

Barnsley Metropolitan
Borough Council

Elsecar Park & Ride

Transport Statement

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Transport Statement

July 2010

Ove Arup & Partners Ltd

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This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party

Job number 213305-00

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1 Introduction

1.1 Commission

Arup has been commissioned by Barnsley Metropolitan Borough Council (BMBC) to provide engineering and planning advice for a proposed Park and Ride (P&R) facility, access road and residential development adjacent to Elsecar rail station.

Arup has prepared this Transport Statement to accompany the detailed planning application for the P&R site and access road and outline application for the residential element of the scheme. This Transport Statement is provided to BMBC, as planning and highway authority, to assist in the determination of the planning applications.

1.2 Background

SYPTe own the land adjacent to the northern side of the rail line at Elsecar rail station and BMBC own the adjoining land between the rail line and King Street. BMBC and SYPTe are working together to develop a Park and Ride facility and residential development at this location. The scheme is being developed as part of the Barnsley Housing Growth Point initiative.

Pre-application discussions were held with the BMBC Highway Development Control officer (Barbara Wilson) on 19 May 2010. In these discussions, it was agreed that a full Transport Assessment was not required to support the application. However, a Transport Statement providing detail of the predicted trip generation and technical analysis of the proposed access junctions to the rail station car park was requested by BMBC. This document forms the information required by BMBC to support the planning application.

1.3 Report Structure

Following on from this introduction, Section 2 provides some background information to the development site location, the local highway network and the surrounding local transport network. The proposed development is discussed in Section 3 including details of development traffic generation and access arrangements. Technical analysis of the access junctions to the site is also provided in Section 3 and Section 4 provides a summary and conclusions to the report.

2 Site Location and Existing Transport Network

2.1 Site Location

The site is located at Elsecar which is to the south of Hoyland between Barnsley and Rotherham, as shown on Figure 1. The site is bounded by the B6097 King Street to the north and Millhouses Street to the northwest. Residential properties on Noble Street provide the western boundary and the rail line provides a boundary to the south and east of the site.

Hoyland and Elsecar are predominantly residential areas within commuter distance of Barnsley, Rotherham, Sheffield, Doncaster and Leeds.

2.2 Local Highway Network

The key highway links surrounding the site are shown in Figure 1.

The site is located to the south of the B6097 King Street. The B6097 provides a link between Elsecar and Hoyland and provides connections to the M1 Junction 36 to the west. In the vicinity of the site, King Street is an approximately 9m wide single carriageway road providing access to local residences and some informal on street parking. The road is subject to a 30mph speed limit and footways and street lighting are provided on both sides of the road.

To the east of the site the B6097 becomes Hill Street with a bridge passing over the rail line and pedestrian access provided to the rail station. Hill Street is an approximately 7.7m single carriageway road with a 30mph speed limit and street lighting. Footways are provided on both sides of the carriageway although the footway adjacent to the southbound carriageway is very narrow at approximately 1m width. Parked cars on both sides of Hill Street narrow the effective width of the road in places, preventing two vehicles from passing. Double yellow lines are provided over the rail bridge to prevent parking at this location.

A priority junction with B6097 King Street to the north west of the site provides access to Millhouses Street. Millhouses Street is also subject to a 30mph speed limit and is a single carriageway road with footways and street lighting. A number of priority junctions along its length provide access to residential areas. As on King Street, some informal on street parking occurs but there is generally enough room for two vehicles to pass each other.

2.2.1 Existing Rail Parking

No formal car parking is provided at Elsecar rail station. However, a site visit undertaken on Wednesday 16 June 2010 indicates a number of cars parked on the B6097 Hill Street in the vicinity of the rail station access. On site observations indicated between seven and ten cars being parked, which are most likely associated with rail commuter parking.

2.2.2 Existing Vehicle Movements

Eastbound and westbound traffic count data has been provided by BMBC for the B6097 King Street in the vicinity of the site. The surveys were undertaken in December 2009 for three consecutive weekdays. This showed the morning peak hour to be 08:00 to 09:00 hours and the evening peak hour as 16:00 to 17:00 hours. The eastbound flows were recorded as 130 and 200 in the morning and evening peak hours, respectively. The westbound flows were recorded as 161 and 171 in the morning and evening peak hours, respectively.

Arup has undertaken peak hour turning counts at the junction of the B6097 King Street and Millhouses Street. These were broadly consistent with the BMBC link flow data, although generally slightly higher. The eastbound flows were recorded as 143 and 217 in the morning and evening peak hours, respectively. The westbound flows were recorded as 188 and 191 in the morning and evening peak hours, respectively. On Millhouses Street, the northbound flows were recorded as 45 and 68 in the morning and evening peak hours, respectively and the southbound flows were recorded as 62 and 50 in the morning and evening peak hours, respectively. Figures 2 and 3 present the June 2010 turning count data for the morning and evening peak hours and the full survey data is provided at Appendix A.

2.3 Public Transport

2.3.1 Rail

The key mode of public transport close to the development site is rail. Regular services operate between Sheffield, Leeds and Huddersfield. The rail station is located to the south east corner of the site, currently accessed from the B6097 Hill Street. Ramp access is provided to the platforms with electronic real time timetable information provided on screens at the top of the platforms. Full timetables are provided on boards located near the rail bridge on Hill Street. Shelters are provided for waiting on each platform.

An hourly service provides connections from Sheffield and Meadowhall to Elsecar and onwards to Barnsley, Wakefield, Castleford and Leeds. An hourly service operates in the opposite direction from Leeds to Sheffield. In addition, an hourly service operates from Sheffield and Meadowhall to Huddersfield via Elsecar, Barnsley, Penistone and Denby Dale.

Journey times from Elsecar are approximately 10 minutes to Barnsley, 20 minutes to Sheffield, 30 minutes to Wakefield and over an hour to Leeds.

2.3.2 Bus

Bus stops are provided on the B6097 King Street adjacent to the site. On the westbound carriageway a shelter is provided and on the eastbound carriageway only a pole is provided.

Bus service 66 provides a circular route from Barnsley to Elsecar via Worsborough, Birdwell, Hoyland and Jump. Frequent services are provided with six services per hour Monday to Saturday from 07:00 to 18:00 hours and less frequent services between 18:00 hours and midnight and on Sundays.

Bus service 227 provides an hourly service throughout the day on Monday to Saturday between Rotherham and Hoyland via Wentworth and Elsecar. From 18:00 hours the service continues on to Barnsley via Jump, Hemingfield and Wombwell. Services operate from approximately 07:00 hours to 23:00 hours. On Sundays an hourly service operates from Rotherham to Barnsley from approximately 09:00 to 23:00 hours.

2.4 Pedestrians and Cyclists

Footways are provided on both sides of Millhouses Street and King Street in the vicinity of the site. Dropped kerb crossings are provided at the priority junction of King Street and Millhouses Street and across the recently constructed access to the small residential development on the northern side of King Street opposite the site.

At the rail station, ramped pedestrian access is provided from the B6097 Hill Street with connection between the two platforms being provided via the road and ramp access. The existing ramp is steep and not DDA compliant. Footways on the bridge over the rail line are narrow, particularly on the southbound carriageway. Parked cars on Hill Street reduce the footway widths at some locations.

No cycle facilities were noted on the local highway network in the vicinity of the site. The rail station also does not provide cycle facilities.

3 Development Proposals

3.1 Development Proposals

The scheme comprises residential development, provision of a Park and Ride facility for Elsecar rail station and an associated access road. Drawing Reference EL-PL-001 presented in Appendix B provides a general arrangement for the scheme, which comprises the following:

- 26 three and four bed detached, semi detached and town houses with driveways, garages and gardens;
- New access junction and site access road;
- Internal access roads for the residential element of the scheme;
- 90 space car park, including eight parking spaces for the disabled;
- Car park turning head and drop-off area;
- Pedestrian access through the site and connection to the rail station;
- Improved pedestrian ramp access from B6097 Hill Street to the station Barnsley-bound platform;
- Landscaping and amenity spaces;
- CCTV coverage.

3.2 Access Arrangements

Access to the site is provided via a new priority-controlled junction with Millhouses Street, located approximately 40m from the Millhouses Street junction with B6097 King Street. A 6m wide access road provides access to the Park and Ride facility and residential areas. A 2m footway is provided along the eastern side of the access road for access to the car park and residential area. Access arrangements are shown on the scheme General Arrangement Drawing Reference EL-PL-001.

3.2.1 Park and Ride

A priority-controlled junction from the new scheme access road provides access to the Park and Ride car park. The access will have a height restriction barrier to restrict the type of vehicle that can access to the car park.

A turning circle at the eastern end of the car park close to the railway platforms allows vehicle drop-off and turning.

90 no. 4.8m x 2.4m car parking spaces are provided in two parallel lines separated by a 6m wide aisle. Eight car parking spaces are provided for disabled drivers with 1.2m wide hatched transfer areas provided on both sides of the spaces and at the rear of each space for access.

A 2m footway provides pedestrian access through the car park to its southern boundary parallel to the railway line. A gate to the north east of the car park and close to the turning circle provides access to the platform.

A new DDA compliant pedestrian access route is provided from B6097 Hill Street to the car park and Barnsley-bound platform.

3.2.2 Residential

A priority-controlled junction from the new access road will provide access to the residential element of the scheme. Footways on both sides of the residential road will provide access for pedestrians.

3.3 Trip Generation

The predicted trip generation for both the Park and Ride and residential elements of the scheme have been estimated as set out in the paragraphs below.

3.3.1 Park and Ride

The predicted trips for the proposed Park and Ride at Elsecar have been based on surveys at Bentley rail station car park undertaken in March 2007.

