

# POST OPENING PROJECT EVALUATION

# A6 Clapham Bypass



## FIVE YEARS AFTER STUDY

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# Glossary

Term	Definition
AADT	Annual Average Daily Traffic. Average of 24 hour flows, seven days a week, for all days within the year.
Accessibility	Accessibility can be defined as 'ease of reaching'. The accessibility objective is concerned with increasing the ability with which people in different locations, and with differing availability of transport, can reach different types of facility.
AM	denoting the morning peak period
AST	Appraisal Summary Table. This records the impacts of the scheme according to the Government's five key objects for transport, as defined in DfT guidance contained on its Transport Analysis Guidance web pages, WebTAG
ATC	Automatic Traffic Count, a machine which measures traffic flow at a point in the road.
AWT	Average Weekday Traffic. Average of Monday to Friday 24 hour flows.
COBA	COst Benefit Analysis – a computer program which compares the costs of providing road schemes with the benefits derived by road users (in terms of time, vehicle operating costs and accidents), and expresses the results in terms of a monetary valuation. The COBA model uses the fixed trip matrix.
DfT	Department for Transport
Detrunking	The process of transferring the management of non-core trunk roads from the Highways Agency to the Local Highway Authority.
DETR	Department of Environment, Transport, and the Regions (in existence from 1997 to 2001).
Discounting	Discounting is a technique used to compare costs and benefits that occur in different time periods and is the process of adjusting future cash flows to their present values to reflect the time value of money, e.g. £1 worth of benefits now is worth more than £1 in the future. A standard base year needs to be used which is 2002 for the appraisal used in this report.
DMRB	Design Manual for Roads and Bridges (DfT).
ES	Environmental Statement. A document giving the predicted environmental impacts of a scheme, and proposed measures to mitigate them.
EST	Evaluation Summary Table. In POPE studies, this is a summary of the evaluations of the TAG objectives using a similar format to the forecasts in the AST.
HGV	Heavy Goods Vehicle.
Highways Agency	An Executive Agency of the Department for Transport, responsible for operating, maintaining and improving the strategic road network in England.
NATA	New Approach to Transport Appraisal (1998). The basis of the current

	standard DfT appraisal approach.
OPR	Order Publication Report
PIA	Personal Injury Accident. A road traffic accident in which at least one person required medical treatment.
PIA/mvkm	PIA/mvkm is the number of PIAs per million vehicle kilometres where 'vehicle kilometres' are the number of vehicles using a section of the road multiplied by the length of the road.
PM	evening peak period
POPE	Post Opening Project Evaluation, before & after monitoring of all major highway schemes in England.
ROADWAY	Modelling software to predict the traffic effects of major road schemes, in use at the time this project was being appraised.
Route Stress	This is used as a proxy for journey time reliability. It is described as the stress level of a road and is calculated as the ratio of flow to capacity: AADT / CRF.
Rule of Half	A technique for assessing the benefits of a scheme which results in increased trips, in which half the time saving is applied to the additional trips to represent the average benefit.
Severance	Community severance is the separation of adjacent areas by road or heavy traffic, causing negative impact on non-motorised users, particularly pedestrians.
TPI	Targeted Programme of Improvements. The Highways Agency's programme of investment in improvements to the Trunk road and Motorway road network comprised of a number of major schemes each costing more than £5m. Now called Major Schemes.
Vehicle hours	Vehicle hours refers to the total time spent by all vehicles using a road and is expressed normally as a yearly value. For example, if 10,000 vehicles a day used a route with a 6 minute journey time, then the route's vehicle hours for the year would be 365,000.
Vpd	Vehicles Per Day

# Executive Summary

The A6 Clapham bypass (named Paula Radcliffe Way) officially opened on 12<sup>th</sup> December 2002 and consists of a 5 km dual carriageway bypassing the village of Clapham, north of Bedford. This report is a Five Year After (FYA) evaluation of the scheme impacts and builds upon the findings from two previous studies conducted in April 2003 (Traffic Impact Study) and March 2005 (One Year After Study (OYA)).

## Scheme Objectives

Whilst also considering the above specific issues, this evaluation report will build on previous Post Opening Evaluation (POPE) studies to provide an updated assessment of the extent to which the following scheme objectives have been achieved:

- **To improve road safety on the A6;**
- **To relieve congestion on the A6 through Clapham; and**
- **Provide the opportunity for environmental improvement in Clapham by removing through traffic.**

## Scheme Description

The Clapham Bypass (located in Highways Agency Area 8) is the southern most of a series of bypasses built on the A6 prior to its de-trunking in 2004. The scheme included the following key elements:

- A new 5km dual carriageway bypass of Clapham between Manton Lane Roundabout (north of Bedford) and where it re-joins the former A6 north of Highfield Road Interchange;
- Two new interchanges with the new A6 at Oakley Road and Highfield Road;
- The former A6 southbound forms the southbound offslip of the new A6 at Oakley Hill;
- A new over bridge serving Lower Farm Road;
- A new roundabout junction at Clapham Road;
- A 300m widened section of the former A6 at the southern end of the scheme between Clapham Road Roundabout and Manton Lane; and
- Two new viaducts crossing the river Ouse.

## Key Impacts

### Traffic

- The bypass is used by 17,300 – 19,000 vpd. The old A6 through Clapham is used by 1,700 – 8,600 vpd, representing a reduction of 60% to 87% compared with before the scheme opened;
- Traffic flows have generally increased at rate lower than background growth observed across the county as a whole;
- Traffic flows FYA opening are broadly comparable to those observed at the OYA stage suggesting the re-assignment impacts stabilised within a year of opening;
- There is some evidence of small amounts of local re-routing via Church Lane between Oakley and Bromham (between the OYA and the FYA) – this is likely to be attributable to the A428 offering a quicker route into Bedford during the AM peak where there are significant delays at the southern end of the A6;

- Journey times have typically improved by 2-3 minutes on the new route, however they have deteriorated to pre-opening levels since 2004 due to congestion at the Sainsbury Roundabout (south of the bypass);
- Compared to figures at the OYA stage, traffic levels have increased by 300 vpd on the old road. Observed AADT's are above those forecast in COBA;
- Traffic flows in 2008 were higher than forecast on the old road (south of Clapham) by around 1000vpd, and higher than forecast on Oakley Road and Church Lane by 1,000vpd and 300vpd respectively;
- Traffic volumes on the A6 bypass were 16-42% lower than forecast – this equates to around 3,200 – 12,700 vpd less than forecast;
- Journey time reliability has improved despite some congestion issues south of the bypass;
- Background traffic growth has been less than forecast using NRTF89 growth assumptions.;

## Safety

- The number of personal injury accidents fell from 17.3 per year 'Before' to 11.0 'After'. This is a statistically significant change;
- Casualties fell from 25.3 per year to 14.4. Both accidents and casualties fell by about 40%;
- Significant reductions have been observed in head-on collisions, collisions at junctions, and accidents involving pedestrians and cyclists. However, single-vehicle accidents have increased, indicating a change in the causes of accidents;
- When vehicle-kilometres travelled are taken into account, the rate on the A6 has fallen from 0.382 pia/mvkm 'Before' to 0.190 pia.mvkm 'After'. The accident rate for the combined new and old A6 is 0.250 pia/mvkm;
- The observed reduction in accidents matches well with COBA predictions for the same subset of links; and
- Public consultation indicates a general feeling that safety has improved, although written comments identify speeding traffic in Clapham and congestion at the southern end of the bypass as being dangerous.

## Economic Benefits

- The outturn scheme cost was £39 million (the cost of construction at 2002 prices). This is 4% higher than predicted;
- Combined accident and journey time savings were £53.4m compared with a forecast of £61.3m;
- The outturn Benefit Cost Ratio (BCR) of 1.3 was marginally lower than forecast (1.6) and therefore offers good value for money;
- The reduction in BCR compared to forecast can largely be attributed to lower than expected journey time savings due to over-prediction of flows on key links in the forecasts
- Overall this evaluation has demonstrated that forecasts were prepared with a good degree of accuracy despite misjudging forecast traffic flow changes on key links and eroded journey time benefits in the AM peak caused by worsening delays that Sainsbury's roundabout
- The BCR does not capture additional benefits from enhanced journey time reliability on the route.

## Environment

The key environmental impacts are tabulated below.

Objectives	Key Issues
<b>Noise</b>	Reduction in noise for properties adjacent to the old A6, and an increase for properties close to bypass.
<b>Air Quality</b>	Improvement adjacent to the old A6 due to the reduction in through traffic. There are very few properties close to the bypass; and Annual carbon emission has increased by 855 tonnes (less than the predicted increase).
<b>Landscape</b>	Earthworks, cuttings and low profile bridges within the floodplain minimise impact; Environmental barriers and new planting will in time screen traffic, but traffic is still visible within the floodplain and from nearby residential areas; Planting is generally establishing satisfactorily but will require continuing aftercare; and Landscape areas have been handed over to the local authority for maintenance and management. There are no third party commitments for ongoing monitoring, although it is recommended as best practice in the Landscape Management Plan.
<b>Biodiversity</b>	Although the Environmental Statement (ES) did not specifically mention protected species these have been mitigated for as part of the scheme; Great crested newts were translocated from the route corridor prior to construction; Species rich grass areas were not particularly in evidence at the time of the site visit; and Badgers appeared to be using the badger tunnels.
<b>Heritage</b>	Benefit to listed buildings in Clapham as expected; and Archaeology was not considered in the ES although this was not unusual at the time it was written, and an area of unknown archaeology was discovered in the floodplain as part of pre-construction investigation. Overall impact as expected.
<b>Water</b>	Drainage facilities have been provided as expected. The Environment Agency believes the scheme has affected the water level in an aquifer, but further study would be required to evaluate this.
<b>Physical Fitness</b>	Removal of through traffic has improved the local environment for pedestrians and cyclists; and Footpath / bridleway links have been maintained across the bypass as expected.
<b>Journey Ambiance</b>	Driver stress will have improved on the old A6 due to the significant reduction in through traffic, as expected in the ES; and The bypass is generally free flowing, except that long southbound queues occur at the Manton Lane roundabout in the AM peak during school term time.

