the threshold criteria in deciding whether a TA should be undertaken. The document states that consideration should be given to both sustainable access and safety, and that developments should be located where the need to travel can be minimised and sustainable transport can be maximised. The NPPF outlines a commitment to the use of Travel Plans to reinforce the sustainable credentials of a development. The NPPF document also states that refusal on transport grounds should only be made when residual cumulative impacts of the development proposal are severe.
- 3.6 Planning Practice Guidance (PPG) published in 2014 provides guidance on the application of NPPF principles for local authorities and developers. In terms of transport, PPG states where and when the assessment of transport impacts and the production of a travel plan will be required. PPG states, in line with NPPF, that assessment of the transport implications of development will be required for proposals that are of a scale that will generate a significant volume of traffic or will have a severe impact on the local highway network. PPG also outlines government commitment where accessibility is or can be made good.
- 3.7 NPPF and PPG replace planning policy advice in planning policy guidance notes, including PPG13.
- 3.8 In line with NPPF and PPG, the site is located in an accessible location with highway infrastructure suitable for the use proposed already in place. The TA demonstrates that the residual traffic generated by the proposal can be safely accommodated on the local highway network and will not cause a severe change from either background or baseline operational characteristics.
- 3.9 Local transport policy is outlined in the third South Yorkshire Local Transport Plan (known as the ‘Sheffield City Region Transport Strategy: 2011-2026’). The document outlines transport strategy and investment priorities for Barnsley, Doncaster, Rotherham and Sheffield for the 15 year period. The document underpins local planning policy, including the Core Strategy, and aims to:
- Support economic growth
  - Enhance social inclusion and health
  - Reduce emissions from vehicles
  - Maximise safety and security
  - Provide excellent road, rail and air links to/from South Yorkshire
  - Provide a well managed and enhanced road network that facilitates the free movement of goods
- 3.10 LTP3 seeks to influence land use planning by locating development so that the need to travel is reduced, accessibility is maximised and local infrastructure is appropriate to the needs of the development type.
- 3.11 The South Yorkshire Passenger Transport Executive (SYLTE) document ‘Land Use Planning and Public Transport: A Developer Guide’ seeks to:

- Support developers in designing a sustainable site
- Highlight public transport interventions and incentives available

3.2 The SYPTE guidance aims to:

'...prevent dependency on the private car, it is important that attractive public transport as well as walking and cycling links are in place, supported by incentives to use them.'

- 3.12 SYPTE promotes developments that provide good connections to existing sustainable route corridors. SYPTE guidance states to be deemed accessible a development must be within 400m (5-minute walk) of public transport facilities. The proposal meets this requirement.
- 3.13 The development proposal meets relevant adopted local and national policy requirements.

## 4 PERMITTED DEVELOPMENT

### Permitted Development Description

- 4.2 The site benefits from planning consent for the development of 19 industrial units totalling 10,607m<sup>2</sup> GFA and 208 car parking spaces (application ref 2008/1426). The planning permission was renewed in 2011 and remains a live consent that could be brought forward.

### Permitted Development Traffic

- 4.3 Extant site traffic flows have been forecast in line with the 2013 'TRICS Good Practice Guide'. The trip forecast uses TRICS land use 02 – employment/d (industrial estate). Guidance states that this is the land use to be used for industrial sites with more than one building/operator. The extant forecast removes sites in London and Ireland, and only includes industrial estates that sit in edge of town/suburban areas.
- 4.4 The vehicle traffic flows permitted by the current site consent are summarized in **table 4.1** and the TRICS output is attached as **appendix d**.

	ALL VEHICLES (LV + HV)			HV ONLY			TOTAL TRAFFIC (PCU)		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
AM Peak Hour	55	25	80	1	3	4	56	28	84
PM Peak Hour	13	47	60	1	0	1	13	47	60
DAILY (12HR)	378	389	768	26	26	53	405	416	820

**Table 4.1:** Consented Use Traffic Flows

- 4.5 The permitted development flows have been distributed onto the study area network in line with surveyed turning movements.

## 5 PROPOSAL

### Development Description

- 5.1 The proposed renewable energy centre comprises a 150,000tpa Timber Resource Recovery Centre, which will treat up to 150,000tpa of waste wood and virgin timber through a gasification process and will export over 20MW of renewable electrical power.
- 5.2 In line with the permitted site use vehicle access will be taken from the existing spur on the Houghton Main Colliery Roundabout.
- 5.2 The proposed site layout is shown in **appendix e**.

### Operation

- 5.3 The facility will have the capability to deal with 150,000tpa of waste (import material). The facility will generate export material as ash (up to 11,133tpa) and fly ash (up to 4,500tpa). The facility will operate continuously throughout the year.
- 5.4 The vehicle fleet for the facility will be made up of 20t payload vehicles for import, 25t payload vehicles for ash export and 20t payload vehicles for fly ash export.
- 5.5 The resulting annual and daily HV loads and resulting daily HV movements for the facility as advised by the operator are summarised in **table 5.1**.

TRRC	TPA	Average Payload (t)	Annual HV	Working Days	Daily Load	Daily Trips
Deliveries	150000	20	7500	275	27	55
Ash Export	11133	25	445	275	2	3
Fly Ash Export	4500	20	225	275	1	2
					30	59

**Table 5.1:** Heavy Vehicle Movements Summary

- 5.6 The HV movements will occur throughout the day. The daily profile for a typical landfill facility has been used as the basis to forecast a typical arrival/departure profile of HV movements to the facility. The resulting movements are summarised in **table 5.2**.

	Heavy Vehicle Traffic		
	IN	OUT	TOTAL
AM Peak Hour	3	3	6
PM Peak Hour	0	1	2
Daily	30	30	59

**Table 5.2:** Heavy Vehicles Peak Hour Forecast  
(not adjusted for rounding errors)

- 5.7 The energy centre will employ a total of 25 members of staff. The operator has advised that a maximum of 4 shift staff will be on site at any one time and that the facility will operate two 12-hour shifts per day (7am – 7pm and 7pm – 7am). Managerial staff will work between 8am and 5pm and so the traffic forecast for the assessment is based on 4 managerial staff on site during this period.

- 5.8 Typical mode shares for travel to work in Barnsley are again used to complete the analysis of traffic movements associated with the facility. These are shown in **table 5.3**.

	HV Traffic			Shift Staff Car Traffic			Management Staff Car Traffic			Total Traffic		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
AM Peak Hour	3	3	6	0	0	0	3	0	3	6	3	9
PM Peak Hour	0	1	2	0	0	0	0	3	3	0	4	5
Daily	30	30	59	6	6	11	3	3	6	38	38	76

**Table 5.3:** Proposal Traffic Movements  
(not adjusted for rounding errors)

### Travel Plan & Heavy Vehicle Management Strategy

- 5.9 The proposed development is expected to generate very low levels of traffic but in order to ensure opportunities for sustainable trip making are taken up where possible a Framework Travel Plan has been prepared. The Framework is attached as **appendix b**.
- 5.10 The focus of the Framework Travel Plan is to promote take-up of alternative modes of travel to the car for staff accessing the site. Given the site's location and availability of existing bus services the realistic options to minimise car journeys are considered to be bus, cycle and car sharing.
- 5.11 A survey undertaken at the adjacent ASOS Fulfilment Centre as part of the recent expansion application showed that staff car travel to the site is 20% lower and staff bus use is 6.3% higher than Barnsley ONS Census commuting mode share. Local precedents support the ability of the location of the proposal site adjacent to existing bus corridors and proposed travel plan measures to reduce future staff car travel beneath that assessed as a worst-case in this TA.
- 5.12 The Framework also includes the management strategy for the movement of HV to and from the site. At this stage this identifies existing restrictions on the highway network and the routes that will be used by large vehicles, together with proposed restrictions on the timing of movements.
- 5.13 The HV management strategy will be developed in more detail with specific delivery patterns as part of the implementation of the Framework Travel Plan.
- 5.14 The effects of the Framework Travel Plan and HV management strategy on traffic movements associated with the proposal have not been taken into account in the consideration of development traffic impact for the purposes of the TA analysis, to allow a robust assessment. The controls on delivery movements and the timing of staff travel will effectively reduce peak hour movements at the site to a negligible level.

### Parking Provision

- 5.15 Parking will be provided on site at a level required to meet the operational needs of the facility only. 10 spaces are proposed, including two disabled spaces.
- 5.16 The Framework Travel Plan recommends that some of the parking spaces should be allocated to car sharers to assist with reducing single occupancy staff car trips.

## 6 FORECAST

### Assessment Study Area & Assessment Scenarios

6.1 The study area includes the following junctions:

- Site Access/Park Spring Road
- A6195/A635 'Broomhill Roundabout'
- A6195/Manvers Way/Highgate 'Cathill Roundabout'

6.2 Background traffic flows for the development opening year (2017) and future year (2019) have been forecast using TEMPRO adjusted NTM local traffic growth factors. The background traffic forecasts are shown in **appendix f**. The background traffic do not contain flows associated with the permitted development proposal.

6.3 Baseline traffic forecasts have also been produced against which the impact of the proposed development is considered. The baseline traffic forecasts include the permitted development scheme for the site. These are also included in **appendix f**.

6.4 Traffic forecasts with the proposed development include the traffic associated with the renewable energy centre development. These are also included in **appendix f**.

6.5 The scenarios considered in the TA are, therefore:

- 2017 Background AM/PM
- 2017 Baseline AM/PM
- 2017 with Development AM/PM
- 2019 Baseline AM/PM
- 2019 with Development AM/PM

### Generation

6.3 The traffic forecast is outlined in **section 5** and the development traffic flows summarised in **table 6.1**.

	HV Traffic			Shift Staff Car Traffic			Management Staff Car Traffic			Total Traffic		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
AM Peak Hour	3	3	6	0	0	0	3	0	3	6	3	9
PM Peak Hour	0	1	2	0	0	0	0	3	3	0	4	5
Daily	30	30	59	6	6	11	3	3	6	38	38	76

**Table 6.1:** Development Traffic (veh)  
(not adjusted for rounding errors)

6.4 **Table 6.2** shows the total development traffic flows converted to passenger car units (pcu) in line with TRR67 conversion, where the HV value is 2.0 and LV value is 1.0.

	Total Traffic		
	IN	OUT	TOTAL
AM Peak Hour	9	5	14
PM Peak Hour	1	6	6
Daily	68	68	136

**Table 6.2:** Total Development Traffic (pcu)  
(not adjusted for rounding errors)

6.5 Full calculations and TRICS data utilised within the analysis is presented in **appendix f**.

### Distribution

6.6 The operator has confirmed that the routing of trips will follow general population/settlement distributions. The ATC flows at the site roundabout approaches and DfT link flows on the wider network have therefore been used to distribute the HV and staff traffic.

6.7 **Table 6.3** shows the distribution of traffic from the site. In the peak hours there will be minimal change in traffic flows at junctions/links away from the development site. The table shows a worst-case scenario, as in reality the proposed heavy vehicle management strategy will remove heavy vehicle movements from the peak periods.

Route Name	2017 AADT	Distribution	Total Traffic (LV + HV)			HV Total Traffic		
			AM	PM	Daily	AM	PM	Daily
A6195 N Park Spring Road	9349	49%	4	2	38	3	1	29
A6195 S Park Spring Road	9583	51%	4	2	39	3	1	30
A635 W Doncaster Road	17077	16%	1	1	12	1	0	10
A635 E Doncaster Road	13204	12%	1	1	9	1	0	7
A6195 S	23515	22%	2	1	17	1	0	13

**Table 6.3:** Development Traffic Distribution (veh)

6.8 The equivalent distribution pattern has also been used to assign traffic relating to the consented industrial development scheme for the purposes of comparison with baseline traffic conditions, as shown in **table 6.4**.

Route Name	2017 AADT	Distribution	Total Permitted Traffic (LV + HV)			Permitted HV Traffic		
			AM	PM	Daily	AM	PM	Daily
A6195 N Park Spring Road	9349	49%	40	29	379	2	0	26
A6195 S Park Spring Road	9583	51%	41	30	389	2	1	27
A635 W Doncaster Road	17077	16%	13	10	123	1	0	8
A635 E Doncaster Road	13204	12%	10	7	95	1	0	7
A6195 S	23515	22%	18	13	170	1	1	12

**Table 6.4:** Permitted Development Traffic Distribution (veh)

## 7 IMPACT

- 7.1 This section of the TA outlines the traffic and highway impact of the development proposal.
- 7.2 The forecast changes in traffic flows with the inclusion of the development traffic are shown to be insignificant in relation to both background and baseline traffic conditions. The volume of traffic that will be generated by the renewable energy centre is also shown to be substantially lower than would be generated by the permitted site use.

### Comparison of Permitted & New Site Traffic

- 7.3 The site benefits from extant planning consent for a 19 unit industrial development and 208 parking spaces. **Table 7.1** shows a comparison of the previous consent traffic flows and those associated with the current proposal.

	Total Daily Traffic (LV+HV)	Total Daily HV
Permitted	768	53
Total Proposal	76	59
<i>Change</i>	<i>-691</i>	<i>6</i>

**Table 7.1:** Comparison with Permitted Site Use (veh)

- 7.4 The proposed use will generate significantly less total traffic than the uses currently permitted for the site.
- 7.5 Forecast HV movements is only six vehicles higher than that currently permitted for the employment/industrial use of the site. This level of increase, spread over the day, will be imperceptible to other road users and does not constitute a material change from the current site consent. The total HV flow is also insignificant when compared to the baseline traffic flows.
- 7.6 A HV management strategy is proposed that will ensure that the large vehicle movements do not detrimentally affect the operation of the highway network at peak times. This strategy will also minimise the impact of HV movements on amenity through the control of the routes used by delivery vehicles.
- 7.7 **Table 7.2** shows a comparison of permitted site traffic flows and the new proposal flows in pcu.

	Total Daily PCU
Permitted	873
Proposal	136
<i>Change</i>	<i>-737</i>

**Table 7.2:** Comparison with Permitted Use (pcu)

- 7.8 As is shown, the new proposal will generate significantly less than the uses currently permitted on site.
- 7.9 It should also be noted that the current planning permission does not include a requirement to limit heavy vehicle movements in peak periods.

**Comparison with 2017 Background Traffic Flows**

- 7.10 **Table 7.3** shows the change in peak hour traffic flows as a result of the development proposal; against the 2017 background traffic flows.
- 7.11 For robustness in this instance to demonstrate the insignificant number of vehicles generated by the proposal, the base flows do not include the permitted site traffic flows.

Junction Flow	AM Peak			PM Peak		
	Background	With Dev	%	Background	With Dev	%
A6195 Site Access	996	1010	1.4%	1181	1187	0.51%
Cathill Roundabout	3969	3976	0.18%	4148	4152	0.10%
Broomhill Roundabout	3370	3373	0.09%	3511	3513	0.06%

**Table 7.3:** 2017 Comparison of Total Peak Hour Background Traffic & With Development Flows (pcu)

- 7.12 **Table 7.4** shows a comparison of the AADT baseline and with development flows on the wider network links, again the permitted site traffic flows are not included in the background flows shown below to allow a worst-case comparison.

Link Flow	Background	With Dev	Change
	2017 AADT	2017 AADT	
A6195 N Park Spring Road	9349	9386	0.40%
A6195 S Park Spring Road	9583	9622	0.40%
A635 W Doncaster Road	17077	17089	0.07%
A635 E Doncaster Road	13204	13214	0.07%
A6195 S	23515	23532	0.07%

**Table 7.4:** 2017 Comparison of Total Daily Background Traffic & With Development Flows (veh)

- 7.13 **Table 7.5** shows the change in HV movements as a result of the development.

Link Flow	Background	With Dev	Change
	2017 HV %	2017 HV %	
A6195 N Park Spring Road	12%	12%	0.27%
A6195 S Park Spring Road	13%	13%	0.26%
A635 W Doncaster Road	3%	3%	0.03%
A635 E Doncaster Road	9%	9%	0.09%
A6195 S	5%	5%	0.05%

**Table 7.5:** 2017 Comparison of Background HV% & With Development HV%

7.14 **Tables 7.3, 7.4 and 7.5** show that the worst-case change in network traffic resulting from the development is low and will not cause an impact on road operation or highway safety.

#### Comparison with 2017 Base Traffic Flows

7.15 **Table 7.6** shows the change peak hour traffic flows when compared to the 2017 base flows (eg. the forecast situation that would occur should the permitted site development go ahead).

7.16 The analysis shows that the new proposal will cause a reduction in network traffic when compared to that previously consented by BMBC as acceptable for the local highway network.

Junction Flows	AM Peak			PM Peak		
	2017 Base	With Dev	%	2017 Base	With Dev	%
A6195 Site Access	1080	1010	-6.93%	1242	1187	-4.43%
Cathill Roundabout	4011	3976	-0.88%	4179	4152	-0.64%
Broomhill Roundabout	3388	3404	-0.46%	3524	3535	-0.32%

**Table 7.6:** Change from 2017 Base Flows (pcu)

#### Site Access Assessments

7.17 The tables above show that the development will have an insignificant impact on the local highway network when compared to both the background traffic and the baseline traffic volumes. Despite this, full operational assessments have been undertaken for the 2017 and 2019 base and with development scenarios.

7.18 The junctions in the study area have been assessed for opening year (2017) and future year (2019) traffic flow scenarios with and without the proposed development. All flows used are in pcu.

7.19 Full assessment output is included in **appendices g** and **h** for the opening year and future year, respectively. The results of the analysis of the site access junction (Houghton Main Colliery Roundabout) are summarised in **tables 7.7** and **7.8**.

	2017 AM Base		2017 AM with Dev		2017 PM Base		2017 PM with Dev	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
From A6195 (N)	0.361	1	0.342	1	0.414	1	0.406	1
ASOS	0.024	0	0.023	0	0.065	0	0.064	0
From A6195 (S)	0.370	1	0.352	1	0.388	1	0.383	1
Site Access	0.026	0	0.005	0	0.046	0	0.006	0

**Table 7.7:** Houghton Main Colliery Roundabout Analysis – Opening Year

	2019 AM Base		2019 AM with Dev		2019 PM Base		2019 PM with Dev	
	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)	Max RFC	Max Queue (pcu)
From A6195 (N)	0.389	1	0.353	1	0.447	1	0.421	1
ASOS	0.026	0	0.025	0	0.073	0	0.067	0
From A6195 (S)	0.398	1	0.364	1	0.419	1	0.397	1
Site Access	0.027	0	0.005	0	0.047	0	0.006	0

**Table 7.8:** Houghton Main Colliery Roundabout Analysis – Future Year

- 7.20 The analysis demonstrates that the site access junction will operate within capacity in all scenarios and that there is considerable spare capacity.
- 7.21 The results also show that the site access junction is forecast to operate marginally better in the scenario with the proposed development than in the base case in which the consented development scheme is progressed.

#### **Broomhill & Cathill Roundabout Traffic Impact**

- 7.22 The TA shows that the proposal will generate less traffic onto the highway network than currently permitted for the site. It also shows that the proposal will not cause a significant increase in traffic when compared to background or base traffic flows. BMBC has requested that consideration be given of the impact of the proposal at the Cathill and Broomhill Roundabouts.
- 7.23 The traffic impact at both locations as a result of the proposals is shown in **table 7.9**.

Junction Flow	AM Peak			PM Peak		
	Background	With Dev	%	Background	With Dev	%
Cathill Roundabout	3969	3976	0.18%	4148	4152	0.10%
Broomhill Roundabout	3370	3373	0.09%	3511	3513	0.06%

**Table 7.9:** Impact at Cathill & Broomhill Roundabouts (Comparison with 2017 Background Traffic Conditions)

- 7.24 **Table 7.9** shows that the maximum increase in traffic, when compared to 2017 background levels, will be only 0.18% occurring in the AM peak. This level of increase will be imperceptible to other road users and will not have a material impact on operation or road safety.
- 7.25 A comparison has also been made of the impact at these locations in terms of change from 2017 base flows (i.e. the situation that will occur if the existing site consent is implemented). **Table 7.10** shows that the new proposal will reduce site traffic at these locations when compared to that previously considered acceptable by BMBC.

Junction Flows	AM Peak			PM Peak		
	2017 Base	With Dev	%	2017 Base	With Dev	%
Cathill Roundabout	4011	3976	-0.88%	4179	4152	-0.64%
Broomhill Roundabout	3388	3404	-0.46%	3524	3535	-0.32%

**Table 7.10:** Traffic Impact at Cathill & Broomhill Roundabouts (Comparison with 2017 Base Consented Situation)

7.26 The TA shows that the proposal will not have a significant impact on road safety or traffic operation at the Cathill and Broomhill roundabouts. Notwithstanding this, the operator is prepared to manage HV access to the site so that it doesn't coincide with peak network periods.

**Impact on Road Safety**

7.27 Full analysis has been undertaken of the latest three-year collision data available from BMBC. This analysis has been undertaken for the TA study area, defined as the Park Spring Road adjacent to the site and the Broomhill and Cathill Roundabouts.

7.28 The analysis (shown in **section 2**) shows that there are no significant accident hotspots or prevalent collision causes on the A6195 adjacent to the site. The TA also shows that changes in traffic resulting from the proposal are below that currently permitted for the site and also that the development flows will not cause a material change when compared to background or baseline traffic conditions. As a consequence, the development will not have a significant impact on local road safety.

7.29 Notwithstanding this, the development proposes travel planning measures to reduce single occupancy staff car trips. These measures will further reduce highway and safety impact.

7.30 Consideration has also been given to historic accidents at the Cathill and Broomhill Roundabouts. The analysis shows that there has only been one accident at the Broomhill Roundabout in the previous three years and there are no prevalent safety issues at this location.

7.31 The analysis shows that there have been a number of accidents at the Cathill Roundabout relating to driver behaviour during queuing traffic situations and drivers failing to stop/giveway appropriately. The level of traffic change at this location is less than the site traffic generation previously accepted by BMBC. For example, the TA shows that the inclusion of the development traffic leads to a maximum increase from 2017 background levels of 0.18% occurring in the AM peak hour, and a maximum decrease of -0.88% in the AM peak when compared to the 2017 base (eg. the situation that would occur should the industrial permission on site be implemented). The new development proposal will result in a reduction in traffic at the Cathill and Broomhill roundabouts when compared to that consented and previously considered acceptable by BMBC.

7.32 It is clearly shown that even the worst-case increase in traffic change (ie. increase from background levels) will not significantly change existing safety levels at this location.

7.33 Notwithstanding the insignificant impact at the Cathill and Broomhill Roundabouts, the operator has agreed to limit deliveries and export movements during the AM and PM peak periods. This will further assist in reducing traffic and road safety impact at both junctions.

### Heavy Vehicle Impact

- 7.34 The site is well located for access by heavy vehicles, with immediate highway access routes of good standard and construction. The site already benefits from a live consent for industrial uses, with associated HV movements, and adjacent land uses have similar large vehicle access requirements as the proposal.
- 7.35 BMBC has expressed concern at the operation of two junctions to the south of the proposal, Broomhill and Cathill Roundabouts, in the peak periods. The development includes measures to reduce impact at these locations during critical periods, including restricting site HV delivery/export so that it doesn't coincide with stress periods. The TA also shows that the level of HV movements will not be significant and will have no impact on the surrounding highway network.
- 7.36 As shown on **figures 7.1, 7.2 and 7.3** a number of locations within the vicinity of the site benefit from height, width and weight restrictions to reduce the impact of HV on local amenity. As outlined in the Framework Travel Plan, the operator is committed to promoting access to the site by the most appropriate heavy vehicle routes to minimise impact on sensitive residential locations.