The Bentley rail station car park surveys were used to determine trip rates per car parking space for the car park. It should be noted that the arrangement at Bentley enables easy access for drop-off and pick-up within the rail station car park. A high proportion of cars leaving the car park in the morning peak hour supports that this drop-off activity occurs. It is considered that, at Elsecar, the morning drop-off is unlikely to occur within the station car park. Vehicular access would be required through the residential development and car park before being able to turn around and exit via the car park and residential development. It is considered more likely that morning drop-off activity would continue on B6097 Hill Street as currently. In the evening peak hour when vehicles are likely to be waiting for longer periods to pick-up passengers, however, it is likely that drivers will wait within the car park. The trip rates for Bentley rail station have therefore been revised and resulting trips at Elsecar rail station are as set out in Table 1 below.

Table 1: Park and Ride Trip Rate

	Bentley Trip Rates (per car park space)		Revised Trip Rates (per car park space)		Predicted Elsecar Trips	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
AM Peak	0.66	0.23	0.44	0.00	39	0
PM Peak	0.06	0.32	0.06	0.32	6	29

It should be noted that not all of these trips will be new to the highway network. As observed on the site visit, a number of cars are parked on-street near the rail station and are likely to be commuters who will use the new Park and Ride facility. In addition, it is considered likely that other users of the Park and Ride facility will be attracted from elsewhere on the wider highway network. However, for purposes of the junction assessment within this Transport Statement these trips will be new to site access and Millhouses Street.

3.3.2 Residential

The residential trip generation has been estimated using trip rates taken from the TRICS 2010(a) v6.5.2 database. Average trip rates have been used for all sites with parameters chosen to limit the selection to weekdays and sites within Suburban Area and Edge of Town locations. The resulting trip rates are presented in Table 2 below.

Table 2: Residential Trip Rate

	Trip Rates (per dwelling)		Trips	
	Arrivals	Departures	Arrivals	Departures
AM Peak	0.163	0.455	4	12
PM Peak	0.346	0.221	9	6

3.3.3 Total Trips

The total peak hour trips for the development have been combined and are set out in Table 3 below. The trip generation supporting data is provided in Appendix C.

Table 3: Total Scheme Trips

	Total Trips	
	Arrivals	Departures
AM Peak	43	12
PM Peak	15	35

3.3.4 Trip Distribution

The distribution of trips on the local highway network has been undertaken on the basis of the 2010 traffic count data and examining the wider highway network. The flows on King Street and Millhouses Street are relatively similar in each direction with no tidal flow patterns. King Street provides connections east and west and to the M1 motorway and Millhouses Street provides a link on to A6135 Sheffield Road. Both roads run through residential areas. Both routes will therefore be popular route choices for residential and commuter trips to/from the site.

The 2010 traffic count data indicates a much higher number of vehicles turning between Millhouses Street and the eastern arm of King Street than the western arm of King Street. This is because vehicles from existing residential areas wanting to turn onto King Street west would have numerous alternative options such as Noble Street, Gill Street and Milton Street.

For the purposes of this assessment the distribution has therefore assumed an equal split of vehicles to/from the north and south onto Millhouses Street at the site access. Similarly, an equal split of vehicles to/from the east and west onto King Street at the Millhouses Street junction has been assumed.

The resulting distribution is shown in Figure 4.

3.3.5 Development Traffic Flows

The total development traffic flows are shown on Figures 5 and 6 for the morning and evening peak hours, respectively.

The trip generation and distribution result in two-way traffic flows of 28 on Millhouses Street and 14 on King Street in the morning peak hour and 24 on Millhouses Street and 13 on King Street in the evening peak hour. As these flows fall below the DfT *Guidance on Transport Assessment* threshold of 30 two way trips, a full Transport Assessment is not required. This Transport Statement does, however, consider the operation of the new priority-controlled junction providing access to the site from Millhouses Street.

3.3.6 Future Traffic Flows

The total traffic flows for the local highway network when the development is open (expected sometime during 2011) comprise the 2010 existing traffic flows and development traffic flows. Figures 7 and 8 show the total future traffic flows for the morning and evening peak hours, respectively.

3.4 Junction Assessment - Millhouses Street / Site Access

The PICADY 4.1 program has been used to assess the capacity of the new site access junction with Millhouses Street.

PICADY is a computer program which calculates the Ratio of Flow to Capacity (RFC), plus maximum queues and the total delay experienced by all vehicles (in vehicle-minutes). For a given peak hour, PICADY models a 90 minute period, split into six 15 minute periods, centred on the peak hour. Within the modelled period, PICADY synthesises a peak profile for the traffic data. Queue and RFC results are calculated for each 15 minute period and the RFC and queuing presented in this report are the highest values calculated.

The RFC is an indicator of the likely performance of a particular turning movement at a junction under a given set of traffic flows. Due to site to site variation, there may be a standard error in the prediction of the entry capacity by PICADY $\pm 15\%$ for any site. A junction should not operate overcapacity with the given traffic flows in about five out of six peak hour periods or sites if a maximum RFC of about 0.85 (85%) is used. In general, junction approaches with RFC values greater than 0.85 are considered to operate in excess of capacity.

The site access / Millhouses Street junction has been assessed in the future opening year of the scheme. The results of the assessments are set out in Table 4 below. Appendix D contains the full junction assessment outputs.

Table 4: PICADY Junction Assessment Results

Approach	Assessment AM		Assessment PM	
	RFC	Queue (Pcu)	RFC	Queue (Pcu)
Site Access / Millhouses Street				
Site Access all moves	0.026	0.0	0.078	0.1
Millhouses Street (south) all moves	0.048	0.1	0.015	0.0

The results demonstrate that the junction is predicted to operate well within capacity in both the morning and evening peak hours.

3.5 Transport Impacts

The scheme provides a number of positive transport impacts for this site and surrounding area. The provision of a new rail based Park and Ride facility will encourage the use of rail services in the area. By providing car parking for the station, the issues associated with existing on street parking on the B6097 Hill Street will be removed, improving vehicular and pedestrian access on the B6097 Hill Street. In addition, the provision of a new DDA compliant ramp access to the Barnsley bound platform will improve pedestrian access to the station. CCTV coverage will improve security at the site.

4 Summary and Conclusions

Arup has been commissioned by BMBC to provide engineering and planning advice for a proposed Park and Ride facility, access road and residential development adjacent to Elsecar rail station.

Arup has prepared this Transport Statement to accompany the detailed planning application for the P&R site and access road and the outline application for the residential element of the scheme. This Transport Statement is provided to BMBC, as planning and highway authority, to assist in the determination of the planning applications. The requirement for the Transport Statement has been discussed and agreed with BMBC Highways Development Control.

The site is located at Elsecar which is to the south of Hoyland between Barnsley and Rotherham. The scheme comprises residential development (26 dwellings), provision of a 92 space Park and Ride facility for Elsecar rail station and an associated access road. Access to the site is provided via a new priority-controlled junction with Millhouses Street, located approximately 40m from the Millhouses Street junction with the B6097 King Street.

The predicted trips for the proposed Park and Ride at Elsecar have been based on surveys at a similar rail station car park. The residential trip generation has been calculated using trip rates taken from the TRICS 2010(a) v6.5.2 database. The distribution of trips on the local highway network has been undertaken on the basis of the 2010 traffic count data and examining the wider highway network.

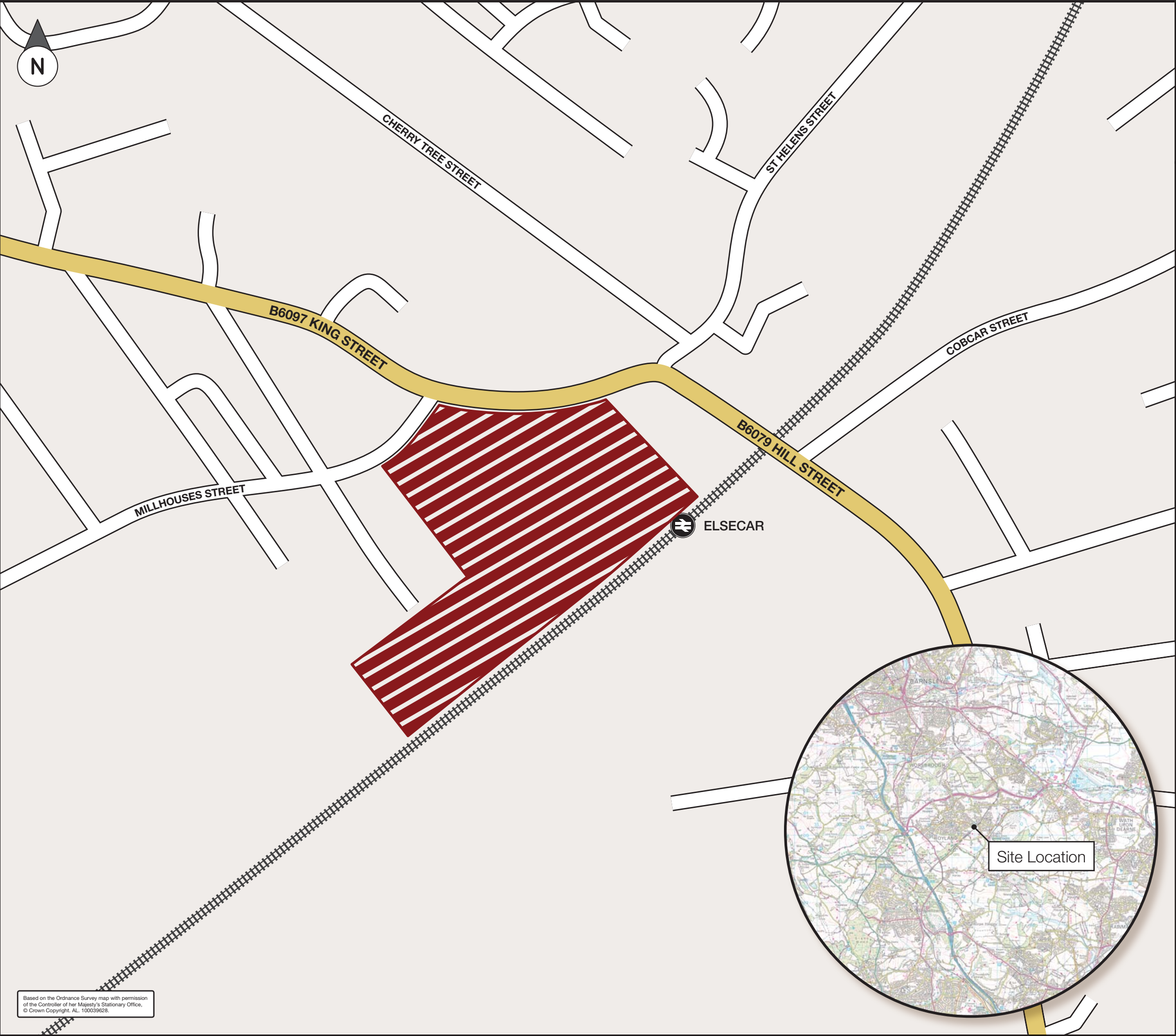
The resulting traffic movements at the new site access junction have been calculated and assessment of the junction has been undertaken using the PICADY junction assessment program. The results demonstrate that the junction is predicted to operate well within capacity in both the morning and evening peak hours.

