

Stagecoach UK Bus

Wakefield Road Bus Depot Transport Assessment – FINAL

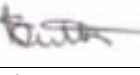
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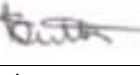
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	Originator	Checked by	Reviewed by	Approved by
Original	NAME Jemma Cross	NAME Sarah Cutter	NAME John Macaulay	NAME John Macaulay
DATE 16th March 2011	SIGNATURE 	SIGNATURE 	SIGNATURE 	SIGNATURE 
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Revision 1	NAME Sarah Cutter	NAME John Macaulay	NAME John Macaulay	NAME John Macaulay
DATE 27th May 2011	SIGNATURE 	SIGNATURE 	SIGNATURE 	SIGNATURE 
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Revision 1a	NAME Sarah Cutter	NAME John Macaulay	NAME John Macaulay	NAME John Macaulay
DATE 08th July 2011	SIGNATURE 	SIGNATURE 	SIGNATURE 	SIGNATURE 
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1 INTRODUCTION

1.1 Commission

Jacobs Consultancy was commissioned by Stagecoach UK Bus to prepare a Transport Assessment (TA) to support the planning application for the proposed expansion of the Wakefield Road Bus Depot.

This TA sets out the transport issues relating to the site, and considers the transport implications of the proposed expansion. It has been prepared in accordance with Department for Transport (DfT) Guidance on Transport Assessment.

A TA Scoping Note was issued to Barnsley Metropolitan Borough Council on 7th March 2011 to advise officers of the proposed approach.

1.2 Site Location

The site is located on the A61 Wakefield Road, approximately 2.6km north of Barnsley (Figure 1.1).

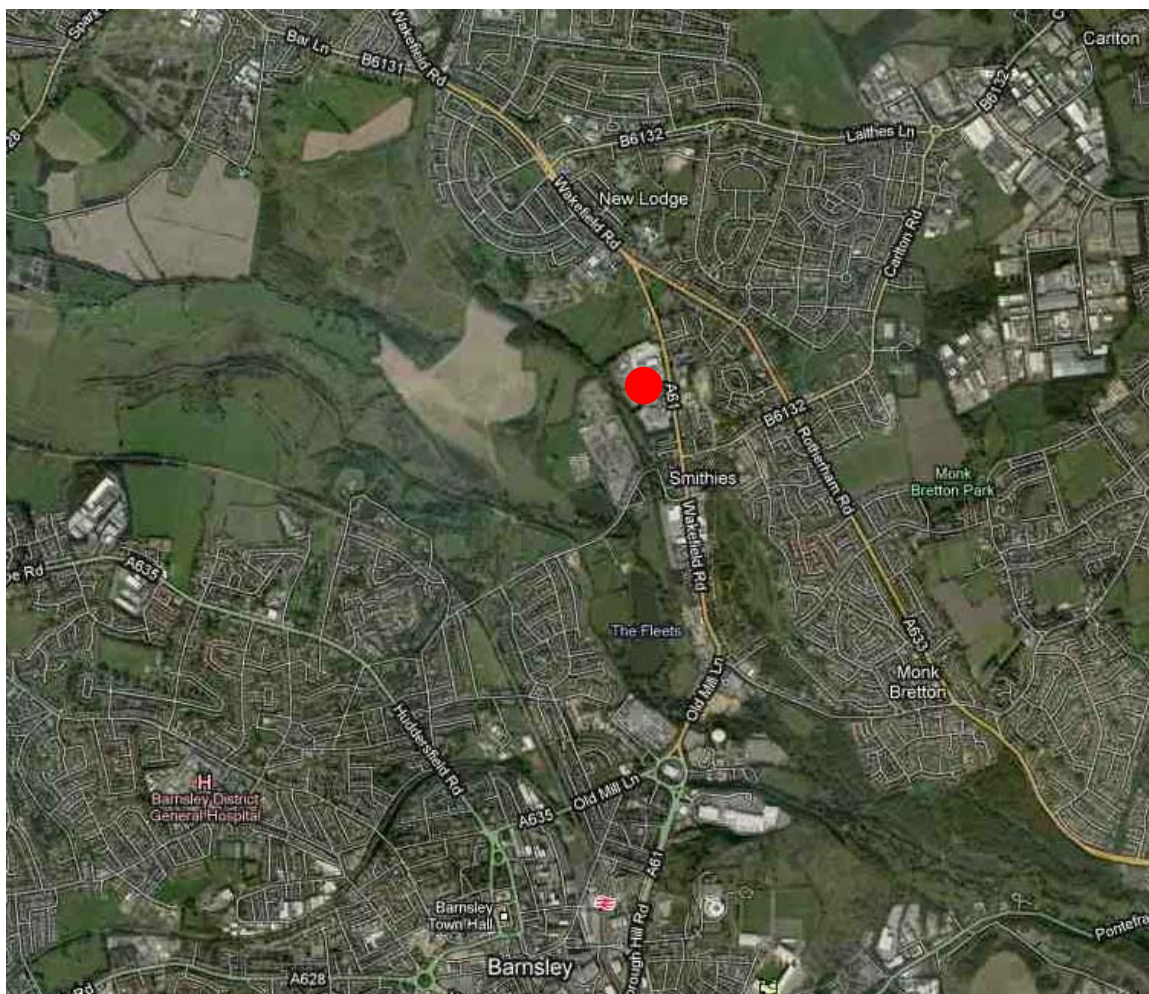


Figure 1.1 Site Location¹

¹ www.getamap.ordnancesurvey.co.uk

The surrounding land use is predominantly residential; however some light industry buildings are located directly south of the site. The land to the north of the existing depot, part of which is the subject of this application, is currently undeveloped.

1.3 Background

The site, which is owned and operated by Stagecoach UK Bus, currently comprises an existing bus depot of approximately 2.5 acres and a 1.56 acre (0.63 ha) parcel of undeveloped land which is the subject of the planning application. Existing facilities at the site include:

- ◆ Bus Depot buildings;
- ◆ Wash facilities;
- ◆ Hardstanding for 98 buses;
- ◆ 57 car parking spaces; and
- ◆ Fuel areas.

Staff operational hours are as follows:

- ◆ Monday – Friday: 04:15 – 01:30
- ◆ Saturday: 04:15 – 01:30
- ◆ Sunday and Bank Holidays: 07:00 – 01:00

Currently staff shifts sign in from 04:12am, with the final shift starting work at 16:39.

Stagecoach UK Bus previously submitted a planning application for the expansion of the Wakefield Road Depot but this was subsequently refused in July 2010 due to the:

- ◆ permanent development of urban land;
- ◆ potential detrimental impact on residential amenity due to intensification; and
- ◆ appearance on the surrounding character of the area.

This application was not however supported by any technical information such as a Transport Assessment (TA) and it is understood, from recent discussions between Montagu Evans and the Council, that a re-submission could be considered if accompanied by the appropriate supporting technical documents.

1.4 Development Proposals

The proposed expansion comprises an additional open area of hardstanding for bus storage, and car parking which can be accommodated on an adjacent parcel of land currently owned by UK Coal. Figure 2.1 shows the boundary of the expansion proposals.

Under these expansion proposals, capacity for bus parking would be increased to accommodate approximately 130 buses, compared with the 98 that can currently be accommodated. This would be accompanied by an increase in staffing levels as indicated in Table 1.1 below, which show the existing and proposed staffing levels for the site.

Access to the proposed parking area, which is the subject of the planning application, will be via a 35m ramp from the existing depot site. The gradient of the ramp will be 1:25 which is within acceptable standards.

Table 1.1 Existing and Proposed Staffing Levels

	Existing	Proposed (inc. existing)
Full-time	200	300
Part-time	25	25
Total	225	325

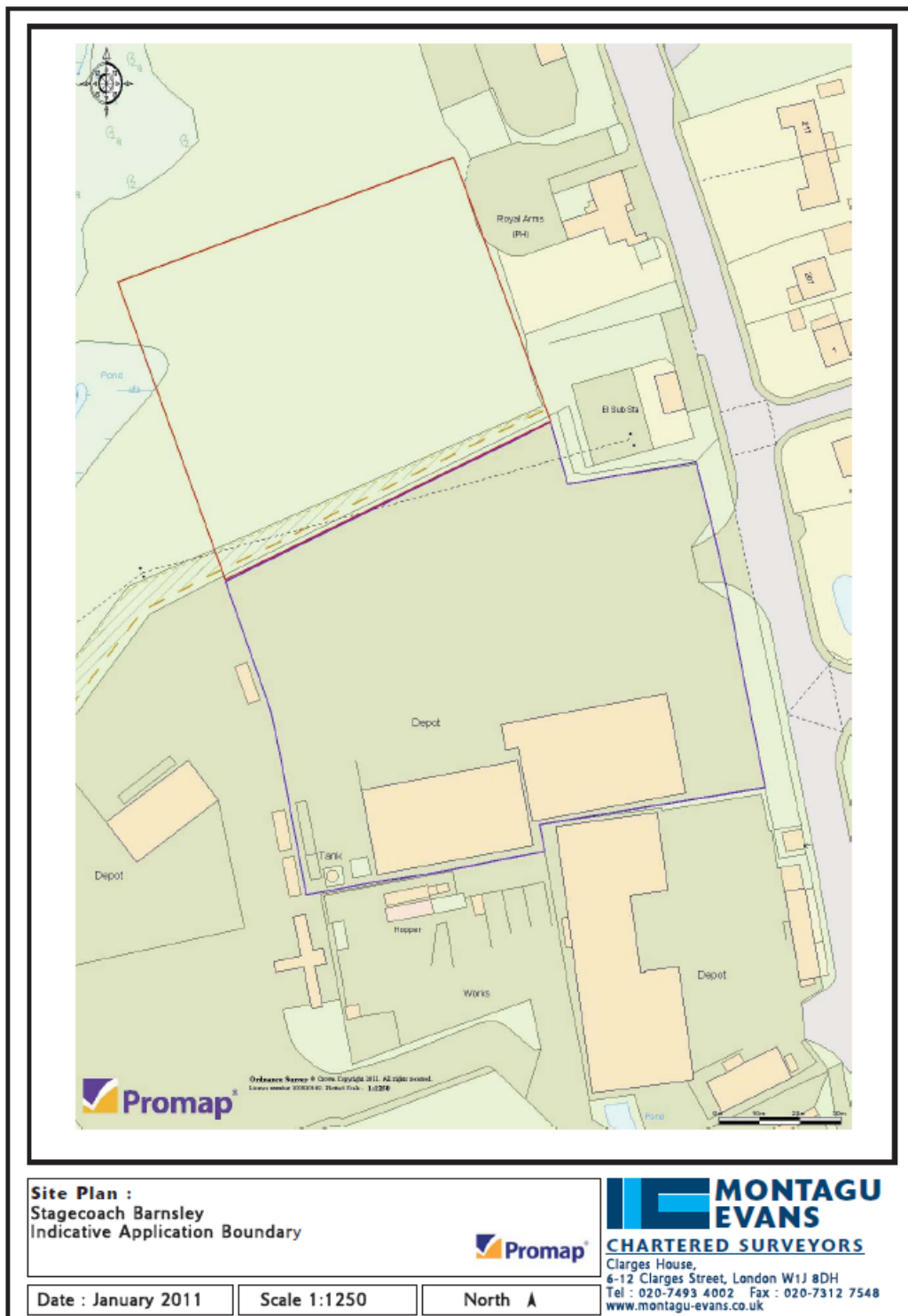


Figure 1.2 Depot and Indicative Planning Application Boundary

Wakefield Road Bus Depot, Transport Assessment, July 2011

1.5 Report Structure

Subsequent sections of the report are as follows:

- ◆ Section 2 sets the policy context;
- ◆ Section 3 review the existing highway network within the vicinity of the site and existing public transport, walking and cycling provision;
- ◆ Section 4 provides details of the assumptions and approach to the traffic forecasts for the expansion proposals, along with providing the resulting traffic generation figures;
- ◆ Section 5 sets out the assessment of the traffic impact of the proposed expansion and provides details of the future proposals such as site access arrangements; and
- ◆ Section 6 provides a summary of the TA.

2 POLICY CONTEXT

2.1 Introduction

This section summarises the key national, regional and local transport and planning policies relevant to the assessment of the transport impact of the proposed development.

2.2 National Policy

Planning Policy Guidance 13 (PPG13) on Transport, an updated version of which was published in 2011, provides guidance on the integration of planning and transport at the national, regional, strategic and local level. It stresses the need to manage demand and reduce the need for travel, particularly by car, and to provide for alternative modes of transport, particularly public transport and cycling. In doing so it sets out the circumstances where it is appropriate to change the emphasis and priorities in provision among different transport modes, in pursuit of wider Government objectives. However, it also acknowledges the role the car plays in rural areas, areas with poor public transport accessibility and groups with mobility issues.

Other issues that local authorities should take into account when preparing development plans and considering planning applications include promotion of more sustainable transport choices for both people and for moving freight; promotion of accessibility to jobs, shopping, leisure facilities and services by public transport, walking and cycling; and reduction in the need to travel, especially by car. It also provides advice for local authorities to ensure that their strategies on parking, traffic and demand management are consistent with their overall strategy on planning and transport.

The document also sets out the requirement for a Transport Assessment to be prepared to accompany planning applications for developments likely to have significant transport implications.