**Figure 7.1: Existing Width Restrictions**  
[source: ukhaulier.co.uk]



**Figure 7.3: Existing Weight Restrictions**  
[source: ukhaulier.co.uk]



**Figure 7.3:** Existing Height Restrictions  
[source: ukhaulier.co.uk]

## 8 CONCLUSIONS

- 8.1 SK Transport Planning Ltd has been appointed by Peel Environmental Management (UK) Ltd to prepare a Transport Assessment in support of a planning application for the development of a renewable energy centre at Houghton Main in Barnsley.
- 8.2 The proposed renewable energy centre comprises a 150,000tpa Timber Resource Recovery Centre, which will treat up to 150,000tpa of waste wood and virgin timber through a gasification process and will export over 20MW of renewable electrical power.
- 8.3 The site is located on the south side of the A6135 Park Spring Road, west of the settlements of Little Houghton and Great Houghton and north of Darfield. The site benefits from an existing roundabout access junction shared with the ASOS Fulfilment Centre on the north side of Park Spring Road. The site is well served by existing public transport routes on Park Spring Road.
- 8.4 The TA has been produced in line with the Department for Transport's 'Guidance on Transport Assessment'. The scope for the TA has been discussed with the local highway authority, Barnsley Metropolitan Borough Council (BMBC), in relation to the previous application for a larger renewable energy centre. The current proposal will result in a lower level of traffic generation and thus the previously agreed scope provides a robust means of assessing impact of the revised proposal. At the request of the council, consideration is also given to the traffic impact of the proposals at the Broomhill and Cathill Roundabouts.
- 8.5 The assessment shows that the renewable energy centre will generate a low number of vehicle movements, substantially below the level that would be generated by the consented industrial scheme, and that the proposed scheme will have a minimal effect on highway operation and safety.
- 8.6 The type of development proposed, whilst not generating substantial volumes of traffic, will include heavy vehicle traffic required for the transport of materials to the site, and to a lesser extent exports from the site. The operator has some control over these movements and has agreed to institute management strategies to minimise the impact of heavy vehicle movements on amenity and highway operation during critical periods.
- 8.7 The forecast heavy vehicle movements associated with the proposal are in line with level of movements that would be generated by the permitted use of the site for 19 industrial units.

- 8.8 A Framework Travel Plan has been prepared to support and promote sustainable access to the site, and identify measures that can be implemented to further reduce the number of single occupancy car trips generated by the proposal.
- 8.9 The Transport Assessment concludes that the proposal meets the requirements of local and national policy, and that the residual impact of the proposal will not be severe.

## **APPENDIX A**



140318/SK213441/TA/Scope  
BY EMAIL

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18<sup>th</sup> March 2014

Dear Barbara,

**RE: Anaerobic Digestion Facility & Timber Resource Recovery Centre, Houghton Colliery, Houghton Main – Transport Assessment Scope**

It was good to meet with you last month at the inception meeting for the Houghton Colliery project. I feel that it was a productive meeting and your advice gave me a good indication of the highway authority's requirements in terms of transport planning submission documents and scope.

Since this meeting Enzygo has submitted the Environmental Impact Assessment scoping study for the facilities. We provided the transport information for this, which included your stated requirement to examine impact of the proposal at the Broomhill and Cathill roundabouts to the south of the site. Given the differences between IEMA ES transport chapter requirements and the Department for Transport (DfT) Transport Assessment requirements, I thought it would be useful to contact you directly regarding our proposed scope for the Transport Assessment and also to provide you with the trip generation forecasts discussed in the meeting.

My scope, outlined below, is in line with DfT guidance and is also informed by development trip forecast information from the two operators of the AD and TRR facilities.

**Background to the Proposal:**

The site is located circa 1km to the west of Little Houghton and 6.5km to the east of Barnsley town centre. Access to the site is from a spur off a roundabout (known as Houghton Main Colliery Roundabout) on the A6195 Park Spring Road. The existing roundabout provides a good standard of access to the site and the ASOS facility opposite.

Park Spring Road is a single carriageway road, which is subject to the national speed limit (60mph). Park Spring Road is also an existing bus corridor that provides a reasonable service provision of circa two buses per hour in each direction during the day. Existing bus services provide good coverage of local areas, including Barnsley, Grimethorpe and Pontefract. Footways link the site to the existing bus stops.

The site relates well to the strategic highway network, with the both the A1(M) and M1 approximately 9km away to the east and west, respectively. Access to the motorway

network and surrounding areas can be gained using the A6195 and other A class highway routes linking to it. Similarly, a good class of road (A635) provides an existing connection to Barnsley town centre.

Historically the site was used as Houghton Colliery and the site currently benefits from a live permission for the development of 19 industrial units with 208 parking spaces (ref: 2008/1426). This permission was renewed in 2012 and is still a live consent.

Extant site traffic flows have been forecast in line with the 2013 'TRICS Good Practice Guide'. The trip forecast (output attached to this letter) uses TRICS land use 02 – employment/d (industrial estate). Guidance states that this is the land use to be used for industrial sites with more than one building/operator. The extant forecast removes sites in London and Ireland, and only includes industrial estates that sit in edge of town/suburban areas. The vehicle traffic flows permitted by the current site consent are summarized in table 1.

	ALL VEHICLES			OGV		
	IN	OUT	TOTAL	IN	OUT	TOTAL
AM	55	25	80	1	3	4
PM	13	47	60	1	0	1
DAILY	378	389	768	26	26	53

**Table 1:** Extant Site Use Traffic Flows

### **Trip Forecast:**

The trip forecast for new AD and TRR facility proposal is based on HV deliveries/export numbers, vehicle payloads and staff numbers provided by the future operators of the site. The operators, who run similar facilities throughout the UK, have advised that the forecast is very realistic and replicates their experience elsewhere. I have outlined below the method used.

#### *Anaerobic Digestion (AD) Facility:*

The AD facility will have the capability to deal with 60,000tpa of waste per year. Export is split into digestate and general residue. The operator has confirmed that the facility will generate 51,000tpa digestate export and 3,000tpa general residue export.

The facility will operate 24 hours a day, 365 days per year. However, deliveries will be restricted to 5.5 working days per week. Import will occur on 10t payload vehicles, digestate export will occur on 15t payload vehicles and general residue export on 10t payload vehicles.

Table 2 shows the resulting annual and daily HV loads, and resulting daily HV movements generated by the facility.

AD	TPA	Average Payload (t)	Annual HV	Working Days	Daily Load	Daily Trips
Deliveries	<b>60,000</b>	10	6000	275	22	44
Digestive Export	51,000	15	3400	275	12	25
General Residue	3,000	10	300	275	1	2
					<b>35</b>	<b>71</b>

**Table 2:** AD Heavy Good Annual/Daily Forecast

The HV movements will occur throughout the day. As before, and to allow an assessment of hourly HV arrivals and departures, we have used a typical land fill site traffic profile from TRICS.

	AD Heavy Vehicle Traffic		
	IN	OUT	TOTAL
AM	4	3	7
PM	0	2	2
Daily	35	35	71

**Table 3:** AD Heavy Good Peak Hour Forecast

The AD facility will employ 10 members of staff. The operator has advised that a maximum of five staff will be on site at any one time and that the facility will operate one 12 hour shift per day between 7am and 7pm. Consequently none of the staff will arrive for work or depart work in the network peak period.

To calculate how many car trips the staff will generate I have applied ONS 2011 Census journey to work mode share data for Barnsley (71% car).

The total traffic associated with the AD facility is shown in table 4.

	AD HV Traffic			AD Staff Car Traffic			Total AD Traffic		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
AM	4	3	7	0	0	0	4	3	7
PM	0	2	2	0	0	0	0	2	2
Daily	35	35	71	4	4	7	39	39	78

**Table 4:** Total AD Traffic

*Timber Resource Recovery Centre (TRRC):*

The TRRC facility will have the capability to deal with 150,000tpa of waste per year. Export is split into digestate and general residue. The operator has confirmed that the facility will generate 11,133tpa ash export and 4,500tpa fly ash export.

The facility will operate 24 hours a day, 365 days per year. However, deliveries will be restricted to 5.5 working days per week. Import will occur on 20t payload vehicles, ash export will occur on 25t payload vehicles and fly ash export on 20t payload vehicles.

Table 5 shows the resulting annual and daily HV loads, and resulting daily HV movements generated by the facility.

TRRC	TPA	Average Payload (t)	Annual HV	Working Days	Daily Load	Daily Trips
Deliveries	<b>150000</b>	20	7500	275	27	55
Ash Export	11133	25	445	275	2	3
Fly Ash Export	4500	20	225	275	1	2
					<b>30</b>	<b>59</b>

**Table 5:** TRRC Heavy Good Annual/Daily Forecast

The HV movements will occur throughout the day. As before, and to allow an assessment of hourly HV arrivals and departures, we have used a typical land fill site traffic profile from TRICS.

	TRRC Heavy Vehicle Traffic		
	IN	OUT	TOTAL
AM	3	3	6
PM	0	1	2
Daily	30	30	59

**Table 6:** TRRC Heavy Good Peak Hour Forecast

The TRRC facility will employ 25 members of staff. The operator has advised that a maximum of 4 shift staff will be on site at any one time and that the facility will operate a 12-hour shift per day, starting at 7am and finishing at 7pm. The operator has also advised that the managers will also be on site and will work between 8am and 5pm. For the purposes of the forecast I have assumed that 4 managers will be on site each day during this period.

To calculate how many car trips the staff will generate I have again applied ONS 2011 Census journey to work mode share data for Barnsley (71% car).

The total traffic associated with the AD facility is shown in table 7.

	TRRC HV Traffic			TRRC Shift Staff Car Traffic			TRRC Management Staff Car Traffic			Total TRRC Traffic		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
AM	3	3	6	0	0	0	3	0	3	6	3	9
PM	0	1	2	0	0	0	0	3	3	0	4	5
Daily	30	30	59	3	3	6	3	3	6	35	35	71

**Table 7:** Total TRRC Traffic

*Total Site Traffic:*

Table 8 shows total forecast traffic generation.

	Total HV Traffic			Total Staff Car Traffic			Total Traffic		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
AM	7	6	13	3	0	3	10	6	15
PM	1	3	4	0	3	3	1	6	7
Daily	65	65	130	9	9	18	74	74	148

**Table 8:** Total Development Site Traffic

*Site Traffic Impact:*

The proposed development traffic generation is compared below to the traffic generation associated with the existing site permission.

	Total Daily Traffic (LV+HV)	Total Daily HV
Extant	768	53
AD	78	71
TRRC	71	59
<i>Total Proposed</i>	<i>148</i>	<i>130</i>

**Table 9:** Comparison with Consented

As can be seen, the proposed use will generate significant less total traffic than the uses currently consented for the site. HV movements are higher with the current proposals, but spread over the day and distributed across the wider network, this is unlikely to be perceptible. Measures can be put in place to manage HV access, as discussed with you at the meeting.

*Forecast Distribution:*

The operators have confirmed that the routing of trips will follow general population/settlement distributions. Therefore we have used existing turning movements at the site access roundabout and link flows on the wider network to distribute the HV and staff traffic.

Table 10 shows the distribution of traffic from the site. In the peak hours there will be minimal change in traffic flows at junctions/links away from the development site. Furthermore, the change in traffic resulting from the new proposals is significantly less than the traffic levels associated with the current consent for the site, as shown in table 9.

Route Name	2017 AADT	Distribution	Total Traffic (LV + HV)			HV Total Traffic		
			AM	PM	Daily	AM	PM	Daily
A6195 N Park Spring Road	9349	49%	8	3	73	6	2	64
A6195 S Park Spring Road	9583	51%	8	3	75	6	2	66
A635 W Doncaster Road	17077	16%	2	1	24	2	1	21
A635 E Doncaster Road	13204	12%	2	1	18	2	0	16
A6195 S	23515	22%	3	1	33	3	1	29

**Table 10:** Distribution

**Study Area Requirements:**

Although it is shown above the development will not generate significant volumes of traffic in the peak periods and also that the forecast development traffic is below that currently permitted for the site, I still propose the submission of a full Transport Assessment with the application. This is to ensure that the impact of the proposal is fully appraised from a traffic, safety and accessibility perspective, and also to fit with the requests made by you at our meeting.

In terms of study area, bearing in mind the low volume of hourly traffic forecast (particularly when compared to the extant permission for the site) I would normally suggest that the

study be restricted to the site access and the Park Spring Road links. However, in the meeting last month you outlined the highway authority's concerns regarding the existing operating conditions of the Broomhill and Cathill roundabouts to the south of the site and I agreed that we would examine the impact of the proposals at these locations in the Transport Assessment study area. Our client also indicated at the meeting willingness to commit to a restriction on site HV movements during critical AM and PM peak hours.

Given this I have set the TA study area as follows:

- Site Access/Park Spring Road
- Broomhill Roundabout
- Cathill Roundabouts

We have already undertaken surveys at the site access roundabout and ATC volume/speed surveys of Park Spring Road (north and south). We also have obtained recent daily link flow data for a significant number of roads in the highway network from DfT. This data has been used to assist with forecasting the distribution and setting the study area.

At the meeting you said that we would be able to purchase traffic flow data for Broomhill and Cathill from BMBC. Could you provide me with contact details so that we can purchase this data and include impact assessments at these two junctions in our Transport Assessment?

### **Transport Assessment Scope:**

In line with current DfT guidance the TA will include the following elements:

#### 1) Existing Situation

- Site location
- Surrounding highway network (including character and classification)
- Existing access arrangements
- Extant/historic site uses
- Existing peak hour study area traffic flows
- Park Spring Road speed survey
- Extant site traffic flows
- Road accident history

#### 2) Policy Context

- National/regional policy review
- Local policy review

#### 3) Development Proposals

- Proposed scale & land use
- Proposed layout
- Proposed staff numbers
- Proposed parking provision
- Proposed servicing & HV access strategy (with swept paths)
- Proposed staff sustainable access strategy (with travel plan type measures)

#### 4) Accessibility by Non-car Modes

- Accessibility on foot
- Accessibility by cycle
- Accessibility by public transport

- Access to local amenities & services
- Accessibility impact analysis

#### 5) Traffic Forecast

- Forecast of opening and future year base study area peak hour flows
- Forecast of development traffic (LV & HV)
- Forecast impact of sustainable access strategy measures on staff car use
- Forecast residual traffic flows (LV & HV)
- Forecast development trip distribution (LV & HV)
- Forecast opening year/future year base and development study area peak hour flows
- Summary of daily flows to be used in the ES Chapter

#### 6) Impact & Mitigation

- Comparison of new & extant site traffic flows
- Network impact analysis
- Modelling analysis of study area junctions
- Identification of mitigation measures, if required

#### **Framework Travel Plan:**

The proposed staff numbers at the site is not of the scale that would typically warrant the submission of a Travel Plan with the development. However, I suggest that a brief document is included in the TA to outline measures that could be used at the site to influence travel behavior, these measures would obviously need to be mindful of operating requirements, etc.

The Framework Travel Plan will be included as an appendix to the Transport Assessment. The measures proposed would be taken from latest government and local authority guidance and best practice.

I trust my proposed scope meets your requirements and look forward to discussing this with you further next week. If you could ring me as soon as possible with contact details for Cathill and Broomhill roundabout traffic flows I would greatly appreciate it.

Yours sincerely,

JOHN THOMPSON

## **APPENDIX B**

TRANSPORT ASSESSMENT APPENDIX B  
HOUGHTON MAIN  
RENEWABLE ENERGY CENTRE  
FRAMEWORK TRAVEL PLAN

## DOCUMENT CONTROL

<b>Project Title:</b>	Houghton Main Renewable Energy Centre		
<b>Client:</b>	Peel Environmental Management (UK) Limited		
<b>Project Manager:</b>	John Thompson		
<b>Project Number:</b>	SK21341TRR		
<b>Document Reference:</b>	SK21341TRR_FTP02		
<b>Document Type:</b>	Framework Travel Plan		
<b>Reviewed by:</b>	Lesli Speers		
<b>Authorised by:</b>	John Thompson		
<b>Directory &amp; File Name:</b>	P:\2013 PROJECT FOLDERS\SK21341\Technical\Reports\SK21341TRR_FTP02		
<b>Issue</b>	<b>Date</b>	<b>Distribution</b>	<b>Comments</b>
01	23.01.15	Project Team	-
02	02.02.15	Project Team	Updated shift patterns

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## 1 CONTEXT

### **Introduction & Background to the Proposal**

- 1.1 SK Transport Planning Ltd (SKTP) has been appointed by Peel Environmental Management (UK) Limited a framework travel plan in support of a planning application for the development of a Renewable Energy Centre at the Houghton Main site in Barnsley.
- 1.2 The proposal site benefits from a live planning consent for employment use, the approved scheme comprises 19 industrial units with a total GFA of 10,607m<sup>2</sup> and 208 car parking spaces.
- 1.3 A Transport Assessment (TA) has been produced for the site, in line with local and national guidance. The scope of the TA was discussed with Barnsley Metropolitan Borough Council (BMBC) at a meeting in January 2014 and a full scope submitted in March 2014 for a larger scheme than currently proposed and thus the adopted method allows a robust assessment.
- 1.4 The proposed Renewable Energy Centre comprises a 150,000tpa Timber Resource Recovery Centre, which will treat up to 150,000tpa of waste wood and virgin timber through a gasification process and will export over 20MW of renewable electrical power.
- 1.5 In line with the permitted use of the site, vehicle access will be taken from the existing spur on the Houghton Main Colliery Roundabout.
- 1.6 The energy centre will employ a total of 25 members of staff. The operator has advised that a maximum of 4 shift staff will be on site at any one time and that the facility will operate two 12-hour shifts per day (7am – 7pm and 7pm – 7am). Managerial staff will work between 8am and 5pm, the traffic forecast for the assessment is based on 4 managerial staff on site during this period.
- 1.7 The framework measures proposed acknowledges the low number of staff employed and also the low forecast traffic levels.
- 1.8 The TA shows that the site is well served by public transport routes that provide good coverage of residential areas. Existing public transport routes also provide services that sit well with future shift patterns on the site.
- 1.9 The type of development proposed, whilst not generating substantial volumes of traffic, will include heavy vehicle (HV) traffic required for the transport of materials to the site, and to a lesser extent exports from the site. The operator has some control over these movements and has agreed to institute management strategies to minimise the impact of HV movements on residential amenity and highway operation during critical periods.
- 1.10 The assessment concludes that the renewable energy centre will generate a low number of vehicle movements, substantially below the level that would be generated by the consented industrial scheme, and that the proposed scheme will have a minimal effect on highway operation and safety.
- 1.11 Full details of the impact of the proposal are available in SKTP Transport Assessment report (SK21341TRR\_TA02) submitted with the application.
- 1.12 This framework outlines site management and policy measures that build upon existing the accessibility level of the site and will assist in reducing single occupancy car use to the site.

### **The Travel Plan Process**

- 1.13 A travel plan is a tool for managing access to a site that aims to promote access by sustainable modes. A travel plan contains a package of measures designed to meet

the objective to reduce car use generated from the site by supporting sustainable modes of transport and measures that will build on the accessible location of the site. Travel plans are site specific and the contents of the plan is dependent upon site location, site scale and site operation.

- 1.14 A successful travel plan involves a dynamic process of implementation, monitoring indicators and review to ensure that it is meeting the needs of staff of the site and reducing unnecessary single occupancy car use. The first stage in the travel plan process is often a framework, or interim, plan that outlines the philosophy that will be adopted upon occupation of a development.
- 1.15 This submitted framework outlines the accessibility of the site, infrastructure measures proposed as part of the development, and management and policy measures for adoption upon occupation of the site. The measures proposed acknowledge the opportunities that already exist for staff to access the site by public transport, and also the operational characteristics of the site. The measures outlined in the framework have been drawn from UK and local area best practice.
- 1.16 The travel plan also includes a HV management strategy to assist in reducing the impact on residential amenity and critical network periods.

### **Policy Overview**

- 1.17 The framework measures have been developed in line with local and national green travel planning advice and best practice, including:
  - 'National Planning Policy Framework'
  - 'Planning Practice Guidance'
  - Department for Transport 'Planning Policy Guidance Note 13: Transport'
  - The Department for Transport, Local Government & the Regions 'Walk In to Walk Out'
  - The Department for Environment, Transport & the Regions 'Preparing your Organisation for Transport in the Future: The Benefits of Green Transport Plans'
  - The Energy Efficiency Best Practice Programme 'A Travel Plan Resource Pack for Employers'
  - Department for Transport 'Making Travel Plans Work'
  - Department for Transport 'Essential Guide to Travel Planning'
  - Department for Transport 'Effects of Smarter Choice Programme in Sustainable Travel Towns'
  - Department for Transport 'Smarter Choices – Changing the Way we Travel'
  - Transport for Quality of Life 'Tools for Travel Planning in Urban Areas'
  - Highways Agency, TRAVELWISE et al 'Soft Measures – Hard Facts'
- 1.18 In line with local and national guidance, the measures proposed include *soft* measures (such as promotion and marketing and site activity management) and *hard* measures (such as cycle parking provision and dedicated car sharer parking).

### **Benefits & Objectives**

- 1.19 The adoption of a travel plan can result in the following benefits for future staff, and the wider community:
  - Promoting of active and healthy lifestyles
  - Providing sustainable and vibrant communities
  - Reducing road safety and congestion issues
  - Reducing carbon emissions and improving local air quality issues
  - Reducing single occupancy car trips
  - Reducing the impact of HV traffic

- 1.20 The principal aim of a travel plan is to reduce the environmental effects of transport associated with new developments, particularly those associated with the private car such as air quality and vehicle emissions. There are also secondary benefits to the introduction of travel plans, which include improvements to quality of life, reduction in congestion, improvements to health, travel cost savings and improvements to road safety.
- 1.21 Initial key aims of the framework travel plan are set as follows:
- To provide clear guidance on the methods to be used to assess the impact of the travel plan
  - To develop a toolkit of strategy measures to complement the site operation and location
  - To outline the strategy for monitoring and reviewing the plan
- 1.22 This framework includes an initial package of measures to be taken forward by the travel plan co-ordinator upon occupation of the development. The key objectives of framework have been initially set as:
- Reducing single occupancy car use
  - Promoting access by public transport
  - Promoting suitable HV routes and delivery/export times

## **2 SITE LOCATION & ACCESSIBILITY**

### **Site Location**

- 2.1 The site is located on the south side of the A6195 Park Spring Road just over 1km west of the settlements of Little Houghton and Great Houghton, some 6.5km east of the centre of Barnsley and 1.5km north of Darfield.
- 2.2 Vehicle access to the site is available via an existing roundabout on Park Spring Road, known as Houghton Main Colliery Roundabout. The junction also provides access to the ASOS Fulfilment Centre on the northern side of Park Spring Road.
- 2.3 The site forms part of the Houghton Main Colliery site (disused) and benefits from a live planning consent for the development of 19 industrial units with 208 parking spaces (application ref. 2008/1426). The planning consent, originally granted in 2008, was renewed in 2012 and is still live.

### **Access by Vehicle**

- 2.4 The A6195 Park Spring Road is a single carriageway road subject to national speed limit. The road is of relatively recent construction and is of a high standard. The route is a bus corridor with typical service provision of two buses per hour in each direction during the day. Bus stops with good standard shelters are located on Park Spring Road adjacent to the site, footway connections to these are provided from the Houghton Main Colliery Roundabout.
- 2.5 The site relates well to the strategic highway network, with both the A1(M) and M1 approximately 9km to the east and west of the site, respectively. Access to strategic routes and the local area can be gained via the A6195 and other A class routes including the A635 which routes east-west between the M1 and A1(M) via Barnsley town centre, and meets the A6195 at the Cathill Roundabout some 2.5km south-east of the site.