In addition, the scheme provides a number of positive transport impacts for the site and surrounding area. The provision of a new rail-based Park and Ride facility will encourage the use of rail services in the area. By providing car parking for the station, the issues associated with existing on street parking on the B6097 Hill Street will be removed, improving vehicular and pedestrian access on Hill Street. In addition, the provision of a new DDA compliant ramp access to the platform will improve pedestrian access to the station.

In summary, it is concluded that the development proposals are acceptable from a transport perspective.

FIGURES

- Figure 1 Site Location and Local Highway Network**
- Figure 2 2010 Traffic Count Data – AM Peak Hour**
- Figure 3 2010 Traffic Count Data – PM Peak Hour**
- Figure 4 Development Trip Distribution**
- Figure 5 Development Trips – AM Peak Hour**
- Figure 6 Development Trips – PM Peak Hour**
- Figure 7 Future Traffic Flows – AM Peak Hour**
- Figure 8 Future Traffic Flows – PM Peak Hour**



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Key:

Site Location



Issue:	Date:	Originator:	Checked:	Approved:
D1	24.06.10	SM		

Barnsley Metropolitan Borough Council
ELSECAR PARK AND RIDE
Site Location and Local Highway Network

Scale @ A3:
Not to Scale

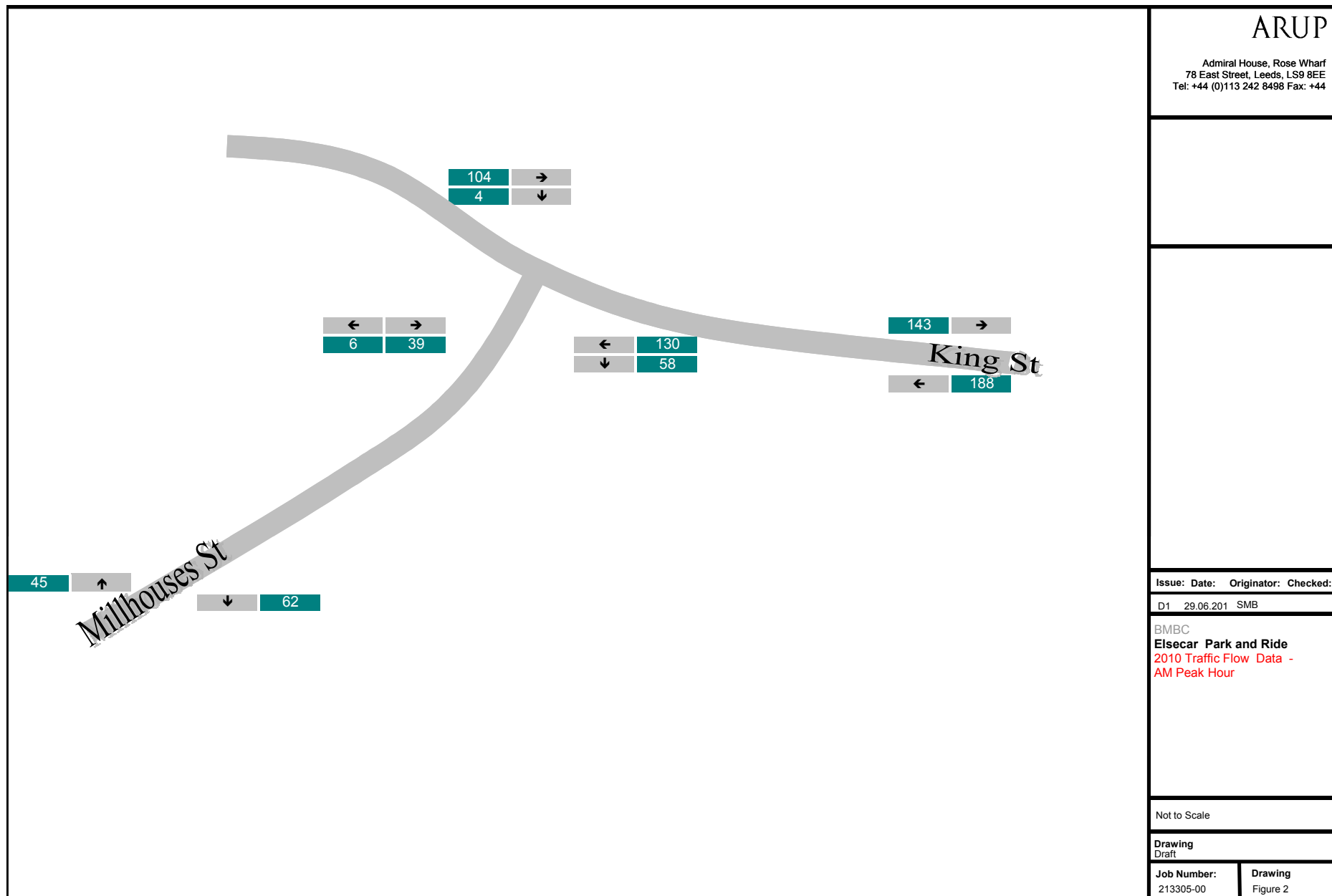
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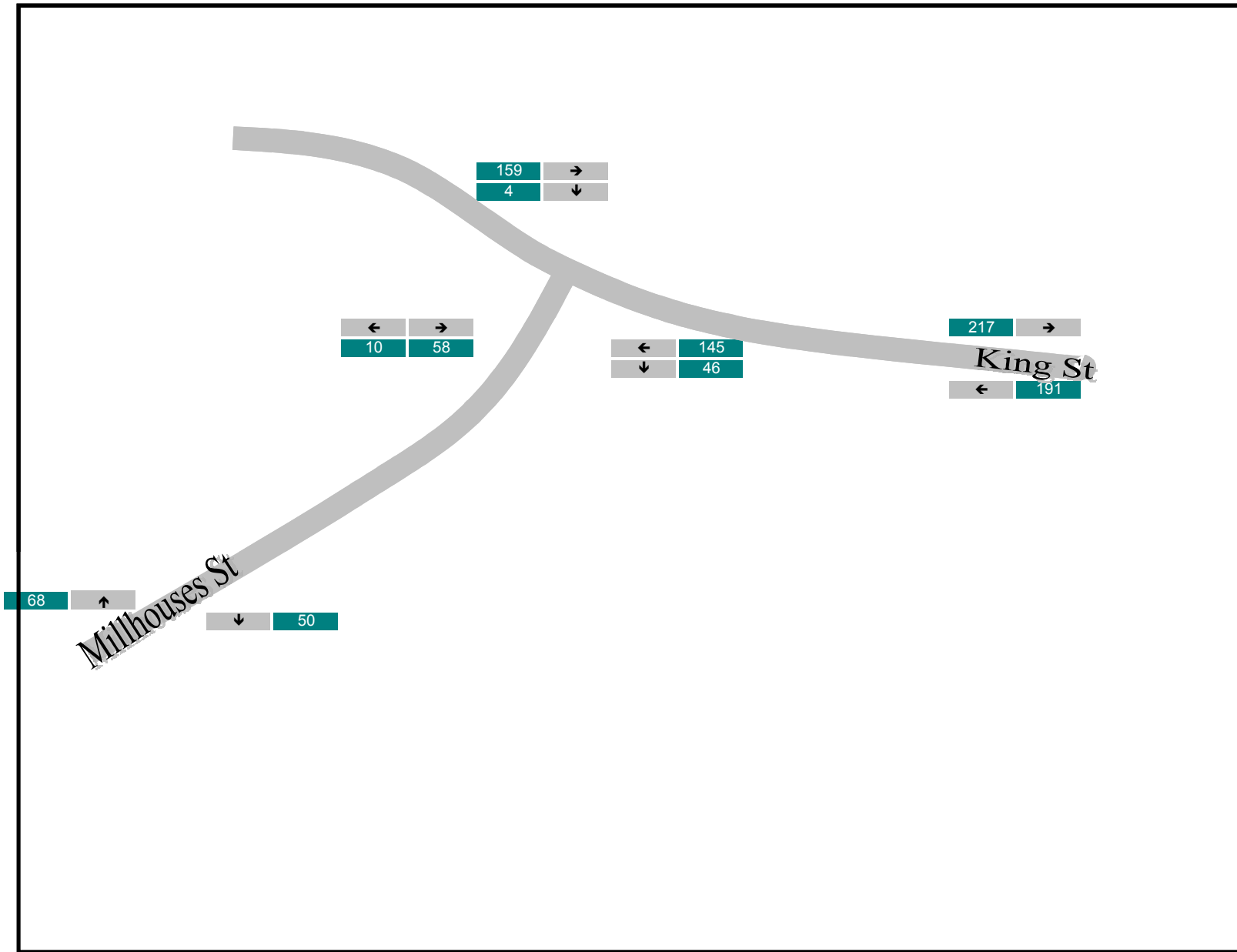
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213305-00