2.3 Regional Policy

'The Yorkshire and the Humber Plan' Regional Spatial Strategy (RSS)

On the 6th July 2010, Eric Pickles (the Secretary of State for Communities and Local Government) announced the revocation of Regional Spatial Strategies (RSS) with immediate effect. Although this decision has subsequently been subject to a successful legal challenge, the Government has introduced the Localism Bill providing legislation to revoke RSS. However, the RSS policies still form part of the statutory development plan until such time as alternative guidance comes forward and have therefore been included.

The RSS is a statutory document which sets out the policies for the redevelopment of the regions land up until 2026. The RSS recognises that transport and connectivity play a vital role in the economic development of the region, and therefore the Regional Transport Strategy (RTS) is included within the RSS. The RTS for the region sets out the policies and guidance for the integration of transport planning with other policy areas, for the region. This focuses upon increasing and maintaining the connectivity of the region to sustain and improves people's quality of life. However, it also recognises the priorities of ensuring that the environmental consequences of increasing travel are addressed, through the promotion of sustainable modes of travel.

Additionally, local authority development plans should also follow and be cohesive with the Plan and must be taken into consideration when determining planning applications in local authority areas.

South Yorkshire Local Transport Plan 3 (LTP3)

South Yorkshire third Local Transport Plan has been produced by South Yorkshire LTP Partnership, which includes the four Local Authorities in South Yorkshire (Barnsley, Doncaster, Rotherham and Sheffield) and the South Yorkshire Passenger Transport Executive.

The LTP3 is the main transport strategy for the county and its objectives are to support economic growth by developing and maintaining an integrated transport system and enhancing the overall quality of life for people in the county.

This plan covers a bigger area than the previous LTPs, namely the Sheffield City Region. It is given direction and focus by the overall Sheffield City Region (SCR) Transport Strategy (2011-2026) which has four main goals:

- ◆ support the economic growth of the SCR;
- ◆ enhance social inclusion and health;
- ◆ reduce the emissions from vehicles; and
- ◆ make transport increasingly safe and secure.

Within the 15-year period there will be a series of implementation plans for how the partnership intends to achieve these goals; implementation plans for the 2011-2015 are already included within the LTP3.

Public transport enhancements and measures to improve accessibility and create travel choice, in order to increase bus patronage and travel by other sustainable modes are identified in the plan among actions required to achieve these goals.

2.4 Local Policy

Barnsley Unitary Development Plan (UDP)

The Barnsley UDP sets out the development plan for Barnsley and the Barnsley council borough area. The plan outlines the level of development required across the borough, including the locations and type.

The UDP includes proposals for transport infrastructure improvements and policies which will aid and compliment the development proposals outlined in the UDP. The transport proposals are based on ensuring travel opportunities and choice of travel mode are improved and maintained.

The key objectives of the Transport Strategy are to:

- ◆ improve transport provision and services to the area of poor accessibility and job creation
- ◆ improve and protect the environment
- ◆ provide safety and efficiency
- ◆ provide genuine travel choices of mode of transport as alternatives to the private car including improvements to public transport, cycling and walking facilities
- ◆ meet the needs of physically and socially disadvantaged groups

Given that one of the key objectives of the UDP is to maintain and improve public transport facilities, Policy T11 relates to bus priority measures. The policy aims to

provide such measures to improvement the movement of buses around the borough in an effort to increase patronage. As part of this, bus priority measures were identified along the radial route north along the A61 from Barnsley to alleviate heavy congestion.

Barnsley UDP Supplementary Planning Document (SPD): 32

This document provides guidance for developer, land owners and planners involved in the preparation of planning applications. The document gives guidelines on the thresholds for when Transport Assessments are required for developments, as well as indicating maximum car parking standards and minimum cycle parking standards which all new developments should adhere to.

The maximum number of car parking spaces and minimum number of cycle parking spaces for 'Storage and Distribution', which is the most comparable use class in the SPD to Wakefield Road Depot, are:

- ◆ 1 car parking space per 3 staff or 1 space per 60m² gross floor area up to 300m², then 1 space per 100m² up to 1,000m² and 1 space per 150m² thereafter; and
- ◆ 1 short stay cycle parking space per 1000m² gross floor area for visitors; and 1 long stay space per 40 staff.

Barnsley Local Development Framework (LDF) Draft Core Strategy

The LDF is intended to replace the borough's UDP and consists of a portfolio of development plan documents (including the Draft Core Strategy) and supplementary planning documents.

The Draft Core Strategy, which was published for consultation in September 2010, sets out the council's vision for the development of Barnsley over the next 15-20 years.

The Transportation Strategy section of the Draft Core Strategy identifies the need to influence travel behaviour and encourage a move towards sustainable travel by improving public transport where travel is necessary and ensuring sustainable travel is embedded in new development.

2.5 Summary

From the planning and transport policy context, the following should be considered in relation to proposed development within the borough of Barnsley:

- ◆ the potential impacts on the highway network and appropriate mitigation, undertaken through the preparation of a transport assessment;
- ◆ measures to promote more sustainable modes of travel to reduce congestion and emissions; and
- ◆ application of appropriate parking standards.

Consolidation at this site will improve the efficiency of Stagecoach's activities, both from a commercial viability and operational perspective, whilst allowing the company to continue providing services to support increased bus patronage and modal shift to reduce congestion in, and support economic development of, the borough in accordance with more strategic policy objectives.

3 EXISTING TRANSPORT SITUATION

3.1 Introduction

This section of the report reviews the existing highway network in the immediate vicinity of the site, and provides information on existing public transport, walking and cycling provision.

3.2 Existing Highway Network

The site is located on Wakefield Road (A61), which runs in a north-south direction to the east of the site.

The junction of the site access and Wakefield Road is a priority junction. No road markings are currently present at the site access.

Wakefield Road is a major 'A' road with a speed limit of 30mph, which provides connections to Barnsley to the south of the site and Wakefield to the north (via the A61 Barnsley Road). The A61 at Barnsley meets the A628 where it connects to the M1 junction 37, providing quick links to Sheffield and Leeds, and other motorway connections. The A61 is also a key alternative north south route between Barnsley and Wakefield to the M1.

There are no parking restrictions on the A61 Wakefield Road, within the vicinity of the site. The existing on-site parking provision is set out in Table 3.1.

Table 3.1 Existing On-site Parking Provision

Type of Vehicle	Number of Spaces
Car	57
LGV	2
Motorcycles	3
Disabled	3
Cycle	5
Bus	98

3.2.1 Existing Traffic Flows

Manual Classified Turning counts (MCTC) were carried out on the 10th March 2011. Turning movement data was collected between 07:00-10:00 in the morning peak and 16:00-19:00 in the evening peak at the following locations:

- ◆ Wakefield Road j/w the depot access
- ◆ Wakefield Road j/w Ingleton Mews; and
- ◆ Wakefield Road j/w Brunswick Close

The survey data was analysed to determine the peak hours, and associated flows, for the network. The weekday network peak hours were identified as 08:15-09:15 and 17:00-18:00 and network diagrams showing the total number of vehicle and PSV (Public Service Vehicle) movements for both peaks are shown in Figure 3.1 below.

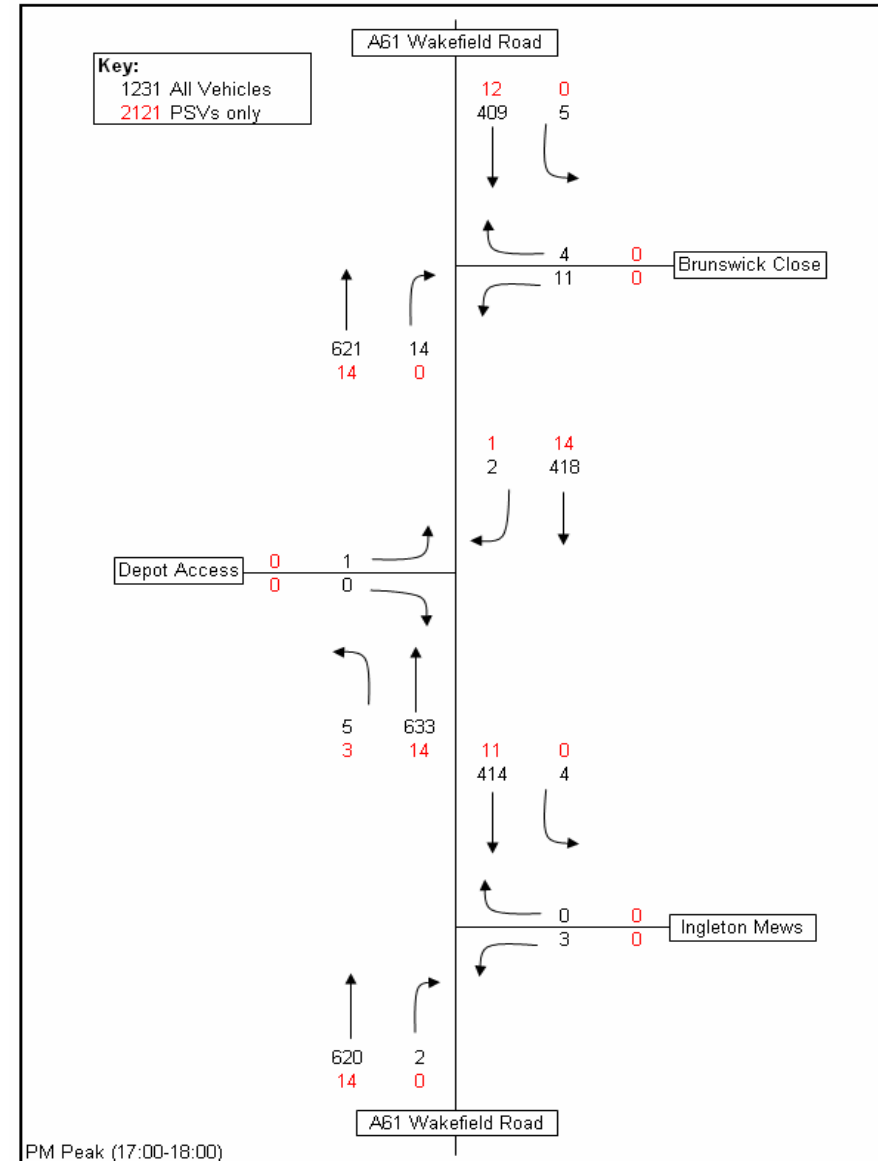
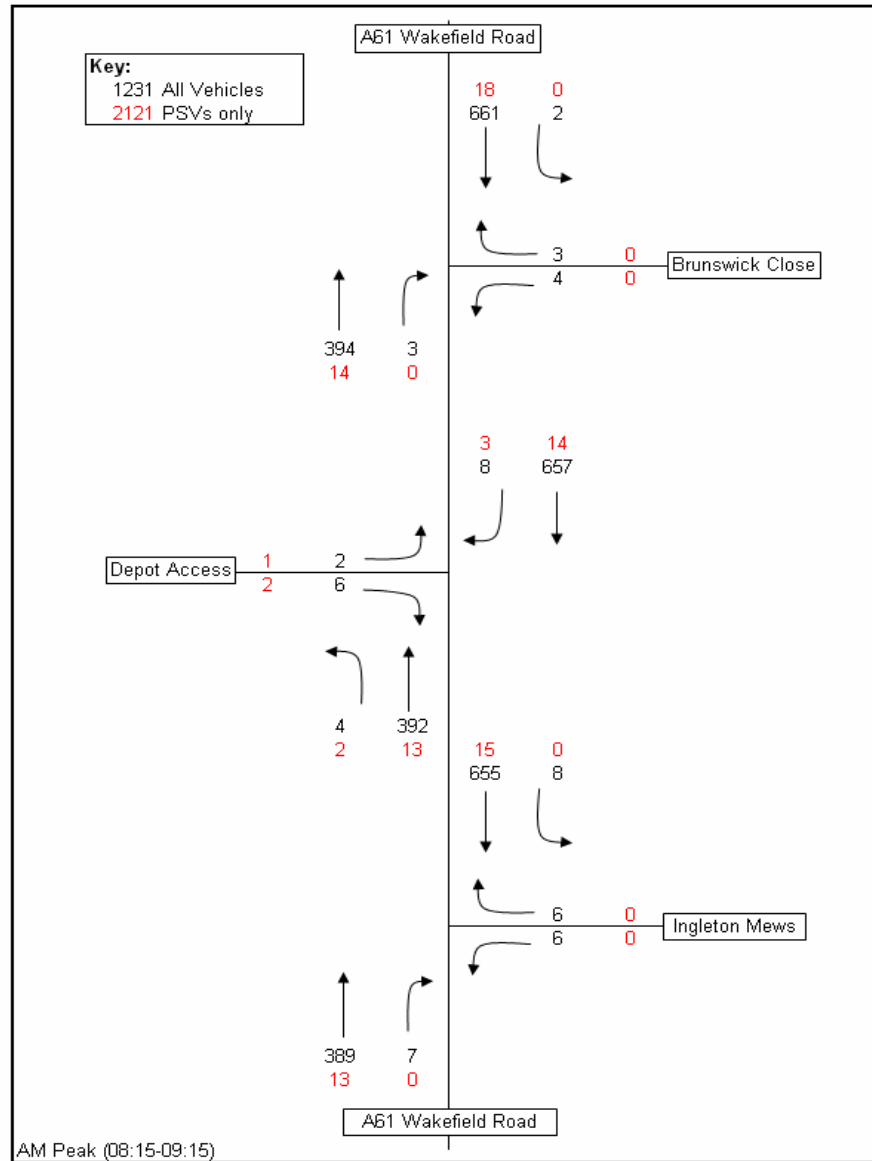


Figure 3.1 AM & PM Peak Hour Base Total Traffic Flows

As can be seen in Figure 3.1 above, the number of existing arrivals and departures to the site during both the AM and PM network peak hours are very low. It should also be noted that the peak hours for the site, based on the periods captured by the surveys, are 09:00-10:00 and 18:00-19:00 (a total of 20 vehicles arriving and departing in the AM peak and 33 in the PM peak).