- 2.6 The TA shows that the proposal will generate considerably less total traffic than that already permitted for the site, and also that the new proposal will have an insignificant impact when compared to baseline traffic conditions. Despite this the Cathill Roundabout and Broomhill Roundabout have been included in the study area for the TA and impact at these locations is considered, to accord with a request from BMBC.
- 2.7 The Cathill Roundabout connects the A6195 with the A635, the Broomhill Roundabout is the next junction to the south on the A6195, 2km south of the Cathill Roundabout, and provides access to Broomhill via Highgate and areas of Brampton and Wath Upon Dearne via Manvers Way.
- 2.8 The opportunities for walking, cycling and public transport for access to the site have been considered. Use of these modes offers the opportunity to reduce the amount of traffic generated by the proposal thereby minimising the negative effects of traffic associated with the scheme.

#### **Access on Foot**

- 2.9 Walking offers a realistic alternative to car trips of up to 2km. The settlements of Little Houghton, Great Houghton & Middlecliffe lie within the accepted maximum walking distance of 2km for commuting trips and footpath connections exist between Middlecliffe Lane and the A6195, just north of the proposal site, and to Great Houghton via Chapel Lane.
- 2.10 The northern part of Darfield is also within 2km of the site and footpath connections are again present between Darfield and the A6195 via Ings Lane, to the south of the proposal site.
- 2.11 Given the limited population within an acceptable walking distance of the site it is considered that walking is unlikely to make a significant contribution to travel to the site, but routes are available from the nearest settlement areas.

#### **Access by Cycle**

- 2.12 Cycling offers a realistic alternative to car trips up to 5km. The area from which employees could reasonably be expected to cycle extends to the residential areas of Darfield, Cudworth and Grimethorpe and includes areas of Goldthorpe, Thurnscoe and the eastern fringe of Barnsley,
- 2.13 The section of Park Spring Road between the site access junction and Ings Lane is designated as part of the local cycle network with a cycle connection available to Middlecliff Lane. To the north of the site further off-road cycle connections are available from the A6195 to Great Houghton and Cudworth.
- 2.14 National cycle network routes 62 and 67 run to the west and south of the site.

#### **Access by Bus**

- 2.15 Bus stops are available on both sides of Park Spring Road adjacent to the site. These are of a good standard with shelters, timetable information and footway connections.
- 2.16 A number of bus services currently use the stops adjacent to the site. These are summarised in **table 2.1**.

Stop	Service No.	Route	First Bus	Last Bus	Frequency
Both	26/X26	Barnsley – Cudworth – Grimethorpe – Great Houghton – Middlecliff – Darfield – Wombwell – Brampton	05.52	23.14	Hourly in each direction
Both	28/28A	Barnsley – Shafton – Grimethorpe – Park Spring Road	05.36	23.18	Hourly
Southbound	29/29A	Barnsley – Shafton – Park Spring Road – Grimethorpe – Hemsworth – South Elmsall – Upton	14.25	23.18	Limited service
Northbound	30A	Barnsley – Cudworth – Grimethorpe – Brierley	-	-	One service to each terminus 22.40 to Barnsley & 23.26 to Brierley
Both	216	Wombwell – Wath upon Dearne – Goldthorpe – Thurnscoe – Little Houghton – Grimethorpe	06.38	23.15	3 per day in each direction
Both	X27	Barnsley – Cudworth – Shafton – Grimethorpe – Goldthorpe	06.15	17.22	Hourly in each direction

**Table 2.1:** Existing Bus Services

*[source: Travel South Yorkshire new service timetables as of 24.01.15]*

- 2.17 The existing bus services offer a good level of coverage and timings for access to the site by bus. Services are available between the site and the major local centres of population. The timings of the services will cover the proposed shift patterns at each facility and regular services are available during the day.
- 2.18 The number and frequency of existing bus services currently available offer a realistic option for travel to the site.

### **3 PROPOSAL**

#### **Permitted Development Description**

- 3.1 The site benefits from planning consent for the development of 19 industrial units totalling 10,607m<sup>2</sup> GFA and 208 car parking spaces (application ref 2008/1426). The planning permission was renewed in 2012 and remains a live consent that could be brought forward.
- 3.2 The permission for the industrial use does not include a requirement to manage HV access times.

#### **Proposal**

- 3.3 The proposed renewable energy centre comprises a 150,000tpa Timber Resource Recovery Centre (TRRC), which will treat up to 150,000tpa of waste wood and virgin timber through a gasification process and will export over 20MW of renewable electrical power.

- 3.4 In line with the permitted site use vehicle access will be taken from the existing spur on the Houghton Main Colliery Roundabout.
- 3.5 Parking will be provided on site at a level required to meet the operational needs of the facility only 10 spaces are proposed, including two disabled spaces.

**Heavy Vehicle Routes**

- 3.6 The site is well located for access by large vehicles, with immediate highway access routes of good standard and construction. The site already benefits from a live consent for industrial uses, with associated HV movements, and adjacent land uses are similar in nature.
- 3.7 BMBC has expressed concern at the operation of two junctions to the south of the proposal, Broomhill and Cathill Roundabouts, in the peak periods. The development includes measures to reduce impact at these locations during critical periods, including restricting site HV delivery/export so that it doesn't coincide with stress periods. The TA also shows that the level of HV movements will not be significant.
- 3.8 As shown on **figures 3.1, 3.2 and 3.3** a number of locations within the vicinity of the site benefit from height, width and weight restrictions to reduce the impact of heavy vehicles on local amenity. The operator is committed to promoting access to the site by the most appropriate HV routes to minimise impact on sensitive residential locations.



**Figure 3.1: Existing Width Restrictions**  
[source: ukhaulier.co.uk]



**Figure 3.2:** Existing Weight Restrictions  
[source: ukhaulier.co.uk]



**Figure 3.3:** Existing Height Restrictions  
[source: ukhaulier.co.uk]

### Operation

- 3.9 The facility will have the capability to deal with 150,000tpa of waste (import material). The facility will generate export material as ash (up to 11,133tpa) and fly ash (up to 4,500tpa). The facility will operate continuously throughout the year.
- 3.10 The vehicle fleet for the facility will be made up of 20t payload vehicles for import, 25t payload vehicles for ash export and 20t payload vehicles for fly ash export.
- 3.11 The resulting annual and daily HV loads and resulting daily HV movements for the TRRC as advised by the future operator are summarised in **table 3.1**.

TRRC	TPA	Average Payload (t)	Annual HV	Working Days	Daily Load	Daily Trips
Deliveries	150000	20	7500	275	27	55
Ash Export	11133	25	445	275	2	3
Fly Ash Export	4500	20	225	275	1	2
					30	59

**Table 3.1:** Daily Heavy Vehicle Movements Summary

3.12 The HV movements will occur throughout the day. The daily profile for a typical landfill facility has again been used as the basis for calculation of delivery movements to the facility. The resulting movements are summarised in **table 3.2**.

	Heavy Vehicle Traffic		
	IN	OUT	TOTAL
AM Peak Hour	3	3	6
PM Peak Hour	0	1	2
Daily	30	30	59

**Table 3.2:** Heavy Vehicles Peak Hour Forecast

### Staff

3.13 The facility will employ a total of 25 members of staff. The operator has advised that a maximum of 4 shift staff will be on site at any one time and that the facility will operate two 12-hour shifts per day (7am – 7pm and 7pm – 7am). Managerial staff will work between 8am and 5pm, the traffic forecast for the assessment is based on 4 managerial staff on site during this period.

3.14 Typical mode shares for travel to work in the area are again used to complete the analysis of traffic movements associated with the facility. These are shown in **table 3.3**.

	HV Traffic			Shift Staff Car Traffic			Management Staff Car Traffic			Total Traffic		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
AM Peak Hour	3	3	6	0	0	0	3	0	3	6	3	9
PM Peak Hour	0	1	2	0	0	0	0	3	3	0	4	5
Daily	30	30	59	6	6	11	3	3	6	38	38	76

**Table 3.3:** Proposal Traffic Movements  
[not adjusted for rounding errors]

## 4 TRAVEL PLAN MANAGEMENT

### Travel Plan Co-ordinator

- 4.1 An effective travel plan needs a clear hierarchy of responsibility. Travel plan co-ordinators play an important role in developing the plan, managing the plan and monitoring its effectiveness.
- 4.2 Three months prior to the occupation of the site, a travel plan co-ordinator will be identified and contact details given to BMBC to enable the plan to be finalised and agreed shortly after occupation of the site.
- 4.3 The travel plan co-ordinator will be responsible for the day-to-day running of the travel plan and will also develop, implement and monitor the travel plan's effectiveness.
- 4.4 The co-ordinator will form the main point of contact for the local authority and staff. The co-ordinator will also be responsible for raising awareness and marketing the travel plan and surveying its effectiveness.

- 4.5 In summary, the travel plan co-ordinator's general role and responsibilities will include:
- Implementing the plan measures
  - Providing a point of contact for staff and local residents
  - Publicising and raising awareness of the travel plan initiatives
  - Keeping up to date local public transport information on the travel notice board
  - Regularly monitoring and surveying travel patterns
  - Managing parking space allocation
- 4.5 The travel plan co-ordinator will also liaise with the site manager should any issues arise with heavy vehicle routeings.

### **Marketing & Promotion**

- 4.6 Research undertaken by DfT and Sustrans as part of the Cycle Demonstration and Sustainable Towns initiatives demonstrated that marketing and promotion are as important to facilitating active travel as the provision of new transport infrastructure. This has been corroborated by recent research undertaken by HA, TRAVELWISE *et al* in 2011. The research shows that people will more readily make sustainable trips if information on available routes and mode choice is readily available.
- 4.7 The travel plan co-ordinator will be responsible for marketing and promoting the final plan. The following measures are proposed to raise awareness of local public transport routes and initiatives:
1. Provision of welcome packs for all new staff
  2. Provision and maintenance of an up to date travel notice board in prominent locations.
  3. Creation of simple car sharing database

## **5 TRAVEL PLAN TOOLKIT**

- 5.1 The recommendations included in the toolkit acknowledge the operational requirements of the proposal and low number of staff at the facility. The measures have been drawn from best practice, DfT guidance, case studies throughout the UK.
- 5.2 The monitoring and management plan in **section 6** provides commitment to regularly reviewing the adopted marketing and management measures. The framework includes a commitment to undertake a simple staff travel survey upon occupation of the facility to allow car sharing matches to be made and an understanding of staff requirements to be gained. The surveys will allow the toolkit outlined below to be validated and updated, as required.

<b>Cycling Toolkit:</b>		
Measure	Responsibility	Timescale
Provide secure cycle storage spaces in line with local standards	Contractor	Construction
Provide cycle route maps on prominent travel noticeboard	Travel Plan Co-ordinator	On-going
Promote local and national cycling events/initiatives	Travel Plan Co-ordinator	On occupation, on-going
<b>Public Transport Toolkit:</b>		
Measure	Responsibility	Timescale
Provide link to SY journey planning website as part of welcome pack	Travel Plan Co-ordinator	On appointment
Provide local bus route maps and timetables on noticeboard	Travel Plan Co-ordinator	On-going
<b>Efficient Staff Car Use Toolkit:</b>		
Measure	Responsibility	Timescale
Car parking levels in line with BMBC maximum standards	Contractor	Construction
Set up simple staff car sharing database	Travel Plan Co-ordinator	Within 6 months
Provide local taxi company numbers on noticeboard	Travel Plan Co-ordinator	On occupation
Promote www.taxibudi.com a scheme offered by Liftshare to reduce travel costs	Travel Plan Co-ordinator	On occupation
Provide priority car sharer parking spaces	Contractor	Construction
<b>Efficient Heavy Vehicle Use Toolkit:</b>		
Measure	Responsibility	Timescale
Restrict heavy vehicle delivery and export times to periods outside 8am-9am and 5pm-6pm	Operator	On occupation
Restrict heavy vehicle routes to strategic network or most appropriate roads, in line with existing highway restrictions	Operator	On occupation

**Table 5.1:** Toolkit & Implementation

## 6 PERFORMANCE MONITORING

### Monitoring, Review & Timescales

- 6.1 The travel plan will be monitored on a regular basis to using staff surveys to ensure that single occupancy car use is reduced and the heavy vehicle strategy is adhered to.
- 6.2 A questionnaire survey will be used and will aim to collect the following information:
  - Actual travel mode
  - Preferred travel mode
  - Home location
- 6.3 The first surveys will be undertaken six months after occupation of the facility.
- 6.4 Following the initial surveys, monitoring will be repeated on an annual basis for a period of three years, in line with DfT guidance.

### Targets

- 6.5 The overarching targets of the final travel plan will be to reduce single occupancy car trips to the site, and reduce impact of heavy vehicles on local amenity and the peak period highway network.
- 6.6 DfT also recommends that action based targets should be set for new developments, based on specific milestones or indicators. The following interim action based targets have been set for the framework and will be agreed with BMBC upon finalisation of the plan.
  - Appointment of travel plan co-ordinator three months prior to occupation

- Appointment of travel plan co-ordinator
- Provision of timetables and sustainable transport maps on a prominent noticeboard

## **APPENDIX C**

**2014 Surveyed Houghton Main Roundabout Flows (in pcu)**

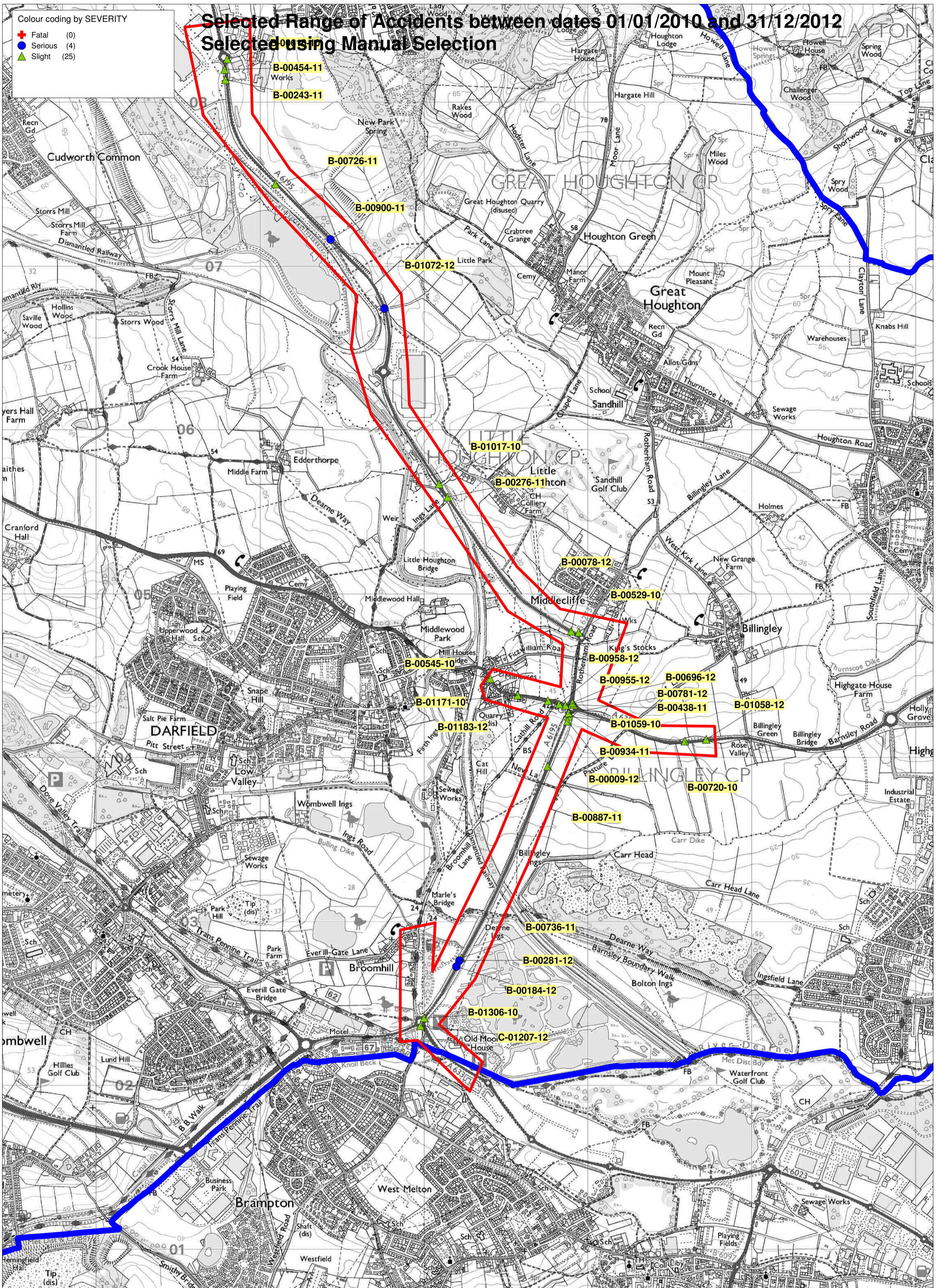
	AM Peak: 7.30am- 8.30am				PM Peak: 4.15pm-5.15pm			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	26	398	0	0	12	503	0
ASOS	12	0	14	0	26	0	39	0
A6195 S	471	35	0	0	543	10	0	0
Access	0	0	0	0	0	0	0	0

**2014 Surveyed Flows (in pcu): Cathill Roundabout**

	AM Peak: 7.30am- 8.30am				PM Peak: 4.45pm-5.45pm			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	132	437	46	0	172	523	116
A635 E	214	0	523	510	192	0	561	661
A6195 S	510	521	0	103	580	323	0	173
A635 W	59	540	219	0	60	476	140	0

**2014 Surveyed Flows (in pcu): Broomhill Roundabout**

	AM Peak: 7.30am- 8.30am				PM Peak: 4.45pm-5.45pm			
	A6195 N	Manvers Way	A6195 S	Highgate	A6195 N	Manvers Way	A6195 S	Highgate
A6195 N	0	576	552	0	0	532	653	20
Manvers Way	501	0	417	8	498	0	469	58
A6195 S	640	493	0	7	613	506	0	17
Highgate	13	19	12	0	0	1	0	0



**Selected Range of Accidents between dates 01/01/2010 and 31/12/2012**  
**Selected using Manual Selection**

Colour coding by SEVERITY

- Fatal (0)
- Serious (4)
- ▲ Slight (25)

Selected map area

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SCALE	1 : 16500
DATE	03/04/2014
DRWG No.	
DRN BY	

**MAKING SOUTH YORKSHIRE  
ROADS SAFER**

accidents between dates 01/01/2010 and 31/12/2012 (36) months

election:

ected using Build Query : Local\_auth = 'BARNESLEY'

Notes:

SK Transport Ltd

Police Ref.	Date	Cas.	Sev.	P2W	Cycs	Peds	Ch	OAPs	Vis.	Manv.	Road Cond.	Time	Location
-00529-10	17/05/2010	1	Slight	0	1	0	0	0	Light	No turn	Dry	0634	PARK SPRINGS RD MIDDLECLIFFE AT J/W ROTHERHAM RD RDBT
-00545-10	24/05/2010	1	Slight	0	0	1	0	0	Light	No turn	Dry	1242	DONCASTER RD DARFIELD
-00616-10	09/06/2010	1	Slight	0	0	0	0	1	Light	No turn	Dry	0640	PARKSPRINGS RD GRIMETHORPE J/W SPRINGVALE RD
-00720-10	03/07/2010	2	Slight	0	0	0	1	0	Light	No turn	Dry	1045	A635 GOLDTHORPE
-01017-10	29/09/2010	3	Slight	0	0	0	1	0	Light	No turn	Wet/Damp	0900	PARK SPRING RD BARNESLEY
-01059-10	06/10/2010	1	Slight	0	0	0	0	0	Light	No turn	Wet/Damp	0802	DEARNE VALLEY PARKWAY DARFIELD 30 MTS FROM CATHILL R/AB
-01171-10	06/11/2010	3	Slight	0	0	0	0	0	Dark	No turn	Dry	1728	DONCASTER RD DARFIELD
-01306-10	06/12/2010	2	Slight	0	0	0	0	0	Light	No turn	Snow	1415	BROOMHILL RDBT BRAMPTON AT J/W DEARNE VALLEY PARKWAY
-00243-11	15/03/2011	1	Slight	0	0	0	0	0	Dark	No turn	Wet/Damp	0426	PARK SPRING RD GRIMETHORPE
-00276-11	20/03/2011	1	Slight	0	1	0	0	0	Light	No turn	Dry	1230	PARK SPRING RD LITTLE HOUGHTON
-00438-11	24/04/2011	1	Slight	0	0	0	0	0	Dark	No turn	Dry	2200	DONCASTER RD DARFIELD J/W CATHILL R/ABOUT
-00454-11	11/05/2011	1	Slight	1	0	0	0	0	Dark	No turn	Dry	2320	PARK SPRING RD GRIMETHORPE
-00726-11	31/07/2011	1	Slight	0	0	0	0	0	Light	No turn	Dry	1025	PARK SPRING RD GRIMETHORPE
-00736-11	04/08/2011	5	Slight	0	0	0	0	0	Light	No turn	Wet/Damp	1109	DEARNE VALLEY PARKWAY BROOMHILL 500 MTS FROM MANVERS
-00887-11	17/09/2011	1	Slight	0	0	0	0	0	Light	No turn	Dry	1330	DEARNE VALLEY PARKWAY DARFIELD 300 MTS FROM DONCASTER
-00900-11	23/09/2011	1	Serious	0	0	0	0	0	Light	No turn	Dry	0700	PARK SPRING ROAD GRIMETHORPE BARNESLEY 750M N HOUGHTON
-00934-11	28/09/2011	5	Slight	0	0	0	0	0	Light	No turn	Dry	1425	DEARNE VALLEY PARKWAY DARFIELD
-00009-12	01/01/2012	2	Slight	0	0	0	1	0	Dark	No turn	Wet/Damp	0230	DEARNE VALLEY PARKWAY BROOMHILL 40 MTS FROM CATHILL R/
-00078-12	26/01/2012	1	Slight	0	0	0	0	0	Light	No turn	Wet/Damp	0937	PARK SPRING RD MIDDLECLIFFE
-00184-12	01/03/2012	1	Serious	1	0	0	0	0	Light	Right	Dry	1725	DEARNE VALLEY PARKWAY BROOMHILL 400 YDS FROM A 633
-00281-12	28/03/2012	1	Serious	1	0	0	0	0	Light	Right	Dry	1320	DEARNE VALLEY PARKWAY BROOMHILL 500 MTS FROM BROOMHILL
-00696-12	31/07/2012	1	Slight	0	0	0	0	0	Light	No turn	Dry	1520	DONCASTER RD BARNESLEY J/W CATHILL R/ABOUT
-00781-12	30/08/2012	1	Slight	1	0	0	0	0	Light	No turn	Dry	1220	DEARNE VALLEY PARKWAY DARFIELD, BARNESLEY J/W BARNESLEY J
00955-12	22/10/2012	1	Slight	1	0	0	0	0	Dark	No turn	Wet/Damp	0720	ROTHERHAM RD BARNESLEY J/W CATHILL R/ABOUT
00958-12	22/10/2012	2	Slight	0	0	0	0	0	Light	Right	Wet/Damp	1100	DONCASTER RD BARNESLEY
01207-12	09/11/2012	1	Slight	0	0	0	0	0	Light	No turn	Dry	1300	PONTEFRAC RD BRAMPTON ROTHERHAM J/W BARNESLEY RD
01058-12	21/11/2012	3	Slight	0	0	0	0	1	Light	No turn	Wet/Damp	1124	DONCASTER ROAD BARNESLEY 200 METRES BILLINGLY GREEN LANE
01072-12	25/11/2012	1	Serious	0	0	0	0	0	Dark	No turn	Wet/Damp	0658	PARK SPRINGS RD BARNESLEY
01183-12	19/12/2012	1	Slight	0	0	0	0	0	Light	No turn	Wet/Damp	1240	DONCASTER ROAD DARFIELD, BARNESLEY 100 M EAST DEARNE VAL

olumn Totals 47 5 2 1 3 2  
of Accidents 5 2 1 3 2

total number of accidents listed: 29

Accidents between dates 01/01/2010 and 31/12/2012 (36) months

Selection:

Notes:

Selected using Build Query : Local\_auth = 'BARNESLEY'

SK Transport Ltd

Police Ref.      Date      Cas.      Sev.      P2W      Cyps      Peds      Ch      OAPs      Vis.      Manv.      Road Cond.      Time      Location

Accidents between dates 01/01/2010 and 31/12/2012 (36) months

Selection:

Notes:

Selected using Build Query : Local\_auth = 'BARNESLEY'

SK Transport Ltd

Police Ref.	Acc Class	Date	Time	Grid References	Casualties			Causation Factors/Prob	Ped L M D	Light	Weather	Road Surface	Vehicle Types
					Ft	Ser	Slt						
-00529-10	Slight	17/05/2010	0634	442947 404765	0	0	1	405V1A 407V1A 706V1A 802V1A	0 0 0	Light	Fine without high winds	Dry	1 9
-00545-10	Slight	24/05/2010	1242	442406 404481	0	0	1	803C1B	9 9 0	Light	Fine without high winds	Dry	1 1
-00616-10	Slight	09/06/2010	0640	440800 408264	0	0	1	403V1B	0 0 0	Light	Fine without high winds	Dry	9 17
-00720-10	Slight	03/07/2010	1045	443595 404100	0	0	2	405V2B 409V2B 410V2B	0 0 0	Light	Fine without high winds	Dry	9 9
-01017-10	Slight	29/09/2010	0900	442094 405669	0	0	3	408V2B	0 0 0	Light	Raining without high winds	Wet/Damp	9 9
-01059-10	Slight	06/10/2010	0802	442883 404250	0	0	1	405V2A 406V2A	0 0 0	Light	Raining without high winds	Wet/Damp	9 9
-01171-10	Slight	06/11/2010	1728	442574 404380	0	0	3	901V3A	0 0 0	Dark	Fine without high winds	Dry	9 9 9
-01306-10	Slight	06/12/2010	1415	442002 402410	0	0	2	405V2A 406V2A	0 0 0	Light	Other	Snow	19 9
-00243-11	Slight	15/03/2011	0426	440790 408137	0	0	1	109V1A	0 0 0	Dark	Fog or mist	Wet/Damp	9
-00276-11	Slight	20/03/2011	1230	442146 405590	0	0	1	602V1A 405V1A	0 0 0	Light	Fine without high winds	Dry	9 1
-00438-11	Slight	24/04/2011	2200	442916 404322	0	0	1	403V1A 410V1B 601V1B	0 0 0	Dark	Fine without high winds	Dry	9
-00454-11	Slight	11/05/2011	2320	440784 408199	0	0	1	410V1A	0 0 0	Dark	Fine without high winds	Dry	9 2
-00726-11	Slight	31/07/2011	1025	441095 407501	0	0	1	410V2B	0 0 0	Light	Fine without high winds	Dry	9 9
-00736-11	Slight	04/08/2011	1109	442229 402776	0	0	5	405V1A	0 0 0	Light	Fine without high winds	Wet/Damp	9 19
-00887-11	Slight	17/09/2011	1330	442757 403947	0	0	1	307V1A 405V1A	0 0 0	Light	Fine without high winds	Dry	9 9
-00900-11	Serious	23/09/2011	0700	441431 407162	0	1	0	409V2B 410V2B	0 0 0	Light	Fine without high winds	Dry	9 21
-00934-11	Slight	28/09/2011	1425	442885 404274	0	0	5	406V1A	0 0 0	Light	Fine without high winds	Dry	9 9 9
-00009-12	Slight	01/01/2012	0230	442878 404221	0	0	2	509V1A 503V1A	0 0 0	Dark	Fine without high winds	Wet/Damp	9
-00078-12	Slight	26/01/2012	0937	442900 404771	0	0	1	403V2A 307V2B 410V2B 408V2B	0 0 0	Light	Fine without high winds	Wet/Damp	2 1 9
00184-12	Serious	01/03/2012	1725	442199 402724	0	1	0	405V1A	0 0 0	Light	Fine without high winds	Dry	9 5 9
00281-12	Serious	28/03/2012	1320	442218 402761	0	1	0	403V1A 405V1A	0 0 0	Light	Fine without high winds	Dry	5 9
00696-12	Slight	31/07/2012	1520	442865 404318	0	0	1	308V2A 408V1A	0 0 0	Light	Unknown	Dry	9 9
00781-12	Slight	30/08/2012	1220	442885 404271	0	0	1	405V1A 403V1A	0 0 0	Light	Fine without high winds	Dry	5 9
00955-12	Slight	22/10/2012	0720	442908 404334	0	0	1	405V1A	0 0 0	Dark	Raining without high winds	Wet/Damp	5 19
00958-12	Slight	22/10/2012	1100	442827 404326	0	0	2	405V1B 406V1B 306V2B	0 0 0	Light	Raining without high winds	Wet/Damp	9 9
01207-12	Slight	09/11/2012	1300	441980 402362	0	0	1	302V2B 405V2B	0 0 0	Light	Fine without high winds	Dry	9 9
01058-12	Slight	21/11/2012	1124	443725 404110	0	0	3	406V2A	0 0 0	Light	Raining without high winds	Wet/Damp	9 9

Accidents between dates 01/01/2010 and 31/12/2012 (36) months

**Selection:**

Selected using Build Query : Local\_auth = 'BARN斯LEY'  
Notes: SK Transport Ltd

Police Ref.	Acc Class	Date	Time	Grid References	Ftd	Ser	Slt	Causation Factors/Prob	Ped LMD	Light	Weather	Road Surface	Vehicle Types
-01072-12	Serious	25/11/2012	0658	441760 406741	0	1	0	103V1A	0 0 0	Dark	Raining without high winds	Wet/Damp	9 9
-01183-12	Slight	19/12/2012	1240	442758 404347	0	0	1	406V2A	0 0 0	Light	Fine without high winds	Wet/Damp	9 9

Column Totals

0 4 0

Total number of accidents listed: 29

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00529-10 17/05/2010 Monday Time:0634 Vehicles 2 Casualties 1 Slight  
Easting: 442,947 Northing: 404,765  
Fine without high winds Road Surface:Dry Daylight:street lights present  
Road Type: Roundabout Speed Limit: 30

Location: PARK SPRINGS RD MIDDLECLIFFE AT J/W ROTHERHAM RD RDBT  
Description:V1 ENTERED RDBT AND CLIPPED REAR WHEEL OF CYCLIST ALREADY ON RDBT.

Vehicle Reference1 Car Going ahead right hand bend  
First point of impact:Front  
Vehicle direction: N to W Journey: Journey as part of work  
Age of Driver : 41 Breath test:Not applicable

Contributory Factors : 405 407 706 802

Vehicle Reference2 Pedal cycle Going ahead  
First point of impact:Back  
Vehicle direction: W to E Journey: Journey as part of work  
Age of Driver : 35 Breath test:Not applicable

Contributory Factors : 405 407 706 802

Casualty Reference 1 Age:35 Male Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

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## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00545-10 24/05/2010 Monday Time:1242 Vehicles 1 Casualties 1 Slight  
Easting: 442,406 Northing: 404,481  
Fine without high winds Road Surface Dry Daylight:street lights present  
Road Type: Single carriageway Speed Limit: 30

Location: DONCASTER RD DARFIELD

Description: V1 (PCV) TV ALONG DONCASTER RD. V1 BEGINS TO PULL IN TO BUS STOP  
WHEN PED STEPS BACKWARDS INTO PATH OF V1 & COLL OCCURRED.

Vehicle Reference: 1 Bus or coach Slowing or Stopping  
First point of impact: Front  
Vehicle direction: NW to SE Journey: Journey as part of work  
Age of Driver : 43 Breath test: Not applicable

Contributory Factors : 803

Casualty Reference 1 Age: 17 Male Pedestrian Severity: Slight  
Ped Dir: Pedestrian Dir Ped Movement : Movement U/K  
Ped Location: In carr not crossing

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Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00616-10 09/06/2010 Wednesday Time:0640 Vehicles 2 Casualties 1 Slight  
Easting: 440,800 Northing: 408,264  
Fine without high winds Road Surface: Dry Daylight: street lights present  
Road Type: Roundabout Speed Limit: 60

Location: PARKSPRINGS RD GRIMETHORPE J/W SPRINGVALE RD  
Description: V1 LOST CONTROL ON R/ABOUT CAUSING IT TO TIP ONTO OPP C/WAY. V1 THEN  
COLL WITH FRONT OF V2 TV IN OPP DIRC.

Vehicle Reference1 Agricultural vehicle Going ahead  
First point of impact: Front  
Vehicle direction: N to S Journey: Journey as part of work  
Age of Driver : 67 Breath test: Not applicable

Contributory Factors : 403

Casualty Reference 1 Age: 67 Male Driver/rider Severity: Slight  
Ped Dir: Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Going ahead  
First point of impact: Front  
Vehicle direction: S to N Journey: Commuting to/from work  
Age of Driver : 46 Breath test: Not applicable

Contributory Factors : 403

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Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00720-10 03/07/2010 Saturday Time:1045 Vehicles 2 Casualties 2 Slight  
Easting: 443,595 Northing: 404,100  
Fine without high winds Road Surface:Dry Daylight:street lights present  
Road Type: Single carriageway Speed Limit: 60

Location: A635 GOLDTHORPE

Description:V1 TV ALONG A635 IN DIRC OF DARFIELD BEHIND V2. V1 O/T V2 WHEN SAFE TO DO SO BUT AS V1 WAS O/T DRIVER OF V2 SWERVED OUT & COLL WITH PASS SIDE OF V1 CAUSING IT TO SHUNT ACROSS OPP C/WAY & INTO LAYBY.6

Vehicle Reference:1 Car Overtaking moving vehicle on its offside  
First point of impact:Did not impact  
Vehicle direction: E to W Journey: Not known  
Age of Driver : 48 Breath test:Not applicable

Contributory Factors : 405 409 410

Casualty Reference 1 Age:48 Male Driver/rider Severity:Slight

Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 2 Age:11 Male Passenger Severity:Slight

Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Going ahead  
First point of impact:Offside  
Vehicle direction: E to W Journey: Not known  
Age of Driver : 62 Breath test:Not applicable

Contributory Factors : 405 409 410

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Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-01017-10 29/09/2010 Wednesday Time:0900 Vehicles 2 Casualties 3 Slight  
Easting: 442,094 Northing: 405,669  
Raining without high winds Road Surface:Wet/Damp Daylight: no street lighting  
Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING RD BARNSELEY  
Description:V1 SLOWING FOR TF IN FRONT, V2 FAILED TO REACT IN TIME AND COLL WITH REAR OF V1.

Vehicle Reference1 Car Slowing or Stopping  
First point of impact:Back  
Vehicle direction: SW to NE Journey: Taking pupil to/from school  
Age of Driver : 40 Breath test:Not applicable

Contributory Factors : 408

Casualty Reference 1 Age:40 Female Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 3 Age:10 Male Passenger Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Slowing or Stopping  
First point of impact:Front  
Vehicle direction: SW to NE Journey: Journey as part of work  
Age of Driver : 25 Breath test:Not applicable

Contributory Factors : 408

Casualty Reference 2 Age:25 Female Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

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Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-01059-10 06/10/2010 Wednesday Time:0802 Vehicles 2 Casualties 1 Slight  
Easting: 442,883 Northing: 404,250  
Raining without high winds Road Surface:Wet/Damp Daylight: no street lighting  
Road Type: Single carriageway Speed Limit: 60

Location: DEARNE VALLEY PARKWAY DARFIELD 30 MTS FROM CATHILL R/ABOUT  
Description:V1 TV ALONG A6195 FROM W/WELL TW CATHILL.V2 TV SAME DIRC. V1 CAME TO  
HALT IN QUEUING TF.V2 BRAKED BUT WAS UNABLE TO STOP IN TIME & COLL  
WITH REAR OF V1.

Vehicle Reference:1 Car Going ahead  
First point of impact:Back  
Vehicle direction: S to N Journey: Journey as part of work  
Age of Driver : 45 Breath test:Not applicable

Contributory Factors : 405 406 103 307

Casualty Reference 1 Age:45 Female Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Going ahead  
First point of impact:Front  
Vehicle direction: S to N Journey: Journey as part of work  
Age of Driver : 21 Breath test:Not applicable

Contributory Factors : 405 406 103 307

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Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-01171-10 06/11/2010 Saturday Time:1728 Vehicles 3 Casualties 3 Slight  
Easting: 442,574 Northing: 404,380  
Fine without high winds Road Surface:Dry Darkness: street lights present and lit  
Road Type: Single carriageway Speed Limit: 30

Location: DONCASTER RD DARFIELD  
Description:V1 & V2 STATIONARY AT TEMP TF LGTS, V3 FAILED TO REACT IN TIME COLL  
WITH REAR OF V2 PUSHING IT INTO V1,

Vehicle Reference1 Car Waiting to go ahead but held up  
First point of impact:Back  
Vehicle direction: E to W Journey: Not known  
Age of Driver : Breath test:Not applicable

Contributory Factors : 901

Casualty Reference 1 Age: Male Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Waiting to go ahead but held up  
First point of impact:Front  
Vehicle direction: E to W Journey: Not known  
Age of Driver : Breath test:Not applicable

Contributory Factors : 901

Casualty Reference 2 Age:29 Female Passenger Severity:Slight  
Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 3 Age:35 Male Passenger Severity:Slight  
Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

Vehicle Reference3 Car Going ahead  
First point of impact:Front  
Vehicle direction: E to W Journey: Not known  
Age of Driver : Breath test:Not applicable

Contributory Factors : 901

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B-01306-10 06/12/2010 Monday Time:1415 Vehicles 2 Casualties 2 Slight  
Easting: 442,002 Northing: 402,410  
Other Road Surface:Snow Daylight:street lights present  
Road Type: Roundabout Speed Limit: 60

Location: BROOMHILL RDBT BRAMPTON AT J/W DEARNE VALLEY PARKWAY  
Description:V1 STOPPED AT RDBT BUT V2 FAILED TO REACT IN TIME AND COLL WITH REAR OF V1.

Vehicle Reference1 Car Waiting to go ahead but held up  
First point of impact:Back  
Vehicle direction: N to S Journey: Not known  
Age of Driver : 18 Breath test:Not applicable

Contributory Factors : 405 406

Casualty Reference 1 Age:18 Male Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 2 Age:16 Male Passenger Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Van or Goods <= 3.5 tonnes n Going ahead  
First point of impact:Front  
Vehicle direction: N to S Journey: Not known  
Age of Driver : 52 Breath test:Not applicable

Contributory Factors : 405 406

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00243-11 15/03/2011 Tuesday Time:0426 Vehicles 1 Casualties 1 Slight  
Easting: 440,790 Northing: 408,137  
Fog or mist Road Surface:Wet/Damp Darkness: no street lighting  
Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING RD GRIMETHORPE  
Description:V1 TV ALONG PARK SPRING RD SUDDENLY CONFRONTED BY HORSES  
ROAMING FREE ON C/WAY IN PATH OF HIS VEH.V1 SWERVED TO AVOID  
HORSES & LOST CONTROL, VEH ROLLED ONTO ITS O/S & HIT KERB, CAUSING IT  
TO LAND ON IT'S WHEELS ON OPP SIDE OF RD.

Vehicle Reference:1 Car Going ahead  
First point of impact:Offside  
Vehicle direction: S to N Journey: Commuting to/from work  
Age of Driver : 31 Breath test:Negative

Contributory Factors : 109

Casualty Reference 1 Age:31 Male Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00276-11 20/03/2011 Sunday Time:1230 Vehicles 2 Casualties 1 Slight  
Easting: 442,146 Northing: 405,590  
Fine without high winds Road Surface:Dry Daylight: street lighting unknown  
Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING RD LITTLE HOUGHTON  
Description:DRIVER OF V2 STOPPED DUE TO CRAMP, V1 COLL WITH REAR OF V2  
THROWING CYCLIST ONTO ROOF.

Vehicle Reference1 Pedal cycle Going ahead  
First point of impact:Front  
Vehicle direction: N to S Journey: Not known  
Age of Driver : 34 Breath test:Driver not contacted

Contributory Factors : 602 405

Casualty Reference 1 Age:34 Male Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Parked  
First point of impact:Back  
Vehicle direction: Parked to Parked Journey: Not known  
Age of Driver : 46 Breath test:Not requested

Contributory Factors : 602 405

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## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNESLEY' SK Transport Ltd

B-00438-11 24/04/2011 Sunday Time:2200 Vehicles 1 Casualties 1 Slight  
 Easting: 442,916 Northing: 404,322  
 Fine without high winds Road Surface:Dry Darkness: street lights present and lit  
 Road Type: Roundabout Speed Limit: 60

Location: DONCASTER RD DARFIELD J/W CATHILL R/ABOUT  
 Description:V1 TV ALONG A6195 TW CATHILL R/ABOUT. V1 APP R/ABOUT AT SPEED LOST  
 CONTROL & LEFT C/WAY COLL WITH FENCE

Vehicle Reference1 Car Going ahead  
 First point of impact:Front  
 Vehicle direction: N to W Journey: Not known  
 Age of Driver : 28 Breath test:Negative

Contributory Factors : 403 410 601

Casualty Reference 1 Age:17 Female Passenger Severity:Slight  
 Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00454-11 11/05/2011 Wednesday Time:2320 Vehicles 2 Casualties 1 Slight  
Easting: 440,784 Northing: 408,199  
Fine without high winds Road Surface Dry Darkness: no street lighting  
Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING RD GRIMETHORPE  
Description: V2 (M/CYCLE) TV ALONG A6195 TW GRIMETHORPE. V1 TV SAME DIRC. AS V1  
APP V2 DRIVER OF V1 LOST CONTROL DUE TO TYRE BLOW OUT. V1 SWERVED  
INTO ONCOMING LN & ATTEMPTED TO CORRECT SKID BY STEERING TO N/S. AS  
A RESULT V1 COLL WITH V2.

Vehicle Reference1 Car Going ahead  
First point of impact: Offside  
Vehicle direction: SE to NW Journey: Commuting to/from work  
Age of Driver : 26 Breath test: Not requested

Contributory Factors : 410

Vehicle Reference2 Motorcycle 50cc and under Going ahead  
First point of impact: Back  
Vehicle direction: SE to NW Journey: Not known  
Age of Driver : 16 Breath test: Not requested

Contributory Factors : 410

Casualty Reference 1 Age: 16 Male Driver/rider Severity: Slight  
Ped Dir: Pedestrian Direction Ped Movement : Not pedestrian  
Ped Location:

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00726-11 31/07/2011 Sunday Time:1025 Vehicles 2 Casualties 1 Slight  
Easting: 441,095 Northing: 407,501  
Fine without high winds Road SurfaceDry Daylight:street lights present  
Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING RD GRIMETHORPE  
Description:3 VEH'S IN SLOW MOVING TF, V2 PULLED OUT TO OVERTAKE AND AS IT GOT  
ALONG SIDE V3 PULLED OUT CAUSING V2 TO TAKE EVASIVE ACTION LOSING  
CONTROL AND COLL WITH V1 THAT WAS STATIONARY.

Vehicle Reference1 Car Parked  
First point of impact:Back  
Vehicle direction: Parked to Parked Journey: Not known  
Age of Driver : 66 Breath test:Not requested

Contributory Factors : 410

Vehicle Reference2 Car Going ahead  
First point of impact:Offside  
Vehicle direction: SE to NW Journey: Not known  
Age of Driver : 38 Breath test:Not requested

Contributory Factors : 410

Casualty Reference 1 Age:38 Male Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNESLEY' SK Transport Ltd

B-00736-11 04/08/2011 Thursday Time:1109 Vehicles 2 Casualties 5 Slight  
 Easting: 442,229 Northing: 402,776  
 Fine without high winds Road Surface:Wet/Damp Daylight: no street lighting  
 Road Type: Dual carriageway Speed Limit: 60

Location: DEARNE VALLEY PARKWAY BROOMHILL 500 MTS FROM MANVERS WAY  
 Description:V1 ATTEMPTS A U TURN IN CARR AND COLL WITH V2.

Vehicle Reference:1 Car Moving off  
 First point of impact:Front  
 Vehicle direction: NE to NE Journey: Journey as part of work  
 Age of Driver : 51 Breath test:Negative

Contributory Factors : 405

Casualty Reference 1 Age:51 Male Driver/rider Severity:Slight  
 Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

Vehicle Reference2 Van or Goods <= 3.5 tonnes m Going ahead  
First point of impact:Front  
Vehicle direction: SW to NE Journey: Journey as part of work  
Age of Driver : 55 Breath test:Negative

Contributory Factors : 405

Casualty Reference 2 Age:54 Male Passenger Severity:Slight

Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 3 Age:27 Male Passenger Severity:Slight

Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 4 Age:55 Male Driver/rider Severity:Slight

Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

Casualty Reference 5 Age:47 Male Passenger Severity:Slight

Ped Dir:Pedestrian Dii Ped Movement : Not pedestrian  
Ped Location:

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00887-11 17/09/2011 Saturday Time:1330 Vehicles 2 Casualties 1 Slight  
Easting: 442,757 Northing: 403,947  
Fine without high winds Road Surface:Dry Daylight: no street lighting  
Road Type: Single carriageway Speed Limit: 60

Location: DEARNE VALLEY PARKWAY DARFIELD 300 MTS FROM DONCASTER RD  
Description:V2 QUEUEING IN STATIONARY TF, V1 FAILED TO REACT IN TIME AND COLL WITH REAR OF V2.

Vehicle Reference:1 Car Slowing or Stopping  
First point of impact:Front  
Vehicle direction: S to N Journey: Not known  
Age of Driver : 42 Breath test:Negative

Contributory Factors : 307 405

Casualty Reference 1 Age:30 Female Passenger Severity:Slight

Ped Dir: Ped Movement :  
Ped Location:

Vehicle Reference2 Car Waiting to go ahead but held up  
First point of impact:Back  
Vehicle direction: S to N Journey: Not known  
Age of Driver : 58 Breath test:Negative

Contributory Factors : 307 405

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00900-11 23/09/2011 Friday Time:0700 Vehicles 2 Casualties 1 Serious  
 Easting: 441,431 Northing: 407,162  
 Fine without high winds Road Surface:Dry Daylight: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING ROAD GRIMETHORPE BARNSELEY 750M N HOUGHTON MAIN R  
 Description:VEH 1 TRAVEL TOWARDS SHAFTON. VEH 2 TRAV OPPOSITE DIRECTION  
 COLLIDES OFFSIDE TO OFFSIDE WITH VEH 1 FOR REASONS UNKNOWN AT THIS  
 TIME.