## Accessibility and Integration Impacts

- Accessibility has improved for pedestrians and cyclists with the opening of the bypass, owing to the reduction in traffic and congestion; and
- The bypass has not furthered all the aspects of Integration that were predicted. The Bedford North station and park-and-ride proposals have not been implemented and the Bedford/Kempston Package of improvements for pedestrians and cyclists were not situated near the scheme, despite being mentioned in the AST.

## Summary

The fulfilment of the scheme objectives is shown in the following table.

Objective	Fulfilment
<b>Improve road safety</b>	Yes
<b>Relieve congestion</b>	Congestion has been relieved in the village, but remains a problem at the southern end of the bypass in the AM peak in school term time.
<b>Provide the opportunity for environmental improvement in Clapham by removing through traffic</b>	Yes

# 1. Introduction

## Background

1.1 The A6 Clapham bypass (locally known as the Paula Radcliffe Way) officially opened on 12<sup>th</sup> December 2002 and consists of a 5 km dual carriageway bypassing the village of Clapham, north of Bedford. This report is a Five Year After (FYA) evaluation of the scheme impacts and builds upon the findings from two previous studies conducted in April 2003 (Traffic Impact Study) and March 2005 (One Year After Study (OYA)).

## Scheme Description

### Scheme History

1.2 The Clapham Bypass (located in Highways Agency Area 8) is the southern most of a series of bypasses built on the A6 prior to its de-trunking in 2004. The opening of the bypass precedes the opening of bypasses at Great Glen (April 2003), Rothwell and Desborough (August 2003) and Rushden and Higham Ferrers (August 2003). The impact of these schemes is discussed in a series of separate evaluation reports. A summary of the scheme’s history is provided in **Figure 1.2**.

Figure 1.1 – Summary of A6 Clapham Scheme History



### Scheme Location

1.3 The scheme location and its context in the road network, is illustrated in **Figure 1.2** and **Figure 1.3**.

Figure 1.2 - Scheme Location (Strategic Context)

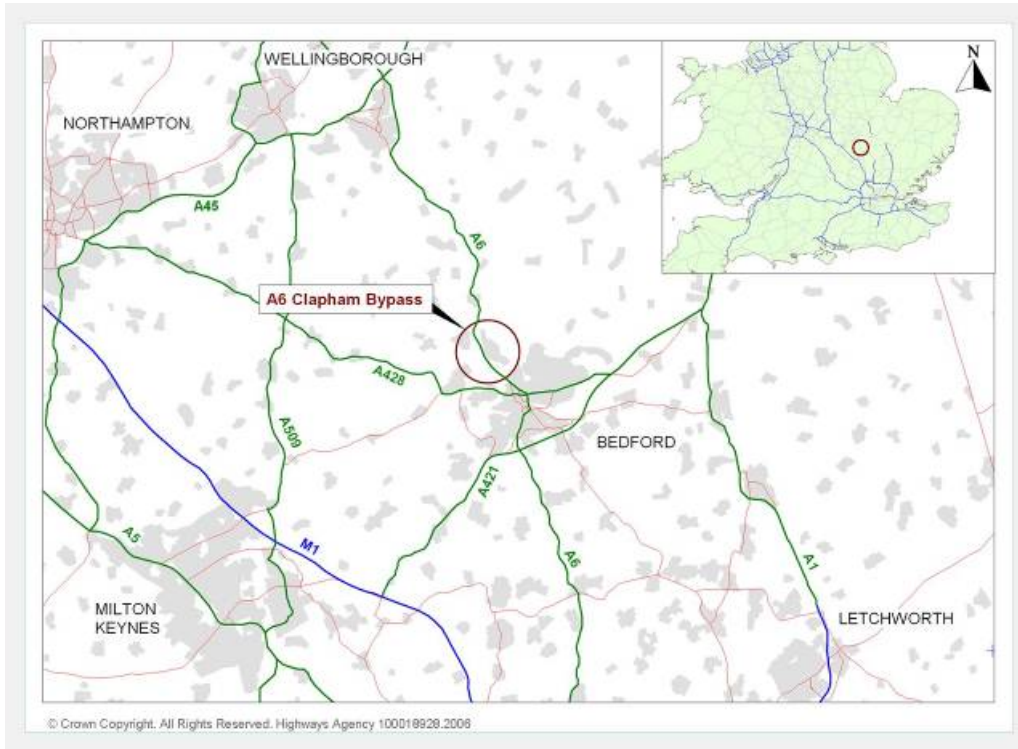
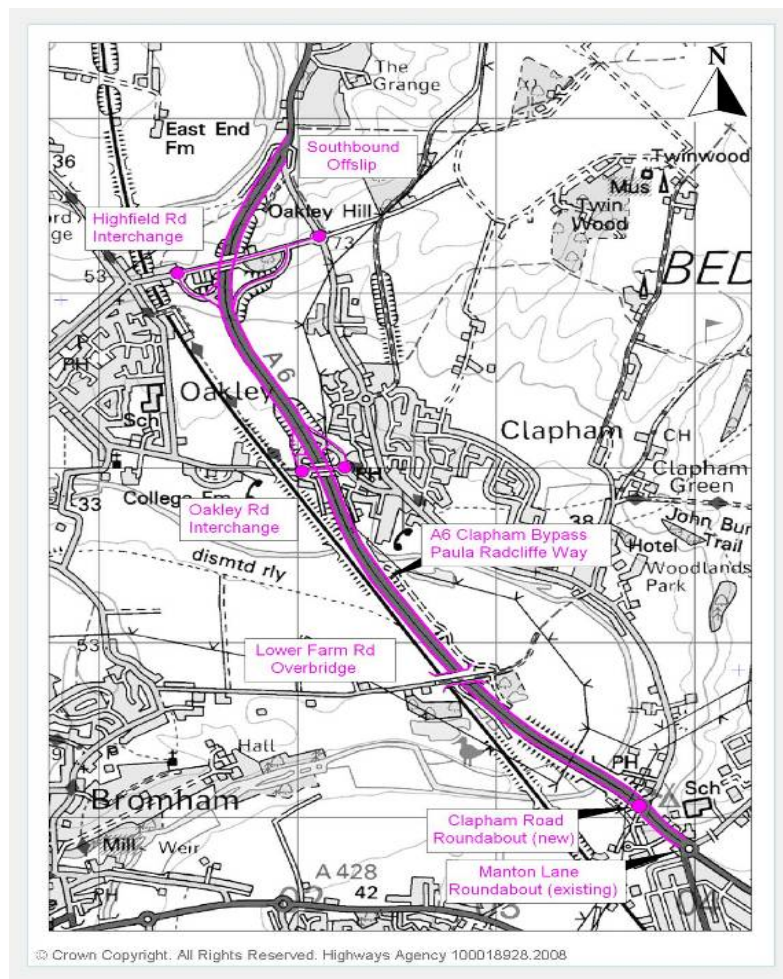


Figure 1.3 – Key Scheme Features



### The Scheme

- 1.4 The scheme included the following key elements:
- A new 5km dual carriageway bypass of Clapham between Manton Lane Roundabout (north of Bedford) and where it re-joins the former A6 north of Highfield Road Interchange;
  - Two new interchanges with the new A6 at Oakley Road and Highfield Road;
  - The former A6 southbound forms the southbound offslip of the new A6 at Oakley Hill;
  - A new over bridge serving Lower Farm Road;
  - A new roundabout junction at Clapham Road;
  - A 300m widened section of the former A6 at the southern end of the scheme between Clapham Road Roundabout and Manton Lane; and
  - Two new viaducts crossing the river Ouse.

### Scheme Objectives

- 1.5 The A6 Clapham and adjacent improvements were listed in the Highways Agency's former Targeted Programme of Improvements (TPI) – now known as the Major Schemes Programme. The AST sets out a number of traffic related problems that the scheme was intended to address, including: Noise and air quality problems in Clapham; Accidents due to pedestrian and vehicle conflict caused by a poor standard single carriageway; and increased journey times due to having to travel through a built up area.
- 1.6 The objectives of this scheme were defined in the 1998 Roads Review, and are as follows:
- **To improve road safety on the A6;**
  - **To relieve congestion on the A6 through Clapham; and**
  - **Provide the opportunity for environmental improvement in Clapham by removing through traffic.**

## The POPE Report

### Report Purpose

- 1.7 The Highways Agency is committed to carrying out post-opening evaluations of trunk road schemes recently implemented under the HA's Major Schemes Programme. This report represents the 'Five-Year After' report for the A6 Clapham, and is prepared under the Highways Agency Post-Opening Project Evaluation (POPE) Commission. This is the last of a series of POPE reports on the scheme.
- 1.8 This FYA study is intended to evaluate whether the original objectives of the scheme have been achieved, and provides a comparison of the predicted scheme impacts against those actually emerging five years after opening. The overall impacts of the scheme are assessed, where possible, against the core NATA (New Approach to Appraisal) objectives of Economy, Safety, Environment, Integration and Accessibility and are presented in the form of an Evaluation Summary Table (EST).
- 1.9 In addition to measuring the out-turn impacts of the A6 Clapham improvements, additional objectives of this report are to:
- Identify differences between predicted and out-turn impacts and economic forecasts;
  - Where evidence is available provide explanations of these differences; and
  - Identify wider lessons and action based recommendations that can inform the enhancement and reliability of HA appraisal methods.