A new run out / run in timetable, which came into effect from the 9th May 2010 after the traffic surveys had been undertaken, has been provided by Stagecoach UK Bus for the existing depot. Figure 3.2 below provides the daily bus arrival and departure profile for the site based on this new timetable. Whilst the weekday PM peak is 18:00-19:00 as suggested by the traffic surveys, the AM peak for bus movements is actually 06:00-07:00. Nevertheless, this demonstrates that bus movements are typically outside of the network peak hours, as is the case for total vehicle arrivals and departures to the site.

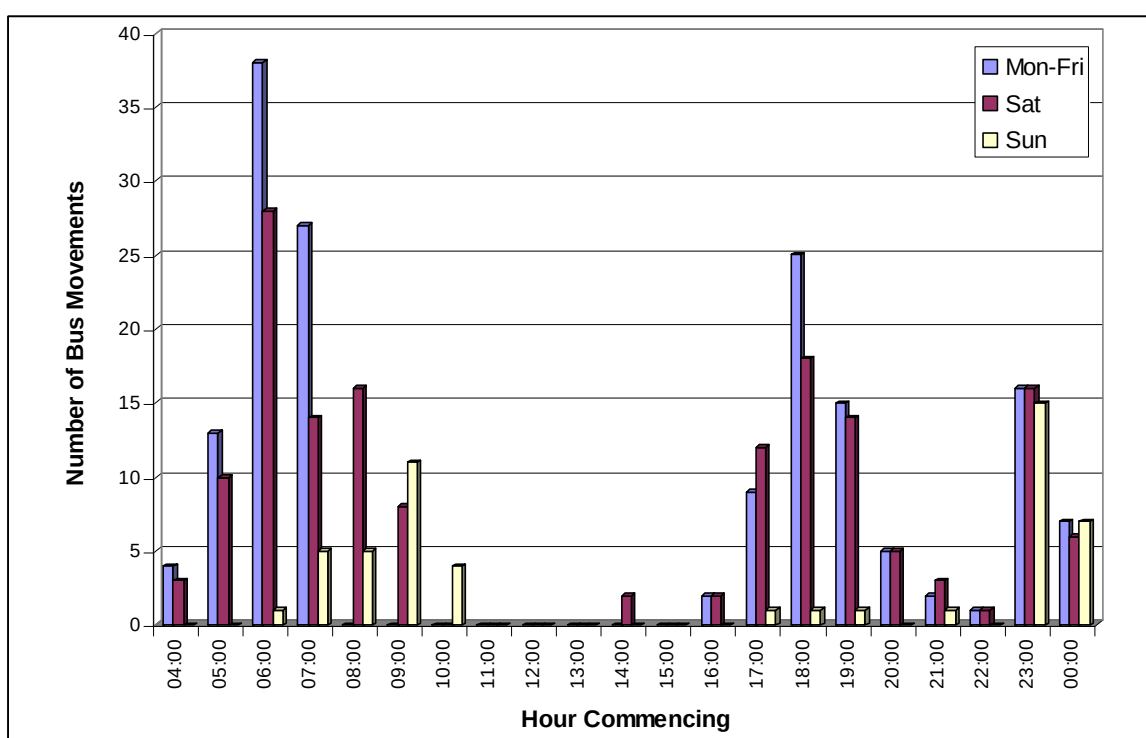


Figure 3.2 Daily Bus Arrival and Departure Profile for Wakefield Road Depot

3.2.2 Site Access Operational Review

At present the site access is a priority junction with the A61 Wakefield Road.

The industry standard software for the assessment of priority junctions, PICADY, has been used to determine the existing operation of the site access. The junction geometries have been determined from an OS base drawing, with traffic flows derived from the MCTC data.

Table 3.2 provides the PICADY assessment results for the AM and PM peak hours. The full PICADY report is contained in Appendix A.

Table 3.2 AM and PM Peak Hour Operational Assessment Results

Turning Movement	AM		PM	
	RFC	Queue (vehicles)	RFC	Queue (vehicles)
Site Access to A61 Wakefield Road (N)	0.014	0.0	0.007	0.0
Site Access to A61 Wakefield Road	0.045	0.0	0.038	0.0
A61 Wakefield Road (N) to Site Access & A61 Wakefield Road (S)	0.035	0.0	0.147	0.4

A desirable maximum Ratio of Flow to Capacity (RFC) for a priority junction is 0.85 and indicates that the junction is operating within its theoretical capacity. Therefore, with a maximum RFC of 0.147 on Wakefield Road northbound in the PM peak, the junction is currently operating well within capacity and therefore requires no capacity improvements.

3.2.3 Collision Analysis

Personal Injury Accident (PIA) data for the most recently available 36 month period was obtained from Barnsley Metropolitan Council for the vicinity of the site and analysed to identify any potential road safety issues which may need to be considered in association with the expansion proposals. A plan of the study area and the collision locations can be found in Figure 3.3.

Analysis of the data indicates that no collisions have occurred at the junction with the site access and Wakefield Road.

A total of 15 collisions (which resulted in 24 casualties) were recorded along the length of Wakefield Road from its junction with Rotherham Road to its junction with Carlton Road. Of these, two resulted in serious injury and the remainder were slight (no fatalities were recorded).

Six of these collisions occurred to the north of the site, five of which were at the A61 Wakefield Road / A633 Rotherham Road junction and the remaining one just north of the junction. Nine collisions were recorded to the south of the site, five of which were at the A61 Wakefield Road / Carlton Road Junction. The nearest collision to the site occurred 125m from the site access.

With regards to vulnerable road users, two of the collisions involved pedestrians. The first of which occurred when the rider of a powered two wheeler struck a pedestrian crossing Wakefield Road, this resulted in the pedestrian being seriously injured. The second occurred at the junction of Wakefield Road / Carlton Road when a pedestrian stepped out into the path of a moving vehicle, resulting in a slight injury.

One collision involved a cyclist; this occurred when a Medium Goods Vehicle turned left onto Wakefield Road from the industrial area just south of the site and collided with the cyclist, knocking the rider of their bicycle. The cyclist was slightly injured as a result.

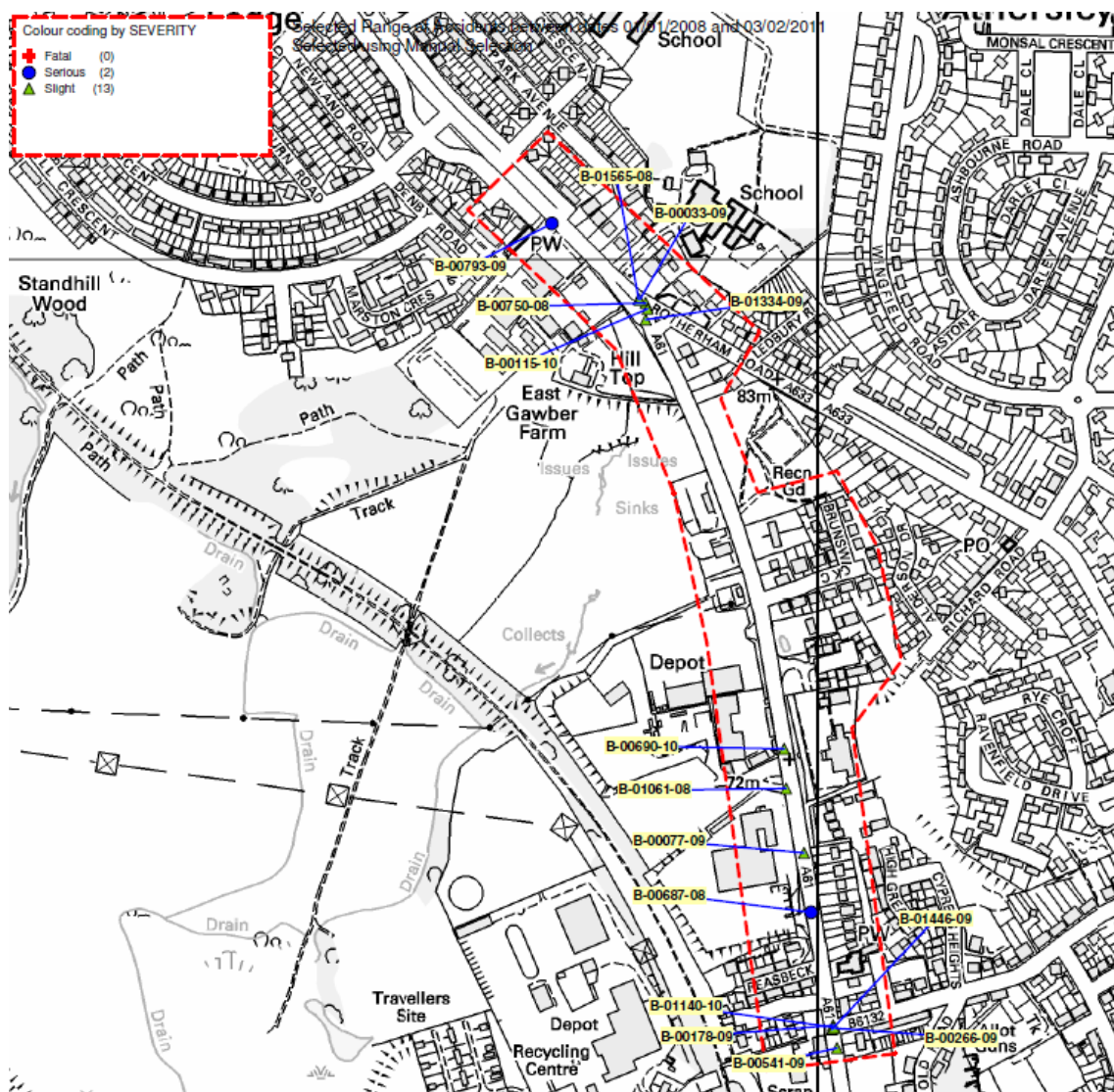


Figure 3.3 Collision Record for Wakefield Road (01/01/2008 to 03/02/2011)

3.3 Public Transport Provision

3.3.1 Bus Stop and Routes

There are two bus stops in close proximity to the site located on Wakefield Road serving both northbound and southbound directions. The northbound is located approximately 70m north of the site and is not sheltered. The southbound shelter is located approximate 120m north of the site and is sheltered.

These stops are served by the routes 1 (Barnsley to Staincross), 11 (Barnsley to Athersley) and 194 (Barnsley to Wakefield). Table 4.1 summarises the bus routes and their frequencies.

Table 3.3 Bus Service Information and Frequency

Route Number		Route	Frequency		
			Monday to Friday	Saturdays	Sundays
1	NB	Barnsley – New Lodge – Mapplewell – Staincross	10 - 20 minutes	15 - 30 minutes	30 minutes
	SB	Staincross - Mapplewell – New Lodge - Barnsley	10 - 20 minutes	15 - 30 minutes	30 minutes
11	NB	Barnsley – Honeywell – Smithies – New Lodge – Athersley	10 – 20 minutes	10 – 20 minutes	30 minutes
	SB	Athersley – New Lodge – Smithies – Honeywell – Barnsley	10 – 20 minutes	10 – 20 minutes	30 minutes
194	NB	Barnsley – Athersley – Royston – Ryhill – Newstead – Crofton - Wakefield	Every hour	Every hour	Every hour
	SB	Wakefield – Crofton – Newstead – Ryhill – Royston – Athersley – Barnsley	Every hour	Every hour	Every hour

As part of the Stagecoach Yorkshire Wakefield Road Depot Travel Plan, discussed in section 3.6 below and contained in Appendix B, a staff bus is also provided to transport drivers from across south Yorkshire to the Depot. The first bus leaves the depot at 03:20, with the final bus scheduled at 02:00. The numbers of staff using this service is typically ranges from 15 to 20.

3.3.2 National Rail Stations and Services

The closest rail station is Barnsley located 1.8 miles away. The station is on the main line between Leeds and Sheffield. Leeds is a 36 minute journey with a frequency at 30 minute intervals, Monday to Friday. Sheffield is a 23 minute journey (30 minutes slow train) with a frequency of four an hour, Monday to Friday.

Bus route numbers 1, 11 and 194 all provide connection between the site and Barnsley Rail Station.

3.4 Provision for Pedestrians

Pedestrian access to the site is considered to be good. Footways are present along both sides of Wakefield Road, providing connections between the site and nearby bus stops. Dropped kerbs and tactile paving is present on both sides of the site access.

The nearest formal crossing to the site is a controlled crossing forming part of the signalised junction of Wakefield Road / Carlton Road, approximately 400m to the south of the site.

3.5 Provision for Cyclists

At present there are cycle parking facilities for 5 bicycles. Showering and changing facilities are provided on site for staff use.