Vehicle Reference1 Goods >= 7.5 tonnes mgw Going ahead  
 First point of impact:Front  
 Vehicle direction: SE to NW Journey: Journey as part of work  
 Age of Driver : 47 Breath test:Negative

Contributory Factors : 409 410

Vehicle Reference2 Car Going ahead  
 First point of impact:Front  
 Vehicle direction: SE to NW Journey: Commuting to/from work  
 Age of Driver : 17 Breath test:Not provided (medical)

Contributory Factors : 409 410

Casualty Reference 1 Age:17 Male Driver/rider Severity:Serious  
 Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00934-11 28/09/2011 Wednesday Time:1425 Vehicles 3 Casualties 5 Slight  
 Easting: 442,885 Northing: 404,274  
 Fine without high winds Road Surface:Dry Daylight:street lights present  
 Road Type: Roundabout Speed Limit: 40

Location: DEARNE VALLEY PARKWAY DARFIELD  
 Description:ALL VEHS SLOWING IN LINE OF TF AS THEY APP R/ABOUT. V1 FAILED TO STOP  
 IN TIME & COLL WITH REAR OF V2. V2 SHUNTED INTO REAR OF V3.

Vehicle Reference:1 Car Slowing or Stopping  
 First point of impact:Front  
 Vehicle direction: S to N Journey: Not known  
 Age of Driver : 18 Breath test:Negative

Contributory Factors : 406

Casualty Reference 1 Age:18 Female Driver/rider Severity:Slight

Ped Dir: Ped Movement :  
 Ped Location:

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

Vehicle Reference2 Car Slowing or Stopping  
First point of impact:Back  
Vehicle direction: S to N Journey: Not known  
Age of Driver : 18 Breath test:Negative

Contributory Factors : 406

Casualty Reference 2 Age:18 Female Driver/rider Severity:Slight

Ped Dir: Ped Movement :  
Ped Location:

Casualty Reference 3 Age:16 Female Passenger Severity:Slight

Ped Dir: Ped Movement :  
Ped Location:

Casualty Reference 4 Age:18 Female Passenger Severity:Slight

Ped Dir: Ped Movement :  
Ped Location:

Casualty Reference 5 Age: Female Passenger Severity:Slight

Ped Dir: Ped Movement :  
Ped Location:

Vehicle Reference3 Car Slowing or Stopping  
First point of impact:Back  
Vehicle direction: S to N Journey: Not known  
Age of Driver : 40 Breath test:Negative

Contributory Factors : 406

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00009-12 01/01/2012 Sunday Time:0230 Vehicles 1 Casualties 2 Slight  
 Easting: 442,878 Northing: 404,221  
 Fine without high winds Road Surface:Wet/Damp Darkness: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: DEARNE VALLEY PARKWAY BROOMHILL 40 MTS FROM CATHILL R/ABOUT  
 Description:V1 TV SOUTH ALONG A6195 WHEN VEH GENTLY VEERS OFF RD TO O/S

Vehicle Reference1 Car Going ahead  
 First point of impact:Front  
 Vehicle direction: NE to SW Journey: Not known  
 Age of Driver : 46 Breath test:Negative

Contributory Factors : 509 503

Casualty Reference 1 Age:46 Male Driver/rider Severity:Slight  
 Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

Casualty Reference 2 Age:3 Male Passenger Severity:Slight  
 Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNESLEY' SK Transport Ltd

B-00078-12 26/01/2012 Thursday Time:0937 Vehicles 2 Casualties 1 Slight  
 Easting: 442,900 Northing: 404,771  
 Fine without high winds Road Surface:Wet/Damp Daylight: street lighting unknown  
 Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRING RD MIDDLECLIFFE  
 Description:VEH'S TR IN OPP DIRECTIONS, V2 OVERTAKING THEN BRAKED TO AVOID  
 ONCOMING V1, V2 THEN COLL WITH BARRIER AND V1.

Vehicle Reference1 Goods >= 7.5 tonnes mgw Going ahead  
 First point of impact:Front  
 Vehicle direction: E to W Journey: Journey as part of work  
 Age of Driver : 47 Breath test:Negative

Contributory Factors : 403 307 410 408

Vehicle Reference2 Car Overtaking on nearside  
 First point of impact:Front  
 Vehicle direction: W to E Journey: Not known  
 Age of Driver : 40 Breath test:Negative

Contributory Factors : 403 307 410 408

Casualty Reference 1 Age:40 Male Driver/rider Severity:Slight

Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00184-12 01/03/2012 Thursday Time:1725 Vehicles 3 Casualties 1 Serious  
 Easting: 442,199 Northing: 402,724  
 Fine without high winds Road Surface: Dry Daylight: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: DEARNE VALLEY PARKWAY BROOMHILL 400 YDS FROM A 633  
 Description: V1 IN SLOW TF, V2 IN SLOW TF ON OPP CARR, V3 BEGAN TO OVERTAKE V1 AS  
 V1 CARRIED OUT A U TURN CLIPPING V3 SENDING IT INTO PATH OF V2.

Vehicle Reference1 Car U turn  
 First point of impact: Offside  
 Vehicle direction: SW to NE Journey: Not known  
 Age of Driver : 26 Breath test: Negative

Contributory Factors : 405

Vehicle Reference2 Car Going ahead  
 First point of impact: Front  
 Vehicle direction: NE to SW Journey: Not known  
 Age of Driver : 57 Breath test: Negative

Contributory Factors : 405

Vehicle Reference3 Motorcycle over 500cc Overtaking moving vehicle on its offside  
 First point of impact: Front  
 Vehicle direction: SW to NE Journey: Not known  
 Age of Driver : 55 Breath test: Negative

Contributory Factors : 405

Casualty Reference 1 Age: 55 Male Driver/rider Severity: Serious

Ped Dir: Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00281-12 28/03/2012 Wednesday Time:1320 Vehicles 2 Casualties 1 Serious  
 Easting: 442,218 Northing: 402,761  
 Fine without high winds Road SurfaceDry Daylight: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: DEARNE VALLEY PARKWAY BROOMHILL 500 MTS FROM BROOMHILL RDBT  
 Description:VEH'S TR IN SAME DIRECTION, V1 TAKEN WRONG TURN SO PULLED ACC CARR  
 TO LAYBY COLLIDING WITH V2 FOLLOWING.

Vehicle Reference1 Car U turn  
 First point of impact:Offside  
 Vehicle direction: W to E Journey: Not known  
 Age of Driver : 38 Breath test:Negative

Contributory Factors : 403 405

Vehicle Reference2 Motorcycle over 500cc Going ahead  
 First point of impact:Nearside  
 Vehicle direction: N to S Journey: Not known  
 Age of Driver : 54 Breath test:Negative

Contributory Factors : 403 405

Casualty Reference 1 Age:54 Male Driver/rider Severity:Serious  
 Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

---

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
Selection: Notes:  
Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00696-12 31/07/2012 Tuesday Time:1520 Vehicles 2 Casualties 1 Slight  
Easting: 442,865 Northing: 404,318  
Unknown Road Surface:Dry Daylight:street lights present  
Road Type: Roundabout Speed Limit: 60

Location: DONCASTER RD BARNSELEY J/W CATHILL RNDBT  
Description:V1 STATIONARY AT JCT WHEN V2 COLL WITH REAR.

Vehicle Reference1 Car Moving off  
First point of impact:Back  
Vehicle direction: W to E Journey: Not known  
Age of Driver : 19 Breath test:Not requested

Contributory Factors : 308 408

Casualty Reference 1 Age:19 Female Driver/rider Severity:Slight  
Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
Ped Location:

Vehicle Reference2 Car Going ahead  
First point of impact:Front  
Vehicle direction: W to E Journey: Not known  
Age of Driver : Breath test:Driver not contacted

Contributory Factors : 308 408

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00781-12 30/08/2012 Thursday Time:1220 Vehicles 2 Casualties 1 Slight  
 Easting: 442,885 Northing: 404,271  
 Fine without high winds Road SurfaceDry Daylight:street lights present  
 Road Type: Roundabout Speed Limit: 60

Location: DEARNE VALLEY PARKWAY DARFIELD, BARNSELEY J/W BARNSELEY ROAD  
 Description:VEH 2 POLICE MCYCLE ENTERING RNDBT INTENDING TO TURN RT. VEH 1 MCAR  
 TV BEHIND VEH 2. VEH 1 COLL REAR VEH 2.

Vehicle Reference1 Car Moving off  
 First point of impact:Front  
 Vehicle direction: S to E Journey: Not known  
 Age of Driver : 67 Breath test:Negative

Contributory Factors : 405 403

Vehicle Reference2 Motorcycle over 500cc Moving off  
 First point of impact:Back  
 Vehicle direction: S to E Journey: Journey as part of work  
 Age of Driver : 50 Breath test:Negative

Contributory Factors : 405 403

Casualty Reference 1 Age:50 Male Driver/rider Severity:Slight

Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00955-12 22/10/2012 Monday Time:0720 Vehicles 2 Casualties 1 Slight  
 Easting: 442,908 Northing: 404,334  
 Raining without high winds Road Surface:Wet/Damp Darkness: street lights present and lit  
 Road Type: Roundabout Speed Limit: 60

Location: ROTHERHAM RD BARNSELEY J/W CATHILL R/ABOUT  
 Description:VEH1 LGV TV ALG ROTHERHAM RD T/W RABOUT COLL REAR VEH2 MCYCLE  
 WHICH WAS STAT WAITING TO ENTER R/ABOUT

Vehicle Reference1 Van or Goods <= 3.5 tonnes n Going ahead  
 First point of impact:Front  
 Vehicle direction: N to S Journey: Journey as part of work  
 Age of Driver : 58 Breath test:Not requested

Contributory Factors : 405

Vehicle Reference2 Motorcycle over 500cc Slowing or Stopping  
 First point of impact:Back  
 Vehicle direction: N to S Journey: Not known  
 Age of Driver : 53 Breath test:Not requested

Contributory Factors : 405

Casualty Reference 1 Age:53 Male Driver/rider Severity:Slight  
 Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-00958-12 22/10/2012 Monday Time:1100 Vehicles 2 Casualties 2 Slight  
 Easting: 442,827 Northing: 404,326  
 Raining without high winds Road Surface:Wet/Damp Daylight: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: DONCASTER RD BARNSELEY

Description:VEH1 MCAR EXITS CATHILL GARAGE TURNING R ONTO DONCASTER RD & IS HIT  
 BY VEH2 MCAR WHICH HAD JUST EXITED THE R.ABOUT ONTO DONCASTER RD

Vehicle Reference1 Car Turning right  
 First point of impact:Offside  
 Vehicle direction: Parked to E Journey: Not known  
 Age of Driver : 49 Breath test:Not requested

Contributory Factors : 405 406 306

Casualty Reference 1 Age:49 Female Driver/rider Severity:Slight

Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

Casualty Reference 2 Age:17 Female Passenger Severity:Slight

Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

Vehicle Reference2 Car Going ahead  
 First point of impact:Front  
 Vehicle direction: E to W Journey: Not known  
 Age of Driver : Breath test:Driver not contacted

Contributory Factors : 405 406 306

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

C-01207-12 09/11/2012 Friday Time:1300 Vehicles 2 Casualties 1 Slight  
 Easting: 441,980 Northing: 402,362  
 Fine without high winds Road Surface: Dry Daylight: street lights present  
 Road Type: Roundabout Speed Limit: 40

Location: PONTEFRACT RD BRAMPTON ROTHERHAM J/W BARNSELEY RD  
 Description: VH2 M/CAR PULLS ONTO RNDABT FRM PONTEFRACT RD INFRNT OF VH1 M/CAR  
 TRV FRM BARNSELEY RD TWDS WOMBWELL. VH1 COLL OS VH2. VH2 FTS

Vehicle Reference1 Car Going ahead  
 First point of impact: Front  
 Vehicle direction: SE to NW Journey: Not known  
 Age of Driver : 24 Breath test: Not requested

Contributory Factors : 302 405

Casualty Reference 1 Age: 24 Female Driver/rider Severity: Slight

Ped Dir: Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

Vehicle Reference2 Car Going ahead  
 First point of impact: Offside  
 Vehicle direction: NE to SW Journey: Not known  
 Age of Driver : 74 Breath test: Not requested

Contributory Factors : 302 405

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-01058-12 21/11/2012 Wednesday Time:1124 Vehicles 2 Casualties 3 Slight  
 Easting: 443,725 Northing: 404,110  
 Raining without high winds Road Surface:Wet/Damp Daylight: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: DONCASTER ROAD BARNSELEY 200 METRES BILLINGLY GREEN LANE  
 Description:V1 TRAV TWDS CATHILL ROUNDABOUT, A LORRY WAS TURNING RIGHT INTO A  
 LAY-BY ACROSS TRAFFIC HOLDING IT UP, V1 STATIONARY AS LORRY TURNED,  
 V2 CAME BEHIND V1 AT SPEED AND FAILED TO STOP COLLIDING WITH ITS  
 REAR, BOTH DRIVERS & PASSENGER IN V1 INJURED

Vehicle Reference1 Car Waiting to go ahead but held up  
 First point of impact:Back  
 Vehicle direction: E to W Journey: Journey as part of work  
 Age of Driver : 30 Breath test:Negative

Contributory Factors : 406

Casualty Reference 1 Age:30 Female Driver/rider Severity:Slight

Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

Casualty Reference 3 Age:30 Female Passenger Severity:Slight

Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

Vehicle Reference2 Car Going ahead  
 First point of impact:Front  
 Vehicle direction: E to W Journey: Not known  
 Age of Driver : 83 Breath test:Negative

Contributory Factors : 406

Casualty Reference 2 Age:83 Male Driver/rider Severity:Slight

Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELEY' SK Transport Ltd

B-01072-12 25/11/2012 Sunday Time:0658 Vehicles 2 Casualties 1 Serious  
 Easting: 441,760 Northing: 406,741  
 Raining without high winds Road Surface:Wet/Damp Darkness: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: PARK SPRINGS RD BARNSELEY

Description:V1 HIT FLOW OF WATER RUNNING ACC CARR AND LOST CONTROL COLL WITH UNATTENDED V2.

Vehicle Reference1 Car Going ahead right hand bend  
 First point of impact:Front  
 Vehicle direction: N to S Journey: Commuting to/from work  
 Age of Driver : 18 Breath test:Negative

Contributory Factors : 103

Casualty Reference 1 Age:18 Male Driver/rider Severity:Serious

Ped Dir:Pedestrian Dir Ped Movement : Not pedestrian  
 Ped Location:

Vehicle Reference2 Car Parked  
 First point of impact:Offside  
 Vehicle direction:Parked to Parked Journey: Not known  
 Age of Driver : 52 Breath test:Driver not contacted

Contributory Factors : 103

---

## AccsMap - Accident Analysis System

Accidents between dates 01/01/2010 and 31/12/2012 (36) months  
 Selection: Notes:  
 Selected using Build Query : Local\_auth = 'BARNSELY' SK Transport Ltd

B-01183-12 19/12/2012 Wednesday Time:1240 Vehicles 2 Casualties 1 Slight  
 Easting: 442,758 Northing: 404,347  
 Fine without high winds Road Surface:Wet/Damp Daylight: no street lighting  
 Road Type: Single carriageway Speed Limit: 60

Location: DONCASTER ROAD DARFIELD, BARNSELY 100 M EAST DEARNE VALLEY P  
 Description:VEH 1 MCAR STAT ON DONCASTER RD 100 M EAST OF DERNE VALLEY  
 PARKWAY IN QUEUING TRAFFIC. VEH 2 TV BEHIND VEH 1. VEH 2 COLL REAR  
 VEH 1.

Vehicle Reference1 Car Waiting to go ahead but held up  
 First point of impact:Back  
 Vehicle direction: W to E Journey: Journey as part of work  
 Age of Driver : 46 Breath test:Negative

Contributory Factors : 406

Casualty Reference 1 Age:46 Male Driver/rider Severity:Slight

Ped Dir:Pedestrian Di Ped Movement : Not pedestrian  
 Ped Location:

Vehicle Reference2 Car Going ahead  
 First point of impact:Front  
 Vehicle direction: W to E Journey: Journey as part of work  
 Age of Driver : 44 Breath test:Negative

Contributory Factors : 406

---

## **APPENDIX D**

**TRIP RATE CALCULATION SELECTION PARAMETERS:**

Land Use : 02 - EMPLOYMENT  
Category : D - INDUSTRIAL ESTATE

**VEHICLES**

Selected regions and areas:

<b>02</b>	<b>SOUTH EAST</b>	
	ES EAST SUSSEX	1 days
	EX ESSEX	1 days
	KC KENT	1 days
<b>03</b>	<b>SOUTH WEST</b>	
	CW CORNWALL	1 days
	DV DEVON	1 days
	WL WILTSHIRE	1 days
<b>04</b>	<b>EAST ANGLIA</b>	
	CA CAMBRIDGESHIRE	1 days
	NF NORFOLK	1 days
<b>05</b>	<b>EAST MIDLANDS</b>	
	NT NOTTINGHAMSHIRE	1 days
<b>06</b>	<b>WEST MIDLANDS</b>	
	WM WEST MIDLANDS	1 days
<b>07</b>	<b>YORKSHIRE &amp; NORTH LINCOLNSHIRE</b>	
	NY NORTH YORKSHIRE	1 days
	WY WEST YORKSHIRE	1 days
<b>08</b>	<b>NORTH WEST</b>	
	CH CHESHIRE	1 days
	LC LANCASHIRE	1 days
	MS MERSEYSIDE	1 days
<b>09</b>	<b>NORTH</b>	
	CB CUMBRIA	1 days
	DH DURHAM	1 days
	NB NORTHUMBERLAND	2 days
	TW TYNE & WEAR	1 days
<b>11</b>	<b>SCOTLAND</b>	
	AG ANGUS	1 days
	HI HIGHLAND	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

### Filtering Stage 2 selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Gross floor area  
Actual Range: 1197 to 64889 (units: sqm)  
Range Selected by User: 552 to 234115 (units: sqm)

#### Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/05 to 04/10/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

#### Selected survey days:

Monday	6 days
Tuesday	4 days
Wednesday	4 days
Thursday	1 days
Friday	7 days

This data displays the number of selected surveys by day of the week.

#### Selected survey types:

Manual count	22 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

#### Selected Locations:

Edge of Town	19
Free Standing (PPS6 Out of Town)	3

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

#### Selected Location Sub Categories:

Industrial Zone	9
Residential Zone	6
Out of Town	2
No Sub Category	5

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

### Filtering Stage 3 selection:

#### Use Class:

Not Known	3 days
B1	5 days
B2	10 days
B8	2 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

**Filtering Stage 3 selection (Cont.):**

Population within 1 mile:

1,000 or Less	2 days
1,001 to 5,000	4 days
5,001 to 10,000	5 days
10,001 to 15,000	2 days
15,001 to 20,000	4 days
20,001 to 25,000	2 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	4 days
25,001 to 50,000	3 days
50,001 to 75,000	3 days
75,001 to 100,000	1 days
100,001 to 125,000	1 days
125,001 to 250,000	6 days
250,001 to 500,000	4 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	7 days
1.1 to 1.5	15 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	22 days
----	---------

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE

**VEHICLES****Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	22	14667	0.133	22	14667	0.050	22	14667	0.183
07:30 - 08:00	22	14667	0.254	22	14667	0.074	22	14667	0.328
08:00 - 08:30	<b>22</b>	<b>14667</b>	<b>0.261</b>	22	14667	0.110	22	14667	0.371
08:30 - 09:00	22	14667	0.258	22	14667	0.127	<b>22</b>	<b>14667</b>	<b>0.385</b>
09:00 - 09:30	22	14667	0.189	22	14667	0.135	22	14667	0.324
09:30 - 10:00	22	14667	0.164	22	14667	0.137	22	14667	0.301
10:00 - 10:30	22	14667	0.159	22	14667	0.159	22	14667	0.318
10:30 - 11:00	22	14667	0.145	22	14667	0.143	22	14667	0.288
11:00 - 11:30	22	14667	0.159	22	14667	0.158	22	14667	0.317
11:30 - 12:00	22	14667	0.162	22	14667	0.175	22	14667	0.337
12:00 - 12:30	22	14667	0.150	22	14667	0.187	22	14667	0.337
12:30 - 13:00	22	14667	0.171	22	14667	0.184	22	14667	0.355
13:00 - 13:30	22	14667	0.171	22	14667	0.187	22	14667	0.358
13:30 - 14:00	22	14667	0.184	22	14667	0.156	22	14667	0.340
14:00 - 14:30	22	14667	0.148	22	14667	0.143	22	14667	0.291
14:30 - 15:00	22	14667	0.137	22	14667	0.149	22	14667	0.286
15:00 - 15:30	22	14667	0.149	22	14667	0.153	22	14667	0.302
15:30 - 16:00	22	14667	0.137	22	14667	0.166	22	14667	0.303
16:00 - 16:30	22	14667	0.147	22	14667	0.224	22	14667	0.371
16:30 - 17:00	22	14667	0.119	22	14667	0.257	22	14667	0.376
17:00 - 17:30	22	14667	0.073	<b>22</b>	<b>14667</b>	<b>0.285</b>	22	14667	0.358
17:30 - 18:00	22	14667	0.045	22	14667	0.158	22	14667	0.203
18:00 - 18:30	22	14667	0.030	22	14667	0.098	22	14667	0.128
18:30 - 19:00	22	14667	0.022	22	14667	0.054	22	14667	0.076
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			3.567			3.669			7.236

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP\*FACT. Trip rates are then rounded to 3 decimal places.