### Report Structure

- 1.10 Following this introduction this report is structured as follows:

## A6 Clapham Bypass – FYA Study

- **Section 2 – Traffic Analysis.** Provides a general discussion of outturn changes in traffic flows on the new A6, former A6 and other affected routes and makes a comparison with those originally forecast;
- **Section 3 – Safety Analysis.** Discusses changes in accident patterns and personal security as a result of the scheme. This analysis builds upon the findings documented in the OYA study in 2005;
- **Section 4 - Economy.** An updated presentation of out-turn costs and benefits is made and compared to those forecast in the scheme appraisal;
- **Section 5 – Environment. Summarises** the scheme’s environmental impacts and performance of mitigation measures described in the scheme’s environmental statement;
- **Section 6. Accessibility and Integration Impacts.** Largely based upon a survey of residents and desktop review, this section provides a review of how the scheme has affected accessibility for all route users and complements local policies in the area; and
- **Section 7. AST and EST.** Presents a comparison of the forecast scheme impacts (Appraisal Summary Table, AST) and highlights whether the out-turn impacts have been better or worse than predicted in the form of an Evaluation Summary Table (EST).
- **Annex A1 gives journey time survey results**
- **Annex A2 gives the full environmental evaluation**
- **Annex B is the residents’ survey questionnaire.**

## Summary of Data Sources

1.11 The content of this report has been informed by the following key sources:

- Traffic count and accident data provided by Bedfordshire County Council;
- New traffic and journey time surveys commissioned specifically for the purpose of this study;
- Appraisal Summary Table (July 1998);
- *The A6 Trunk Road (Clapham Bypass) Order 19, Concurrent local Inquiries*, Highways Agency, October 1991
- *London–Carlisle Trunk Road, A6 Clapham Bypass: Forecasting and COBA Inputs Report*, Freeman Fox Ltd, March 1987.
- COBA Files dated 1997;
- The Environmental Statement;
- Statutory environmental consultees (Natural England, English Heritage and the Environment Agency); and
- Site visits by Atkins transport planners and environmental specialists.
- *A6 Clapham Bypass Resident Survey 2008*, the report of a public consultation undertaken for POPE.

1.12 Further specialist environmental documentation was obtained. This is listed in Table B.1 in Annex B at the end of this report.

## 2. Traffic Data Collection and Analysis

### Introduction

2.1 A comprehensive data collection exercise was undertaken for the OYA which has been repeated for the purpose of preparing this FYA report. This section:

- Provides an overview of the traffic count and journey time information collected to inform this study;
- Summarises the observed impacts of the scheme on traffic flows and journey times on the A6 corridor through Clapham; and
- Identifies and explains the main differences between predicted and out-turn traffic volumes;
- To summarise some of the public views on the scheme impacts as collected as part of residents survey completed in April 2008.

### Data Collection

#### Traffic Count Information

2.2 A combination of permanent and temporary traffic counts were obtained from Bedfordshire County Council (Figure 2.1). These sites were selected coincide with where data was previously collected for the purpose of previous POPE studies. Such an approach enables direct before-and-after comparisons to be made of traffic flows in the study area. These were selected in consultation with Bedfordshire County Council and the HA and influenced by where a majority of traffic impacts were anticipated to occur.



Figure 2.1 - Traffic Count Locations

A6 Clapham Bypass – FYA Study

**Journey Time Information**

2.3 Journey time surveys were carried out on the three routes listed below and illustrated in Figure 2.2:

- A6 via new bypass, between Manton Lane, Bedford, and Radwell Road, Milton Ernest (red);
- Old A6 between the same end points as above (blue); and
- A loop through Oakley, via Highfield Road and Lovell Road (green).

2.4 Journey times information presented in the latter part of this section represent average values from at least 6 runs across each direction and time period. Journey time information was collected to be consistent with the traffic flow data and was collected in April of each year. Results appear in Annex A at the end of this report.

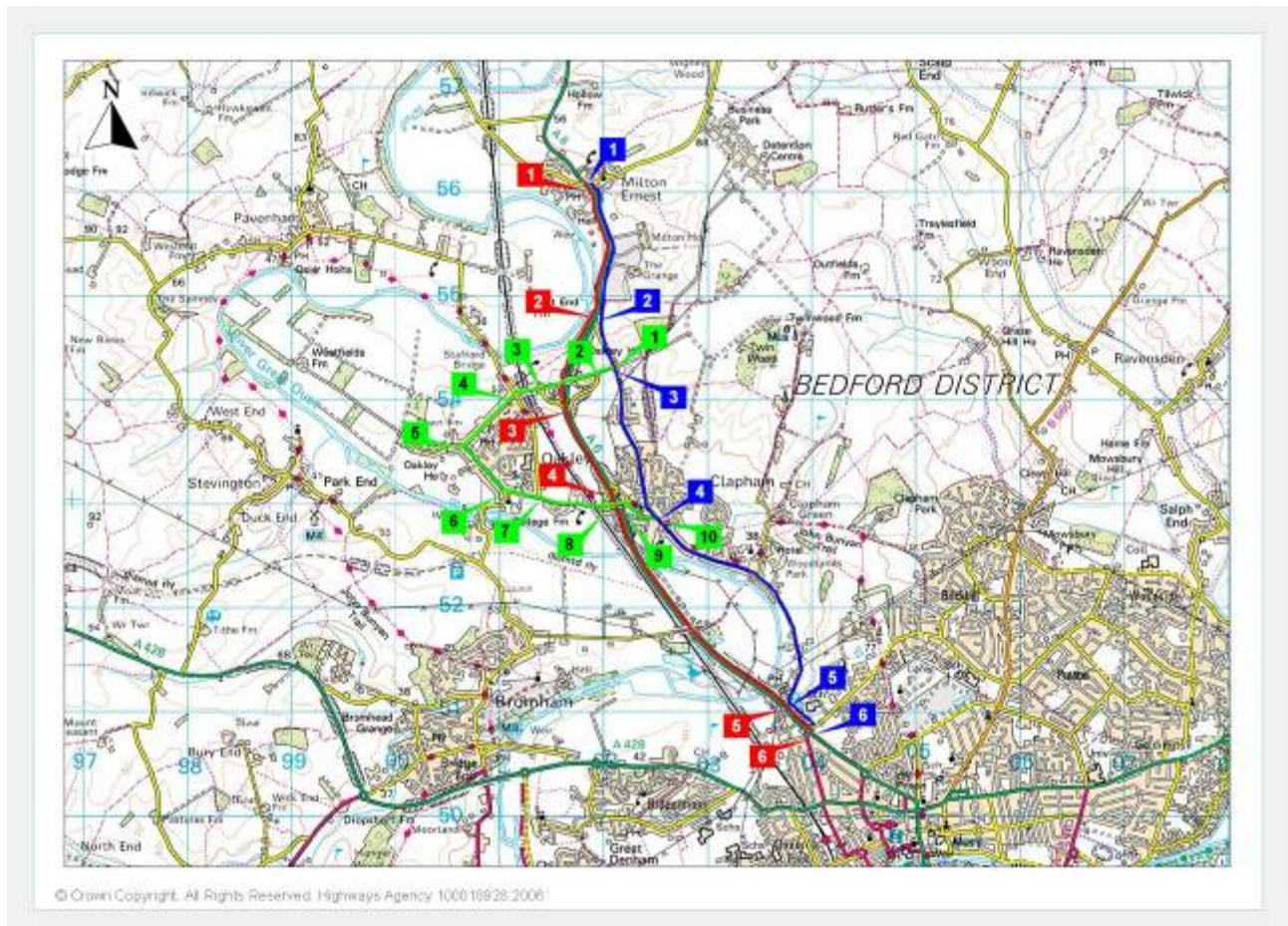


Figure 2.2 - Journey Time Routes

2.5 Following discussions with Bedfordshire County Council, it was revealed that there were continued delays at the Clapham Road Roundabout during the AM peak. Additional queue length information was therefore collected in April 2008 to confirm the nature of this problem and its impact on our observed journey times.

**Scheme Impact on Traffic Volumes**

**Conclusions from the OYA Report**

2.6 Three headline conclusions can be drawn from the OYA report that are of relevance to traffic impacts emerging from the Clapham improvements, these are:

- The scheme was successful in significantly reducing traffic volumes on the A6 through Clapham ;
- An average reduction in journey times for through traffic of 2-3 minutes was observed; and

A6 Clapham Bypass – FYA Study

- Evidence of some local re-routing issues caused by the creation of new access points to the A6.

2.7 The sub-section that follows builds upon and looks to verify key findings originating from the OYA study.

**Summary of Traffic Impacts - Five Year After Opening**

2.8 Average Weekday Traffic (AWT) volumes for the period 2002 to 2008 are provided in Table 2.1. Before' and '5-Year After' flows are also shown geographically in Figure 2.2.

Table 2.1 - Summary of Traffic Volume Changes (2002-2008)

Location	Traffic Volume (AWT)			
	Before Opening (2002)	Immediately after Opening (2003)	1 Yr After Opening (2004)	5 Yr After Opening (2008)
1 A6 Bedford Rd, N of Bypass	13,000	15,900	16,700	18,000
2 A6 Bypass, N of Highfield Rd	-	-	-	18,100
3 A6 Bypass, S of Highfield Rd	-	-	-	17,300
4 A6 Bypass, S of Oakley Rd	-	17,300	18,400	19,000
5 Old A6 Bedford Rd, N of Highfield Rd	13,400	2,300	1,700	1,700
6 Old A6 Clapham, E of Green Rd	21,400	8,500	8,300	8,600
7 Highfield Rd, E of Pavenham Rd	4,900	3,500	4,600	4,600
8 Oakley Rd (Lovell Rd) , E of Station Rd	6,000	7,000	7,300	6,900
9 Church La, Oakley	7,200	7,500	7,400	8,000
10 Oakley Rd, between old A6 and bypass	5,200	4,100	6,500	6,100

All flows have been seasonally adjusted to April of each year. No other adjustments for traffic growth have been made.