On road cycle facilities are provided in approximately 460m north of the site. The cycle facility is a bus lane which runs for approximately 500m in a northbound direction along Wakefield Road between Regent Crescent and New Lodge Crescent.

3.6 Stagecoach Yorkshire Wakefield Road Depot Travel Plan

As part of their Environmental Policy, Stagecoach recognises the need to produce a Travel Plan to encourage staff, deliveries and customers/visitors to make journeys to and from the site as harm free to the environment as possible.

As such, Stagecoach Yorkshire produced a Travel Plan for the site which outlines measures that will be delivered in order to promote sustainable modes of travel to the site. The Travel Plan included a review of the current mode share for travel to work. As shown in Table 3.4 the dominant mode choice is the car with 76% (including as passengers). Bus has a modal share of 16% and walking at 8%, however no individuals cycle to work at present.

The Travel Plan, which is contained in Appendix B, focuses on encouraging cycling and car sharing, through increased cycle parking, shower facilities, and car share promotion.

Table 3.4 Existing Mode Share

Mode	Percentage Mode Share
Car (as driver)	72%
Car (as passenger)	4%
Bus	16%
Tram	0%
Train	0%
Powered two wheelers	0%
Walk	8%
Cycle	0%
Other	0%

4 TRAFFIC FORECASTS

4.1 Introduction

This section discusses the approach to the traffic forecasting and the resultant level of traffic generation for the expansion proposals.

4.2 Existing Arrivals and Departures

Table 4.1 provides details of the existing arrivals and departures to the site during the weekday AM (08:15-09:15) and PM (17:00-18:00) peak hours for the network, based on the MCTC data for the site access / A61 Wakefield Road junction.

Table 4.1 Existing AM and PM Peak Hour Arrivals and Departures

Mode	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Car	5	1	2	1
LGV	1	3	2	0
MGV	0	1	0	0
HGV	1	0	0	0
PSV	5	3	4	0
Total	12	8	8	1

4.3 Approach and Assumptions

Traffic generation forecasts have been developed for the expansion proposals based on a pro-rata increase in PSV and total vehicular traffic during the weekday AM and PM network peak hours.

The development proposals include a 33% increase in parking spaces for buses and as such this increase has been applied to the existing AM peak hour PSV arrivals and departures, as contained in Table 4.1 above. The new run out / run in timetable for the site, discussed in sub-section 3.2.1 previously, suggests that no PSVs arrive or depart the site during the AM peak and as such using the figures in Table 4.1 is considered to allow a robust assessment. However, the run out / run in timetable suggests that nine PSVs arrive during the PM peak when the traffic survey data in Table 4.1 implies only four arrivals. In order to ensure a robust assessment the PSV forecast for the PM peak is therefore based on nine arrivals.

A 44% increase in car movements has been derived from the proposed increased in staff numbers. Although there is no increase in car parking spaces associated with the proposed expansion of the Depot (refer to section 5.5 below), in order to ensure a robust assessment, this increase has been applied to the existing car movements.

Based on current site operation, servicing and delivery activities are anticipated to predominantly take place outside of the weekday network peak hours. However, the existing LGV, MGV and HGV movements, as set out in Table 4.1, have also been factored up by 44% to ensure any additional peak hour traffic is considered within the assessment.

4.4 Traffic Generation

Figure 4.1 shows the resultant AM and PM peak hour traffic generated for both the arrivals and departures as a result of the expansion proposals. The development trips were applied to the network based on the existing trip distribution.

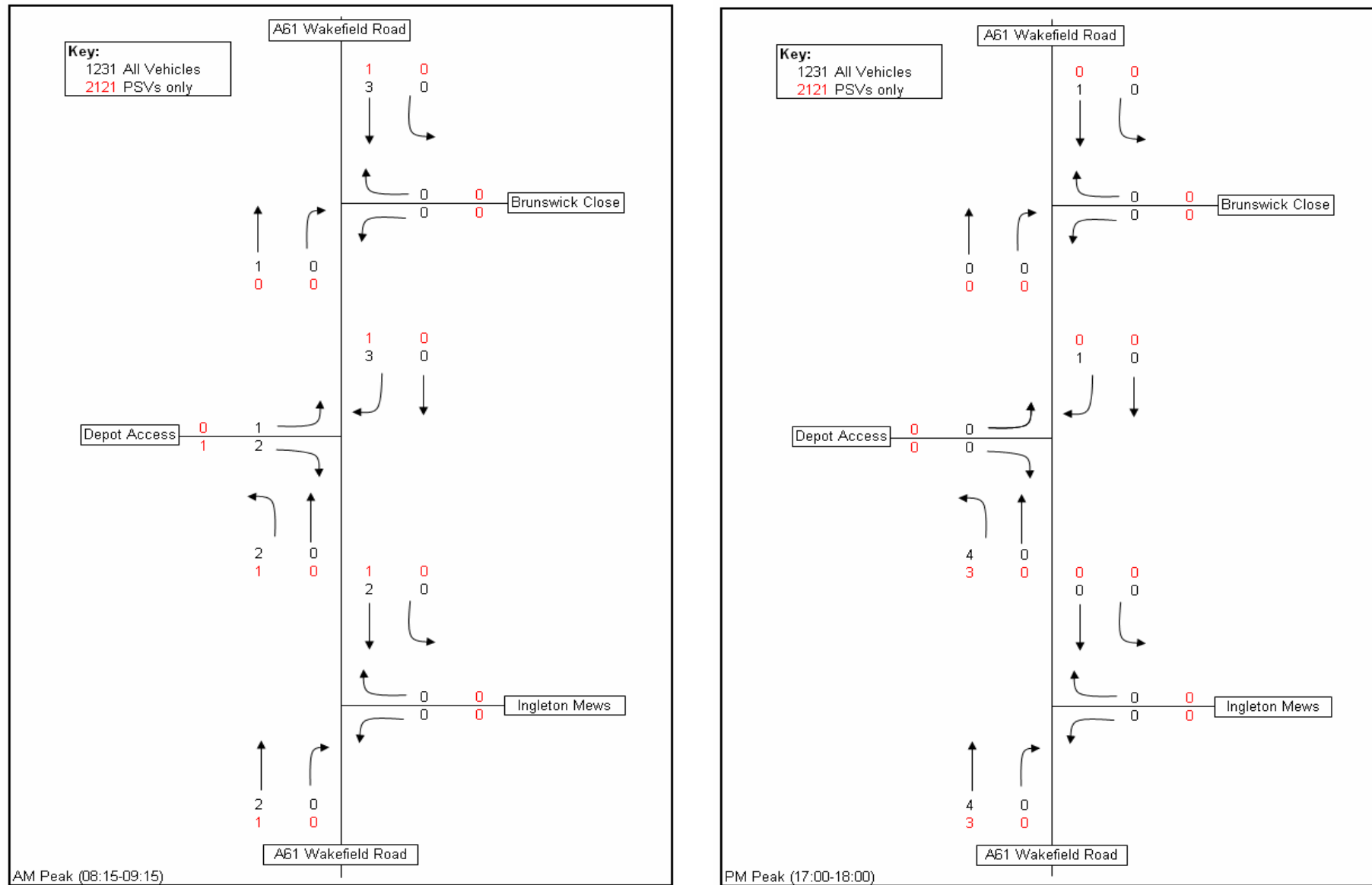


Figure 4.1 Development Trip Generation – AM and PM Peak Hour Arrivals and Departures

5 DEVELOPMENT IMPACT AND FUTURE PROPOSALS

5.1 Introduction

This section assesses the likely impacts of the changes in traffic generation associated with the expansion proposals. In addition, it outlines the future proposals relating to site access arrangements, parking provision and other proposed improvements.

5.2 Assessment of Development Impact

5.2.1 Scale of Impact

Figure 5.1 below illustrates the traffic flows for the AM and PM peak hours with the additional development traffic.

Figure 5.2 illustrates the scale of impact on the local highway network, based on the existing AM and PM peak hour traffic flows on Wakefield Road. As can be seen, based on the traffic forecasts, the traffic impact of the proposed expansion will be negligible, with a maximum increase in traffic flow on Wakefield Road of 0.6% in the PM peak.

5.2.2 Operational Assessment

A PICADY assessment has been carried out for the site access to determine the impact of proposed expansion on the performance of the junction. Due to the relatively small number of trips to be generated during the peak hours, the total traffic generation for each peak hour has been assumed to take place within a 15 minute interval.

Tables 5.1 and 5.2 provide a summary of the PICADY outputs and a comparison with the base outputs for both the AM and PM peak hours. The full PICADY report is contained in Appendix C.

The PICADY assessments indicate that site access will continue to operate well within capacity with the additional traffic forecast to be generated as a result of the proposed expansion.

Table 5.1 AM Peak Hour Operational Assessment Results – Development Impact

Movement	Base		Base + Proposed		Difference	
	RFC	Queue	RFC	Queue	RFC	Queue
Site Access to A61 Wakefield Road (N)	0.014	0.0	0.016	0.0	0.002	0
Site Access to A61 Wakefield Road (A)	0.045	0.0	0.091	0.1	0.046	0.1
A61 Wakefield Road (N) to Site Access & A61 Wakefield Road (S)	0.035	0.0	0.079	0.1	0.044	0.1

Table 5.2 PM Peak Hour Operational Assessment Results – Development Impact

Movement	Base		Base + Proposed		Difference	
	RFC	Queue	RFC	Queue	RFC	Queue
Site Access to A61 Wakefield Road (N)	0.007	0.0	0.008	0.0	0.001	0.0
Site Access to A61 Wakefield Road (A)	0.038	0.0	0.038	0.0	0.038	0.0
A61 Wakefield Road (N) to Site Access & A61 Wakefield Road (S)	0.147	0.4	0.147	0.4	0.147	0.0

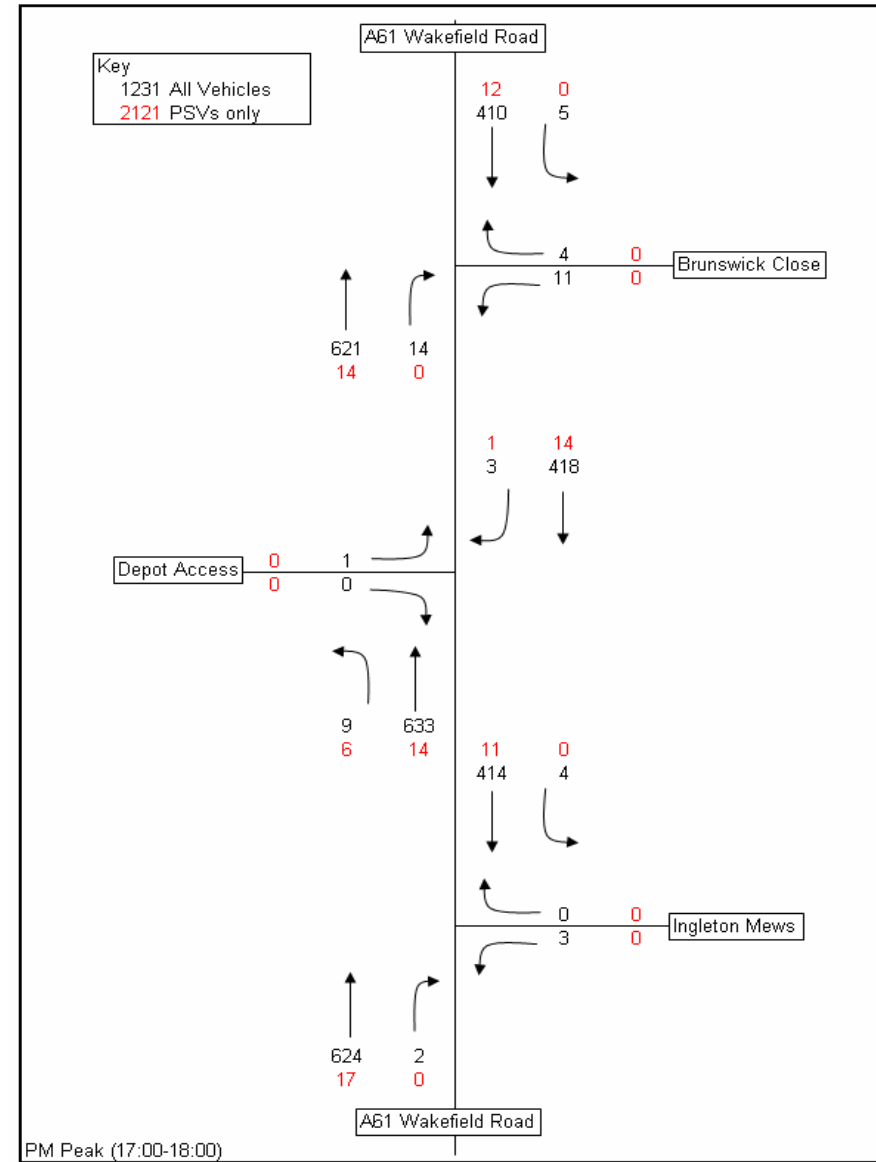
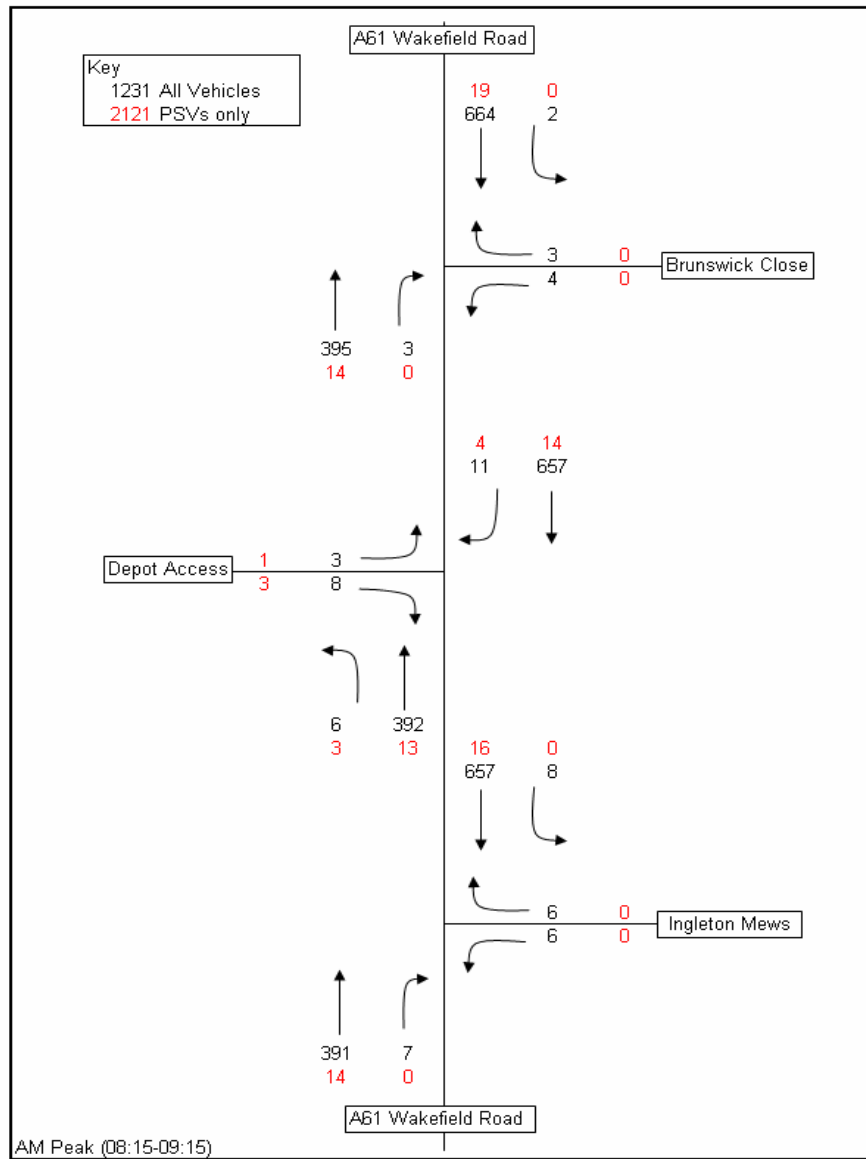