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Figure 01

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BMBC

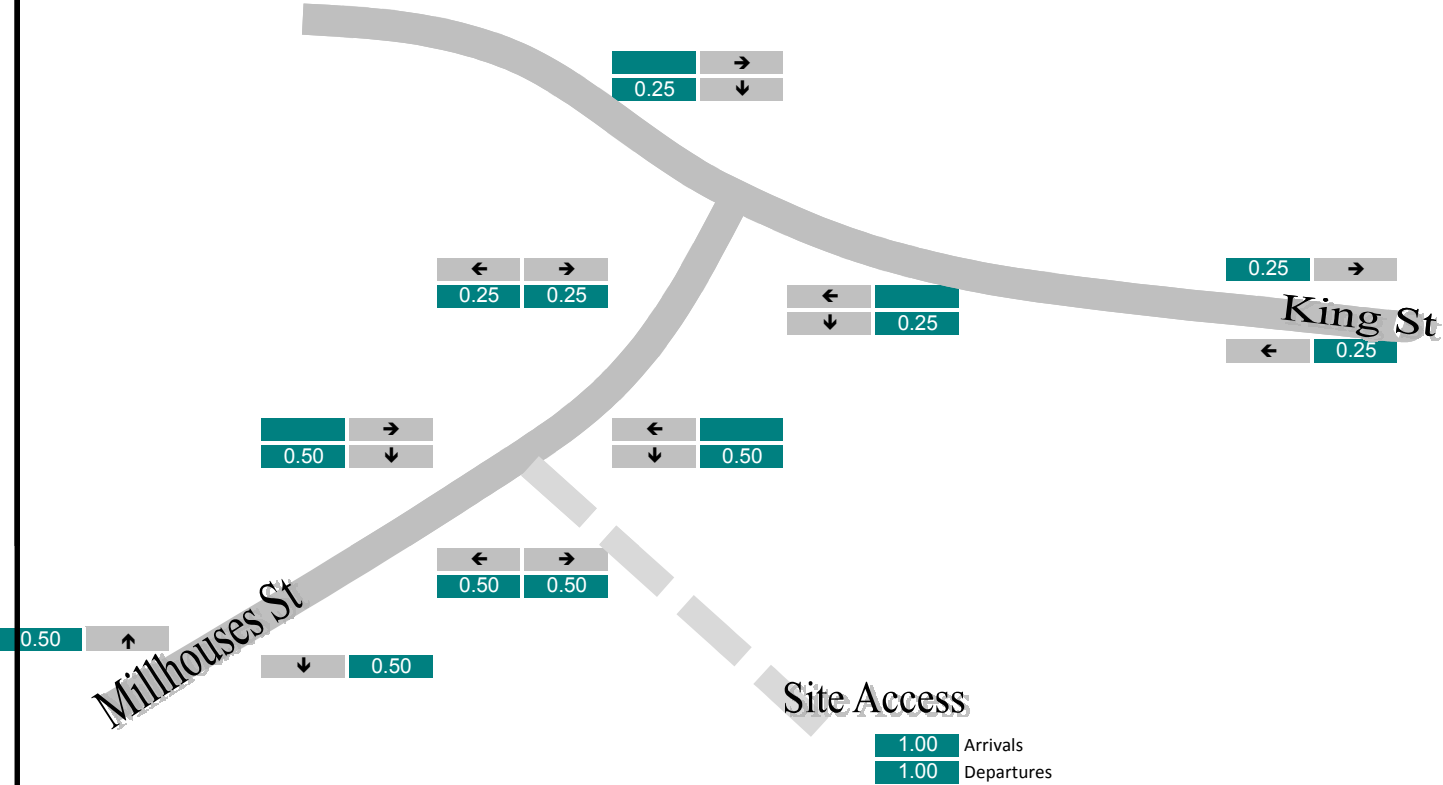
Elsecar Park and Ride
2010 Traffic Flow Data -
PM Peak Hour

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Figure 3



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BMBC
Elsecar Park and Ride
Development Trip Distribution

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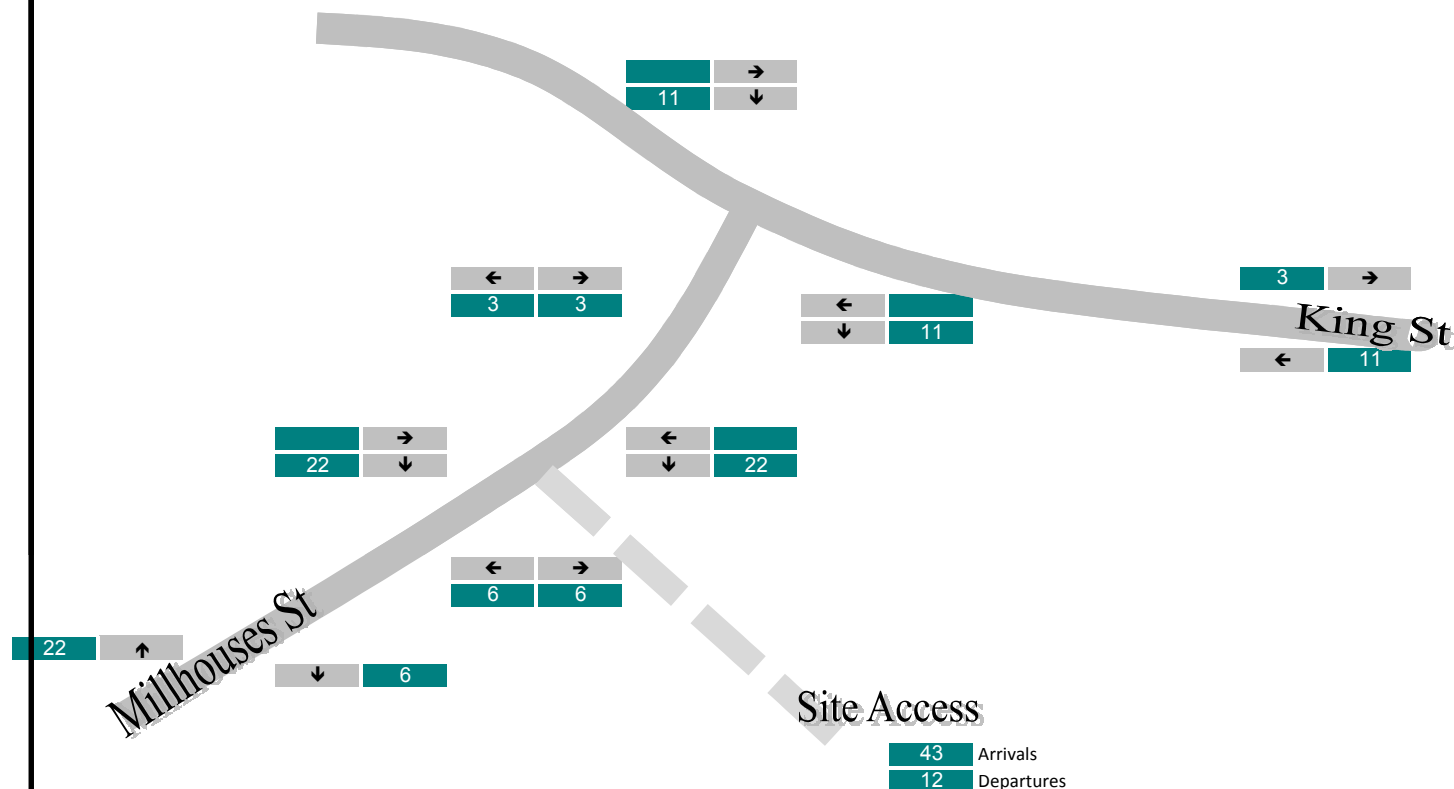
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Figure 4