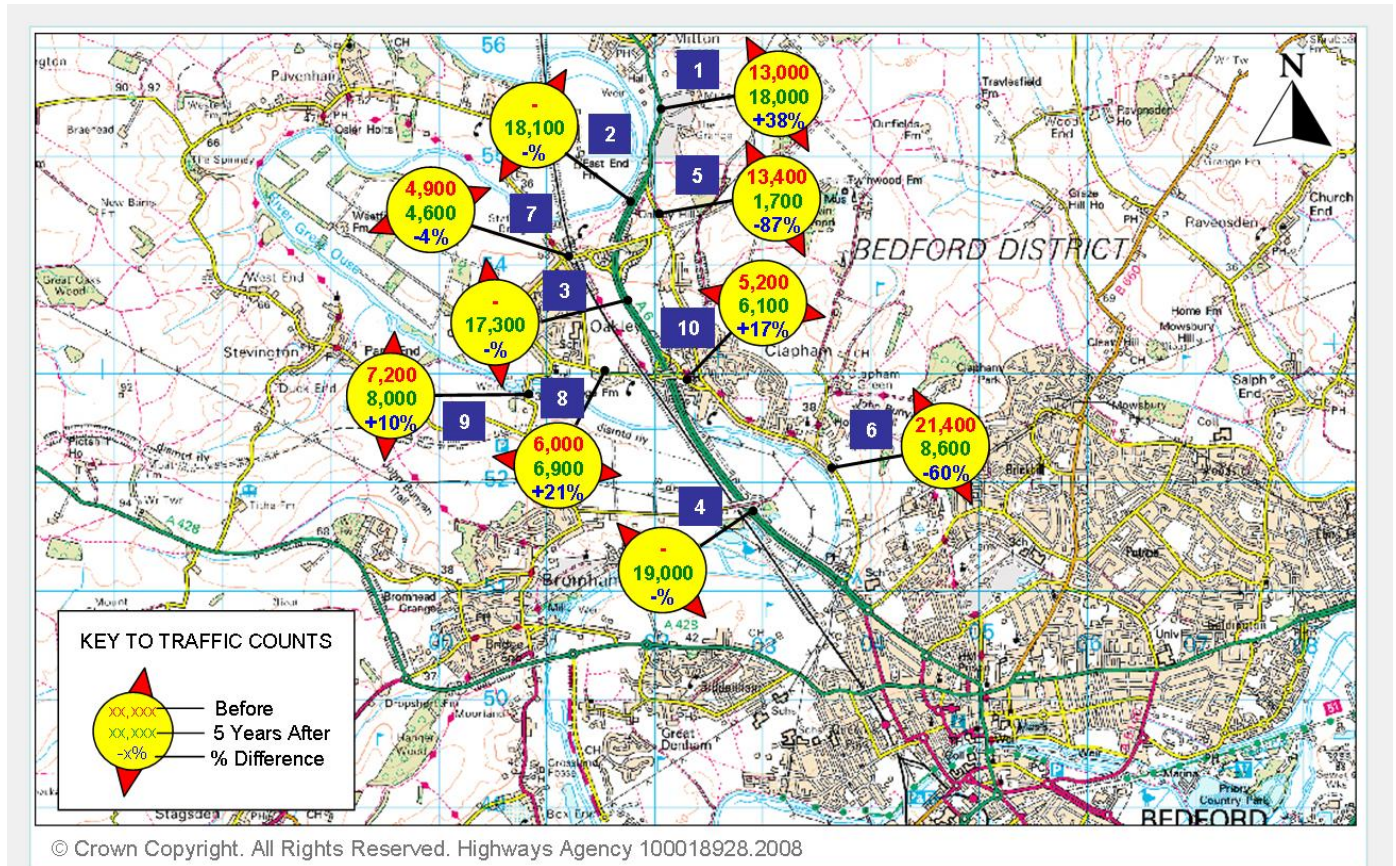


Figure 2.3 - Comparison of Traffic Volumes 'Before' and 'Five Years After'

A6 Clapham Bypass – FYA Study

- 2.9 Traffic flows have been adjusted for seasonal variation, but not background growth (this is considered further during latter parts of this section). For the purposes of the Five Years After study, traffic volumes have also been compared on three links of the bypass, whereas previously they had only been measured on the southernmost link.
- 2.10 Key points to note from our analysis of traffic flow changes in the vicinity of the scheme are summarised as follows:

### The Bypass

- **Traffic volumes along the bypass vary between 17,300 vpd (site 3) and 19,000 (site 4) vpd (FYA)** - The cause of traffic flow variability on the New A6 is likely to be attributable to the location of the scheme on the edge of Bedford. There are significant traffic generators close to the southern end of the scheme. In addition to the superstore with an access directly onto the A6, there are developments at Manton Lane just east of the southern limit of the scheme, which include Bedford Modern School, and Manton Industrial Estate (these were present before the scheme was built). All will generate complex trip patterns in the locality of the scheme.
- **There has been a observed increase in traffic on the southern section of the A6 bypass - an increase from 17,300 vpd to 19,000 vpd at site 4 (an increase of 10%) since the One Year After stage.**
- **The number of vehicles accessing the new A6 at Oakley Interchange has fallen by around 400 vehicles per day when compared to conditions OYA opening-** This suggests that more residents of Oakley and Bromham are now using Church Lane as an alternative route into Bedford than was the case in 2004. No change in flows at the Highfield Road Interchange and long queues the bypass southern tie offer evidence for such re-routing.
- **The number of vehicles accessing the new A6 at Highfield Road Interchange has remained unchanged compared to conditions OYA opening – flows here are around 4% (300vpd) lower than in 2002 –** Users of this junction are most likely to be confined to northern parts of Oakley or residents from Bromham heading north on the A6. As per the last point residents of Bromham appear to be using Church Lane as an alternative route into Bedford to avoid congestion at the southern tie ins.
- **Observed traffic flow changes between the OYA and FYA have been small relative to the changes observed in the opening year –** It is clear that traffic flows on the A6 have not changed significantly since the opening year, indicating that a majority of re-routing effects have occurred immediately after opening and not as a direct result of the scheme.

### The Old A6

- **AWT on the old route north of Clapham (new A6 southbound offslip) has fallen 87% from 13,400 to 1,700 (a reduction of 11,700 vpd) since before opening –** this can be explained by the fact that this is now a one-way road leading from the A6 into Clapham village. It is likely that a majority of these existing trips are destined for Oakley as those destined for Clapham are more likely to use the access point at Oakley Interchange. There has been no change in traffic volume at this location since 2004;
- **AWT on the old road south of Clapham has fallen 60% from 21,400 to 8,600 vehicles (a reduction of 12,800 vpd) since before opening –** this reduction is marginally less than was evident at the OYA stage (2004) when there were 8,300 vpd's on the old route. There is no evidence to suggest that traffic is beginning to re-route back on to the old road;
- **Traffic on the old A6 remains has remained relatively unchanged since the OYA study –** see above point;

### The Corridor

- **Traffic volumes north of Clapham and the bypass link (site 1) have increased by 5,000 vpd to around 18,000 vpd (an increase of 38%) since the opening of the scheme –** This

A6 Clapham Bypass – FYA Study

increase is marginally above what would be expected through traffic growth alone (see Table 2.2).

- A screen line south of Clapham (flows observed at sites 4,6 and 9) over the same period show:
  - **Total traffic in the A6 corridor has increased from 28,600 vpd to 35,600 (7,000 extra trips) – an increase of 24%;**
  - **Traffic on the bypass (site 4) and old A6 (site 6) only, have risen more than traffic north of Clapham (site 1) –** This could be a consequence of increasing movements on the A6 caused by more Clapham and Oakley residents using the Oakley Interchange to access the southbound A6;
  - **There has been no change in the distribution of traffic through each site since the OYA stage – around 53% of traffic uses the new A6, whilst the remaining traffic is distributed between the sites 6 and 9 –** It is assumed that traffic using sites 6 and 9 is local traffic originating and destined for Bromham, Oakley and Clapham and is not strategic traffic
- **Total traffic in the A6 corridor through Clapham has increased by an average of 6,750 vehicles per day since before opening** – This is less than can be expected through traffic growth alone
- **Traffic volumes on the A6 north of Clapham have increased by around 1500 vpd since the OYA surveys were undertaken** - this is balanced by an increases further south of 600, 600 and 300 vpd at sites 9, 4 and 6 respectively since 2004; and
- **Observed traffic flow changes between the OYA and FYA have been small relative to the changes observed in the opening year.**

### Local Routes

- **Compared to before scheme opening, total traffic entering Oakley has increased by around 1,400 vehicles per day (7.7% increase):** This represents a total 1,700 vehicle per day increase at sites 8 (Oakley Road) and 9 (Church Lane) compared to a reduction of 300 vpd at site 7 (Highfield Road).
- **The 900 vehicle increase at site 8, is consistent with a 800 vehicle increase at site 9 -** this suggests that new traffic at the Oakley Interchange is likely to have originated from Bromham;
- With the exception of site 9, traffic volumes on other minor routes monitored have either remained constant or fallen slightly since the OYA study.

### The Relevance of Background Traffic Growth

2.11 Annual background growth between the time of the ‘Before’ counts (2002) and ‘Five Year After’ counts (2008), has been 5.4%. This is based on the observed growth in vehicle-kilometres in Bedfordshire, as reported by the DfT in *Traffic Statistics for Local Authorities 1993-2007*. Any observed changes in traffic volumes greater than this in the Clapham area are likely to reflect additional traffic in the area as a result of:

- Small pockets of development in Clapham and Bromham villages;
- Local reassignment emerging as a result of new safer access points to the A6 Bypass and improved journey times offered by the scheme; and
- Additional strategic traffic attracted to the area following opening of the bypass and other improvements at Rushden and Rothwell north on the A6.

2.12 Table 2.2.provides a comparison of observed traffic flow changes between 2002 and 2008 and illustrates traffic volume changes that could materialise through background increases in traffic alone.

**Table 2.2 – Summary of Changes in AWT (2002 – 2008)**

Location		Traffic Volume (AWT)			
		Before Opening (2002)	Expected 2008 Flow (based on 5.4% annual growth alone)	Actual Observed Flow (2008)	Difference
1	A6 Bedford Rd, N of Bypass	13,800	17,800	18,000	200
2	A6 Bypass, N of Highfield Rd	-	-	18,100	-
4,6	A6 Bypass, S of Highfield Rd and Old A6 Clapham, E of Green Road	21,400	29,300	27,600	- 1,700
7	Highfield Rd, E of Pavenham Rd	4,900	6,700	4,600	-2,100
8	Oakley Rd (Lovell Rd) , E of Station Rd	6,000	8,200	6,900	-1,300
9	Church La, Oakley	7,200	9,900	8,000	-1,900
10	Oakley Rd, between old A6 and bypass	5,200	7,100	6,100	1,000

2.13 Key points to draw from the above are:

- Observed traffic growth between 2002 and 2008, North of Clapham, is marginally above that expected through background traffic growth alone (irrespective of the schemes effects);
- Volumes on Oakley Road (east of the bypass) are around 1,000 higher than would be expected from background growth alone. This suggests new traffic has been generated as a result of local re-assignment caused by the scheme or new development traffic in the area; and
- On all other routes, actual traffic growth has been less than could be expected through average background growth in the county.