Figure 5.1 Base + Development Trips

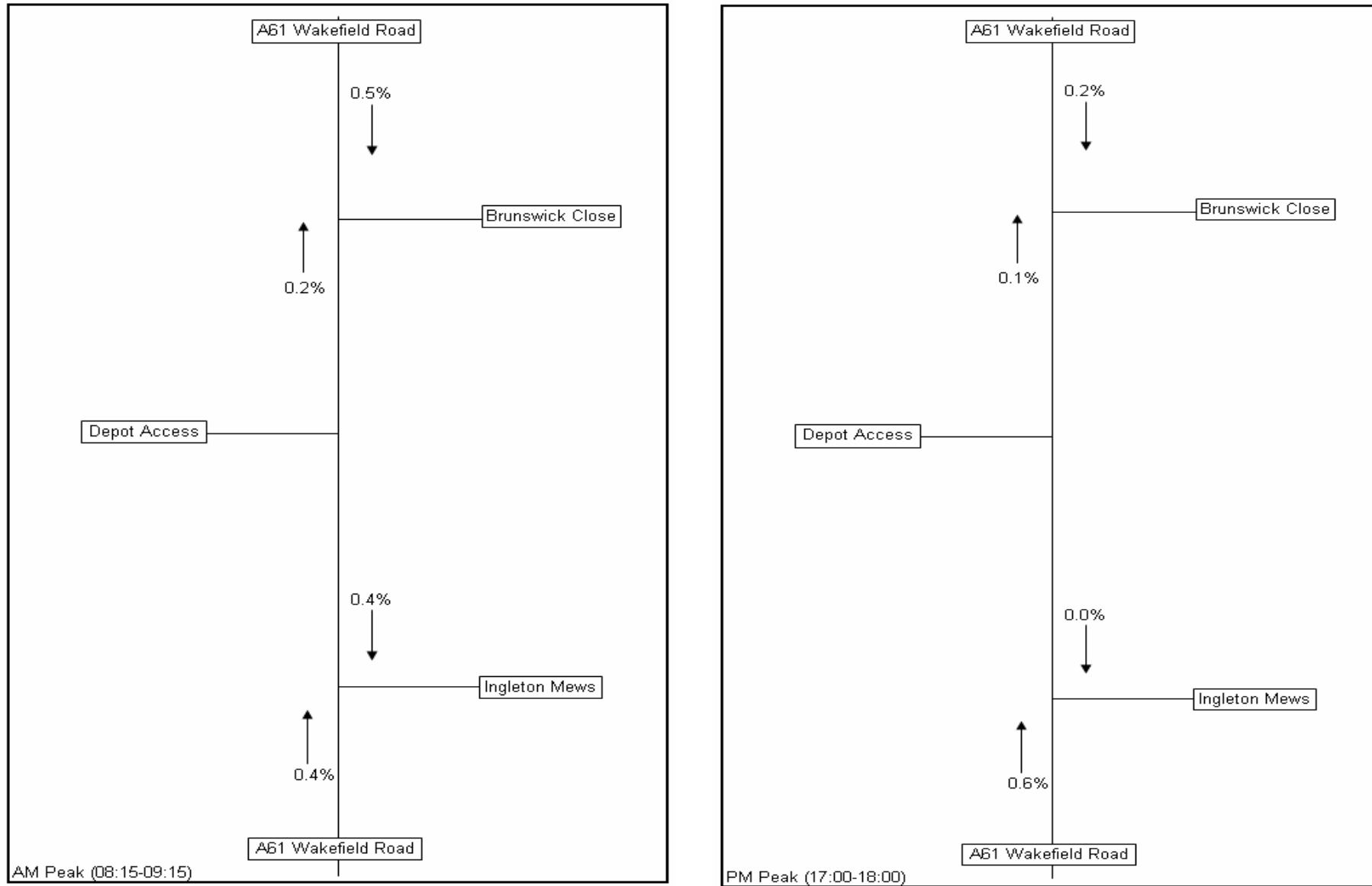
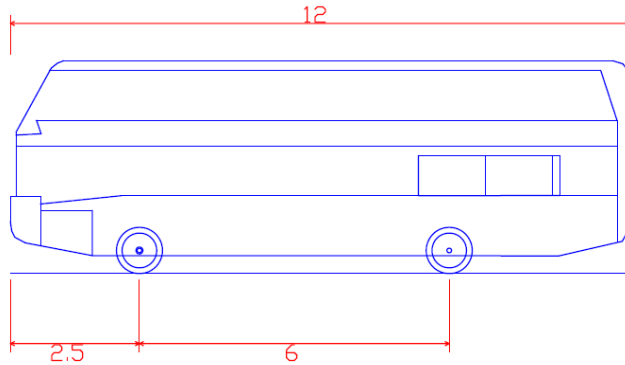


Figure 5.2 Scale of Impact on AM and PM Peak Hour Traffic Flows

5.3 Swept Path Analyses

Autotrack software was used to undertake swept path analyses for the site access and proposed internal access arrangement for the new parking area.

The vehicle used for the assessment was a single decker bus measuring 12 x 2.5m, as shown in Figure 5.3. Due to its length and rigidity this vehicle has a poor turning circle and has therefore been used to ensure a robust assessment.



Rigid Public Service Vehicle	
Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	4.104m
Min Body Ground Clearance	0.343m
Track Width	2.550m
Lock to Lock Time	4.00 sec
Kerb to Kerb Turning Radius	10.500m

Figure 5.3 Single Decker Bus

The results of the assessment are shown in Figure 5.4 below. As can be seen, the vehicle is able to negotiate both the existing access and access to the proposed bus parking area without over-running the kerbs. In addition, two way movements can also be adequately accommodated.

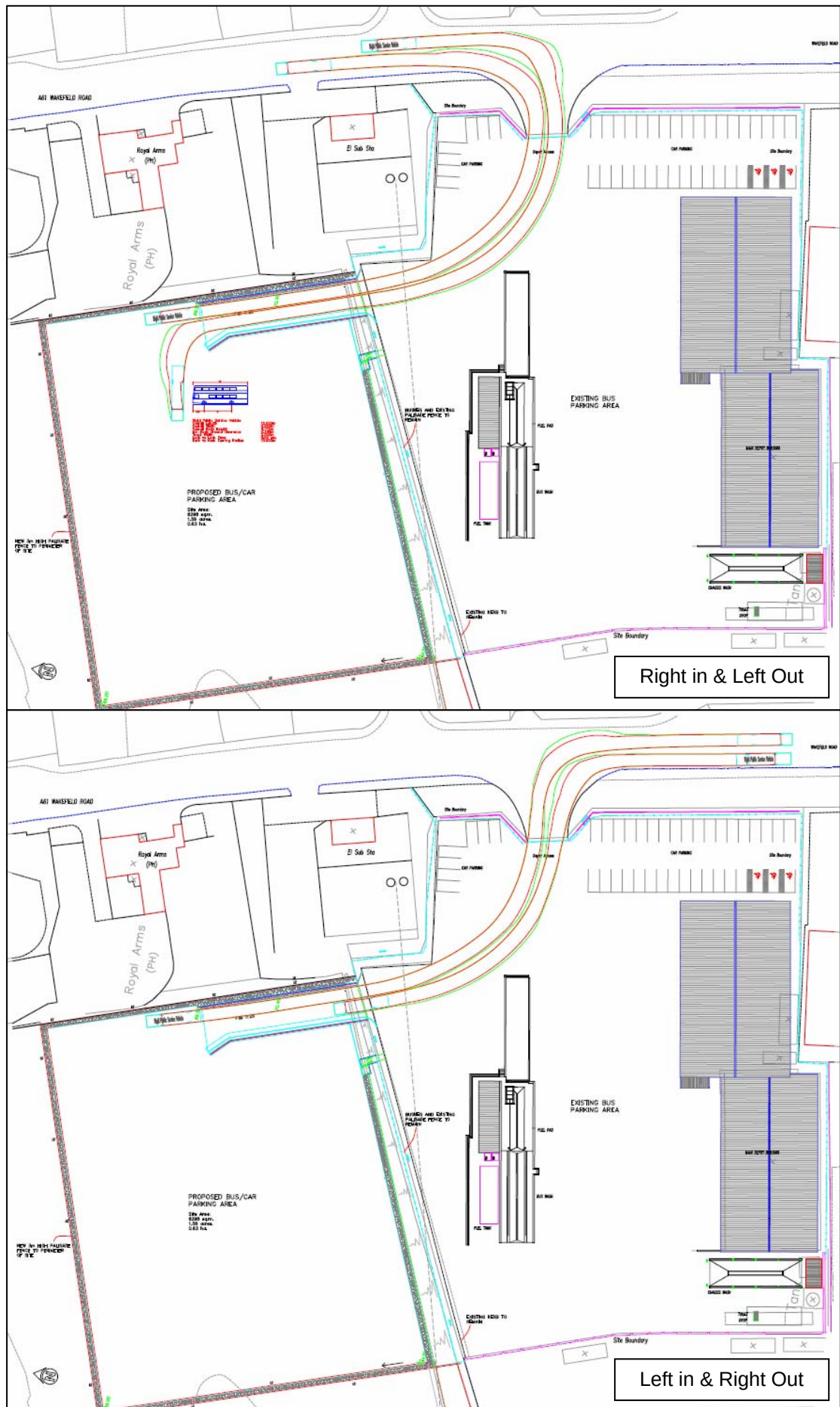


Figure 5.4 Swept Path Analysis of the Site Access and Access to the Proposed Parking Area

5.4 Site Access

Assessments of the existing site access, discussed in sections 5.2.1 and 5.3, have identified no issues with the operational performance of the existing layout. In addition, no safety issues have been identified through the review of the collision record for Wakefield Road.

As such, the existing access arrangement is considered sufficient for the proposed expansion.

However, as discussed in section 3 previously, no road markings are present at the site access. It is therefore proposed to formalise the junction by providing appropriate road markings as indicated in Figure 5.5. This will help to reduce the potential for collisions at the junction.