**Parameter summary**

Trip rate parameter range selected:	1197 - 64889 (units: sqm)
Survey date date range:	01/01/05 - 04/10/13
Number of weekdays (Monday-Friday):	22
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	1

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE

**OGVS****Calculation factor: 100 sqm****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	22	14667	0.006	22	14667	0.010	22	14667	0.016
07:30 - 08:00	22	14667	0.008	22	14667	0.014	22	14667	0.022
08:00 - 08:30	22	14667	0.011	22	14667	0.013	22	14667	0.024
08:30 - 09:00	22	14667	0.010	22	14667	0.014	22	14667	0.024
09:00 - 09:30	22	14667	0.012	22	14667	0.012	22	14667	0.024
09:30 - 10:00	22	14667	0.011	22	14667	0.015	22	14667	0.026
10:00 - 10:30	22	14667	0.012	22	14667	0.014	22	14667	0.026
10:30 - 11:00	22	14667	0.012	22	14667	0.013	22	14667	0.025
11:00 - 11:30	<b>22</b>	<b>14667</b>	<b>0.017</b>	<b>22</b>	<b>14667</b>	<b>0.017</b>	<b>22</b>	<b>14667</b>	<b>0.034</b>
11:30 - 12:00	22	14667	0.014	22	14667	0.010	22	14667	0.024
12:00 - 12:30	22	14667	0.011	22	14667	0.010	22	14667	0.021
12:30 - 13:00	22	14667	0.009	22	14667	0.012	22	14667	0.021
13:00 - 13:30	22	14667	0.012	22	14667	0.010	22	14667	0.022
13:30 - 14:00	22	14667	0.012	22	14667	0.013	22	14667	0.025
14:00 - 14:30	22	14667	0.012	22	14667	0.008	22	14667	0.020
14:30 - 15:00	22	14667	0.011	22	14667	0.011	22	14667	0.022
15:00 - 15:30	22	14667	0.015	22	14667	0.013	22	14667	0.028
15:30 - 16:00	22	14667	0.012	22	14667	0.012	22	14667	0.024
16:00 - 16:30	22	14667	0.016	22	14667	0.010	22	14667	0.026
16:30 - 17:00	22	14667	0.012	22	14667	0.007	22	14667	0.019
17:00 - 17:30	22	14667	0.005	22	14667	0.004	22	14667	0.009
17:30 - 18:00	22	14667	0.007	22	14667	0.005	22	14667	0.012
18:00 - 18:30	22	14667	0.002	22	14667	0.001	22	14667	0.003
18:30 - 19:00	22	14667	0.000	22	14667	0.001	22	14667	0.001
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
<b>Total Rates:</b>			<b>0.249</b>			<b>0.249</b>			<b>0.498</b>

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

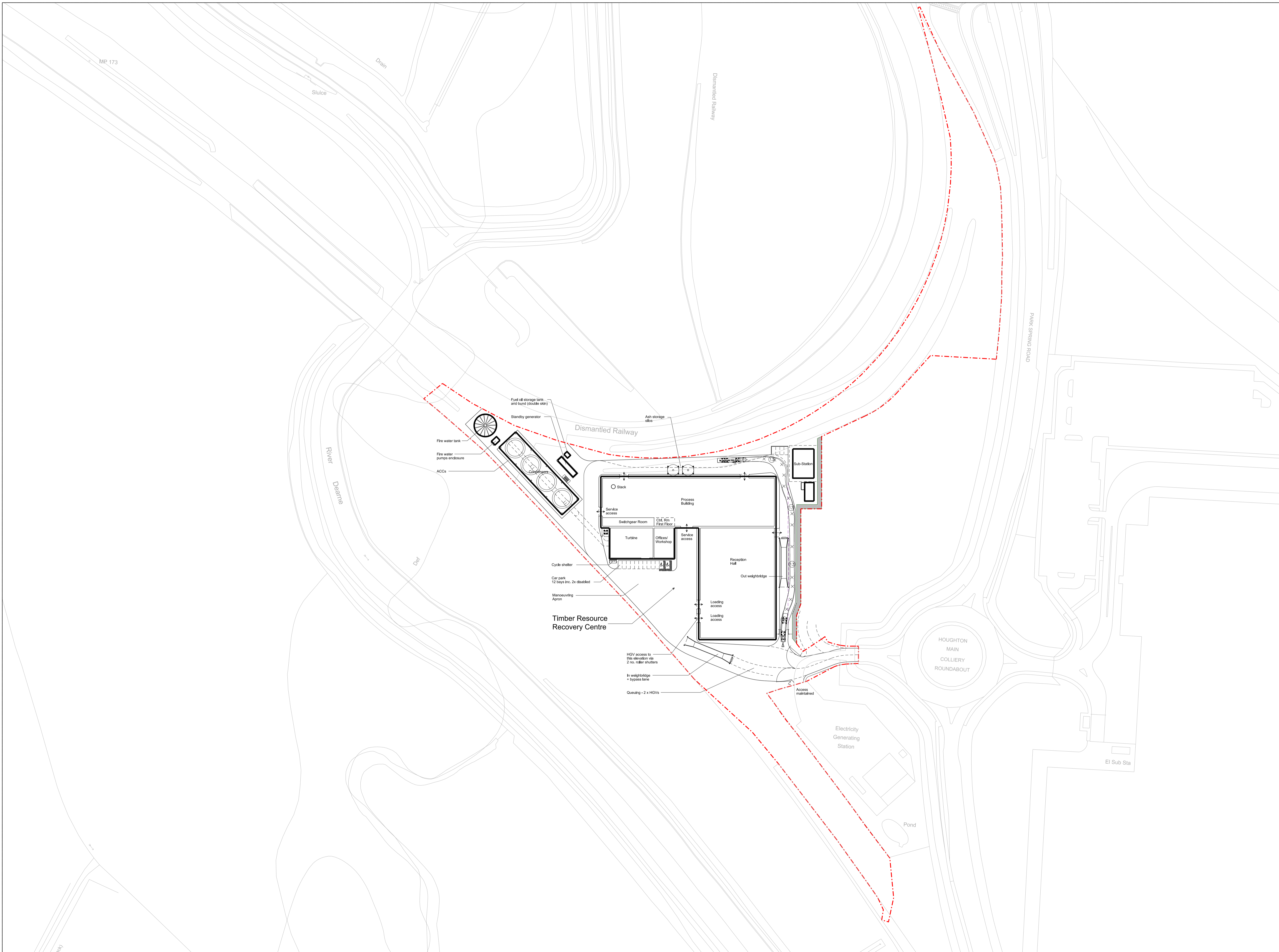
To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is:  $COUNT/TRP*FACT$ . Trip rates are then rounded to 3 decimal places.

**Parameter summary**

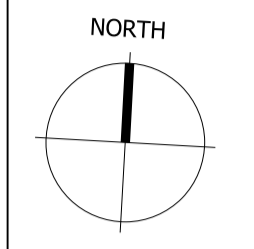
Trip rate parameter range selected:	1197 - 64889 (units: sqm)
Survey date date range:	01/01/05 - 04/10/13
Number of weekdays (Monday-Friday):	22
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	1

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

## **APPENDIX E**



- NOTE**
1. THIS DRAWING IS COPYRIGHT GSDA LTD.
  2. THE CONTRACTOR MUST NOT SCALE FROM THE DRAWING ALL DIMENSIONS TO BE TAKEN FROM DIMENSION STRINGS.
  3. WHERE ANY DISCREPANCIES ARE FOUND BETWEEN DIMENSIONS THESE MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECTS FOR RESOLUTION.
  4. WHERE DISCREPANCIES EXIST BETWEEN REFERENCE OR ASSEMBLY DRAWINGS & DETAIL DRAWINGS, THE LATTER TAKE PREFERENCE.



- KEY**
- Site boundary
  - 2.5m wide hedge/ tree line perimeter

B	150109	Substation layout adjusted
A	150108	Weighbridge bypass included
-	150106	Issued for information

**FOR INFORMATION**

**GSDA**  
 Highlands House, Office 101A, 105 The Broadway, Wimbledon, London, SW19 1NE  
 T. 020 8544 8085

**HOUGHTON MAIN REP**  
 PROJECT  
**Site Location Plan**  
 DRAWING

1:1000@A1 150109  
 1:2000@A3 DATE  
 SCALE

1313_SK170	B	GS
DWG. NO.	REVISION	CHECKED

## **APPENDIX F**

**TRIP RATE CALCULATION SELECTION PARAMETERS:**

Land Use : 12 - CIVIC AMENITY SITES  
Category : C - LANDFILL

**VEHICLES**

Selected regions and areas:

<b>03 SOUTH WEST</b>	
WL WILTSHIRE	1 days
<b>05 EAST MIDLANDS</b>	
NR NORTHAMPTONSHIRE	1 days
<b>07 YORKSHIRE &amp; NORTH LINCOLNSHIRE</b>	
NY NORTH YORKSHIRE	2 days
<b>09 NORTH</b>	
TW TYNE & WEAR	1 days
<b>11 SCOTLAND</b>	
AD ABERDEEN CITY	1 days
DG DUMFRIES & GALLOWAY	1 days
SL SOUTH LANARKSHIRE	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

**Filtering Stage 2 selection:**

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: Site area  
Actual Range: 5.07 to 50.00 (units: hect)  
Range Selected by User: 5.07 to 65.00 (units: hect)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/05 to 20/06/13

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Tuesday	2 days
Wednesday	2 days
Thursday	3 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	8 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaken using machines.

Selected Locations:

Free Standing (PPS6 Out of Town)	8
----------------------------------	---

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Out of Town	8
-------------	---

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

**Filtering Stage 3 selection:**

Use Class:

Not Known	4 days
B2	1 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,000 or Less	4 days
1,001 to 5,000	2 days
5,001 to 10,000	2 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
50,001 to 75,000	1 days
75,001 to 100,000	1 days
125,001 to 250,000	4 days
250,001 to 500,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	6 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	8 days
----	--------

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

LIST OF SITES relevant to selection parameters

<b>1</b>	<b>AD-12-C-01</b>	<b>LANDFILL</b>		<b>ABERDEEN CITY</b>
	INVERBOYNDIE			
	BANFF			
	NEAR ABERDEEN			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		5.07 hect	
	Survey date: FRIDAY		18/05/12	Survey Type: MANUAL
<b>2</b>	<b>DG-12-C-01</b>	<b>LANDFILL</b>		<b>DUMFRIES &amp; GALLOWAY</b>
	B793			
	NEAR DALBEATTIE			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		9.45 hect	
	Survey date: TUESDAY		03/05/05	Survey Type: MANUAL
<b>3</b>	<b>NR-12-C-01</b>	<b>LANDFILL</b>		<b>NORTHAMPTONSHIRE</b>
	OAKLEY ROAD			
	NEAR KETTERING			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		23.37 hect	
	Survey date: WEDNESDAY		19/09/12	Survey Type: MANUAL
<b>4</b>	<b>NY-12-C-02</b>	<b>LANDFILL</b>		<b>NORTH YORKSHIRE</b>
	RIDGE ROAD			
	MICKLEFIELD NR GARFORTH			
	NEAR LEEDS			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		28.00 hect	
	Survey date: THURSDAY		21/04/05	Survey Type: MANUAL
<b>5</b>	<b>NY-12-C-03</b>	<b>LANDFILL</b>		<b>NORTH YORKSHIRE</b>
	WETHERBY ROAD			
	RUFFORTH			
	NEAR YORK			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		39.70 hect	
	Survey date: THURSDAY		21/04/05	Survey Type: MANUAL
<b>6</b>	<b>SL-12-C-01</b>	<b>LANDFILL</b>		<b>SOUTH LANARKSHIRE</b>
	CAIRNMUIR ROAD			
	NEAR EAST KILBRIDE			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		38.00 hect	
	Survey date: THURSDAY		12/05/05	Survey Type: MANUAL
<b>7</b>	<b>TW-12-C-02</b>	<b>LANDFILL</b>		<b>TYNE &amp; WEAR</b>
	A190			
	SEGHILL VILLAGE			
	NEAR CRAMLINGTON			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		33.90 hect	
	Survey date: WEDNESDAY		21/11/12	Survey Type: MANUAL
<b>8</b>	<b>WL-12-C-01</b>	<b>LANDFILL</b>		<b>WILTSHIRE</b>
	HAY LANE			
	NEAR SWINDON			
	Free Standing (PPS6 Out of Town)			
	Out of Town			
	Total Site area:		50.00 hect	
	Survey date: TUESDAY		03/10/06	Survey Type: MANUAL

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 12 - CIVIC AMENITY SITES/C - LANDFILL

**VEHICLES****Calculation factor: 1 hect****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	8	28.44	0.426	8	28.44	0.154	8	28.44	0.580
08:00 - 09:00	8	28.44	0.453	8	28.44	0.356	8	28.44	0.809
09:00 - 10:00	8	28.44	0.488	8	28.44	0.457	8	28.44	0.945
10:00 - 11:00	8	28.44	0.396	8	28.44	0.426	8	28.44	0.822
11:00 - 12:00	<b>8</b>	<b>28.44</b>	<b>0.558</b>	8	28.44	0.497	<b>8</b>	<b>28.44</b>	<b>1.055</b>
12:00 - 13:00	8	28.44	0.308	8	28.44	0.378	8	28.44	0.686
13:00 - 14:00	8	28.44	0.536	8	28.44	0.418	8	28.44	0.954
14:00 - 15:00	8	28.44	0.536	<b>8</b>	<b>28.44</b>	<b>0.514</b>	8	28.44	1.050
15:00 - 16:00	8	28.44	0.316	8	28.44	0.396	8	28.44	0.712
16:00 - 17:00	8	28.44	0.105	8	28.44	0.308	8	28.44	0.413
17:00 - 18:00	7	27.66	0.036	7	27.66	0.201	7	27.66	0.237
18:00 - 19:00	4	19.40	0.000	4	19.40	0.077	4	19.40	0.077
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			4.158			4.182			8.340

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP\*FACT. Trip rates are then rounded to 3 decimal places.

**Parameter summary**

Trip rate parameter range selected: 5.07 to 50.00 (units: hect)  
Survey date range: 01/01/05 - 20/06/13  
Number of weekdays (Monday-Friday): 8  
Number of Saturdays: 0  
Number of Sundays: 0  
Surveys manually removed from selection: 1

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 12 - CIVIC AMENITY SITES/C - LANDFILL

**OGVS****Calculation factor: 1 hect****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	8	28.44	0.268	8	28.44	0.163	8	28.44	0.431
08:00 - 09:00	8	28.44	0.325	8	28.44	0.321	8	28.44	0.646
09:00 - 10:00	8	28.44	0.426	8	28.44	0.396	8	28.44	0.822
10:00 - 11:00	8	28.44	0.312	8	28.44	0.369	8	28.44	0.681
11:00 - 12:00	8	28.44	0.488	8	28.44	0.440	8	28.44	0.928
12:00 - 13:00	8	28.44	0.242	8	28.44	0.290	8	28.44	0.532
13:00 - 14:00	8	28.44	0.426	8	28.44	0.356	8	28.44	0.782
14:00 - 15:00	<b>8</b>	<b>28.44</b>	<b>0.492</b>	<b>8</b>	<b>28.44</b>	<b>0.448</b>	<b>8</b>	<b>28.44</b>	<b>0.940</b>
15:00 - 16:00	8	28.44	0.281	8	28.44	0.321	8	28.44	0.602
16:00 - 17:00	8	28.44	0.062	8	28.44	0.123	8	28.44	0.185
17:00 - 18:00	7	27.66	0.010	7	27.66	0.067	7	27.66	0.077
18:00 - 19:00	4	19.40	0.000	4	19.40	0.000	4	19.40	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			3.332			3.294			6.626

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP\*FACT. Trip rates are then rounded to 3 decimal places.

**Parameter summary**

Trip rate parameter range selected: 5.07 to 50.00 (units: hect)  
Survey date date range: 01/01/05 - 20/06/13  
Number of weekdays (Monday-Friday): 8  
Number of Saturdays: 0  
Number of Sundays: 0  
Surveys manually removed from selection: 1

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 12 - CIVIC AMENITY SITES/C - LANDFILL

**PSVS****Calculation factor: 1 hect****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
08:00 - 09:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
09:00 - 10:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
10:00 - 11:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
11:00 - 12:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
12:00 - 13:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
13:00 - 14:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
14:00 - 15:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
15:00 - 16:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
16:00 - 17:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
17:00 - 18:00	7	27.66	0.000	7	27.66	0.000	7	27.66	0.000
18:00 - 19:00	4	19.40	0.000	4	19.40	0.000	4	19.40	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
<b>Total Rates:</b>			<b>0.000</b>			<b>0.000</b>			<b>0.000</b>

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP\*FACT. Trip rates are then rounded to 3 decimal places.

**Parameter summary**

Trip rate parameter range selected: 5.07 to 50.00 (units: hect)  
 Survey date range: 01/01/05 - 20/06/13  
 Number of weekdays (Monday-Friday): 8  
 Number of Saturdays: 0  
 Number of Sundays: 0  
 Surveys manually removed from selection: 1

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 12 - CIVIC AMENITY SITES/C - LANDFILL

**CYCLISTS****Calculation factor: 1 hect****BOLD print indicates peak (busiest) period**

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate	No. Days	Ave. AREA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
08:00 - 09:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
09:00 - 10:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
10:00 - 11:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
11:00 - 12:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
12:00 - 13:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
13:00 - 14:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
14:00 - 15:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
15:00 - 16:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
16:00 - 17:00	8	28.44	0.000	8	28.44	0.000	8	28.44	0.000
17:00 - 18:00	7	27.66	0.000	7	27.66	0.000	7	27.66	0.000
18:00 - 19:00	4	19.40	0.000	4	19.40	0.000	4	19.40	0.000
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.000			0.000			0.000

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is:  $COUNT/TRP*FACT$ . Trip rates are then rounded to 3 decimal places.

**Parameter summary**

Trip rate parameter range selected: 5.07 to 50.00 (units: hect)  
Survey date date range: 01/01/05 - 20/06/13  
Number of weekdays (Monday-Friday): 8  
Number of Saturdays: 0  
Number of Sundays: 0  
Surveys manually removed from selection: 1

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are shown. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

Houghton Colliery, Barnsley: Forecast Development Flows

Development Flows TRRC (confirmed as appropriate)

TRRC	TPA	Veh Payload (t)	Annual HV	Working Days	Daily Load	Daily Trips
Deliveries	150000	20	7500	275	27	55
Ash Export	11133	25	445	275	2	3
Fly Ash Export	4500	20	225	275	1	2
					<b>30</b>	<b>59</b>

Forecast Staff 25

Study Area & Data Requirements

Access/AS195 MCTC

AS195 N ATC

AS195 S ATC

Comparison With Extant (10607sqm GFA 19 Industrial Units with 204 Parking Spaces)

	Total Daily Vehs	Total Daily HV	Total PCU
Extant	768	53	873
AD	0	0	0
TRRC	76	59	136
Total/ New	76	59	136

-737

NOTES:

2011 Census BMBC JTW Mode Share (71%) applied to forecast staff vehicle trips

Traffic Distribution

Route No.	Route Name	2017 AADT	Distribution	Total Traffic (LV + HV)			HV Total Traffic		
				AM	PM	Daily	AM	PM	Daily
1	A6195 N Park Spring Road	9349	49%	4	2	38	3	1	29
2	A6195 S Park Spring Road	9583	51%	4	2	39	3	1	30
3	A635 W Doncaster Road	17077	16%	1	1	12	1	0	10
4	A635 E Doncaster Road	13204	12%	1	1	9	1	0	7
5	A6195 S	23515	22%	2	1	17	1	0	13

	TRRC HV Traffic			TRRC Shift Staff Car Traffic			TRRC Management Staff Car Traffic			Total TRRC Traffic		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
AM	3	3	6	0	0	0	3	0	3	6	3	9
PM	0	1	2	0	0	0	0	3	3	0	4	5
Daily	30	30	59	6	6	11	3	3	6	38	38	76

8 Shift staff working between 7am and 7pm

4 Managers working between 8am and 5pm

	Total HV Traffic			Total Staff Car Traffic			Total Traffic			Total Traffic (pcu)		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
AM	3	3	6	3	0	3	6	3	9	9	5	14
PM	0	1	2	0	3	3	0	4	5	1	6	6
Daily	30	30	59	8	8	17	38	38	76	68	68	136

**2014 Surveyed Access Flows (in pcu)**

	AM Peak: 7.30am- 8.30am				PM Peak: 4.15pm-5.15pm			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	26	398	0	0	12	503	0
ASOS	12	0	14	0	26	0	39	0
A6195 S	471	35	0	0	543	10	0	0
Access	0	0	0	0	0	0	0	0

**2017 Background Flows**

TEMPRO 1.041

TEMPRO 1.043

	AM Peak: 7.30am- 8.30am				PM Peak: 4.15pm-5.15pm			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	27	415	0	0	12	524	0
ASOS	12	0	14	0	27	0	40	0
A6195 S	491	36	0	0	567	10	0	0
Access	0	0	0	0	0	0	0	0

**2019 Background Flows**

TEMPRO 1.076

TEMPRO 1.080

	AM Peak: 7.30am- 8.30am				PM Peak: 4.15pm-5.15pm			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	28	428	0	0	13	543	0
ASOS	13	0	15	0	28	0	42	0
A6195 S	507	38	0	0	587	11	0	0
Access	0	0	0	0	0	0	0	0

**Development Distribution**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N				49%				49%
ASOS								
A6195 S				51%				51%
Access	49%		51%		49%		51%	

**Committed Development Flows**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N				28				6
ASOS								
A6195 S				28				7
Access	14		14		23		24	

**2017 Base Flows**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	27	415	28	0	12	524	6
ASOS	12	0	14	0	27	0	40	0
A6195 S	491	36	0	28	567	10	0	7
Access	14	0	14	0	23	0	24	0

**2019 Base Flows**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	28	428	28	0	13	543	6
ASOS	13	0	15	0	28	0	42	0
A6195 S	507	38	0	28	587	11	0	7
Access	14	0	14	0	23	0	24	0

**Development Flows**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N				5				0
ASOS								
A6195 S				5				0
Access	2		3		3		3	

**2017 Base & Development Flows**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	27	415	5	0	12	524	0
ASOS	12	0	14	0	27	0	40	0
A6195 S	491	36	0	5	567	10	0	0
Access	2	0	3	0	3	0	3	0

**2019 Base & Development Flows**

	AM Peak				PM Peak			
	A6195 N	ASOS	A6195 S	Access	A6195 N	ASOS	A6195 S	Access
A6195 N	0	28	428	5	0	13	543	0
ASOS	13	0	15	0	28	0	42	0
A6195 S	507	38	0	5	587	11	0	0
Access	2	0	3	0	3	0	3	0

**2014 Surveyed Flows (in pcu): Cathill Roundabout**

	AM Peak: 7.30am- 8.30am				PM Peak: 4.45pm-5.45pm			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	132	437	46	0	172	523	116
A635 E	214	0	523	510	192	0	561	661
A6195 S	510	521	0	103	580	323	0	173
A635 W	59	540	219	0	60	476	140	0

**2017 Background Flows**                      TEMPRO                      1.041    TEMPRO                      1.043

	AM Peak: 7.30am- 8.30am				PM Peak: 4.45pm-5.45pm			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	137	455	48	0	179	545	121
A635 E	223	0	544	530	200	0	585	690
A6195 S	531	542	0	107	605	337	0	181
A635 W	62	562	228	0	62	496	146	0

**2019 Background Flows**                      TEMPRO                      1.076    TEMPRO                      1.080

	AM Peak: 7.30am- 8.30am				PM Peak: 4.45pm-5.45pm			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	142	472	50	0	185	565	125
A635 E	231	0	564	550	207	0	606	714
A6195 S	550	562	0	111	627	349	0	187
A635 W	64	583	236	0	65	514	151	0

**Development Distribution**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N		12%	22%	16%		12%	22%	16%
A635 E	12%				12%			
A6195 S	22%				22%			
A635 W	16%				16%			

**Committed Development Flows**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N		3	6	4		6	10	8
A635 E	7				2			
A6195 S	12				3			
A635 W	9				2			

**2017 Base Flows**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	141	461	53	0	185	556	128
A635 E	230	0	544	530	202	0	585	690
A6195 S	543	542	0	107	608	337	0	181
A635 W	71	562	228	0	65	496	146	0

**2019 Base Flows**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	146	478	54	0	191	575	133
A635 E	238	0	564	550	209	0	606	714
A6195 S	563	562	0	111	630	349	0	187
A635 W	73	583	236	0	67	514	151	0

**Development Flows**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N		1	1	1		1	1	1
A635 E	1				0			
A6195 S	2				1			
A635 W	1				0			

**2017 Base & Development Flows**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	138	456	49	0	180	547	122
A635 E	224	0	544	530	200	0	585	690
A6195 S	533	542	0	107	606	337	0	181
A635 W	63	562	228	0	63	496	146	0

**2019 Base & Development Flows**

	AM Peak				PM Peak			
	A6195 N	A635 E	A6195 S	A635 W	A6195 N	A635 E	A6195 S	A635 W
A6195 N	0	143	473	51	0	186	566	126
A635 E	232	0	564	550	207	0	606	714
A6195 S	553	562	0	111	628	349	0	187
A635 W	65	583	236	0	65	514	151	0