### Traffic Volume Comparison with Predictions

#### Sources of Traffic Flow Forecasts

2.14 Sources from which predicted traffic flow impacts could be obtained were:

- A COBA Input Report dated 1987. This does not contain the results of the COBA run, and the files themselves are not present;
- Photocopied network diagrams with flows, from a COBA Input Report dated 1990. The full report and COBA files have not been obtained;
- The Orders Report, dated 1991; and
- COBA files for a run dated 1998. No supporting documentation is present.

2.15 The predicted flows obtained from these documents are all quite similar, suggesting they were derived from the same source, a ROADWAY traffic model with all-or-nothing assignment, with a 1986 base year, and a 1989 validation year.

#### A comparison of Predicted and Out-turn Flows

2.16 A comparison of predicted and observed flows is given in Table 2.3. The predicted flows are those from the 1998 COBA files. They have been converted to 2008 AADTs (Annual Average Daily Totals), using factors from the same COBA files. Note that ‘actual do-minimum’ represents the observed flows before bypass opening, converted to 2008 traffic levels based on the observed growth in Bedfordshire, mentioned earlier.

Table 2.3 - Predicted and Actual Volumes (AADT)

	Location	Predicted		Actual		Difference	
		Without Bypass	With Bypass	Without Bypass	With Bypass	Without Bypass	With Bypass
1	A6 Bedford Rd, N of Bypass	18,691	19,856	12,801	16,633	-32%	-16%
2	A6 Bypass, N of Highfield Rd	-	21,424	-	16,478	-	-23%
3	A6 Bypass, S of Highfield Rd	-	23,578	-	15,766	-	-33%
4	A6 Bypass, S of Oakley Rd	-	30,201	-	17,506	-	-42%
5	Old A6 Bedford Rd, N of Highfield Rd	21,849	1,568	13,291	1,557	-39%	-1%
6	Old A6 Clapham, E of Green Rd	35,010	7,316	21,295	8,222	-39%	12%
7	Highfield Rd, E of Pavenham Rd	4,093	4,921	4,597	4,394	12%	-11%
8	Oakley Rd (Lovell Rd) , E of Station Rd	9,106	8,492	5,626	6,062	-38%	-29%
9	Church La, Oakley	7,813	6,809	6,835	7,029	-13%	3%
10	Oakley Rd, between old A6 and bypass	9,106	4,666	5,273	5,566	-42%	19%

2.17 A comparison of predicted and out-turn traffic flows helps to identify the following points:

- Traffic flows in 2008 were higher than forecast on the old road (south of Clapham) by around 1000vpd, and higher than forecast on Oakley Road and Church Lane by 1,000vpd and 300vpd respectively; and
- Traffic volumes on the A6 bypass were 16-42% lower than forecast – this equates to around 3,200 – 12,700 vpd less than forecast.

2.18 The Forecasting Report indicates that growth factor assumptions were derived from NRTF89, which has since proved to be too high. If this was the only cause of the discrepancies, then the 'Without Bypass' and 'With Bypass' differences would be similar. In cases where these are not similar, it appears that modelling of the impacts was poor, e.g. that forecasts did not consider the impact of local re-routing caused by ongoing traffic congestion south of the bypass.

## Impact on Journey Time

2.19 A detailed breakdown of the post opening journey time surveys undertaken in the vicinity of the A6 Clapham Improvements is contained in Annex A. A summary of the key journey time changes observed across the 3 surveyed routes is provided below and should be considered alongside Figure 2.2:

- On the bypass (Red Route), free-flow route times are generally between 4 to 5 minutes. Queues at the southern end of the route build up in the AM peak, resulting in average times exceeding 9 minutes;
- On the former A6 through Clapham (Blue Route), FYA times are generally about 7 minutes in the southbound direction. As occurs at the end of the main bypass, southbound queues approaching Bedford increase to over 10 minutes in the AM peak; and
- The Oakley Loop (Green Route) has times of 6 to 7 minutes, without any queuing delays. This represents a post opening journey time of around 3 minutes between Clapham and Oakley.

2.20 The A6 between Milton Ernest and Manton Lane has now been surveyed four times, as part of POPE. Comparative times for the route between identical end-points are tabulated in Table 2.4.

Table 2.4 - Comparative A6 Journey Times (min:sec)

Direction	Time Period	Old A6 (2002)	Journey Time on New A6 Alignment			Observed Time Saving (FYA)
			Immediately After Opening (2003)	1 Yr After Opening (2004)	5 Yr After Opening (2008)	
Southbound	AM	07:10	04:59	07:47	09:37	-02:27
	IP	07:51	05:01	04:28	04:39	03:12
	PM	06:59	04:55	04:54	04:38	02:21
Northbound	AM	07:24	05:22	04:30	04:33	02:51
	IP	07:12	05:13	04:35	04:35	02:37
	PM	07:16	05:14	04:46	04:42	02:34

2.21 Table 2.3 shows that journey times on the bypass five years after opening are generally lower than 2002 levels. This represents a time saving of about 2 to 3 minutes, with the exception of those travelling southbound in the AM peak. Due to capacity issues at the southern tie in, times have steadily worsened since opening and no actually exceed pre-scheme levels.

2.22 The unusually long times in the AM peak may be explained by traffic queues heading inbound into Bedford or travelling towards the A428. The results of our queue length survey conducted in 2008 are shown in Table 2.5.

Table 2.5 - Queue Lengths (metres) at Clapham Road Roundabout

Time Periods			Old A6 (Clapham Rd)		A6 East (Clapham Rd)		Cut Throat Lane	A6 West (Clapham Bypass)	
			Lane 1	Lane 2	Lane 1	Lane 2		Lane 1	Lane 2
AM Peak									
07:30	-	07:45	20	0	0	0	0	0	0
07:45	-	08:00	180	0	0	0	0	200	200
08:00	-	08:15	430	0	0	0	0	180	150
08:15	-	08:30	400	15	0	0	0	600	550
08:30	-	08:45	300	15	0	0	0	500	450
08:45	-	09:00	90	15	0	0	0	60	60
PM Peak									
16:30	-	16:45	0	0	0	0	0	0	0
16:45	-	17:00	0	0	0	0	0	30	0
17:00	-	17:15	20	0	0	0	0	0	0
17:15	-	17:30	0	0	0	0	0	0	0
17:30	-	17:45	25	0	0	0	0	20	0
17:45	-	18:00	0	0	0	0	0	20	0

2.23 Table 2.4 shows that:

- Southbound queues on the bypass build up in both lanes, reaching 600 metres in length from 08:15 to 08:30;
- Long queues also form on the old A6 approaching this roundabout, and these are confined to lane 1 (left turn). By comparison, the PM peak is virtually free of traffic queues.

2.24 These queues are likely to be a significant contributory factor to observed re-routing onto local routes through Oakley and Bromham following scheme opening, increased journey times in the AM peak and consequently are likely to be inhibiting the true benefits of the scheme.

**Journey Time Comparison with Predictions**

2.25 Predicted journey time savings per vehicle are available from two sources, the AST and COBA. These are shown in Table 2.5 below, compared with actual average two-way savings. The COBA and Actual are for equivalent lengths of the A6 (between Manton Lane and Milton Ernest).

**Table 2.6 - Journey Time Saving (minutes)**

Time Period	Prediction		Actual
	AST	COBA	
Peak Hour (AM and PM)	4.6	2.4	2.6
Off-peak	3.5	2.1	2.9

2.26 The AST estimate of journey time savings from the bypass is somewhat more optimistic than the COBA. Both show the peak time saving being greater than the off-peak saving, whereas in the actual case, it is less. This reflects the southbound delays in the AM peak. Nevertheless the actual time savings per vehicle remain slightly better than the COBA prediction.

**Journey Time Reliability**

2.27 ‘Route stress’ is a quantifiable indicator of journey time reliability. This is essentially a comparison of volume to capacity. The AST gave a route stress value of 104% ‘Before’ and 38% ‘After’. Based on actual traffic flows route stress has fallen from 104% to 30%. This confirms the AST prediction of a large drop, with completion of the scheme.

**What the residents said - Impact on Traffic**

2.28 As part of the Post Opening Residents Survey (2008), residents were given opportunity to put forward their views on the success of the A6 Clapham Improvements. Key conclusions from this survey help verify a number of issues raised from our technical analysis:

2.29 Whilst 71% of residents felt that the scheme had reduced congestion in Clapham, there were a number outstanding concerns:

- Many consider congestion at the south of Clapham (where the old route and the bypass connect) to be a significant problem especially during peak times. There have also been reports of traffic overtaking and ‘pushing in’ at the roundabout, compromising the safety of other drivers.
- The congestion is believed to be caused by a bottleneck of traffic meeting at the roundabout and children being transported to nearby Bedford Modern School. Some respondents have called for a park and ride scheme into Bedford or an improved school bus service.
- There is a perception that the reduction in traffic through Clapham has now enabled traffic to speed through the village. This is principally a problem early in the morning and late evening.
- There are fears from some respondents that the development of new properties in the area will increase traffic back to levels before the opening of the bypass.