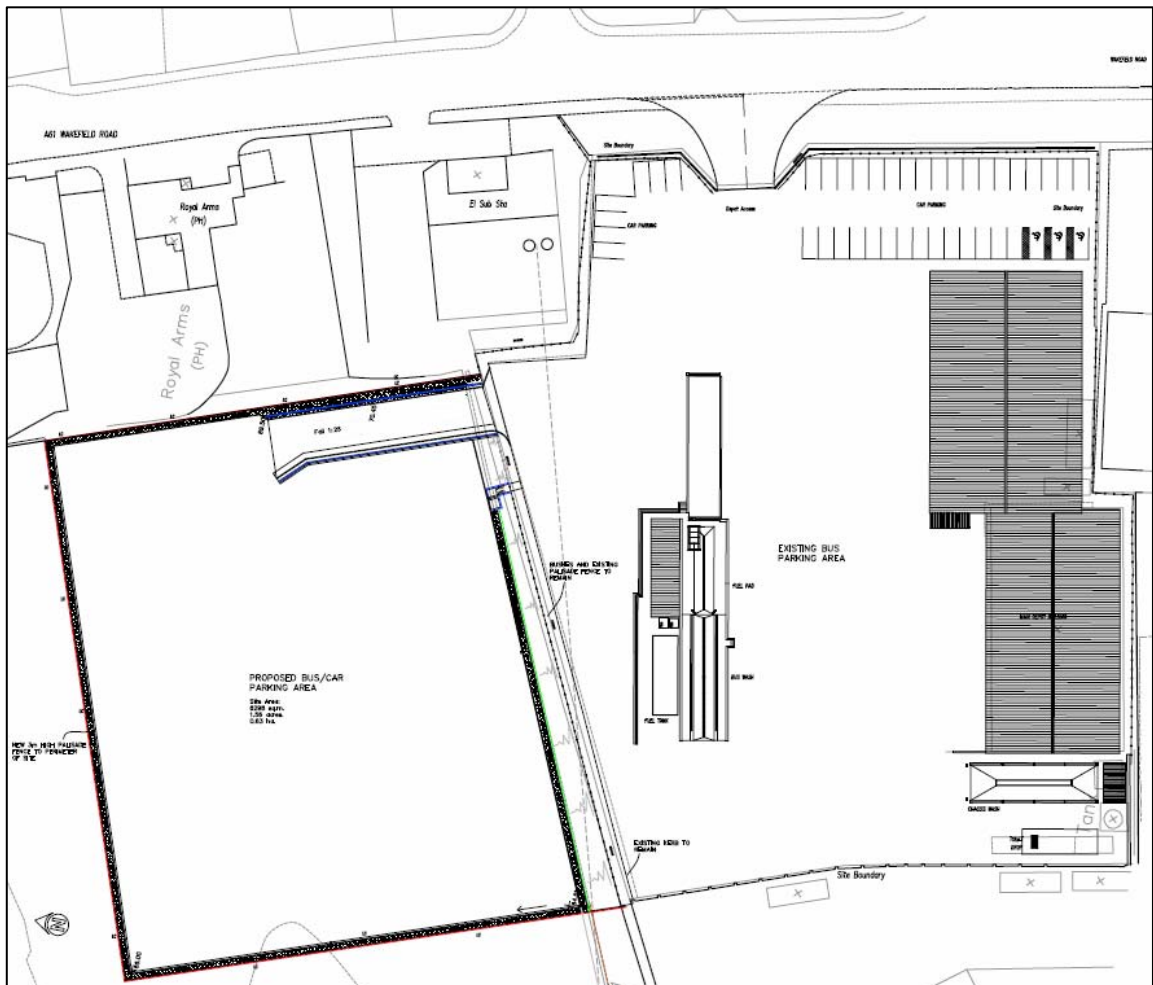


Figure 5.5 Proposed Site Access Junction Markings

5.5 Parking Provision

The expansion proposals include the provision of additional on-site parking, as indicated in Table 5.3.

Table 5.3 Proposed Parking Provision

Type	Parking Provision	
	Proposed (inc. existing)	Increase
Car	57	0
Light goods / public carrier vehicles	4	2
Motorcycles	5	2
Disabled	3	0
Cycle	10	5
Bus	130	32

As can be seen, the proposals do not include increasing the car parking provision.

Local parking standards for cycle parking are outlined in Barnsley's UDP Supplementary Planning Document 32 (discussed in sub-section 2.4 previously). As the total staff numbers following the proposed expansion will be 325, the site is required to provide 8 cycle parking spaces based on the standards for Storage and Distribution use. The total proposed cycle parking provision of 10 spaces therefore exceeds the minimum standards.

5.6 Travel Plan Review & Refresh

As discussed in Section 4.4, there is an existing Travel Plan for the site. Stagecoach Yorkshire recognises that the Depot provides the opportunity to address transport issues as part of a commitment to improving environmental performance and therefore undertakes to review methods of transport used by staff, visitors, deliveries and customers and to promote travel options for all site users.

As such, the existing Travel Plan will be reviewed and refreshed to reflect the increased staffing numbers and traffic generated associated with the site expansion.

A staff travel survey will be undertaken within three months of staff relocating to the site following its expansion. The results of these surveys will be used to inform the travel plan refresh and ultimately the measures to be implemented.

6 SUMMARY & CONCLUSION

Jacobs Consultancy was commissioned to produce a Transport Assessment (TA) to support the planning application for the proposed expansion of the existing bus depot on the A61 Wakefield Road. Stagecoach UK Bus, who own and operate from this site, wish to consolidate their depot operations across the Barnsley area through the proposed expansion.

The proposals include the provision of additional hard standing for bus storage through expanding the depot onto an adjacent vacant plot of land, currently owned by UK Coal (this land is the subject of the planning application). Under these proposals there will be sufficient space for 130 buses and staffing levels at the site could increase to 325 from the 225 at present.

The site has a number of bus stops within close vicinity that provide regular services to Barnsley including the rail station, and a less frequent service to Wakefield. The site also has an existing Travel Plan which sets out measures to promote sustainable forms of travel; this includes the provision of a staff bus, showers and cycle parking facilities. This travel plan will also be refreshed within three months of the proposed expansion.

Assessment of the traffic impact of the proposed expansion was based on traffic forecasts developed assuming a pro-rata increase in existing weekday AM (08:15-09:15) and PM (17:00-18:00) peak hour site traffic, based on traffic count data from March 2011. PSV movements were increased by 33% and other traffic by 44% consistent with the proposed increases in bus parking and staffing numbers (this made an allowance for additional servicing and delivery vehicle trips). For the purposes of traffic forecasting, the base PSV arrivals in the PM peak hour were also increased in line with a new bus run out / run in timetable implemented in May 2011.

Assessment of the scale of impact on the local highway network during the AM and PM peak hours resulting from the level of traffic generation forecast for the expansion has demonstrated the impact will be negligible. This assessment revealed a maximum increase in traffic flows on Wakefield Road of 0.6% during the PM peak.

Operational assessments of the existing site access with Wakefield Road has revealed that this junction currently operates well within its operational capacity and will continue to do so with the additional traffic which could be generated by the proposed expansion. As such, no capacity improvements are required and existing arrangement / layout will be retained. It is however proposed that the site access be formalised through the provision of appropriate road markings. Although no existing road safety issues have been identified with the site access this will help to reduce the potential for collisions at the junction.

Access to the proposed parking area will be via a 35m ramp from the existing depot site, at a gradient of 1:25 which is within acceptable standards. Swept path analyses of both the site and internal accesses have demonstrated that two-way movements by single decker buses can be adequately accommodated.

In conclusion, the proposals for Wakefield Road Bus Depot are policy compliant and the impact of the anticipated level of traffic generation is negligible in terms of the scale of impact on the local network and operational capacity of the site access junction with Wakefield Road. Finally, the proposals do not present any safety concerns.

Appendix A

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

PICADY 4.1 ANALYSIS PROGRAM
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Run with file:-
"M:\Projects\000001-050000\Stagecoach - Barnsley Depot\PICADY\BASE\Site Access AM Base.vpi"
(drive-on-the-left) at 11:24:58 on Friday, 27 May 2011

RUN TITLE

A61 / Site Access AM Base

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

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

ARM A IS A61 / Wakefield Road (NB)
ARM B IS Site Access
ARM C IS A61 / Wakefield Road (SB)

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) 9.00 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) 250.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 29.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 21.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) -	I
I	- LANE 2 WIDTH	I	(WB-A) -	I
I	- WIDTH AT 0 M FROM JUNC.	I	10.00 M.	I
I	- WIDTH AT 5 M FROM JUNC.	I	7.50 M.	I
I	- WIDTH AT 10 M FROM JUNC.	I	5.20 M.	I
I	- WIDTH AT 15 M FROM JUNC.	I	4.50 M.	I
I	- WIDTH AT 20 M FROM JUNC.	I	2.20 M.	I
I	- LENGTH OF FLARED SECTION	I	DERIVED: 2 PCU	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

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

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME		FROM/TO	ARM A	ARM B	ARM C		
08.00 - 08.15	ARM A		0.000	0.022	0.978		
			0.0	2.0	90.0		
			(0.0)	(50.0)	(7.0)		
		ARM B	0.000	0.000	0.000		
			I???????	I???????	I???????		
			(0.0)	(0.0)	(0.0)		
		ARM C	1.000	0.000	0.000		
			166.0	0.0	0.0		
			(3.0)	(0.0)	(0.0)		
08.15 - 08.30	ARM A		0.000	0.010	0.990		
			0.0	1.0	98.0		
			(0.0)	(100.0)	(5.0)		
		ARM B	1.000	0.000	0.000		
			I???????	I???????	I???????		
			(100.0)	(0.0)	(0.0)		
		ARM C	0.987	0.013	0.000		
			156.0	2.0	0.0		
			(2.0)	(100.0)	(0.0)		
08.30 - 08.45	ARM A		0.000	0.000	1.000		
			0.0	0.0	114.0		
			(0.0)	(0.0)	(5.0)		
		ARM B	0.000	0.000	1.000		
			I???????	I???????	I???????		
			(0.0)	(0.0)	(100.0)		
		ARM C	1.000	0.000	0.000		
			163.0	0.0	0.0		
			(4.0)	(0.0)	(0.0)		

		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME		FROM/TO	ARM A	ARM B	ARM C		
08.45 - 09.00	ARM A		0.000	0.012	0.988		
			0.0	1.0	85.0		
			(0.0)	(0.0)	(5.0)		
	ARM B		1.000	0.000	0.000		
			2.0	0.0	0.0		
			(0.0)	(0.0)	(0.0)		
	ARM C		0.982	0.018	0.000		
			168.0	3.0	0.0		
			(4.0)	(33.0)	(0.0)		
09.00 - 09.15	ARM A		0.000	0.021	0.979		
			0.0	2.0	95.0		
			(0.0)	(50.0)	(5.0)		
	ARM B		0.750	0.000	0.250		
			3.0	0.0	1.0		
			(33.0)	(0.0)	(0.0)		
	ARM C		0.988	0.012	0.000		
			164.0	2.0	0.0		
			(4.0)	(50.0)	(0.0)		
09.15 - 09.30	ARM A		0.000	0.029	0.971		
			0.0	3.0	101.0		
			(0.0)	(0.0)	(8.0)		
	ARM B		0.500	0.000	0.500		
			1.0	0.0	1.0		
			(0.0)	(0.0)	(100.0)		
	ARM C		0.959	0.041	0.000		
			94.0	4.0	0.0		
			(5.0)	(0.0)	(0.0)		

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.00	5.87	0.000		0.0	0.0	0.0	
B-A	0.00	5.74	0.000		0.0	0.0	0.0	
C-AB	0.00	9.43	0.000		0.0	0.0	0.0	
C-A	11.07							
A-B	0.13							
A-C	6.00							

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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	08.15-08.30									I
I	B-C	0.00	7.37	0.000		0.0	0.0	0.0		I
I	B-A	0.07	3.12	0.022		0.0	0.0	0.3		I
I	C-AB	0.45	12.69	0.035		0.0	0.0	0.7		I
I	C-A	10.08								I
I	A-B	0.07								I
I	A-C	6.53								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	08.30-08.45									I
I	B-C	0.07	5.05	0.014		0.0	0.0	0.2		I
I	B-A	0.00	2.36	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	12.85	0.000		0.0	0.0	0.0		I
I	C-A	10.87								I
I	A-B	0.00								I
I	A-C	7.60								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	08.45-09.00									I
I	B-C	0.00	4.14	0.000		0.0	0.0	0.0		I
I	B-A	0.13	6.31	0.021		0.0	0.0	0.3		I
I	C-AB	0.53	15.09	0.035		0.0	0.0	0.7		I
I	C-A	10.87								I
I	A-B	0.07								I
I	A-C	5.66								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	09.00-09.15									I
I	B-C	0.07	8.60	0.008		0.0	0.0	0.1		I
I	B-A	0.20	4.49	0.045		0.0	0.0	0.7		I
I	C-AB	0.38	14.22	0.027		0.0	0.0	0.5		I
I	C-A	10.69								I
I	A-B	0.13								I
I	A-C	6.34								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	09.15-09.30									I
I	B-C	0.06	4.71	0.014		0.0	0.0	0.2		I
I	B-A	0.06	5.95	0.011		0.0	0.0	0.2		I
I	C-AB	0.44	13.98	0.031		0.0	0.0	0.6		I
I	C-A	5.96								I
I	A-B	0.20								I
I	A-C	6.73								I
I										I

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

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	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)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
I	B-C	I	3.0	I 2.0	I 0.5	I 0.17	I 0.5	I 0.17
I	B-A	I	7.0	I 4.7	I 1.5	I 0.21	I 1.5	I 0.21
I	C-AB	I	26.9	I 18.0	I 2.6	I 0.09	I 2.6	I 0.09
I	C-A	I	893.2	I 595.4	I	I	I	I
I	A-B	I	9.0	I 6.0	I	I	I	I
I	A-C	I	582.9	I 388.6	I	I	I	I
I	ALL	I	1522.0	I 1014.7	I 4.5	I 0.00	I 4.5	I 0.00