**2017 Base Flows**

	AM Peak				PM Peak			
	A6195 N	Manvers Way	A6195 S	Highgate	A6195 N	Manvers Way	A6195 S	Highgate
A6195 N	0	600	581	0	0	555	691	20
Manvers Way	521	0	434	8	520	0	489	60
A6195 S	678	513	0	7	643	527	0	17
Highgate	13	20	12	0	0	1	0	0

**2019 Base Flows**

	AM Peak				PM Peak			
	A6195 N	Manvers Way	A6195 S	Highgate	A6195 N	Manvers Way	A6195 S	Highgate
A6195 N	0	620	600	0	0	575	716	21
Manvers Way	539	0	448	9	538	0	506	63
A6195 S	701	530	0	8	665	546	0	18
Highgate	13	21	13	0	0	1	0	0

**Development Flows**

	AM Peak				PM Peak			
	A6195 N	Manvers Way	A6195 S	Highgate	A6195 N	Manvers Way	A6195 S	Highgate
A6195 N			1				1	
Manvers Way								
A6195 S	2				1			
Highgate								

**2017 Base & Development Flows**

	AM Peak				PM Peak			
	A6195 N	Manvers Way	A6195 S	Highgate	A6195 N	Manvers Way	A6195 S	Highgate
A6195 N	0	600	576	0	0	555	682	20
Manvers Way	521	0	434	8	520	0	489	60
A6195 S	668	513	0	7	641	527	0	17
Highgate	13	20	12	0	0	1	0	0

**2019 Base & Development Flows**

	AM Peak				PM Peak			
	A6195 N	Manvers Way	A6195 S	Highgate	A6195 N	Manvers Way	A6195 S	Highgate
A6195 N	0	620	595	0	0	575	706	21
Manvers Way	539	0	448	9	538	0	506	63
A6195 S	690	530	0	8	663	546	0	18
Highgate	13	21	13	0	0	1	0	0

## **APPENDIX G**

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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THE USER OF THIS COMPUTER PROGRAM FOR THE SOLUTION OF AN ENGINEERING PROBLEM IS  
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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY\  
HMCR 2017 AM Base.vai"  
(drive-on-the-left ) at 12:38:36 on Tuesday, 8 April 2014

FILE PROPERTIES  
\*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
LOCATION: Barnsley  
DATE: 03/04/14  
CLIENT: Peel Environmental Ltd  
ENUMERATOR: Thompson [THOMPSON-HP]  
JOB NUMBER: SK21341  
STATUS: TIA  
DESCRIPTION:

INPUT DATA  
\*\*\*\*\*  
ARM A - A6195 (north)  
ARM B - ASOS  
ARM C - A6195 (south)  
ARM D - Site Access

GEOMETRIC DATA  
-----

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width                   L = effective flare length                   D = inscribed circle diameter  
E = entry width                            R = entry radius                            PHI = entry angle

TRAFFIC DEMAND DATA  
-----

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	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 (07.15) AND ENDS (08.45)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2017 AM Peak Base

T15

		NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
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	45.00	75.00	5.88	8.81	5.88
I ARM B	I	15.00	45.00	75.00	0.32	0.49	0.32
I ARM C	I	15.00	45.00	75.00	6.94	10.41	6.94
I ARM D	I	15.00	45.00	75.00	0.35	0.52	0.35

DEMAND SET TITLE: 2017 AM Peak Base

T33

		TURNING PROPORTIONS				
		TURNING COUNTS				
		(PERCENTAGE OF H.V.S)				
TIME		FROM/T	ARM A	ARM B	ARM C	ARM D
07.15 - 08.45						
I	ARM A	I	0.000	0.057	0.883	0.060
I		I	0.0	27.0	415.0	28.0
I		I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	ARM B	I	0.462	0.000	0.538	0.000
I		I	12.0	0.0	14.0	0.0
I		I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	ARM C	I	0.885	0.065	0.000	0.050
I		I	491.0	36.0	0.0	28.0
I		I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	ARM D	I	0.500	0.000	0.500	0.000
I		I	14.0	0.0	14.0	0.0
I		I	( 0.0)	( 0.0)	( 0.0)	( 0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

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	07.15-07.30									
I	ARM A	5.90	24.03	0.245	-	0.0	0.3	4.8	-	0.055
I	ARM B	0.33	21.41	0.015	-	0.0	0.0	0.2	-	0.047
I	ARM C	6.96	27.66	0.252	-	0.0	0.3	4.9	-	0.048
I	ARM D	0.35	21.15	0.017	-	0.0	0.0	0.2	-	0.048

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)
07.30-07.45									
ARM A	7.04	23.96	0.294	-	0.3	0.4	6.1	-	0.059
ARM B	0.39	20.81	0.019	-	0.0	0.0	0.3	-	0.049
ARM C	8.32	27.60	0.301	-	0.3	0.4	6.3	-	0.052
ARM D	0.42	20.45	0.021	-	0.0	0.0	0.3	-	0.050

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									
ARM A	8.62	23.87	0.361	-	0.4	0.6	8.3	-	0.065
ARM B	0.48	20.00	0.024	-	0.0	0.0	0.4	-	0.051
ARM C	10.18	27.52	0.370	-	0.4	0.6	8.6	-	0.058
ARM D	0.51	19.49	0.026	-	0.0	0.0	0.4	-	0.053

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									
ARM A	8.62	23.87	0.361	-	0.6	0.6	8.4	-	0.066
ARM B	0.48	20.00	0.024	-	0.0	0.0	0.4	-	0.051
ARM C	10.18	27.52	0.370	-	0.6	0.6	8.8	-	0.058
ARM D	0.51	19.48	0.026	-	0.0	0.0	0.4	-	0.053

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									
ARM A	7.04	23.96	0.294	-	0.6	0.4	6.4	-	0.059
ARM B	0.39	20.81	0.019	-	0.0	0.0	0.3	-	0.049
ARM C	8.32	27.60	0.301	-	0.6	0.4	6.6	-	0.052
ARM D	0.42	20.44	0.021	-	0.0	0.0	0.3	-	0.050

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									
ARM A	5.90	24.03	0.245	-	0.4	0.3	5.0	-	0.055
ARM B	0.33	21.40	0.015	-	0.0	0.0	0.2	-	0.047
ARM C	6.96	27.65	0.252	-	0.4	0.3	5.1	-	0.048
ARM D	0.35	21.14	0.017	-	0.0	0.0	0.3	-	0.048

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.6 *
08.15	0.6 *
08.30	0.4
08.45	0.3

-----  
 QUEUE AT ARM B  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

-----  
 QUEUE AT ARM C  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.6 *
08.15	0.6 *
08.30	0.4
08.45	0.3

-----  
 QUEUE AT ARM D  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

-----  
 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD  
 -----

										T75
I	ARM	I	TOTAL DEMAND	I	* QUEUEING * * DELAY *	I	* INCLUSIVE QUEUEING * * DELAY *	I	I	I
I		I	(VEH)	I	(MIN)	I	(MIN)	I	(MIN/VEH)	I
I	A	I	646.9	I	431.3	I	38.9	I	0.06	I
I	B	I	35.8	I	23.9	I	1.8	I	0.05	I
I	C	I	763.9	I	509.3	I	40.4	I	0.05	I
I	D	I	38.5	I	25.7	I	1.9	I	0.05	I
I	ALL	I	1485.2	I	990.1	I	83.1	I	0.06	I

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

END OF JOB

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

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY - TRRC Only\HMCR 2017 AM with Development.vai"  
 (drive-on-the-left) at 15:44:13 on Thursday, 22 January 2015

FILE PROPERTIES  
 \*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
 LOCATION: Barnsley  
 DATE: 22/01/15  
 CLIENT: Peel Environmental Ltd  
 ENUMERATOR: Thompson [THOMPSON-HP]  
 JOB NUMBER: SK21341  
 STATUS: TIA  
 DESCRIPTION:

INPUT DATA  
 \*\*\*\*\*  
 ARM A - A6195 (north)  
 ARM B - ASOS  
 ARM C - A6195 (south)  
 ARM D - Site Access

GEOMETRIC DATA

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
 E = entry width                  R = entry radius                  PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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 (07.15) AND ENDS (08.45)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2017 AM Peak with Development

T15

I ARM	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
		I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER
I	I	I TO RISE	I IS REACHED	I FALLING	I PEAK	I OF PEAK	I PEAK
I ARM A	I	I 15.00	I 45.00	I 75.00	I 5.59	I 8.38	I 5.59
I ARM B	I	I 15.00	I 45.00	I 75.00	I 0.32	I 0.49	I 0.32
I ARM C	I	I 15.00	I 45.00	I 75.00	I 6.65	I 9.98	I 6.65
I ARM D	I	I 15.00	I 45.00	I 75.00	I 0.06	I 0.09	I 0.06

DEMAND SET TITLE: 2017 AM Peak with Development

T33

I TIME	I FROM/T	TURNING PROPORTIONS			
		I ARM A	I ARM B	I ARM C	I ARM D
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
I 07.15 - 08.45	I ARM A	I 0.000	I 0.060	I 0.928	I 0.011
		I 0.0	I 27.0	I 415.0	I 5.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
	I ARM B	I 0.462	I 0.000	I 0.538	I 0.000
		I 12.0	I 0.0	I 14.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
	I ARM C	I 0.923	I 0.068	I 0.000	I 0.009
		I 491.0	I 36.0	I 0.0	I 5.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
	I ARM D	I 0.400	I 0.000	I 0.600	I 0.000
		I 2.0	I 0.0	I 3.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

I TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I PEDESTRIAN FLOW (PEDS/MIN)	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/ TIME SEGMENT)	I GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 07.15-07.30									
I ARM A	I 5.61	I 24.10	I 0.233	I -	I 0.0	I 0.3	I 4.4	I -	I 0.054
I ARM B	I 0.33	I 21.63	I 0.015	I -	I 0.0	I 0.0	I 0.2	I -	I 0.047
I ARM C	I 6.68	I 27.82	I 0.240	I -	I 0.0	I 0.3	I 4.6	I -	I 0.047
I ARM D	I 0.06	I 21.15	I 0.003	I -	I 0.0	I 0.0	I 0.0	I -	I 0.047

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)
07.30-07.45									
ARM A	6.70	24.05	0.278	-	0.3	0.4	5.7	-	0.058
ARM B	0.39	21.08	0.018	-	0.0	0.0	0.3	-	0.048
ARM C	7.97	27.80	0.287	-	0.3	0.4	5.9	-	0.050
ARM D	0.07	20.45	0.004	-	0.0	0.0	0.1	-	0.049

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									
ARM A	8.20	23.98	0.342	-	0.4	0.5	7.6	-	0.063
ARM B	0.48	20.33	0.023	-	0.0	0.0	0.4	-	0.050
ARM C	9.76	27.76	0.352	-	0.4	0.5	8.0	-	0.056
ARM D	0.09	19.49	0.005	-	0.0	0.0	0.1	-	0.052

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									
ARM A	8.20	23.98	0.342	-	0.5	0.5	7.8	-	0.063
ARM B	0.48	20.33	0.023	-	0.0	0.0	0.4	-	0.050
ARM C	9.76	27.76	0.352	-	0.5	0.5	8.1	-	0.056
ARM D	0.09	19.48	0.005	-	0.0	0.0	0.1	-	0.052

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									
ARM A	6.70	24.05	0.278	-	0.5	0.4	5.9	-	0.058
ARM B	0.39	21.08	0.018	-	0.0	0.0	0.3	-	0.048
ARM C	7.97	27.80	0.287	-	0.5	0.4	6.2	-	0.050
ARM D	0.07	20.44	0.004	-	0.0	0.0	0.1	-	0.049

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									
ARM A	5.61	24.10	0.233	-	0.4	0.3	4.6	-	0.054
ARM B	0.33	21.62	0.015	-	0.0	0.0	0.2	-	0.047
ARM C	6.68	27.82	0.240	-	0.4	0.3	4.8	-	0.047
ARM D	0.06	21.14	0.003	-	0.0	0.0	0.0	-	0.047

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.5 *
08.15	0.5 *
08.30	0.4
08.45	0.3

-----  
 QUEUE AT ARM B  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

-----  
 QUEUE AT ARM C  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.5 *
08.15	0.5 *
08.30	0.4
08.45	0.3

-----  
 QUEUE AT ARM D  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

-----  
 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD  
 -----

										T75
I	ARM	I	TOTAL DEMAND	I	* QUEUEING * * DELAY *	I	* INCLUSIVE QUEUEING * * DELAY *	I	I	I
I		I	(VEH)	I	(MIN)	I	(MIN)	I	(MIN/VEH)	I
I	A	I	615.3	I	410.2	I	36.0	I	0.06	I
I	B	I	35.8	I	23.9	I	1.7	I	0.05	I
I	C	I	732.3	I	488.2	I	37.6	I	0.05	I
I	D	I	6.9	I	4.6	I	0.3	I	0.05	I
I	ALL	I	1390.2	I	926.8	I	75.7	I	0.05	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 =====

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY\  
HMCR 2017 PM Base.vai"  
(drive-on-the-left ) at 12:39:23 on Tuesday, 8 April 2014

FILE PROPERTIES  
\*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
LOCATION: Barnsley  
DATE: 03/04/14  
CLIENT: Peel Environmental Ltd  
ENUMERATOR: Thompson [THOMPSON-HP]  
JOB NUMBER: SK21341  
STATUS: TIA  
DESCRIPTION:

INPUT DATA  
\*\*\*\*\*  
ARM A - A6195 (north)  
ARM B - ASOS  
ARM C - A6195 (south)  
ARM D - Site Access

GEOMETRIC DATA  
-----

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
E = entry width                  R = entry radius                  PHI = entry angle

TRAFFIC DEMAND DATA  
-----

Only sets included in the current run are shown

SCALING FACTORS



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									
ARM A	8.12	24.09	0.337	-	0.4	0.5	7.5	-	0.063
ARM B	1.00	20.05	0.050	-	0.0	0.1	0.8	-	0.052
ARM C	8.75	27.66	0.316	-	0.4	0.5	6.8	-	0.053
ARM D	0.70	19.93	0.035	-	0.0	0.0	0.5	-	0.052

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									
ARM A	9.95	24.03	0.414	-	0.5	0.7	10.3	-	0.071
ARM B	1.23	19.07	0.064	-	0.1	0.1	1.0	-	0.056
ARM C	10.72	27.60	0.388	-	0.5	0.6	9.3	-	0.059
ARM D	0.86	18.86	0.046	-	0.0	0.0	0.7	-	0.056

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									
ARM A	9.95	24.03	0.414	-	0.7	0.7	10.5	-	0.071
ARM B	1.23	19.06	0.065	-	0.1	0.1	1.0	-	0.056
ARM C	10.72	27.60	0.388	-	0.6	0.6	9.5	-	0.059
ARM D	0.86	18.85	0.046	-	0.0	0.0	0.7	-	0.056

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									
ARM A	8.12	24.09	0.337	-	0.7	0.5	7.8	-	0.063
ARM B	1.00	20.04	0.050	-	0.1	0.1	0.8	-	0.053
ARM C	8.75	27.66	0.316	-	0.6	0.5	7.1	-	0.053
ARM D	0.70	19.92	0.035	-	0.0	0.0	0.6	-	0.052

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									
ARM A	6.80	24.13	0.282	-	0.5	0.4	6.0	-	0.058
ARM B	0.84	20.75	0.041	-	0.1	0.0	0.6	-	0.050
ARM C	7.33	27.70	0.264	-	0.5	0.4	5.5	-	0.049
ARM D	0.59	20.71	0.028	-	0.0	0.0	0.4	-	0.050

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5 *
16.45	0.7 *
17.00	0.7 *
17.15	0.5 *
17.30	0.4

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.0

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5
16.45	0.6 *
17.00	0.6 *
17.15	0.5
17.30	0.4

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

										T75		
I	ARM	I	TOTAL DEMAND	I	* QUEUEING * * DELAY *	I	* INCLUSIVE QUEUEING * * DELAY *	I	I	I		
I		I		I		I		I		I		
I		I	(VEH)	I	(MIN)	I	(MIN)	I	(MIN/VEH)	I		
I	A	I	746.0	I	47.8	I	0.06	I	47.8	I	0.06	I
I	B	I	92.2	I	61.5	I	4.9	I	4.9	I	0.05	I
I	C	I	803.8	I	535.9	I	43.4	I	43.4	I	0.05	I
I	D	I	64.7	I	43.1	I	3.4	I	3.4	I	0.05	I
I	ALL	I	1706.8	I	1137.8	I	99.6	I	99.6	I	0.06	I

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

END OF JOB

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

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY - TRRC Only\HMCR 2017 PM with Development.vai"  
 (drive-on-the-left ) at 15:48:55 on Thursday, 22 January 2015

FILE PROPERTIES  
 \*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
 LOCATION: Barnsley  
 DATE: 22/01/15  
 CLIENT: Peel Environmental Ltd  
 ENUMERATOR: Thompson [THOMPSON-HP]  
 JOB NUMBER: SK21341  
 STATUS: TIA  
 DESCRIPTION:

INPUT DATA  
 \*\*\*\*\*  
 ARM A - A6195 (north)  
 ARM B - ASOS  
 ARM C - A6195 (south)  
 ARM D - Site Access

GEOMETRIC DATA

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
 E = entry width                  R = entry radius                  PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

I ARM	I	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 (16.00) AND ENDS (17.30)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2017 PM Peak with Development

T15

I ARM	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
		I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER
I	I	I TO RISE	I IS REACHED	I FALLING	I PEAK	I OF PEAK	I PEAK
I ARM A	I	15.00	45.00	75.00	6.70	10.05	6.70
I ARM B	I	15.00	45.00	75.00	0.84	1.26	0.84
I ARM C	I	15.00	45.00	75.00	7.21	10.82	7.21
I ARM D	I	15.00	45.00	75.00	0.08	0.11	0.08

DEMAND SET TITLE: 2017 PM Peak with Development

T33

I TIME	I FROM/T	TURNING PROPORTIONS			
		I ARM A	I ARM B	I ARM C	I ARM D
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
I 16.00 - 17.30	I ARM A	I 0.000	I 0.022	I 0.978	I 0.000
		I 0.0	I 12.0	I 524.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
		I	I	I	I
	I ARM B	I 0.403	I 0.000	I 0.597	I 0.000
		I 27.0	I 0.0	I 40.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
		I	I	I	I
	I ARM C	I 0.983	I 0.017	I 0.000	I 0.000
		I 567.0	I 10.0	I 0.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
		I	I	I	I
	I ARM D	I 0.500	I 0.000	I 0.500	I 0.000
		I 3.0	I 0.0	I 3.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
		I	I	I	I

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

I TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I PEDESTRIAN FLOW (PEDS/MIN)	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/TIME SEGMENT)	I GEOMETRIC DELAY (VEH.MIN/TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 16.00-16.15									
I ARM A	6.73	24.27	0.277	-	0.0	0.4	5.6	-	0.057
I ARM B	0.84	20.95	0.040	-	0.0	0.0	0.6	-	0.050
I ARM C	7.24	27.75	0.261	-	0.0	0.4	5.2	-	0.049
I ARM D	0.08	20.72	0.004	-	0.0	0.0	0.1	-	0.048

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									
ARM A	8.03	24.25	0.331	-	0.4	0.5	7.3	-	0.062
ARM B	1.00	20.26	0.050	-	0.0	0.1	0.8	-	0.052
ARM C	8.65	27.71	0.312	-	0.4	0.5	6.7	-	0.052
ARM D	0.09	19.93	0.005	-	0.0	0.0	0.1	-	0.050

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									
ARM A	9.84	24.23	0.406	-	0.5	0.7	10.0	-	0.069
ARM B	1.23	19.33	0.064	-	0.1	0.1	1.0	-	0.055
ARM C	10.59	27.66	0.383	-	0.5	0.6	9.1	-	0.059
ARM D	0.11	18.86	0.006	-	0.0	0.0	0.1	-	0.053

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									
ARM A	9.84	24.23	0.406	-	0.7	0.7	10.2	-	0.069
ARM B	1.23	19.32	0.064	-	0.1	0.1	1.0	-	0.055
ARM C	10.59	27.66	0.383	-	0.6	0.6	9.3	-	0.059
ARM D	0.11	18.85	0.006	-	0.0	0.0	0.1	-	0.053

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									
ARM A	8.03	24.25	0.331	-	0.7	0.5	7.6	-	0.062
ARM B	1.00	20.25	0.050	-	0.1	0.1	0.8	-	0.052
ARM C	8.65	27.71	0.312	-	0.6	0.5	6.9	-	0.053
ARM D	0.09	19.92	0.005	-	0.0	0.0	0.1	-	0.050

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									
ARM A	6.73	24.27	0.277	-	0.5	0.4	5.9	-	0.057
ARM B	0.84	20.93	0.040	-	0.1	0.0	0.6	-	0.050
ARM C	7.24	27.75	0.261	-	0.5	0.4	5.4	-	0.049
ARM D	0.08	20.71	0.004	-	0.0	0.0	0.1	-	0.048

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5
16.45	0.7 *
17.00	0.7 *
17.15	0.5
17.30	0.4

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.0

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5
16.45	0.6 *
17.00	0.6 *
17.15	0.5
17.30	0.4

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

ARM	TOTAL DEMAND (VEH)	INCLUSIVE QUEUEING DELAY (MIN)	EXCLUSIVE QUEUEING DELAY (MIN)	TOTAL DEMAND (VEH/H)	INCLUSIVE QUEUEING DELAY (MIN/VEH)	EXCLUSIVE QUEUEING DELAY (MIN/VEH)
A	737.8	46.5	0.06	491.8	46.5	0.06
B	92.2	4.8	0.05	61.5	4.8	0.05
C	794.2	42.5	0.05	529.5	42.5	0.05
D	8.3	0.4	0.05	5.5	0.4	0.05
ALL	1632.4	94.3	0.06	1088.3	94.3	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 =====

## **APPENDIX H**

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY\  
HMCR 2019 AM Base.vai"  
(drive-on-the-left ) at 12:05:19 on Thursday, 17 April 2014

FILE PROPERTIES  
\*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
LOCATION: Barnsley  
DATE: 03/04/14  
CLIENT: Peel Environmental Ltd  
ENUMERATOR: Thompson [THOMPSON-HP]  
JOB NUMBER: SK21341  
STATUS: TIA  
DESCRIPTION:

INPUT DATA  
\*\*\*\*\*  
ARM A - A6195 (north)  
ARM B - ASOS  
ARM C - A6195 (south)  
ARM D - Site Access

GEOMETRIC DATA  
-----

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
E = entry width                  R = entry radius                  PHI = entry angle

TRAFFIC DEMAND DATA  
-----

Only sets included in the current run are shown

SCALING FACTORS

T13

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 (07.15) AND ENDS (08.45)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2019 AM Peak Base

T15

		NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
I ARM	I	I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER
I	I	I TO RISE	I IS REACHED	I FALLING	I PEAK	I OF PEAK	I PEAK
I ARM A	I	15.00	45.00	75.00	6.05	9.08	6.05
I ARM B	I	15.00	45.00	75.00	0.35	0.52	0.35
I ARM C	I	15.00	45.00	75.00	7.16	10.74	7.16
I ARM D	I	15.00	45.00	75.00	0.35	0.52	0.35