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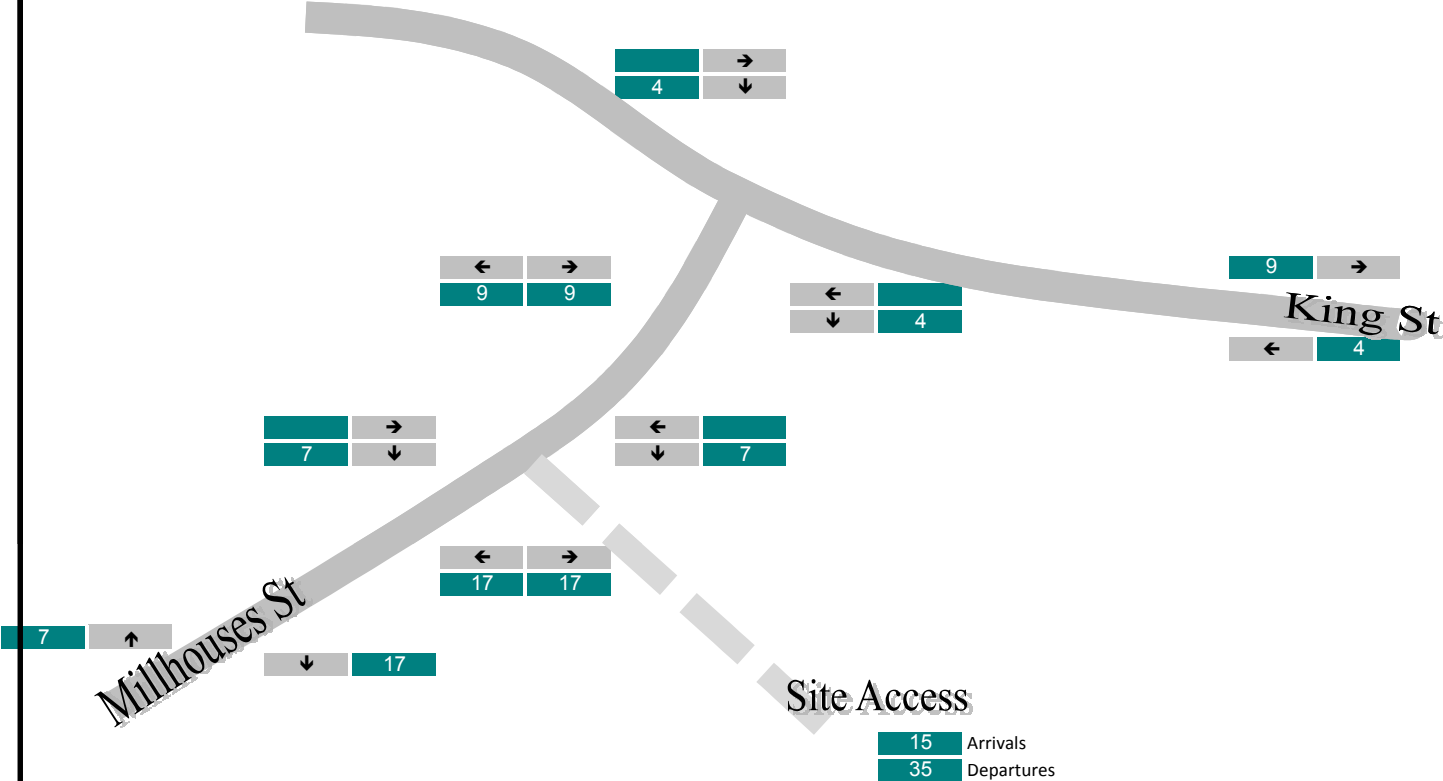
Elsecar Park and Ride
Development Traffic Flows -
AM Peak Hour

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Figure 5



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Elsecar Park and Ride
Development Traffic Flows -
PM Peak Hour

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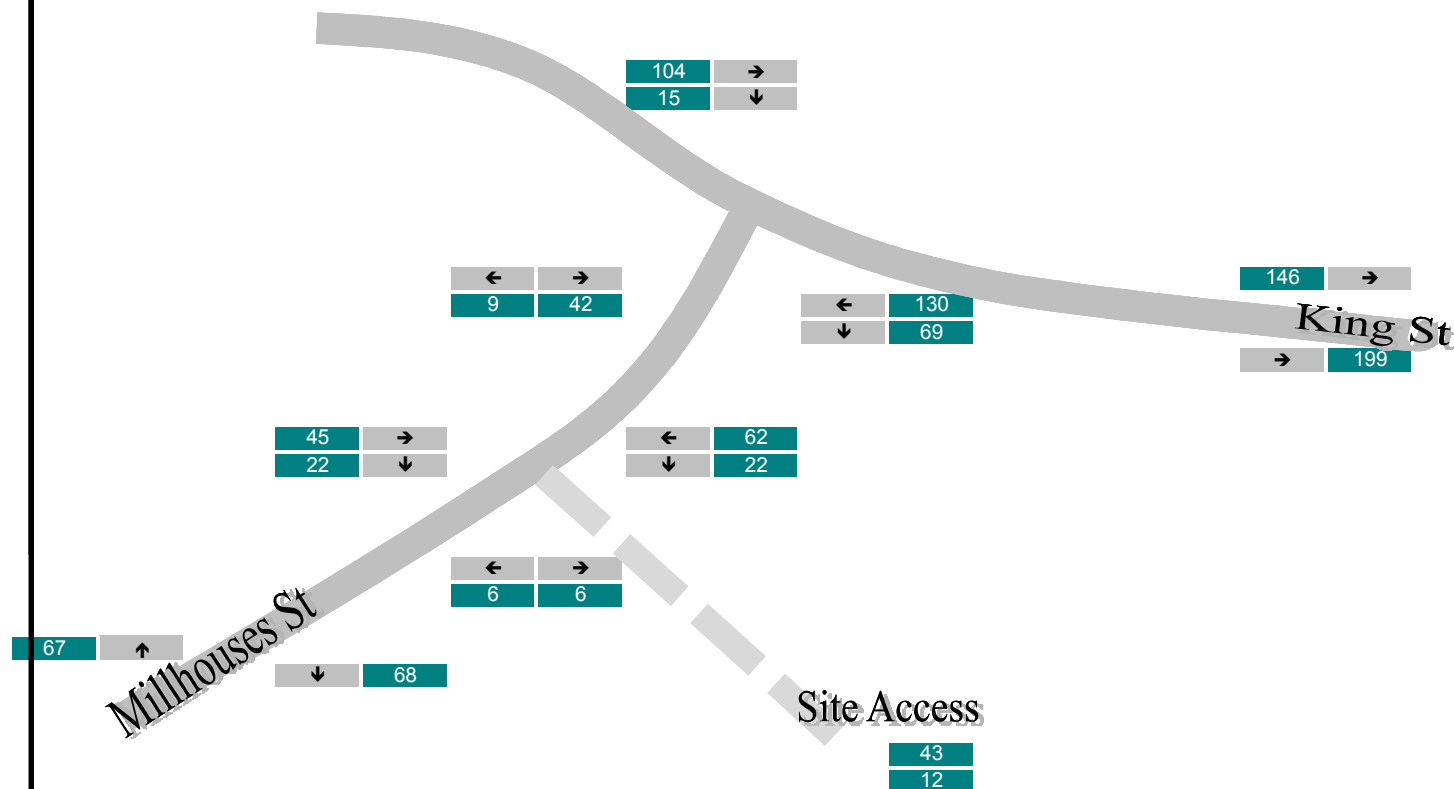
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Figure 6

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Future Traffic Flows with P&R -
AM Peak Hour

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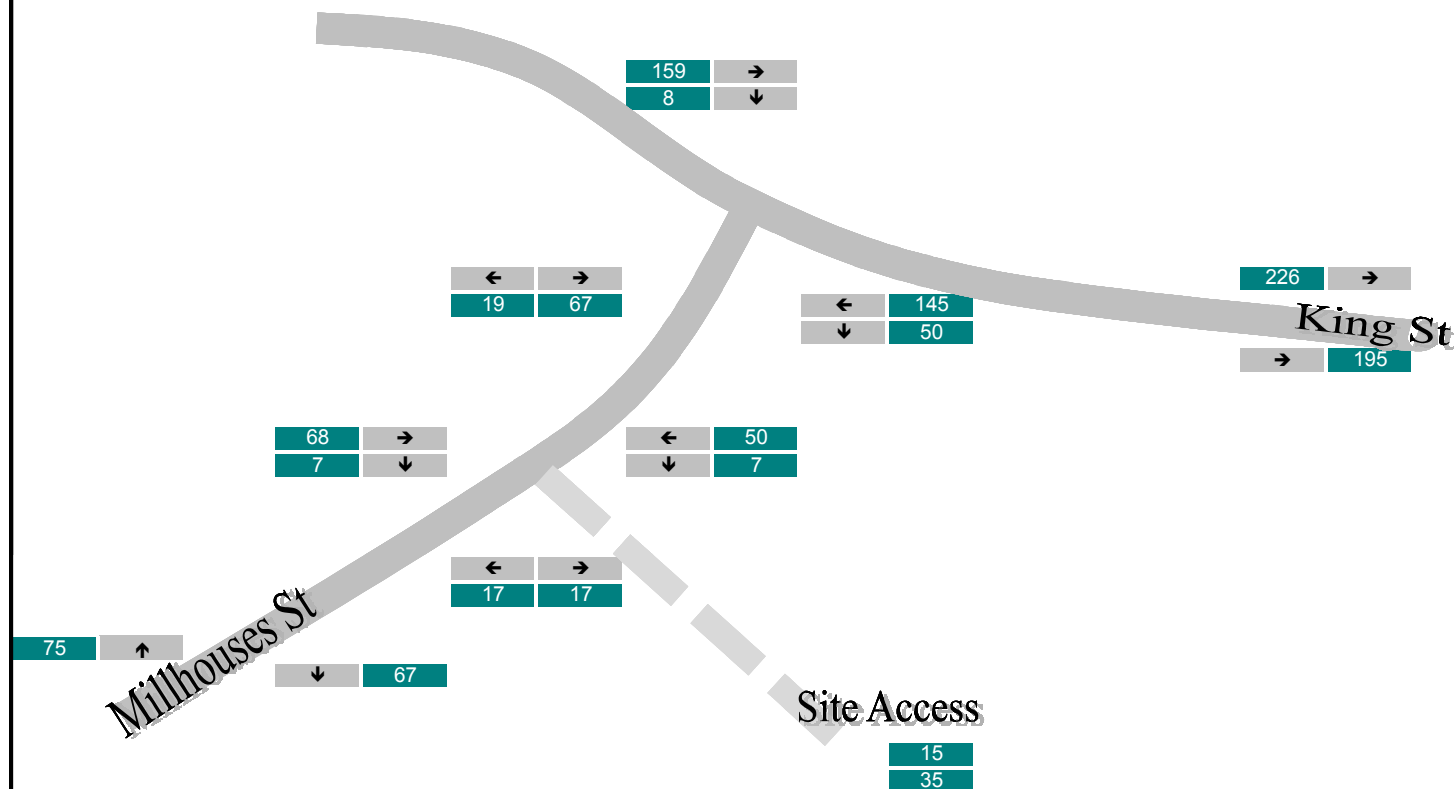
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Figure 7