2.30 The following is a selection of specific comments made on traffic impacts – a majority of which refer to congestion problems at the roundabout at the southern tie in:

*“Having spoken to older residents, the bypass made a huge difference to the village traffic. Now the queues are at the end of the village (Sainsbury’s r/about) but not in the village itself.”*

*“While the bypass has removed the through traffic from Clapham, the poor design of the roundabouts and positioning of the bus stops by Bedford Modern School make access to Bedford from Clapham very difficult, especially in the mornings.”*

*“Although the roads are better and quieter within Clapham, it is now very difficult getting out of Clapham during peak periods for instance the r/about near Sainsbury’s is always congested and it is difficult to get onto it unless you are coming off the bypass.”*

*“Rush hour traffic has not improved, queues into Bedford to get onto r/about by Anglers Rest are just as bad as before bypass - as more housing has been built in the village the queues have grown.”*

*“Getting out of the village in the morning is a nightmare. Also school buses in the morning compound the problem. I only travel 3 miles to work and would cycle but high volume of traffic & lack of cycle routes through Bedford prevent this.”*

*“I feel that it may be necessary to erect traffic lights for peak times at the r/about near Sainsbury’s as it can be very time consuming and difficult to turn left off the roundabout from Clapham village due to traffic coming off the bypass.”*

*“Clapham A6 old route is used as a rat run.”*

*“Traffic uses Clapham in the morning /evening rush hours to try to avoid the queue getting into Bedford.”*

## Main Traffic Conclusions

- The bypass is used by 17,300 – 19,000 vpd. The old A6 through Clapham is used by 1,700 – 8,600 vpd, representing a reduction of 60% to 87% compared with before the scheme opened;
- Traffic flows have generally increased at rate lower than background growth observed across the county as a whole;
- Traffic flows FYA opening are broadly comparable to those observed at the OYA stage suggesting the re-assignment impacts stabilised within a year of opening;
- There is some evidence of small amounts of local re-routing via Church Lane between Oakley and Bromham (between the OYA and the FYA) – this is likely to be attributable to the A428 offering a quicker route into Bedford during the AM peak where there are significant delays at the southern end of the A6;
- Journey times have typically improved by 2-3 minutes on the new route, however they have deteriorated to pre-opening levels since 2004 due to congestion at the Sainsbury Roundabout (south of the bypass);
- Compared to figures at the OYA stage, traffic levels have increased by 300 vpd on the old road. Observed AADT's are above those forecast in COBA;
- The number of vehicles using the A6 southbound offslip (north of Clapham) has remained constant since 2004;
- Traffic flows in 2008 were higher than forecast on the old road (south of Clapham) by around 1000vpd, and higher than forecast on Oakley Road and Church Lane by 1,000vpd and 300vpd respectively;
- Traffic volumes on the A6 bypass were 16-42% lower than forecast – this equates to around 3,200 – 12,700 vpd less than forecast;
- Journey time reliability has improved despite some congestion issues south of the bypass;
- NRTF89 growth assumptions used in the modelling exercise has resulted in traffic being less than forecast on most links in the Do Min and Do Something scenarios;
- Journey times for traffic using the bypass are now 2-3 minutes shorter than previously on the old A6, at most times of the day. The exception is in the AM peak southbound, which now has a longer journey time, as a result of delays at the southern roundabout.
- Long queues form on the approach to Bedford at the southern roundabout junction of the bypass with the old A6, in the AM peak. The queues have been recorded up to 600 metres in length on the bypass, and up to 430 metres on the old A6.
- Whilst the general response to the scheme from the public has been positive - there is a perception that the bypass has removed the location of congestion from Clapham village to the southern junction of the bypass with the old A6.

## 3. Safety

### Introduction

3.1 This section evaluates the safety impacts of the scheme on the affected network and compares this with forecast impacts.

### Data Collection

3.2 Records of personal injury accidents (PIAs) and casualties were obtained from Amey plc, who hold the data on behalf of Bedfordshire County Council. This data is based on the records of personal injury accidents recorded in the STATS19 data collected by the police when attending accidents. It should be noted that this data has not been independently validated by the DfT.

3.3 The study area corresponds with the journey time network and therefore consists of:

- The A6 between Manton Lane and Radwell Road;
- the former A6 through Clapham; and the loop formed by Highfield Road/ Lovell Road in Oakley.<sup>1</sup>

3.4 Data was obtained for three complete years before the start of construction (1<sup>st</sup> May 1998 – 30<sup>th</sup> April 2001) and five years after opening of the bypass (12<sup>th</sup> December 2002 – 11<sup>th</sup> December 2007). The period of construction has been isolated from our before and after analysis.

### Conclusions from the OYA Evaluation

3.5 The initial analysis accident data collated in the OYA evaluation report indicated that the A6 Clapham Bypass has led to a reduction in the number of accidents in the corridor, where up to 7 personal injury accidents have been saved in the first year after opening.

### Safety Impacts

3.6 The locations of accidents occurring in the 'Before' period are shown in Figure 3.1. Those occurring in the 'After' period are shown in Figure 3.2. The average numbers of accidents and casualties in the study area per year, during the 'Before' and 'After' periods, are detailed in Table 3.1.

**Table 3.1 – Before-and-After Accidents and Casualties**

	Accidents per Year		Casualties per Year	
	Before	After	Before	After
Slight	13.7	8.0	20.0	9.8
Serious	3.3	2.8	5.0	4.4
Fatal	0.3	0.2	0.3	0.2
Total	17.3	11.0	25.3	14.4
Severity Index	0.212	0.273	0.211	0.319
Reduction		37%		43%

3.7 The table shows that there was an average of 17.3 accidents per year prior to scheme opening which had reduced to 11.0 following scheme opening, representing a 37% reduction. In terms of casualties, the rate fell from 25.3 to 14.4 per year, which is a 43% reduction.

<sup>1</sup> Data was not collected for the entire COBA network, which covers the whole of Bedford in detail, and is not appropriate for an analysis of the actual effect of the Clapham by passon safety.

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3.8 Reducing the number of people killed or seriously injured (KSI) in road accidents is a Government objective (2010 KSI Casualty Reduction Target). The ‘severity index’, which is the proportion of Serious and Fatal to Total accidents has marginally increased from 0.212 to 0.273. This is a result of accident savings predominantly affecting the Slight category.

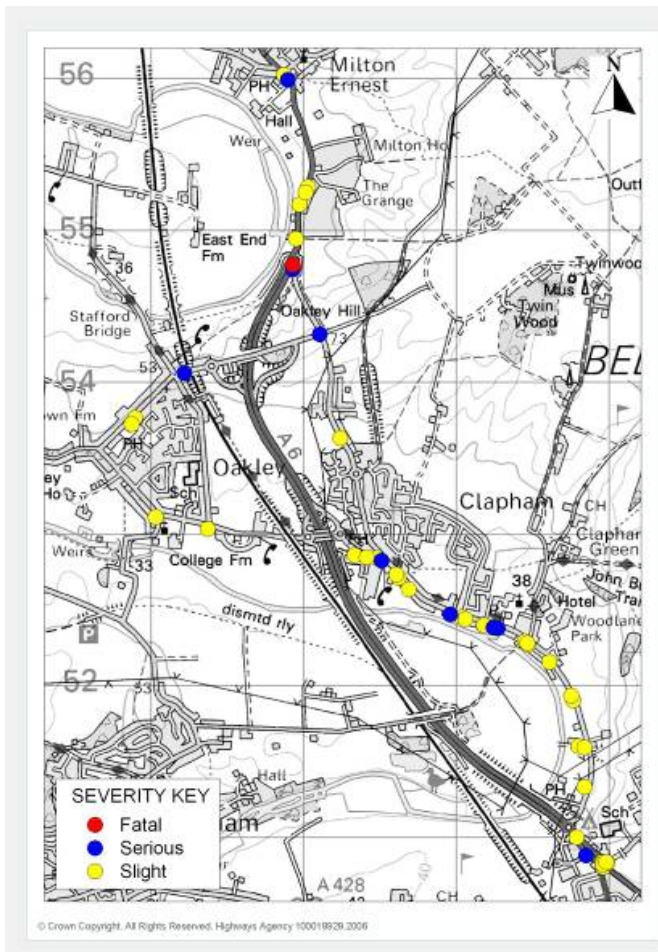


Figure 3.1 – Accident Locations ‘Before’

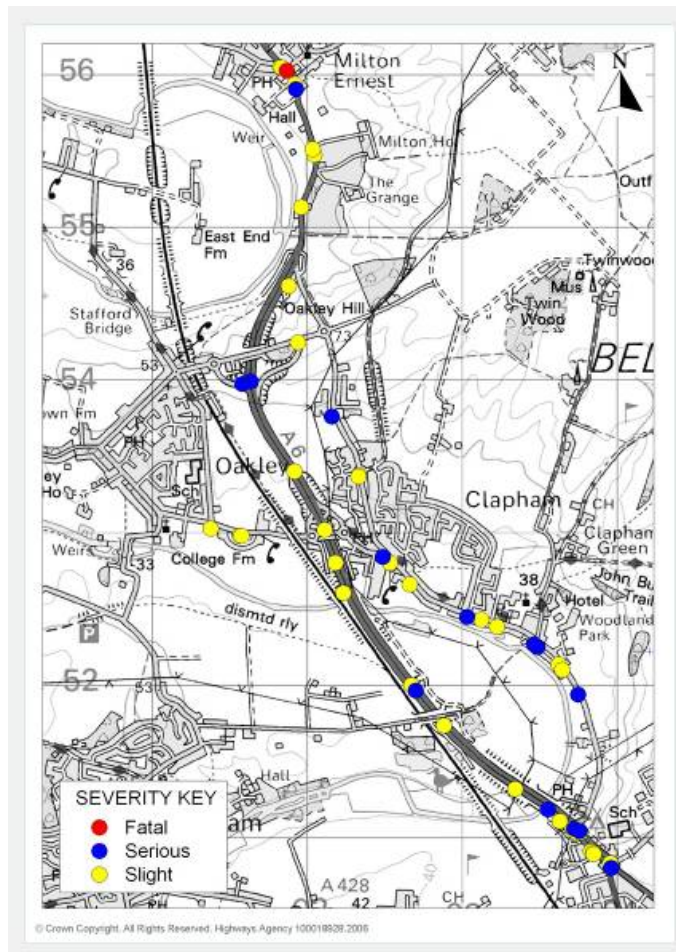


Figure 3.2 – Accident Locations ‘After’

Accident Causation

3.9 The accidents are broken down into various categories as illustrated in Table 3.2. This reveals that:

- Collisions with pedestrians formed the largest category before opening, with 3.3 such accidents per year, falling to 1.0 per year following opening due to the removal of through traffic from the populated area of Clapham.
- The number of collisions with cyclists has also fallen, due to the removal of through traffic from the populated area of Clapham.
- Other categories of accidents showing reductions are head-on collisions and collisions at accesses with the A6. These changes can be attributed to through traffic now using separate carriageways for each direction of travel, and the reduced number of accesses onto the new bypass.
- However the number of single-vehicle accidents has risen from 2.7 to 4.0 per year, accounting for over a third of all accidents in the ‘After’ period. This may be attributable to the greater opportunity for speeding on the new bypass.