* 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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RELEASE 3.0 (MAY 2001)

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Run with file:-
"M:\Projects\000001-050000\Stagecoach - Barnsley Depot\PICADY\BASE\Site Access PM Base.vpi"
(drive-on-the-left) at 11:25:24 on Friday, 27 May 2011

RUN TITLE

A61 / Site Access PM Base

.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 A61 / Wakefield Road (NB)
ARM B IS Site Access
ARM C IS A61 / Wakefield Road (SB)

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)	9.00 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)	250.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I (VB-C)	29.0 M.	I
I	- VISIBILITY TO RIGHT	I (VB-A)	21.0 M.	I
I	- LANE 1 WIDTH	I (WB-C)	-	I
I	- LANE 2 WIDTH	I (WB-A)	-	I
I	- WIDTH AT 0 M FROM JUNC.	I	10.00 M.	I
I	- WIDTH AT 5 M FROM JUNC.	I	7.50 M.	I
I	- WIDTH AT 10 M FROM JUNC.	I	5.20 M.	I
I	- WIDTH AT 15 M FROM JUNC.	I	4.50 M.	I
I	- WIDTH AT 20 M FROM JUNC.	I	2.20 M.	I
I	- LENGTH OF FLARED SECTION	I DERIVED:	2 PCU	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

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

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME		FROM/TO	ARM A	ARM B	ARM C		
16.45 - 17.00							
	ARM A	0.000	0.013	0.987			
		0.0	2.0	147.0			
		(0.0)	(100.0)	(2.0)			
	ARM B	1.000	0.000	0.000			
		I???????	I???????	I???????			
		(0.0)	(0.0)	(0.0)			
	ARM C	1.000	0.000	0.000			
		104.0	0.0	0.0			
		(2.0)	(0.0)	(0.0)			
17.00 - 17.15							
	ARM A	0.000	0.006	0.994			
		0.0	1.0	173.0			
		(0.0)	(0.0)	(2.0)			
	ARM B	0.000	0.000	0.000			
		I???????	I???????	I???????			
		(0.0)	(0.0)	(0.0)			
	ARM C	1.000	0.000	0.000			
		97.0	0.0	0.0			
		(2.0)	(0.0)	(0.0)			
17.15 - 17.30							
	ARM A	0.000	0.007	0.993			
		0.0	1.0	148.0			
		(0.0)	(0.0)	(4.0)			
	ARM B	0.000	0.000	0.000			
		I???????	I???????	I???????			
		(0.0)	(0.0)	(0.0)			
	ARM C	1.000	0.000	0.000			
		97.0	0.0	0.0			
		(2.0)	(0.0)	(0.0)			

TIME	TURNING PROPORTIONS					
	TURNING COUNTS					
	(PERCENTAGE OF H.V.S)					
	FROM/TO	ARM A	ARM B	ARM C		
17.30 - 17.45	ARM A	0.000	0.013	0.987		
		0.0	2.0	149.0		
		(0.0)	(100.0)	(5.0)		
	ARM B	0.000	0.000	0.000		
		I??????? I??????? I??????? I				
		I (0.0) I (0.0) I (0.0) I				
		I I I I				
	ARM C	1.000	0.000	0.000		
		117.0	0.0	0.0		
		I (4.0) I (0.0) I (0.0) I				
		I I I I				
17.45 - 18.00	ARM A	0.000	0.006	0.994		
		0.0	1.0	154.0		
		I (0.0) I (100.0) I (1.0) I				
		I I I I				
	ARM B	0.000	0.000	1.000		
		I??????? I??????? I??????? I				
		I (0.0) I (0.0) I (0.0) I				
		I I I I				
	ARM C	0.981	0.019	0.000		
		103.0	2.0	0.0		
		I (3.0) I (50.0) I (0.0) I				
		I I I I				
18.00 - 18.15	ARM A	0.000	0.036	0.964		
		0.0	4.0	107.0		
		I (0.0) I (100.0) I (5.0) I				
		I I I I				
	ARM B	0.750	0.000	0.250		
		3.0	0.0	1.0		
		I (0.0) I (0.0) I (0.0) I				
		I I I I				
	ARM C	0.963	0.037	0.000		
		103.0	4.0	0.0		
		I (3.0) I (75.0) I (0.0) I				
		I I I I				

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-17.00								
B-C	0.00	6.73	0.000		0.0	0.0	0.0	
B-A	0.07	5.06	0.014		0.0	0.0	0.2	
C-AB	0.00	8.50	0.000		0.0	0.0	0.0	
C-A	13.31							
A-B	0.14							
A-C	10.37							

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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	17.00-17.15									I
I	B-C	0.00	5.09	0.000		0.0	0.0	0.0		I
I	B-A	0.00	4.87	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	8.20	0.000		0.0	0.0	0.0		I
I	C-A	12.31								I
I	A-B	0.07								I
I	A-C	11.91								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	17.15-17.30									I
I	B-C	0.00	5.27	0.000		0.0	0.0	0.0		I
I	B-A	0.00	5.09	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	8.48	0.000		0.0	0.0	0.0		I
I	C-A	12.78								I
I	A-B	0.07								I
I	A-C	10.44								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	17.30-17.45									I
I	B-C	0.00	5.29	0.000		0.0	0.0	0.0		I
I	B-A	0.00	4.82	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	8.49	0.000		0.0	0.0	0.0		I
I	C-A	14.58								I
I	A-B	0.14								I
I	A-C	10.11								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	17.45-18.00									I
I	B-C	0.07	9.41	0.007		0.0	0.0	0.1		I
I	B-A	0.00	3.94	0.000		0.0	0.0	0.0		I
I	C-AB	0.98	15.54	0.063		0.0	0.1	1.6		I
I	C-A	11.80								I
I	A-B	0.07								I
I	A-C	10.65								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 (VEH.MIN/ TIME SEGMENT)	DELAYI
I	18.00-18.15									I
I	B-C	0.07	8.38	0.008		0.0	0.0	0.1		I
I	B-A	0.20	5.28	0.038		0.0	0.0	0.6		I
I	C-AB	2.29	15.61	0.147		0.1	0.4	5.8		I
I	C-A	10.83								I
I	A-B	0.27								I
I	A-C	7.31								I
I										I

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

QUEUE FOR STREAM B-C	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM B-A	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.0
18.15	0.0

QUEUE FOR STREAM C-AB	
TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.1
18.15	0.4

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	
I		I			I			I	
I	B-C	I	2.1	I	1.4	I	0.2	I	0.11
I	B-A	I	4.1	I	2.7	I	0.8	I	0.19
I	C-AB	I	49.1	I	32.7	I	7.4	I	0.15
I	C-A	I	1134.1	I	756.1	I		I	
I	A-B	I	11.4	I	7.6	I		I	
I	A-C	I	911.9	I	607.9	I		I	
I	ALL	I	2112.6	I	1408.4	I	8.4	I	0.00

* 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 =====

Appendix B

STAGECOACH YORKSHIRE: WAKEFIELD RD DEPOT TRAVEL PLAN

Introduction

As part of our Environmental Policy, Stagecoach recognises the need to produce a travel plan to encourage staff, deliveries and customers/visitors to make journeys to and from the site as harm free to the environment as possible.

Objectives

- To encourage staff, visitors (including deliveries) and customers to visit the Wakefield Road Depot whilst reducing the number of vehicles used.
- To actively promote “ Travel Options”
- To encourage the use of low polluting vehicles.
- To encourage cycling
- To encourage better use of public transport

Benefits

- Strengthen environmental performance and improve the company image
- Make the workplace less congested and reduce the needs for large areas of car parking
- Improve health of our employees
- Reduce local pollution levels of carbon dioxide, hydrocarbons, nitrogen monoxide and particulates

Present Situation/Site Audit

Employees: Full time 56 Part time and short term contracts 9

Of these, the majority are engineers who work a set shift pattern where some work permanent early or late with a small number who work typical office hours between 8am and 6pm in administration or managerial roles.

Vehicles: 93 buses owned, 3 leased cars/vans

Parking: Spaces for staff 52, Spaces for buses/lease cars/vans 87

Deliveries: 0700-1800

The Wakefield Rd Depot development gives us the opportunity to address transport issues as part of our commitment to improve our environmental performance. Stagecoach Yorkshire undertakes to review methods of transport used by staff, visitors, deliveries and customers and to actively promote “travel options” by instigating the following:

Travel Survey Results

Date Survey Completed	14 July 2008
Response rate	38.5%

Survey results

Of the 25 respondents, 18 do work early shifts (i.e. starts before 6am), 17 work day shifts (i.e. starts between 6am and 6pm) and 68work late shifts (i.e. starts after 6pm).

The first choice for staff travel to/from work is:

Mode	Actual	Targets*
Car (as driver)	72%	60%
Car (as passenger)	4%	8%
Bus	16%	16%
Tram	0%	0%
Train	0%	0%
Powered Two Wheelers (PTW)	0%	0%
Walk	8%	10%
Cycle	0%	6%
None e.g. home working	0%	0%
Other	0%	0%

When the first choice is not available, travel to work is:

Mode	Actual	Targets*
Car (as driver)	12%	10%
Car (as passenger)	4%	8%
Bus	28%	28%
Tram	0%	0%
Train	0%	0%
Powered Two Wheelers (PTW)	4%	4%
Walk	36%	36%
Cycle	12%	14%
None e.g. home working	0%	0%
Other	0%	0%

Measures to implement

Reviewing travel methods

- Review the methods by which staff, visitors, deliveries and customers visit our premises.
- Compile a data base of staff travel methods and addresses to encourage car sharing.
- To review availability of staff buses where no public transport option exists.

Promoting travel options.

- Encourage environmentally sound transport solutions to staff and customers.
- Ensure that in advertising materials “Getting Here” sections list public transport options first.
- Provide storage for cycles in the building for staff and showers for cyclists and walkers.
- Promote cycle training for adults
- Promote Car Sharing

Reducing Travel

- Provide suitable rooms and equipment for in house training to reduce the need for travel by large numbers of staff to training venues.

Company vehicles

- If purchasing company vehicles ensure that consideration is given to low energy or diesel alternative

Travel plan to be formalised by the company and board and progress reports to be issued yearly to the board.

Travel plan to be brought to the attention of all employees. Copies to be made available to customers and local authorities.

Stagecoach Yorkshire will review this plan regularly as part of its Environmental and Energy policies

Monitoring

Stagecoach Yorkshire will monitor in line with Barnsley Metropolitan Borough Council's monitoring schedule and guidance.

Promotion

Stagecoach will engage in a series of activities to promote the plan, travel options and the plan's measures.

Action Plan

Detailing who, where and when activities/measures will be implemented, monitored and promoted remembering to link all aspects.

Action	Date	Who	Completed
Cycle Count	April 09	Robert Gillicker BMBC	
Bike week	June 09	Robert Gillicker BMBC	
Installation of showers	October 2008	Robert Gillicker BMBC	
Cycle Count	Sept 09	Robert Gillicker BMBC	
Car Share database count	May 09	TPC	
Implement guaranteed parking for car sharers	To launch NLD	TPC	
National Liftshare Day (NLD)	Oct 09	TPC	
Car Share database count/ Car share parking space count	Dec 09	TPC	

Essential to link measures implementation with promotional activities, tied in with before and after monitoring. Implementing a measure can launch a promotional activity.