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BMBC
Elsecar Park and Ride
Future Traffic Flows with P&R -
PM Peak Hour

Not to Scale

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213305-00

Drawing
Figure 8

Appendix A

Traffic Count Data

Weekly Volume Report: Monday, December 14, 2009 to Sunday, December 20, 2009

Site Name: 000010200552

Site ID: 000010200552

Grid: 437920400451

Description: B6097 King Street, Hoyland, opposite No. 194

Channel names and bin settings obtained from setup: 10200552

Channel: Westbound

Class: Any

	Mon 14-Dec	Tue 15-Dec	Wed 16-Dec	Thu 17-Dec	Fri 18-Dec	Sat 19-Dec	Sun 20-Dec	Average Workday	7 Day	Total Count
00:00		9	10	12				10		31
01:00		1	4	2				2		7
02:00		2	2	1				2		5
03:00		2	3	2				2		7
04:00		5	2	2				3		9
05:00		20	22	24				22		66
06:00		39	34	47				40		120
07:00		78	82	90				83		250
08:00		155	155	172				161		482
09:00		119	126					122		366
10:00		149	115					88		264
11:00	127	159	149					109		435
12:00	136	155	143					108		434
13:00	140	136	152					107		428
14:00	130	160	131					105		421
15:00	205	165	195					141		565
16:00	167	182	163					171		512
17:00	166	167	180					171		513
18:00	147	179	141					156		467
19:00	111	117	130					119		358
20:00	77	78	93					83		248
21:00	56	64	58					59		178
22:00	37	34	44					38		115
23:00	15	23	25					21		63
12, 16, 18 & 24 Hour Totals										
07-19		1804	1732	384				1307	0	3920
06-22		2102	2047					2074	0	4149
06-24	1516	2159	2116					1930	0	5791
00-24		2198	2159					2178	0	4357
am Peak		11:00 159	08:00 155	08:00 172				08:00 161		
pm Peak	15:00 205	16:00 182	15:00 195					16:00 171		

Weekly Volume Report: Monday, December 14, 2009 to Sunday, December 20, 2009

Site Name: 000010200552

Site ID: 000010200552

Grid: 437920400451

Description: B6097 King Street, Hoyland, opposite No. 194

Channel names and bin settings obtained from setup: 10200552

Channel: Eastbound

Class: Any

	Mon 14-Dec	Tue 15-Dec	Wed 16-Dec	Thu 17-Dec	Fri 18-Dec	Sat 19-Dec	Sun 20-Dec	Average Workday	7 Day	Total Count
00:00		6	10	17				11		33
01:00		2	3	9				5		14
02:00		2	0	3				2		5
03:00		0	0	2				1		2
04:00		2	3	0				2		5
05:00		10	8	9				9		27
06:00		30	34	32				32		96
07:00		75	80	75				77		230
08:00		112	127	150				130		389
09:00		107	130					120		361
10:00		136	122					86		258
11:00	113	154	135					100		402
12:00	148	166	159					118		473
13:00	162	138	133					108		433
14:00	130	129	128					97		387
15:00	182	182	166					133		531
16:00	225	194	181					200		600
17:00	168	189	207					188		564
18:00	192	174	160					175		526
19:00	118	126	143					129		387
20:00	94	93	91					93		278
21:00	65	85	88					79		238
22:00	42	53	51					49		146
23:00	19	24	32					25		75
12, 16, 18 & 24 Hour Totals										
07-19		1756	1728	351				1278	0	3835
06-22		2090	2084					2087	0	4174
06-24	1659	2167	2167					1998	0	5993
00-24		2189	2191					2190	0	4380
am Peak		11:00 154	11:00 135	08:00 150				08:00 130		
pm Peak	16:00 225	16:00 194	17:00 207					16:00 200		

Elsecar Station Site - Barnsley										
Traffic Count - Kings Street/Millhouse Junction - 16/06/2010										
Traffic Count 1 - Morning Peak - 8:00-9:00										
Time	A	B	C	D	E	F	Total			
8:00-8:15	24	25	0	15	0	7	71			
8:15-8:30	26	27	3	19	2	9	86			
8:30-8:45	23	44	0	14	2	7	90			
8:45-9:00	31	34	1	10	2	16	94			
Total										341
Traffic Count 2 - Afternoon Off-Peak - 11:00-12:00										
Time	A	B	C	D	E	F	Total			
11:00-11:15	23	32	0	7	4	8	74			
11:15-11:30	34	21	0	6	3	15	79			
11:30-11:45	28	39	1	3	3	7	81			
11:45-11:00	32	34	1	9	2	4	82			
Total										316
Traffic Count 3 - Evening Peak - 16:00-17:00										
Time	A	B	C	D	E	F	Total			
16:00-16:15	27	43	0	7	2	14	93			
16:15-16:30	34	28	2	9	6	16	95			
16:30-16:45	55	25	1	11	1	15	108			
16:45-16:00	43	49	1	19	1	13	126			
Total										422

Note - Movements

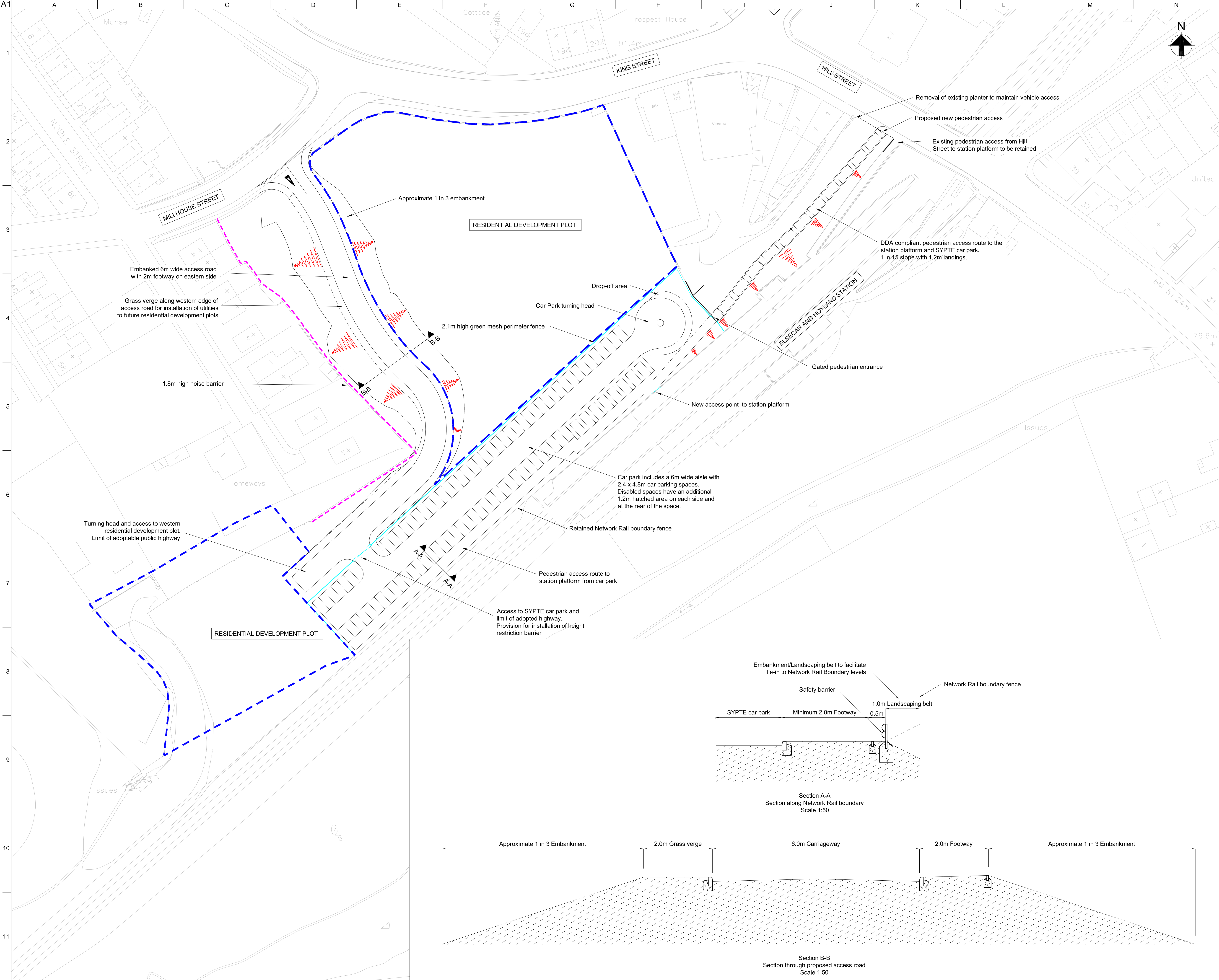
- A King Street - South Ahead Only
- B King Street - North Ahead Only
- C King Street - Right Turn - Facing South
- D King Street - Left Turn - Facing North
- E Millhouses - Left Turn Only
- F Millhouses - Right Turn Only

Notes - Station Car Parking

A small station, with minimal public use, no more the few people observed on the station during most of the day.
 Outside station double yellow, but further up the road, on over bridge some spaces to park the car, approx 5-7 cars parked on Hill Street.
 Also further south from station no parking restriction, few cars parked, but those maybe from local residence.
 Parking also available in residential areas, opposite station.