DEMAND SET TITLE: 2019 AM Peak Base

T33

		TURNING PROPORTIONS				
		TURNING COUNTS				
		(PERCENTAGE OF H.V.S)				
TIME		FROM/T	ARM A	ARM B	ARM C	ARM D
07.15 - 08.45						
	ARM A	0.000	0.058	0.884	0.058	
		0.0	28.0	428.0	28.0	
		( 0.0)	( 0.0)	( 0.0)	( 0.0)	
	ARM B	0.464	0.000	0.536	0.000	
		13.0	0.0	15.0	0.0	
		( 0.0)	( 0.0)	( 0.0)	( 0.0)	
	ARM C	0.885	0.066	0.000	0.049	
		507.0	38.0	0.0	28.0	
		( 0.0)	( 0.0)	( 0.0)	( 0.0)	
	ARM D	0.500	0.000	0.500	0.000	
		14.0	0.0	14.0	0.0	
		( 0.0)	( 0.0)	( 0.0)	( 0.0)	

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

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 07.15-07.30									
I ARM A	6.07	24.01	0.253	- -	0.0	0.3	4.9	-	0.056
I ARM B	0.35	21.32	0.016	- -	0.0	0.0	0.2	-	0.048
I ARM C	7.19	27.65	0.260	- -	0.0	0.3	5.1	-	0.049
I ARM D	0.35	21.03	0.017	- -	0.0	0.0	0.3	-	0.048

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)
07.30-07.45									
ARM A	7.25	23.95	0.303	-	0.3	0.4	6.4	-	0.060
ARM B	0.42	20.71	0.020	-	0.0	0.0	0.3	-	0.049
ARM C	8.59	27.59	0.311	-	0.3	0.4	6.6	-	0.053
ARM D	0.42	20.30	0.021	-	0.0	0.0	0.3	-	0.050

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									
ARM A	8.88	23.86	0.372	-	0.4	0.6	8.7	-	0.067
ARM B	0.51	19.88	0.026	-	0.0	0.0	0.4	-	0.052
ARM C	10.51	27.51	0.382	-	0.4	0.6	9.1	-	0.059
ARM D	0.51	19.31	0.027	-	0.0	0.0	0.4	-	0.053

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									
ARM A	8.88	23.86	0.372	-	0.6	0.6	8.9	-	0.067
ARM B	0.51	19.87	0.026	-	0.0	0.0	0.4	-	0.052
ARM C	10.51	27.51	0.382	-	0.6	0.6	9.2	-	0.059
ARM D	0.51	19.30	0.027	-	0.0	0.0	0.4	-	0.053

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									
ARM A	7.25	23.95	0.303	-	0.6	0.4	6.7	-	0.060
ARM B	0.42	20.70	0.020	-	0.0	0.0	0.3	-	0.049
ARM C	8.59	27.59	0.311	-	0.6	0.5	6.9	-	0.053
ARM D	0.42	20.29	0.021	-	0.0	0.0	0.3	-	0.050

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									
ARM A	6.07	24.01	0.253	-	0.4	0.3	5.2	-	0.056
ARM B	0.35	21.31	0.016	-	0.0	0.0	0.3	-	0.048
ARM C	7.19	27.65	0.260	-	0.5	0.4	5.4	-	0.049
ARM D	0.35	21.01	0.017	-	0.0	0.0	0.3	-	0.048

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.6 *
08.15	0.6 *
08.30	0.4
08.45	0.3

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.6 *
08.15	0.6 *
08.30	0.5
08.45	0.4

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

										T75
I	ARM	I	TOTAL DEMAND	I	* QUEUEING * * DELAY *	I	* INCLUSIVE QUEUEING * * DELAY *	I	I	I
I		I	(VEH)	I	(MIN)	I	(MIN)	I	(MIN/VEH)	I
I	A	I	666.2	I	40.7	I	40.7	I	0.06	I
I	B	I	38.5	I	1.9	I	1.9	I	0.05	I
I	C	I	788.7	I	42.4	I	42.4	I	0.05	I
I	D	I	38.5	I	2.0	I	2.0	I	0.05	I
I	ALL	I	1532.0	I	86.9	I	87.0	I	0.06	I

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

END OF JOB

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

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY - TRRC Only\HMCR 2019 AM with Development.vai"  
 (drive-on-the-left ) at 15:51:03 on Thursday, 22 January 2015

FILE PROPERTIES  
 \*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
 LOCATION: Barnsley  
 DATE: 22/01/15  
 CLIENT: Peel Environmental Ltd  
 ENUMERATOR: Thompson [THOMPSON-HP]  
 JOB NUMBER: SK21341  
 STATUS: TIA  
 DESCRIPTION:

INPUT DATA  
 \*\*\*\*\*  
 ARM A - A6195 (north)  
 ARM B - ASOS  
 ARM C - A6195 (south)  
 ARM D - Site Access

GEOMETRIC DATA

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
 E = entry width                  R = entry radius                  PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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 (07.15) AND ENDS (08.45)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2019 AM Peak with Development

T15

I ARM	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
		I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER
I	I	I TO RISE	I IS REACHED	I FALLING	I PEAK	I OF PEAK	I PEAK
I ARM A	I	I 15.00	I 45.00	I 75.00	I 5.76	I 8.64	I 5.76
I ARM B	I	I 15.00	I 45.00	I 75.00	I 0.35	I 0.52	I 0.35
I ARM C	I	I 15.00	I 45.00	I 75.00	I 6.88	I 10.31	I 6.88
I ARM D	I	I 15.00	I 45.00	I 75.00	I 0.06	I 0.09	I 0.06

DEMAND SET TITLE: 2019 AM Peak with Development

T33

I TIME	I FROM/T	TURNING PROPORTIONS			
		I ARM A	I ARM B	I ARM C	I ARM D
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
I 07.15 - 08.45	I ARM A	I 0.000	I 0.061	I 0.928	I 0.011
		I 0.0	I 28.0	I 428.0	I 5.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
	I ARM B	I 0.464	I 0.000	I 0.536	I 0.000
		I 13.0	I 0.0	I 15.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
	I ARM C	I 0.922	I 0.069	I 0.000	I 0.009
		I 507.0	I 38.0	I 0.0	I 5.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
	I ARM D	I 0.400	I 0.000	I 0.600	I 0.000
		I 2.0	I 0.0	I 3.0	I 0.0
		I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

I TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I PEDESTRIAN FLOW (PEDS/MIN)	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/TIME SEGMENT)	I GEOMETRIC DELAY (VEH.MIN/TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 07.15-07.30									
I ARM A	I 5.78	I 24.09	I 0.240	I -	I 0.0	I 0.3	I 4.6	I -	I 0.054
I ARM B	I 0.35	I 21.55	I 0.016	I -	I 0.0	I 0.0	I 0.2	I -	I 0.047
I ARM C	I 6.90	I 27.81	I 0.248	I -	I 0.0	I 0.3	I 4.8	I -	I 0.048
I ARM D	I 0.06	I 21.03	I 0.003	I -	I 0.0	I 0.0	I 0.0	I -	I 0.048

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)
07.30-07.45									
ARM A	6.91	24.03	0.287	-	0.3	0.4	5.9	-	0.058
ARM B	0.42	20.98	0.020	-	0.0	0.0	0.3	-	0.049
ARM C	8.24	27.79	0.297	-	0.3	0.4	6.2	-	0.051
ARM D	0.07	20.30	0.004	-	0.0	0.0	0.1	-	0.049

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									
ARM A	8.46	23.96	0.353	-	0.4	0.5	8.0	-	0.064
ARM B	0.51	20.21	0.025	-	0.0	0.0	0.4	-	0.051
ARM C	10.09	27.75	0.364	-	0.4	0.6	8.4	-	0.057
ARM D	0.09	19.31	0.005	-	0.0	0.0	0.1	-	0.052

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									
ARM A	8.46	23.96	0.353	-	0.5	0.5	8.1	-	0.064
ARM B	0.51	20.20	0.025	-	0.0	0.0	0.4	-	0.051
ARM C	10.09	27.75	0.364	-	0.6	0.6	8.5	-	0.057
ARM D	0.09	19.30	0.005	-	0.0	0.0	0.1	-	0.052

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									
ARM A	6.91	24.03	0.287	-	0.5	0.4	6.2	-	0.058
ARM B	0.42	20.97	0.020	-	0.0	0.0	0.3	-	0.049
ARM C	8.24	27.79	0.297	-	0.6	0.4	6.5	-	0.051
ARM D	0.07	20.29	0.004	-	0.0	0.0	0.1	-	0.049

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									
ARM A	5.78	24.09	0.240	-	0.4	0.3	4.8	-	0.055
ARM B	0.35	21.53	0.016	-	0.0	0.0	0.3	-	0.047
ARM C	6.90	27.81	0.248	-	0.4	0.3	5.0	-	0.048
ARM D	0.06	21.01	0.003	-	0.0	0.0	0.0	-	0.048

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.5 *
08.15	0.5 *
08.30	0.4
08.45	0.3

-----  
 QUEUE AT ARM B  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

-----  
 QUEUE AT ARM C  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.3
07.45	0.4
08.00	0.6 *
08.15	0.6 *
08.30	0.4
08.45	0.3

-----  
 QUEUE AT ARM D  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
07.30	0.0
07.45	0.0
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0

-----  
 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD  
 -----

										T75
I	ARM	I	TOTAL DEMAND	I	* QUEUEING * * DELAY *	I	* INCLUSIVE QUEUEING * * DELAY *	I		I
I		I	(VEH)	I	(MIN)	I	(MIN)	I	(MIN/VEH)	I
I	A	I	634.5	I	37.7	I	37.7	I	0.06	I
I	B	I	38.5	I	1.9	I	1.9	I	0.05	I
I	C	I	757.0	I	39.5	I	39.5	I	0.05	I
I	D	I	6.9	I	0.3	I	0.3	I	0.05	I
I	ALL	I	1437.0	I	79.4	I	79.4	I	0.06	I

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

END OF JOB  
 ===== end of file =====

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY\  
HMCR 2019 PM Base.vai"  
(drive-on-the-left ) at 12:09:21 on Thursday, 17 April 2014

FILE PROPERTIES  
\*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
LOCATION: Barnsley  
DATE: 03/04/14  
CLIENT: Peel Environmental Ltd  
ENUMERATOR: Thompson [THOMPSON-HP]  
JOB NUMBER: SK21341  
STATUS: TIA  
DESCRIPTION:

INPUT DATA  
\*\*\*\*\*  
ARM A - A6195 (north)  
ARM B - ASOS  
ARM C - A6195 (south)  
ARM D - Site Access

GEOMETRIC DATA  
-----

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width                   L = effective flare length                   D = inscribed circle diameter  
E = entry width                             R = entry radius                             PHI = entry angle

TRAFFIC DEMAND DATA  
-----

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	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 (16.00) AND ENDS (17.30)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2019 PM Peak Base

T15

I	ARM	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
			I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER
I	I	I	I TO RISE	I IS REACHED	I FALLING	I PEAK	I OF PEAK	I PEAK
I ARM A	I	I	15.00	45.00	75.00	7.03	10.54	7.03
I ARM B	I	I	15.00	45.00	75.00	0.88	1.31	0.88
I ARM C	I	I	15.00	45.00	75.00	7.56	11.34	7.56
I ARM D	I	I	15.00	45.00	75.00	0.59	0.88	0.59

DEMAND SET TITLE: 2019 PM Peak Base

T33

I	TIME	I FROM/T	TURNING PROPORTIONS			
			I ARM A	I ARM B	I ARM C	I ARM D
I	I	I	TURNING COUNTS			
I	I	I	(PERCENTAGE OF H.V.S)			
I	16.00 - 17.30	I	I	I	I	I
I	I	I ARM A	0.000	0.023	0.966	0.011
I	I	I	0.0	13.0	543.0	6.0
I	I	I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	I	I	I	I	I	I
I	I	I ARM B	0.400	0.000	0.600	0.000
I	I	I	28.0	0.0	42.0	0.0
I	I	I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	I	I	I	I	I	I
I	I	I ARM C	0.970	0.018	0.000	0.012
I	I	I	587.0	11.0	0.0	7.0
I	I	I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	I	I	I	I	I	I
I	I	I ARM D	0.489	0.000	0.511	0.000
I	I	I	23.0	0.0	24.0	0.0
I	I	I	( 0.0)	( 0.0)	( 0.0)	( 0.0)
I	I	I	I	I	I	I

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

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	16.00-16.15									
I	ARM A	7.05	24.13	0.292	-	0.0	0.4	6.0	-	0.058
I	ARM B	0.88	20.65	0.043	-	0.0	0.0	0.7	-	0.051
I	ARM C	7.59	27.70	0.274	-	0.0	0.4	5.5	-	0.050
I	ARM D	0.59	20.58	0.029	-	0.0	0.0	0.4	-	0.050

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									
ARM A	8.42	24.08	0.350	-	0.4	0.5	7.9	-	0.064
ARM B	1.05	19.90	0.053	-	0.0	0.1	0.8	-	0.053
ARM C	9.06	27.65	0.328	-	0.4	0.5	7.2	-	0.054
ARM D	0.70	19.76	0.036	-	0.0	0.0	0.5	-	0.052

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									
ARM A	10.31	24.02	0.429	-	0.5	0.7	10.9	-	0.073
ARM B	1.28	18.88	0.068	-	0.1	0.1	1.1	-	0.057
ARM C	11.10	27.59	0.402	-	0.5	0.7	9.8	-	0.061
ARM D	0.86	18.65	0.046	-	0.0	0.0	0.7	-	0.056

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									
ARM A	10.31	24.02	0.429	-	0.7	0.7	11.2	-	0.073
ARM B	1.28	18.88	0.068	-	0.1	0.1	1.1	-	0.057
ARM C	11.10	27.58	0.402	-	0.7	0.7	10.1	-	0.061
ARM D	0.86	18.64	0.046	-	0.0	0.0	0.7	-	0.056

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									
ARM A	8.42	24.08	0.350	-	0.7	0.5	8.3	-	0.064
ARM B	1.05	19.89	0.053	-	0.1	0.1	0.8	-	0.053
ARM C	9.06	27.65	0.328	-	0.7	0.5	7.5	-	0.054
ARM D	0.70	19.75	0.036	-	0.0	0.0	0.6	-	0.053

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									
ARM A	7.05	24.12	0.292	-	0.5	0.4	6.3	-	0.059
ARM B	0.88	20.63	0.043	-	0.1	0.0	0.7	-	0.051
ARM C	7.59	27.70	0.274	-	0.5	0.4	5.8	-	0.050
ARM D	0.59	20.56	0.029	-	0.0	0.0	0.4	-	0.050

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5 *
16.45	0.7 *
17.00	0.7 *
17.15	0.5 *
17.30	0.4

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.0

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5
16.45	0.7 *
17.00	0.7 *
17.15	0.5
17.30	0.4

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

										T75
I	ARM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I	I	I
I		I		I	* DELAY *	I	* DELAY *	I		I
I		I	(VEH)	I	(MIN)	I	(MIN)	I	(MIN/VEH)	I
I		I	(VEH/H)	I	(MIN/VEH)	I	(MIN/VEH)	I		I
I	A	I	773.6	I	515.7	I	50.7	I	0.07	I
I	B	I	96.3	I	64.2	I	5.2	I	0.05	I
I	C	I	832.7	I	555.2	I	45.9	I	0.06	I
I	D	I	64.7	I	43.1	I	3.4	I	0.05	I
I	ALL	I	1767.3	I	1178.2	I	105.1	I	0.06	I

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

END OF JOB

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

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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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:-

"C:\Users\Thompson\Documents\SKTP\SK21341 Houghton EfW Barnsley\Junction Assessments\ARCADY - TRRC Only\HMCR 2019 PM with Development.vai"  
 (drive-on-the-left) at 15:52:09 on Thursday, 22 January 2015

FILE PROPERTIES  
 \*\*\*\*\*

RUN TITLE: Houghton Main Colliery Roundabout  
 LOCATION: Barnsley  
 DATE: 22/01/15  
 CLIENT: Peel Environmental Ltd  
 ENUMERATOR: Thompson [THOMPSON-HP]  
 JOB NUMBER: SK21341  
 STATUS: TIA  
 DESCRIPTION:

INPUT DATA  
 \*\*\*\*\*  
 ARM A - A6195 (north)  
 ARM B - ASOS  
 ARM C - A6195 (south)  
 ARM D - Site Access

GEOMETRIC DATA

I	ARM	I	V (M)	I	E (M)	I	L (M)	I	R (M)	I	D (M)	I	PHI (DEG)	I	SLOPE	I	INTERCEPT (PCU/MIN)	I
I	ARM A	I	3.65	I	6.20	I	5.50	I	20.00	I	60.00	I	21.0	I	0.524	I	24.355	I
I	ARM B	I	3.65	I	6.00	I	5.50	I	20.00	I	60.00	I	18.0	I	0.527	I	24.422	I
I	ARM C	I	3.65	I	7.00	I	9.00	I	30.00	I	60.00	I	15.0	I	0.571	I	27.941	I
I	ARM D	I	3.65	I	7.00	I	5.00	I	20.00	I	60.00	I	19.0	I	0.530	I	24.722	I

V = approach half-width      L = effective flare length      D = inscribed circle diameter  
 E = entry width                  R = entry radius                  PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

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 (16.00) AND ENDS (17.30)

LENGTH OF TIME PERIOD - ( 90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2019 PM Peak with Development

T15

I ARM	I	NUMBER OF MINUTES FROM START WHEN			RATE OF FLOW (VEH/MIN)		
		I FLOW STARTS	I TOP OF PEAK	I FLOW STOPS	I BEFORE	I AT TOP	I AFTER
I	I	I TO RISE	I IS REACHED	I FALLING	I PEAK	I OF PEAK	I PEAK
I ARM A	I	I 15.00	I 45.00	I 75.00	I 6.95	I 10.42	I 6.95
I ARM B	I	I 15.00	I 45.00	I 75.00	I 0.88	I 1.31	I 0.88
I ARM C	I	I 15.00	I 45.00	I 75.00	I 7.47	I 11.21	I 7.47
I ARM D	I	I 15.00	I 45.00	I 75.00	I 0.08	I 0.11	I 0.08

DEMAND SET TITLE: 2019 PM Peak with Development

T33

I	I	TURNING PROPORTIONS				
		TURNING COUNTS				
I		I (PERCENTAGE OF H.V.S)				
I		I				
I	I TIME	I FROM/T	I ARM A	I ARM B	I ARM C	I ARM D
I	I 16.00 - 17.30	I	I	I	I	I
I	I	I ARM A	I 0.000	I 0.023	I 0.977	I 0.000
I	I	I	I 0.0	I 13.0	I 543.0	I 0.0
I	I	I	I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
I	I	I	I	I	I	I
I	I	I ARM B	I 0.400	I 0.000	I 0.600	I 0.000
I	I	I	I 28.0	I 0.0	I 42.0	I 0.0
I	I	I	I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
I	I	I	I	I	I	I
I	I	I ARM C	I 0.982	I 0.018	I 0.000	I 0.000
I	I	I	I 587.0	I 11.0	I 0.0	I 0.0
I	I	I	I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
I	I	I	I	I	I	I
I	I	I ARM D	I 0.500	I 0.000	I 0.500	I 0.000
I	I	I	I 3.0	I 0.0	I 3.0	I 0.0
I	I	I	I ( 0.0)	I ( 0.0)	I ( 0.0)	I ( 0.0)
I	I	I	I	I	I	I

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

I TIME	I DEMAND (VEH/MIN)	I CAPACITY (VEH/MIN)	I DEMAND/CAPACITY (RFC)	I PEDESTRIAN FLOW (PEDS/MIN)	I START QUEUE (VEHS)	I END QUEUE (VEHS)	I DELAY (VEH.MIN/TIME SEGMENT)	I GEOMETRIC DELAY (VEH.MIN/TIME SEGMENT)	I AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
I 16.00-16.15									
I ARM A	I 6.98	I 24.26	I 0.288	I -	I 0.0	I 0.4	I 5.9	I -	I 0.058
I ARM B	I 0.88	I 20.82	I 0.042	I -	I 0.0	I 0.0	I 0.6	I -	I 0.050
I ARM C	I 7.50	I 27.74	I 0.270	I -	I 0.0	I 0.4	I 5.4	I -	I 0.049
I ARM D	I 0.08	I 20.58	I 0.004	I -	I 0.0	I 0.0	I 0.1	I -	I 0.049

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									
ARM A	8.33	24.25	0.344	-	0.4	0.5	7.7	-	0.063
ARM B	1.05	20.11	0.052	-	0.0	0.1	0.8	-	0.052
ARM C	8.96	27.70	0.323	-	0.4	0.5	7.0	-	0.053
ARM D	0.09	19.76	0.005	-	0.0	0.0	0.1	-	0.051

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									
ARM A	10.20	24.22	0.421	-	0.5	0.7	10.6	-	0.071
ARM B	1.28	19.15	0.067	-	0.1	0.1	1.1	-	0.056
ARM C	10.97	27.65	0.397	-	0.5	0.7	9.6	-	0.060
ARM D	0.11	18.65	0.006	-	0.0	0.0	0.1	-	0.054

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									
ARM A	10.20	24.22	0.421	-	0.7	0.7	10.9	-	0.071
ARM B	1.28	19.14	0.067	-	0.1	0.1	1.1	-	0.056
ARM C	10.97	27.65	0.397	-	0.7	0.7	9.8	-	0.060
ARM D	0.11	18.64	0.006	-	0.0	0.0	0.1	-	0.054

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									
ARM A	8.33	24.24	0.344	-	0.7	0.5	8.1	-	0.063
ARM B	1.05	20.10	0.052	-	0.1	0.1	0.8	-	0.052
ARM C	8.96	27.70	0.323	-	0.7	0.5	7.3	-	0.053
ARM D	0.09	19.75	0.005	-	0.0	0.0	0.1	-	0.051

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									
ARM A	6.98	24.26	0.288	-	0.5	0.4	6.2	-	0.058
ARM B	0.88	20.81	0.042	-	0.1	0.0	0.7	-	0.050
ARM C	7.50	27.74	0.270	-	0.5	0.4	5.7	-	0.049
ARM D	0.08	20.56	0.004	-	0.0	0.0	0.1	-	0.049

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5 *
16.45	0.7 *
17.00	0.7 *
17.15	0.5 *
17.30	0.4

-----  
 QUEUE AT ARM B  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1
17.30	0.0

-----  
 QUEUE AT ARM C  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.4
16.30	0.5
16.45	0.7 *
17.00	0.7 *
17.15	0.5
17.30	0.4

-----  
 QUEUE AT ARM D  
 -----

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.15	0.0
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0
17.30	0.0

-----  
 QUEUEING DELAY INFORMATION OVER WHOLE PERIOD  
 -----

										T75				
I	ARM	I	TOTAL DEMAND	I	* QUEUEING * * DELAY *	I	* INCLUSIVE QUEUEING * * DELAY *	I	I	I				
I		I		I		I		I		I				
I		I	(VEH)	I	(MIN)	I	(MIN/VEH)	I	(MIN)	I	(MIN/VEH)			
I	A	I	765.3	I	510.2	I	49.3	I	0.06	I	49.3	I	0.06	I
I	B	I	96.3	I	64.2	I	5.1	I	0.05	I	5.1	I	0.05	I
I	C	I	823.1	I	548.7	I	44.9	I	0.05	I	44.9	I	0.05	I
I	D	I	8.3	I	5.5	I	0.4	I	0.05	I	0.4	I	0.05	I
I	ALL	I	1693.0	I	1128.7	I	99.7	I	0.06	I	99.7	I	0.06	I

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

END OF JOB  
 ===== end of file =====