Key to Success

- Commitment from all employees and management
- Communications
- Co-ordination

Appendix C

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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 3.0 (MAY 2001)

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

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

Run with file:-
"M:\Projects\000001-050000\Stagecoach - Barnsley Depot\PICADY\DEV Traffic\Site Access AM Base + Dev.vpi"
(drive-on-the-left) at 11:33:22 on Friday, 27 May 2011

RUN TITLE

A61 / Site Access AM Base + Dev

.MAJOR/MINOR JUNCTION CAPACITY AND DELAY

INPUT DATA

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

ARM A IS A61 / Wakefield Road (NB)
ARM B IS Site Access
ARM C IS A61 / Wakefield Road (SB)

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) 9.00 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) 250.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 29.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 21.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) -	I
I	- LANE 2 WIDTH	I	(WB-A) -	I
I	- WIDTH AT 0 M FROM JUNC.	I	10.00 M.	I
I	- WIDTH AT 5 M FROM JUNC.	I	7.50 M.	I
I	- WIDTH AT 10 M FROM JUNC.	I	5.20 M.	I
I	- WIDTH AT 15 M FROM JUNC.	I	4.50 M.	I
I	- WIDTH AT 20 M FROM JUNC.	I	2.20 M.	I
I	- LENGTH OF FLARED SECTION	I	DERIVED: 2 PCU	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 08.00 AND ENDS 09.30

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

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME	FROM/TO	ARM A	ARM B	ARM C			
08.00 - 08.15	ARM A	0.000	0.022	0.978			
		0.0	2.0	90.0			
		(0.0)	(50.0)	(7.0)			
	ARM B	0.000	0.000	0.000			
		I???????	I???????	I???????			
		(0.0)	(0.0)	(0.0)			
	ARM C	1.000	0.000	0.000			
		166.0	0.0	0.0			
		(3.0)	(0.0)	(0.0)			
08.15 - 08.30	ARM A	0.000	0.010	0.990			
		0.0	1.0	98.0			
		(0.0)	(100.0)	(5.0)			
	ARM B	1.000	0.000	0.000			
		I???????	I???????	I???????			
		(100.0)	(0.0)	(0.0)			
	ARM C	0.987	0.013	0.000			
		156.0	2.0	0.0			
		(2.0)	(100.0)	(0.0)			
08.30 - 08.45	ARM A	0.000	0.000	1.000			
		0.0	0.0	114.0			
		(0.0)	(0.0)	(5.0)			
	ARM B	0.000	0.000	1.000			
		I???????	I???????	I???????			
		(0.0)	(0.0)	(100.0)			
	ARM C	1.000	0.000	0.000			
		163.0	0.0	0.0			
		(4.0)	(0.0)	(0.0)			

TIME	TURNING PROPORTIONS TURNING COUNTS (PERCENTAGE OF H.V.S)					
	FROM/TO	ARM A	ARM B	ARM C		
08.45 - 09.00	ARM A	0.000	0.012	0.988		
		0.0	1.0	85.0		
		(0.0)	(0.0)	(5.0)		
	ARM B	1.000	0.000	0.000		
		2.0	0.0	0.0		
		(0.0)	(0.0)	(0.0)		
	ARM C	0.982	0.018	0.000		
		168.0	3.0	0.0		
		(4.0)	(33.0)	(0.0)		
09.00 - 09.15	ARM A	0.000	0.050	0.950		
		0.0	5.0	95.0		
		(0.0)	(40.0)	(5.0)		
	ARM B	0.750	0.000	0.250		
		6.0	0.0	2.0		
		(33.0)	(0.0)	(0.0)		
	ARM C	0.965	0.035	0.000		
		164.0	6.0	0.0		
		(4.0)	(33.0)	(0.0)		
09.15 - 09.30	ARM A	0.000	0.029	0.971		
		0.0	3.0	101.0		
		(0.0)	(0.0)	(8.0)		
	ARM B	0.500	0.000	0.500		
		1.0	0.0	1.0		
		(0.0)	(0.0)	(100.0)		
	ARM C	0.979	0.021	0.000		
		94.0	2.0	0.0		
		(5.0)	(0.0)	(0.0)		

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
08.00-08.15								
B-C	0.00	5.87	0.000		0.0	0.0	0.0	
B-A	0.00	5.74	0.000		0.0	0.0	0.0	
C-AB	0.00	9.43	0.000		0.0	0.0	0.0	
C-A	11.07							
A-B	0.13							
A-C	6.00							

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.15-08.30									I
I	B-C	0.00	7.37	0.000		0.0	0.0	0.0		I
I	B-A	0.07	3.12	0.022		0.0	0.0	0.3		I
I	C-AB	0.45	12.69	0.035		0.0	0.0	0.7		I
I	C-A	10.08								I
I	A-B	0.07								I
I	A-C	6.53								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.30-08.45									I
I	B-C	0.07	5.05	0.014		0.0	0.0	0.2		I
I	B-A	0.00	2.36	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	12.85	0.000		0.0	0.0	0.0		I
I	C-A	10.87								I
I	A-B	0.00								I
I	A-C	7.60								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	08.45-09.00									I
I	B-C	0.00	4.14	0.000		0.0	0.0	0.0		I
I	B-A	0.13	6.31	0.021		0.0	0.0	0.3		I
I	C-AB	0.53	15.09	0.035		0.0	0.0	0.7		I
I	C-A	10.87								I
I	A-B	0.07								I
I	A-C	5.66								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	09.00-09.15									I
I	B-C	0.13	8.48	0.016		0.0	0.0	0.2		I
I	B-A	0.40	4.39	0.091		0.0	0.1	1.4		I
I	C-AB	1.22	15.40	0.079		0.0	0.1	2.2		I
I	C-A	10.11								I
I	A-B	0.33								I
I	A-C	6.34								I
I										I

I	TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	I
I	09.15-09.30									I
I	B-C	0.06	4.73	0.014		0.0	0.0	0.2		I
I	B-A	0.06	5.88	0.011		0.1	0.0	0.2		I
I	C-AB	0.23	14.01	0.016		0.1	0.0	0.3		I
I	C-A	6.17								I
I	A-B	0.20								I
I	A-C	6.73								I
I										I

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

QUEUE FOR STREAM B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.0
09.30	0.0

QUEUE FOR STREAM B-A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.1
09.30	0.0

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.15	0.0
08.30	0.0
08.45	0.0
09.00	0.0
09.15	0.1
09.30	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)	I	(MIN)	I	(MIN)	I
I		I	(VEH/H)	I	(MIN/VEH)	I	(MIN/VEH)	I
I	B-C	I	4.0	I	2.7	I	0.6	I
I	B-A	I	9.9	I	6.6	I	2.2	I
I	C-AB	I	36.3	I	24.2	I	3.9	I
I	C-A	I	887.7	I	591.8	I		I
I	A-B	I	12.0	I	8.0	I		I
I	A-C	I	582.9	I	388.6	I		I
I	ALL	I	1532.8	I	1021.9	I	6.7	I
							0.00	
							6.7	
							0.00	

* 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

PICADY 4.1 ANALYSIS PROGRAM
RELEASE 3.0 (MAY 2001)

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

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Run with file:-
"M:\Projects\000001-050000\Stagecoach - Barnsley Depot\PICADY\DEV Traffic\Site Access PM Base + Dev.vpi"
(drive-on-the-left) at 11:34:50 on Friday, 27 May 2011

RUN TITLE

A61 / Site Access PM Base + Dev

.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 A61 / Wakefield Road (NB)
ARM B IS Site Access
ARM C IS A61 / Wakefield Road (SB)

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) 9.00 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) 250.0 M.	I
I	- BLOCKS TRAFFIC	I	YES	I
I		I		I
I	MINOR ROAD - VISIBILITY TO LEFT	I	(VB-C) 29.0 M.	I
I	- VISIBILITY TO RIGHT	I	(VB-A) 21.0 M.	I
I	- LANE 1 WIDTH	I	(WB-C) -	I
I	- LANE 2 WIDTH	I	(WB-A) -	I
I	- WIDTH AT 0 M FROM JUNC.	I	10.00 M.	I
I	- WIDTH AT 5 M FROM JUNC.	I	7.50 M.	I
I	- WIDTH AT 10 M FROM JUNC.	I	5.20 M.	I
I	- WIDTH AT 15 M FROM JUNC.	I	4.50 M.	I
I	- WIDTH AT 20 M FROM JUNC.	I	2.20 M.	I
I	- LENGTH OF FLARED SECTION	I	DERIVED: 2 PCU	I

TRAFFIC DEMAND DATA

TIME PERIOD BEGINS 16.45 AND ENDS 18.15

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

DEMAND FLOW PROFILES ARE INPUT DIRECTLY.

I		I	TURNING PROPORTIONS						I	
I		I	TURNING COUNTS						I	
I		I	(PERCENTAGE OF H.V.S)						I	
I		I							I	
I	TIME	I	FROM/TO	I	ARM A	I	ARM B	I	ARM C	I
I	16.45 - 17.00	I		I		I		I		I
I		I	ARM A	I	0.000	I	0.013	I	0.987	I
I		I		I	0.0	I	2.0	I	147.0	I
I		I		I	(0.0)	I	(100.0)	I	(2.0)	I
I		I		I		I		I		I
I		I	ARM B	I	1.000	I	0.000	I	0.000	I
I		I		I	I???????	I	I???????	I	I???????	I
I		I		I	(0.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I
I		I	ARM C	I	1.000	I	0.000	I	0.000	I
I		I		I	104.0	I	0.0	I	0.0	I
I		I		I	(2.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I
I	17.00 - 17.15	I		I		I		I		I
I		I	ARM A	I	0.000	I	0.006	I	0.994	I
I		I		I	0.0	I	1.0	I	173.0	I
I		I		I	(0.0)	I	(0.0)	I	(2.0)	I
I		I		I		I		I		I
I		I	ARM B	I	0.000	I	0.000	I	0.000	I
I		I		I	I???????	I	I???????	I	I???????	I
I		I		I	(0.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I
I		I	ARM C	I	1.000	I	0.000	I	0.000	I
I		I		I	97.0	I	0.0	I	0.0	I
I		I		I	(2.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I
I	17.15 - 17.30	I		I		I		I		I
I		I	ARM A	I	0.000	I	0.007	I	0.993	I
I		I		I	0.0	I	1.0	I	148.0	I
I		I		I	(0.0)	I	(0.0)	I	(4.0)	I
I		I		I		I		I		I
I		I	ARM B	I	0.000	I	0.000	I	0.000	I
I		I		I	I???????	I	I???????	I	I???????	I
I		I		I	(0.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I
I		I	ARM C	I	1.000	I	0.000	I	0.000	I
I		I		I	97.0	I	0.0	I	0.0	I
I		I		I	(2.0)	I	(0.0)	I	(0.0)	I
I		I		I		I		I		I

		TURNING PROPORTIONS					
		TURNING COUNTS					
		(PERCENTAGE OF H.V.S)					
TIME		FROM/TO	ARM A	ARM B	ARM C		
17.30 - 17.45	ARM A		0.000	0.013	0.987		
			0.0	2.0	149.0		
			(0.0)	(100.0)	(5.0)		
	ARM B		0.000	0.000	0.000		
			???????	???????	???????		
			(0.0)	(0.0)	(0.0)		
	ARM C		1.000	0.000	0.000		
			117.0	0.0	0.0		
			(4.0)	(0.0)	(0.0)		
17.45 - 18.00	ARM A		0.000	0.049	0.951		
			0.0	8.0	154.0		
			(0.0)	(50.0)	(1.0)		
	ARM B		0.000	0.000	1.000		
			???????	???????	???????		
			(0.0)	(0.0)	(0.0)		
	ARM C		0.972	0.028	0.000		
			103.0	3.0	0.0		
			(3.0)	(33.0)	(0.0)		
18.00 - 18.15	ARM A		0.000	0.036	0.964		
			0.0	4.0	107.0		
			(0.0)	(100.0)	(5.0)		
	ARM B		0.750	0.000	0.250		
			3.0	0.0	1.0		
			(0.0)	(0.0)	(0.0)		
	ARM C		0.963	0.037	0.000		
			103.0	4.0	0.0		
			(3.0)	(75.0)	(0.0)		

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA

THE TURNING PROPORTIONS USED VARY BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES BETWEEN TIME SEGMENTS

THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)
16.45-17.00								
B-C	0.00	6.73	0.000		0.0	0.0	0.0	
B-A	0.07	5.06	0.014		0.0	0.0	0.2	
C-AB	0.00	8.50	0.000		0.0	0.0	0.0	
C-A	13.31							
A-B	0.14							
A-C	10.37							

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-C	0.00	5.09	0.000		0.0	0.0	0.0		I
I	B-A	0.00	4.87	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	8.20	0.000		0.0	0.0	0.0		I
I	C-A	12.31								I
I	A-B	0.07								I
I	A-C	11.91								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	17.15-17.30									I
I	B-C	0.00	5.27	0.000		0.0	0.0	0.0		I
I	B-A	0.00	5.09	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	8.48	0.000		0.0	0.0	0.0		I
I	C-A	12.78								I
I	A-B	0.07								I
I	A-C	10.44								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	17.30-17.45									I
I	B-C	0.00	5.29	0.000		0.0	0.0	0.0		I
I	B-A	0.00	4.82	0.000		0.0	0.0	0.0		I
I	C-AB	0.00	8.49	0.000		0.0	0.0	0.0		I
I	C-A	14.58								I
I	A-B	0.14								I
I	A-C	10.11								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	17.45-18.00									I
I	B-C	0.07	9.35	0.007		0.0	0.0	0.1		I
I	B-A	0.00	3.87	0.000		0.0	0.0	0.0		I
I	C-AB	1.35	15.93	0.085		0.0	0.2	2.4		I
I	C-A	11.50								I
I	A-B	0.55								I
I	A-C	10.63								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	18.00-18.15									I
I	B-C	0.07	8.38	0.008		0.0	0.0	0.1		I
I	B-A	0.20	5.28	0.038		0.0	0.0	0.6		I
I	C-AB	2.29	15.62	0.147		0.2	0.4	5.9		I
I	C-A	10.83								I
I	A-B	0.27								I
I	A-C	7.31								I
I										I

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

QUEUE FOR STREAM B-C

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

QUEUE FOR STREAM B-A

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

QUEUE FOR STREAM C-AB

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.00	0.0
17.15	0.0
17.30	0.0
17.45	0.0
18.00	0.2
18.15	0.4

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

I	STREAM	I	TOTAL DEMAND	I	* QUEUEING *	I	* INCLUSIVE QUEUEING *	I
I	I	I	I	I	* DELAY *	I	* DELAY *	I
I	I	I	I	I	I	I	I	I
I	I	I	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
I	B-C	I	2.1	I 1.4	I 0.2	I 0.11	I 0.2	I 0.11
I	B-A	I	4.1	I 2.7	I 0.8	I 0.19	I 0.8	I 0.19
I	C-AB	I	54.7	I 36.5	I 8.3	I 0.15	I 8.3	I 0.15
I	C-A	I	1129.6	I 753.0	I	I	I	I
I	A-B	I	18.6	I 12.4	I	I	I	I
I	A-C	I	911.5	I 607.7	I	I	I	I
I	ALL	I	2120.6	I 1413.7	I 9.2	I 0.00	I 9.2	I 0.00

* 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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