Appendix B

Scheme Proposals



- Notes**
- Approximate site grid reference: 437973, 400384
 - The SYPTE car park has 82 car parking spaces and 8 disabled spaces. (Total provision 90 spaces)
- Key**
- Ordnance Survey Base/Topographical Survey
 - General Arrangement and key boundary interfaces
 - Residential development plots
 - Proposed 2.1m high green mesh fence
 - Proposed gate/access point
 - Proposed embankment
 - Noise Barrier

P1	02/07/10	MFS	CW	PI
Planning Submission				
P0	30/06/10	MFS	CW	PI
Draft Planning Submission				
Issue	Date	By	Chkd	Appd

ARUP

Rose Wharf 78 East Street
Leeds LS9 8EE
Tel +44 (0)113 242 8498 Fax +44 (0)113 242 8573
www.arup.com

Client
Barnsley MBC

Job Title
Elsecar Rail Station

Drawing Title
General Arrangement

Scale at A1 1:500

Drawing Status
ISSUED FOR PLANNING

Job No 213305	Drawing No EL-PL-001	Issue P1
-------------------------	--------------------------------	--------------------

Appendix C

Trip Generation

Bentley Peak Hour Surveys**62 space car park**

	ARR	DEP
AM	41	14
PM	4	20

Bentley Trip Rates

	ARR	DEP
AM	0.66129	0.225806
PM	0.064516	0.322581

Bentley Revised Trip Rate - netting off drop-off

	ARR	DEP
AM	0.435484	0
PM	0.064516	0.322581

Elsecar proposed**90 space car park**

	ARR	DEP
AM	60	20
PM	6	29

Elsecar using revised Bentley trips

	ARR	DEP
AM	39	0
PM	6	29

16 hr	92	92
18 hr	92	92

Arup Rose Wharf Leeds

Licence No: 701005

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
 Category : A - HOUSES PRIVATELY OWNED
 VEHICLES

Selected regions and areas:

01	GREATER LONDON	
	BN BARNET	1 days
	BT BRENT	1 days
	KN KENSINGTON AND CHELSEA	1 days
	SK SOUTHWARK	1 days
	WE WESTMINSTER	1 days
02	SOUTH EAST	
	BD BEDFORDSHIRE	2 days
	EX ESSEX	1 days
	SC SURREY	1 days
03	SOUTH WEST	
	CW CORNWALL	2 days
	DC DORSET	1 days
	WL WILTSHIRE	1 days
04	EAST ANGLIA	
	SF SUFFOLK	3 days
05	EAST MIDLANDS	
	LE LEICESTERSHIRE	1 days
	LN LINCOLNSHIRE	2 days
	NT NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS	
	SH SHROPSHIRE	2 days
	ST STAFFORDSHIRE	1 days
	WM WEST MIDLANDS	3 days
	WO WORCESTERSHIRE	6 days
07	YORKSHIRE & NORTH LINCOLNSHIRE	
	NY NORTH YORKSHIRE	2 days
08	NORTH WEST	
	CH CHESHIRE	3 days
	LC LANCASHIRE	2 days
09	NORTH	
	CB CUMBRIA	3 days
	TV TEES VALLEY	1 days
	TW TYNE & WEAR	1 days
10	WALES	
	CF CARDIFF	3 days
	CP CAERPHILLY	1 days
	WR WREXHAM	1 days
11	SCOTLAND	
	EA EAST AYRSHIRE	1 days
	FI FIFE	2 days
	HI HIGHLAND	2 days
	SR STIRLING	1 days
12	CONNAUGHT	
	CS SLIGO	1 days
	GA GALWAY	3 days
	RO ROSCOMMON	1 days
13	MUNSTER	
	CR CORK	1 days
	WA WATERFORD	2 days
14	LEINSTER	
	KD KILDARE	1 days
	KK KILKENNY	1 days
15	GREATER DUBLIN	
	DL DUBLIN	2 days
17	ULSTER (NORTHERN IRELAND)	
	AN ANTRIM	4 days

Arup Rose Wharf Leeds

Licence No: 701005

DE	DERRY	2 days
DO	DOWN	1 days
FE	FERMANAGH	1 days
TY	TYRONE	1 days

Filtering Stage 2 selection:

Parameter: Number of dwellings
Range: 9 to 792 (units:)

Public Transport Provision:

Selection by: Include all surveys

Date Range: 01/01/02 to 10/02/10

Selected survey days:

Monday	16 days
Tuesday	16 days
Wednesday	9 days
Thursday	22 days
Friday	13 days

Selected survey types:

Manual count	71 days
Directional ATC Count	5 days

Selected Locations:

Suburban Area (PPS6 Out of Centre)	36
Edge of Town	40

Selected Location Sub Categories:

Industrial Zone	1
Residential Zone	55
Built-Up Zone	2
Out of Town	1
No Sub Category	17

Arup Rose Wharf Leeds

Licence No: 701005

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00	5	161	0.037	5	161	0.017	5	161	0.054
01:00 - 02:00	5	161	0.022	5	161	0.012	5	161	0.034
02:00 - 03:00	5	161	0.007	5	161	0.006	5	161	0.013
03:00 - 04:00	5	161	0.005	5	161	0.002	5	161	0.007
04:00 - 05:00	5	161	0.009	5	161	0.011	5	161	0.020
05:00 - 06:00	5	161	0.009	5	161	0.039	5	161	0.048
06:00 - 07:00	5	161	0.041	5	161	0.124	5	161	0.165
07:00 - 08:00	76	118	0.078	76	118	0.294	76	118	0.372
08:00 - 09:00	76	118	0.163	76	118	0.455	76	118	0.618
09:00 - 10:00	76	118	0.172	76	118	0.232	76	118	0.404
10:00 - 11:00	76	118	0.148	76	118	0.177	76	118	0.325
11:00 - 12:00	76	118	0.186	76	118	0.179	76	118	0.365
12:00 - 13:00	76	118	0.206	76	118	0.190	76	118	0.396
13:00 - 14:00	76	118	0.204	76	118	0.199	76	118	0.403
14:00 - 15:00	76	118	0.211	76	118	0.212	76	118	0.423
15:00 - 16:00	76	118	0.291	76	118	0.216	76	118	0.507
16:00 - 17:00	76	118	0.346	76	118	0.221	76	118	0.567
17:00 - 18:00	76	118	0.413	76	118	0.241	76	118	0.654
18:00 - 19:00	76	118	0.314	76	118	0.247	76	118	0.561
19:00 - 20:00	5	161	0.393	5	161	0.345	5	161	0.738
20:00 - 21:00	5	161	0.284	5	161	0.203	5	161	0.487
21:00 - 22:00	5	161	0.243	5	161	0.193	5	161	0.436
22:00 - 23:00	5	161	0.158	5	161	0.121	5	161	0.279
23:00 - 24:00	5	161	0.108	5	161	0.067	5	161	0.175
Total Rates:			4.048			4.003			8.051

Parameter summary

Trip rate parameter range selected: 9 - 792 (units:)
Survey date range: 01/01/02 - 10/02/10
Number of weekdays (Monday-Friday): 90
Number of Saturdays: 0
Number of Sundays: 0
Surveys manually removed from selection: 0

Appendix D

PICADY Assessments

TRL LIMITED

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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 4.0 (NOV 2003)

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

Run with file:-
"J:\210000\213305-00\0 Arup\0-11 Transportation\0-11-07 Calcs-Specs\PICADY\Site Access AM Peak.vpi"
(drive-on-the-left) at 13:15:33 on Thursday, 24 June 2010

RUN TITLE

Elsecar P&R Site Access AM Peak

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

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

ARM A IS Millhouses Street North
ARM B IS Site Access
ARM C IS Millhouses Street South

STREAM LABELLING CONVENTION

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

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

ETC.