Table 3.2 - Changes in Accident Causation

Category of Accident	Accidents per Year		Proportion of Total	
	Before	After	Before	After
Single vehicle loss of control	2.7	4.0	15%	36%
Rear shunt (not at junction)	2.3	2.0	13%	18%
Overtaking collision	1.0	1.2	6%	11%
Vehicle collision with pedestrian	3.3	1.0	19%	9%
Collision at priority junction/ access	3.0	1.0	17%	9%
Collision at roundabout	1.0	0.6	6%	5%
Other head-on collision	2.3	0.4	13%	4%
Vehicle collision with cyclist	1.7	0.4	10%	4%
Opposed collision at signals	0.0	0.4	0%	4%
<b>Total</b>	<b>17.3</b>	<b>11.0</b>	<b>100%</b>	<b>100%</b>

### Accident Rate (Per MvKM)

3.10 A safety assessment should also take into account the volumes of traffic. This is achieved using the measure of 'Personal Injury Accidents per Million Vehicle-Kilometres' (pia/mvkm). Table 3.3 below gives this measure for the separate routes in the study area. This shows that the rate on the old A6 was 0.382 pia/mvkm before the scheme. This has been halved on the new bypass, with a rate of 0.190 pia/mvkm five years after the scheme. However it

Table 3.3 - Changes in Accident Rates per Million Vehicle-Kilometres

Route		Accidents per Year	Dist km	AADT	mvkm	PIA/mvkm
Before	Old A6	15.0	6.33	17,003	39.285	0.382
After	A6 Clapham Bypass	5.8	4.94	16,953	30.568	0.190
	Old A6	4.4	5.99	4,676	10.223	0.430
	Combined New & Old A6	10.2				0.250

3.11 Key points to note from this analysis are as follows:

- The old A6 had an accident rate of 0.382, this is approximately half that observed on the similar routes elsewhere ('Other S2 with 30-40 mph limit');
- The accident rate is 0.190 on the bypass marginally higher than the national average rate for roads similar to the new Clapham bypass ('modern D2 with HS) of 0.114 pia/mvkm;
- The accident rate has increased on the old A6, due to accidents not falling in proportion to the traffic reduction. The 'After' rate for the new and old A6 combined is 0.250 pia/mvkm.

### Significance Testing

3.12 To assess the significance of changes in accident rates following an improvement, it is common in accident studies to use the chi-squared test. This checks whether the change in accident numbers in conjunction with changes in vehicle-kilometres travelled on a network is likely to be a real change due to the improvement, rather than random fluctuation due to chance.

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3.13 The result of the chi-squared test exceeds the critical value for the 95% confidence level, thus it is reasonable to conclude that the change in accident rate reported above is not a result of chance alone, and therefore the scheme has had a direct impact on accident rates.

## Comparison with Predictions

3.14 Sources of accident predictions are:

- The scheme AST (Appraisal Summary Table); and
- Outputs from COBA (Cost Benefit Analysis).

3.15 The AST gives 30-year predictions, while the COBA output gives both 30-year and opening year predictions. The COBA opening year predictions are for the first year (2003), and can be compared with the actual annual average for the first five years discussed above. Furthermore the ratio between the COBA 30-year and opening year values can be applied to the AST figure to derive the equivalent AST 1-year value.

3.16 It is assumed that the AST figure refers to an extended study area of which details are not known. It is possible to extract the predicted savings on each of these key links from the COBA files, for comparison with observed data. The results are shown in Table 3.4 below.

Table 3.4 - Predicted & Actual Accident Savings

Data Source	Accidents Saved in Opening Year	
	Whole Network	POPE Study Area
AST	10.0	-
COBA (High Growth)	8.6	7.2
COBA (Low Growth)	7.5	6.1
Actual	-	6.3

3.17 The summary above shows how a majority of benefits were forecast to materialise on the key links affected by the scheme – the network considered in our traffic analysis. The out-turn saving of 6.3 is marginally lower than that identified in the OYA, however this still falls within the high and low forecasts forecast by COBA. As such the actual saving is broadly speaking as forecast.

## Public Perception of Safety in Clapham

3.18 Despite a majority of residents recognising the positive effects on perceived road safety in Clapham, there are some outstanding concerns amongst residents five years after opening of the scheme. Key points from the Clapham Resident Survey are summarised as follows:

- The majority of residents in Clapham believe that safety for road users and pedestrians has improved since the scheme opened – 71% strongly agree/agree that this was the case.
- The general view was that a reduction in traffic has brought an improvement in safety.
- A negative impact however was speeding traffic through the village as a consequence of less cars travelling through Clapham. There were requests for speed and traffic calming measures to be introduced.

3.19 Some of the specific comments received are listed below:

*“The speed of vehicles coming through the village needs urgent attention before someone gets killed. SPEED CAMS NEEDED NOW....”*

*“Clapham needs some speed humps or some speed reducing measures. Parking on paths in High St still a problem.”*

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*“High St now used as a racetrack. Double parking now so dangerous, traffic now has to divide central white line.”*

*“Some sort of traffic calming is needed, as a lot of traffic drive over the speed limit through the village.”*

*“Speed camera please in Bedford End as school children and residents are still at risk.”*

*“...Infuriating when motorists jump the queues by driving on the wrong side of the road to get ahead of the more patient drivers.”*

*“Sort out the roundabout, police the overtaking traffic (old route), before an accident happens, I have witnessed several near misses.”*

*“Junction at Sainsbury's r/about (from village) need altering to stop idiots who overtake on the wrong side of the road at peak times.”*

## Main Safety Conclusions

- The number of personal injury accidents fell from 17.3 per year 'Before' to 11.0 'After'. This is a statistically significant change;
- This saving is marginally less than that forecast at the OYA stage;
- Casualties fell from 25.3 per year to 14.4. Both accidents and casualties fell by about 40%;
- Changes in the causes of accidents showed significant reductions have been observed in head-on collisions, collisions at junctions, and accidents involving pedestrians and cyclists. However, single-vehicle accidents have increased;
- When vehicle-kilometres travelled are taken into account, the rate on the A6 has fallen from 0.382 pia/mvkm 'Before' to 0.190 pia.mvkm 'After'. The accident rate for the combined new and old A6 is 0.250 pia/mvkm;
- The observed reduction in accidents matches well with COBA predictions for the same subset of links; and
- Public consultation indicates a general feeling that safety has improved, although written comments identify speeding traffic in Clapham and congestion at the southern end of the bypass as being dangerous.

# 4. Economy

## Introduction

4.1 This section compares the original economic forecasts for the scheme with an evaluation of the actual costs and re-forecast benefits based on observed data. The financial benefits of the scheme have been appraised over 30 years. Our evaluation is based on a reforecast of economic benefits likely to occur over 30 years as a result of differing traffic flows to those forecast.

## Analysis of Scheme Costs

### Outturn Costs

4.2 The information received from the Regional Finance Manager at the Highways Agency in August 2008, is that costs, including works, land, preparation and supervision, totalled £37.8 million. This is the total as spent between the years 2001 and 2008. When converted and discounted into 2002 values, the Present Value of Costs is equivalent to £40.9m.

### Comparison with Predictions

4.3 The following sources of predictions are known:

- The Appraisal Summary Table (AST) dated July 1998. This shows a PVC of £19.6m (price base not stated, but believed to be 1994);
- The COBA file of May 1998, giving a cost of £28.7m (to a 1998 base).

4.4 To convert these figures to a 2002 price base, they have been un-discounted and adjusted by the RPI. When this is done, the AST and COBA predictions give identical results of £38.0m, showing they are likely to be derived from the same source. This is within 4% of the out-turn cost actually achieved.

**Table 4.1 - Predicted and Actual Costs**

	Costs to 2002 Base (£m)	
	Undiscounted	Discounted
Predicted	38.0	38.8
Actual	39.0	40.9

4.5 When converted and discounted into 2002 values, the Present Value of Costs is equivalent to £38.8m- within 5% of forecast.

## Monetary Benefits

### Approach to Evaluation

4.6 From observed data, it is possible to re-evaluate the two most important components of economic benefit, namely:

- Vehicle-time savings; and
- Accident savings.

4.7 Annual vehicle-hours have been measured from traffic count and journey time surveys on key links in the network, in both the 'Before' and 'After' situations. The actual 'Before' traffic flows have been factored to April 2008, the same as the 'Five Years After' date. The vehicle-time saving is simply calculated from the difference in the product of traffic volumes multiplied by journey time for the 'Before' and 'After' scenarios.

4.8 The basic POPE methodology can be summarised as follows:

- The do-minimum COBA is re-run assuming an opening year of 2008 to generate a revised do-minimum that can be compared to a 2008 do something scenario;
- Journey times are multiplied by traffic flows on key links studied as part of the POPE study;
- These can then be compared with the same links extrapolated from the revised do minimum COBA model to calculate journey time savings on key links in the POPE study area;
- An assumption can then be made about out-turn benefits for the wider COBA network (accidents and journey times) by multiplying the total COBA benefit by the ratio of predicted to outturn benefits on the smaller network. In short the POPE method is based on the assumption that if the out-turn benefits on the smaller network are within 60% of forecast, then the total benefit over the wider area can also assumed to be within 60% of forecast.

4.9 For both vehicle-time and accidents, the low-growth and high-grow benefit predictions have been combined in the proportion 60% Low to 40 % High. This conforms to practice at the time of the original forecasts.

### Time Benefits

4.10 The predicted and actual time savings (for the whole network appraised), and corresponding financial benefits over the 30-year evaluation period, are shown in Table 4.2.