GEOMETRIC DATA

I	DATA ITEM	I	MINOR ROAD B	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I (W)	8.00 M.	I
I	CENTRAL RESERVE WIDTH	I (WCR)	0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I (WC-B)	2.20 M.	I
I	- VISIBILITY	I (VC-B)	40.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I (VB-C)	100.0 M.	I
I	- VISIBILITY TO RIGHT	I (VB-A)	40.0 M.	I
I	- LANE 1 WIDTH	I (WB-C)	3.00 M.	I
I	- LANE 2 WIDTH	I (WB-A)	0.00 M.	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 07.45 AND ENDS 09.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I	I	NUMBER OF MINUTES FROM START WHEN			I	RATE OF FLOW (VEH/MIN)			I
		I	I	I		I	I	I	
I	ARM	I	FLOW STARTS	I	TOP OF PEAK	I	BEFORE	I	AT TOP
I		I	TO RISE	I	IS REACHED	I	PEAK	I	OF PEAK
I		I		I	FALLING	I	PEAK	I	PEAK
I	ARM A	I	15.00	I	45.00	I	1.05	I	1.57
I	ARM B	I	15.00	I	45.00	I	0.15	I	0.23
I	ARM C	I	15.00	I	45.00	I	0.84	I	1.26

I	I	TURNING PROPORTIONS			I
		I	I	I	
I	I	TURNING COUNTS (VEH/HR)			I
		I	I	I	
I	I	(PERCENTAGE OF H.V.S)			I
		I	I	I	
I	TIME	I	FROM/TO	I	I
		I	ARM A	I	
I	07.45 - 09.15	I		I	I
I		I	ARM A	I	I
I		I	0.000	I	I
I		I	0.0	I	I
I		I	(0.0)	I	I
I		I		I	I
I		I	ARM B	I	I
I		I	0.500	I	I
I		I	6.0	I	I
I		I	(10.0)	I	I
I		I		I	I
I		I	ARM C	I	I
I		I	0.672	I	I
I		I	45.0	I	I
I		I	(10.0)	I	I
I		I		I	I

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	07.45-08.00									I
I	B-AC	0.15	8.54	0.018		0.0	0.0	0.3		I
I	C-AB	0.29	9.21	0.032		0.0	0.0	0.5		I
I	C-A	0.54								I
I	A-B	0.28								I
I	A-C	0.77								I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC DELAY	I
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	08.00-08.15									I
I	B-AC	0.18	8.48	0.021		0.0	0.0	0.3		I
I	C-AB	0.35	9.24	0.038		0.0	0.0	0.7		I
I	C-A	0.65								I
I	A-B	0.33								I
I	A-C	0.93								I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC	DELAYI
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	08.15-08.30									I
I	B-AC	0.22	8.40	0.026		0.0	0.0	0.4		I
I	C-AB	0.44	9.28	0.048		0.0	0.1	0.9		I
I	C-A	0.78								I
I	A-B	0.40								I
I	A-C	1.13								I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC	DELAYI
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	08.30-08.45									I
I	B-AC	0.22	8.40	0.026		0.0	0.0	0.4		I
I	C-AB	0.44	9.28	0.048		0.1	0.1	0.9		I
I	C-A	0.78								I
I	A-B	0.40								I
I	A-C	1.13								I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC	DELAYI
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	08.45-09.00									I
I	B-AC	0.18	8.48	0.021		0.0	0.0	0.3		I
I	C-AB	0.35	9.24	0.038		0.1	0.0	0.7		I
I	C-A	0.65								I
I	A-B	0.33								I
I	A-C	0.93								I
I										I

I	TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC	DELAYI
I		(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	I
I				(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	I
I	09.00-09.15									I
I	B-AC	0.15	8.54	0.018		0.0	0.0	0.3		I
I	C-AB	0.29	9.21	0.032		0.0	0.0	0.6		I
I	C-A	0.54								I
I	A-B	0.28								I
I	A-C	0.77								I
I										I

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

QUEUE FOR STREAM B-AC	
TIME SEGMENT	NO. OF
ENDING	VEHICLES
	IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0

QUEUE FOR STREAM C-AB	
TIME SEGMENT	NO. OF
ENDING	VEHICLES
	IN QUEUE
08.00	0.0
08.15	0.0
08.30	0.1
08.45	0.1
09.00	0.0
09.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I	
I		I			I	* DELAY *		I	* DELAY *		I	
I		I										I
I		I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I	
I	B-AC	I	16.5	I 11.0	I	2.0	I 0.12	I	2.0	I 0.12	I	
I	C-AB	I	32.6	I 21.8	I	4.2	I 0.13	I	4.2	I 0.13	I	
I	C-A	I	59.2	I 39.5	I		I	I		I	I	
I	A-B	I	30.2	I 20.1	I		I	I		I	I	
I	A-C	I	85.0	I 56.7	I		I	I		I	I	
I	ALL	I	223.5	I 149.0	I	6.1	I 0.03	I	6.1	I 0.03	I	

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

END OF JOB

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

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

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Run with file:-
"J:\210000\213305-00\0 Arup\0-11 Transportation\0-11-07 Calcs-Specs\PICADY\Site Access PM Peak.vpi"
(drive-on-the-left) at 13:18:21 on Thursday, 24 June 2010

RUN TITLE

Elsecar P&R Site Access PM Peak

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

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

ARM A IS Millhouses Street North
ARM B IS Site Access
ARM C IS Millhouses Street South

STREAM LABELLING CONVENTION

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

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

ETC.

GEOMETRIC DATA

I	DATA ITEM	I	MINOR ROAD B	I
I	TOTAL MAJOR ROAD CARRIAGEWAY WIDTH	I (W)	8.00 M.	I
I	CENTRAL RESERVE WIDTH	I (WCR)	0.00 M.	I
I		I		I
I	MAJOR ROAD RIGHT TURN - WIDTH	I (WC-B)	2.20 M.	I
I	- VISIBILITY	I (VC-B)	40.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I (VB-C)	100.0 M.	I
I	- VISIBILITY TO RIGHT	I (VB-A)	40.0 M.	I
I	- LANE 1 WIDTH	I (WB-C)	3.00 M.	I
I	- LANE 2 WIDTH	I (WB-A)	0.00 M.	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 15.45 AND ENDS 17.15

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

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I I I I	I I I	NUMBER OF MINUTES FROM START WHEN				RATE OF FLOW (VEH/MIN)			
		FLOW STARTS	TOP OF PEAK	FLOW STOPS	BEFORE	AT TOP	AFTER		
		TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK		
I	ARM A	15.00	45.00	75.00	0.71	1.07	0.71		
I	ARM B	15.00	45.00	75.00	0.45	0.67	0.45		
I	ARM C	15.00	45.00	75.00	0.94	1.41	0.94		

		TURNING PROPORTIONS							
		TURNING COUNTS (VEH/HR)							
		(PERCENTAGE OF H.V.S)							
TIME		FROM/TO	ARM A	ARM B	ARM C				
15.45 - 17.15									
		ARM A	0.000	0.123	0.877				
			0.0	7.0	50.0				
			(0.0)	(10.0)	(10.0)				
		ARM B	0.500	0.000	0.500				
			18.0	0.0	18.0				
			(10.0)	(0.0)	(10.0)				
		ARM C	0.907	0.093	0.000				
			68.0	7.0	0.0				
			(10.0)	(10.0)	(0.0)				

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

DEFAULT PROPORTIONS OF HEAVY VEHICLES ARE USED

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC	DELAY
	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	
			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	
15.45-16.00									
B-AC	0.45	8.60	0.052		0.0	0.1	0.8		
C-AB	0.10	9.47	0.010		0.0	0.0	0.2		
C-A	0.84								
A-B	0.09								
A-C	0.63								

TIME	DEMAND	CAPACITY	DEMAND/	PEDESTRIAN	START	END	DELAY	GEOMETRIC	DELAY
	(VEH/MIN)	(VEH/MIN)	CAPACITY	FLOW	QUEUE	QUEUE	(VEH.MIN/	(VEH.MIN/	
			(RFC)	(PEDS/MIN)	(VEHS)	(VEHS)	TIME SEGMENT)	TIME SEGMENT)	
16.00-16.15									
B-AC	0.54	8.55	0.063		0.1	0.1	1.0		
C-AB	0.12	9.55	0.012		0.0	0.0	0.2		
C-A	1.00								
A-B	0.10								
A-C	0.75								

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	16.15-16.30									I
I	B-AC	0.66	8.49	0.078		0.1	0.1	1.2		I
I	C-AB	0.15	9.67	0.015		0.0	0.0	0.3		I
I	C-A	1.22								I
I	A-B	0.13								I
I	A-C	0.91								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	16.30-16.45									I
I	B-AC	0.66	8.49	0.078		0.1	0.1	1.3		I
I	C-AB	0.15	9.67	0.015		0.0	0.0	0.3		I
I	C-A	1.22								I
I	A-B	0.13								I
I	A-C	0.91								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	16.45-17.00									I
I	B-AC	0.54	8.55	0.063		0.1	0.1	1.0		I
I	C-AB	0.12	9.55	0.012		0.0	0.0	0.2		I
I	C-A	1.00								I
I	A-B	0.10								I
I	A-C	0.75								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	17.00-17.15									I
I	B-AC	0.45	8.60	0.052		0.1	0.1	0.9		I
I	C-AB	0.10	9.47	0.010		0.0	0.0	0.2		I
I	C-A	0.84								I
I	A-B	0.09								I
I	A-C	0.63								I
I										I

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

QUEUE FOR STREAM B-AC	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.00	0.1
16.15	0.1
16.30	0.1
16.45	0.1
17.00	0.1
17.15	0.1

QUEUE FOR STREAM C-AB	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.00	0.0
16.15	0.0
16.30	0.0
16.45	0.0
17.00	0.0
17.15	0.0

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I		STREAM	I	TOTAL DEMAND		I	* QUEUEING *		I	* INCLUSIVE QUEUEING *		I		
I			I			I	* DELAY *		I	* DELAY *		I		
I			I			I			I			I		
I			I	(VEH)	(VEH/H)	I	(MIN)	(MIN/VEH)	I	(MIN)	(MIN/VEH)	I		
I	B-AC	I	49.4	I	32.9	I	6.1	I	0.12	I	6.1	I	0.12	I
I	C-AB	I	10.8	I	7.2	I	1.3	I	0.12	I	1.3	I	0.12	I
I	C-A	I	92.1	I	61.4	I		I		I		I		I
I	A-B	I	9.6	I	6.4	I		I		I		I		I
I	A-C	I	68.6	I	45.7	I		I		I		I		I
I	ALL	I	230.4	I	153.6	I	7.4	I	0.03	I	7.4	I	0.03	I

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

END OF JOB

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