Table 4.2 - Time Savings and Benefits

Scenario		Hours saved in yr	Benefit in 30 yrs (£m)	
			1998 Base	2002 Base
COBA	Low Growth	136,744	29.0	39.7
	High Growth	201,030	42.8	58.5
	Weighted 60%L+40%H	162458	34.5	47.2
Actual		137,209	29.2	39.8

4.11 It is apparent from Table 4.2 that:

- Out-turn journey time savings equate to £39.8m. The vehicle hours saved (and related monetary benefits) are marginally higher than the low growth forecast, but much lower than the high-growth forecast;
- The number of vehicle hours saved is lower than the high growth forecast due to lower than forecast flows on the A6 (16-42% lower than expected) as journey time savings were broadly in line with those forecast in the latest COBA forecasts;
- Congestion at the Sainsbury roundabout may have eroded some of the benefits by the scheme given that journey times actually exceed pre-scheme levels.

### Accident Benefits

4.12 The predicted and actual accident savings, and corresponding financial benefits over the 30-year evaluation period, are shown in Table 4.3. The ‘actual’ benefit is again derived by applying the ratio of actual vs predicted saving (for selected links) to the total area-wide forecast benefit.

Table 4.3 - Accident Savings and Benefits

Scenario		Accidents saved in yr	Benefit in 30 yrs (£m)	
			1998 Base	2002 Base
COBA	Low Growth	6.1	9.5	13.0
	High Growth	7.2	11.4	15.6
	Weighted 60%L+40%H	6.5	10.3	14.1
Actual		6.3	9.9	13.5

4.13 In summary out-turn safety benefits (£13.5m) were marginally above the low growth forecast (£13m). Our accident analysis presented in section 3, demonstrates how the accident savings may have been suppressed by higher than expected traffic on the former A6 as well as faster traffic on the new A6 route.

### Value for Money

4.14 Table 4.4 summarises the results previously presented to demonstrate how the scheme has offered good value for money. Other items covered in the COBA assessment, i.e. maintenance expenditure saving, construction delay, and maintenance delay, were insignificant, and have not been considered in this evaluation as they can not easily be measured using a POPE observation based approach. The absence of these inputs will not adversely affect the validity of comparing predicted and out-turn benefit cost ratio (BCR) as they are excluded from both scenarios.

4.15 It should be noted that the BCR ignores non-monetised impacts. In NATA assessments, the impact on environmental, accessibility and integration objectives must be assessed but are not monetised. The evaluation of these three objectives is covered in the following two chapters

Table 4.4 – Benefits and Costs (2002 Base)

	Predicted	Actual
<b>Cost</b>	£38.8m	£40.9m
<b>Benefit - Time</b>	£47.2m	£39.8m
- Accident	£14.1m	£13.5m
- Total	£61.3m	£53.4m
<b>Benefit/ Cost Ratio</b>	<b>1.6</b>	<b>1.3</b>

4.16 Key points to note from the above results are:

- The out-turn BCR is calculated to be 1.3 (compared with a predicted value of 1.6, for the same components as given by COBA);
- The combination of higher-than-predicted costs and lower-than-predicted benefits have meant that this value is slightly lower than predicted;
- Overall the proportion of total scheme benefits derived from journey time savings are consistent for both the predicted and out-turn impacts (74% and 76% respectively);
- Total out-turn benefits are around 13% less than forecast, this can largely be attributed to lower than expected journey time benefits for reasons set out in previous parts of this report;
- For the purpose of POPE Meta Reporting and assessing the accuracy of scheme appraisal, this scheme would be categorised as 'as predicted' as it falls within 15% of the forecast.

## Regeneration

- 4.17 Consultation with Bedfordshire County Council has confirmed the AST statement that no regeneration priority area has been served by the scheme.

## Public Perception

- 4.18 The public consultation did not ask questions directly related to Economy. However 25% of those respondents who had lived in the area more than 5 years thought that *'New development has been attracted to the area'*.

## Main Economic Conclusions

- The outturn scheme cost was £40.9 million (the cost of construction at 2002 prices). This is 4% higher than predicted;
- Combined accident and journey time savings were marginally higher than those forecast in the low growth scenario; The PVB was £53.4m compared to a weighted forecast of £61.3m;
- A 50:50 weighting of low and high growth economic forecasts would have improved the accuracy of the economic forecasts – yet it is recognised this has since been changed;
- The outturn BCR of 1.3 was marginally lower than forecast (1.6) and therefore offers good value for money;
- The reduction in BCR compared to forecast can largely be attributed to lower than expected journey time savings due to over estimating traffic flows on key links in the forecasts
- Overall this evaluation has demonstrated that forecasts were prepared with a good degree of accuracy despite misjudging forecast traffic flow changes on key links and eroded journey time benefits in the AM peak caused by worsening delays that Sainsbury's roundabout
- The BCR does not capture additional benefits from enhanced journey time reliability on the route.

## 5. Environment

### Introduction

- 5.1 This chapter is a summary of the evaluation of the environmental outcomes and indicates whether the impacts are considered to be as expected compared to the Appraisal Summary Table. The full report is included Annex B which includes sources, the predicted scheme impacts and their mitigation, the consultations carried out, and relevant photographs. These are omitted from this chapter, which describes the evaluation only, in order to avoid unnecessary duplication.

### Noise - As Expected

- 5.2 In line with current HA policy a low noise surface has been used for this scheme. This was not proposed in the ES.
- 5.3 A 2m high acoustic barrier has been provided as proposed and has also been extended adjacent to the southbound carriageway to the lay-by, as a result of a Public Inquiry commitment to give some protection to the Folly Park mobile homes west of the bypass near the north Ouse crossing.
- 5.4 There has been a significant reduction in traffic flows on the old A6 through Clapham since the bypass opened and it is likely that properties have benefited with an improvement in the local noise climate. At the northern end, the reductions are very similar to predicted, at the southern end although traffic had reduced by 60% the expectation was that it would be 79% less.
- 5.5 Traffic flows on the bypass are less than were expected in the 1990s due to an over-prediction of future growth. No noise surveys have been carried out for this report and based on traffic flows, properties close to the bypass will have experienced an increase in noise although this may be less than expected in the ES. The bypass will have introduced a source of noise into the countryside, however, as noted in the ES, the route is close to the existing mainline railway which is also a source of noise.

### Air Quality – As Expected

- 5.6 No new air quality monitoring or modelling has been undertaken for this report. Based on the significant reduction in traffic flows on the old A6 it is likely that local air quality will have improved for properties along the old road. There are very few properties close to the bypass and it is not thought that any are within 50m.

### Greenhouse Gases – Better than Expected

- 5.7 This POPE evaluation has calculated the change in tonnes of carbon emitted in accordance with the DMRB methodology, which takes into account actual vehicle flows, speeds, and HGV proportion. Using forecast data, the prediction was for an additional 1201 tonnes of carbon to be emitted as a result of the scheme. Using actual data, only an extra 855 tonnes were emitted, this can be attributed to lower than expected traffic volumes.

### Landscape – As Expected

- 5.8 A Landscape Management Plan (LMP) has been produced in accordance with the contract requirements. This confirms that landscaping was subject to a five year aftercare period and includes a November/December 2007 summary of planting plot condition and identifies establishment and maintenance issues at the time of scheme handover to the local authority. The LMP includes recommended maintenance and management prescriptions for a 30 year period following the opening of the road to allow the maintaining agent to continue the effective management of the scheme after handover.
- 5.9 At the time of the site visit the managing agent (on behalf of Bedfordshire Borough Council) did not think that it was in possession of a copy of the LMP. It is understood that only routine

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maintenance has so far been carried out. It has since been confirmed that a copy of the LMP has been forwarded to Bedford Borough Council.

- 5.10 The site visit in May 2009 confirmed that planting is generally establishing satisfactorily and is providing a framework for the road. Growth rates vary and canopy closure has not been reached in many plots. Stakes, ties and guards have been retained on most plants as a precaution against rabbit damage but that does mean that in some instances shrubs are developing a ‘lollipop’ habit. Ties and stakes were noted to require adjustment for some of the larger stock. Mulch mats are still in place and coming to the end of their natural life. At the time of the site visit noxious weed e.g. thistle was becoming evident in grassed areas throughout the site.
- 5.11 The acoustic fences also act as screen fences and as noted in the noise section have been provided to a greater extent than expected in the ES on the eastern side. Some traffic is still visible above the fences but this should be fully screened as planting matures. At the time of the site visit it was noted that some of the personnel gates providing maintenance access to the rear of the fences were not bolted shut.
- 5.12 The bypass is lit at the Oakley Road junction and southbound to the Manton Lane roundabout as expected. A night-time evaluation was not undertaken but it is likely that the lighting will be visible from nearby properties and within the local landscape.
- 5.13 It is understood that the landscape areas have been handed over to the local authority and are therefore no longer the responsibility of the Highways Agency. To ensure that the planting continues to develop and fulfil its long term objectives – predominantly for screening and integration, the recommendations within the LMP will need to be followed. The LMP notes that although the ongoing monitoring would be in line with best practice, there are no specific third party commitments to monitor the landscape scheme. The planting adjacent to the railway line is to be maintained to comply with the requirements of the railway authority which is to be established by annual liaison. It is understood from Bedford BC that to date routine maintenance has been undertaken.

## Biodiversity – As Expected

- 5.14 The AST noted that a County Wildlife Site would be affected. The ES included very little detail but mentioned Judges Spinney a local Wildlife Trust reserve adjacent to the proposed bypass and Stevington Marsh SSSI (3km downstream). By the time the scheme came to construction badger, great crested newts and grass snakes had been identified and mitigation measures included within the scheme.
- 5.15 It is understood that there was no requirement within the contract for any post opening monitoring and this has meant that there is very little information available to POPE to enable a full evaluation of biodiversity. The LMP makes reference to the protected species impacted on by the scheme with regard to ongoing maintenance of the Scheme.
- 5.16 Judges Spinney is a County Wildlife Site and has been avoided by the Highfield junction as expected.
- 5.17 Translocation of great crested newts from the road corridor and temporary exclusion newt fencing was undertaken as expected. It is understood that no compensation habitat was established with the highway boundary as it was considered that there was sufficient suitable habitat already existing alongside the Scheme.
- 5.18 It is understood that a permanent newt pond has been established as part of the overall restoration proposals of the Contractors borrow pit adjacent to the works. No information is available on the current status of newts in this location and it should be noted that this work was outside the control of the HA and was subject to separate planning approval from Bedfordshire County Council.
- 5.19 It is understood that an artificial sett was provided as expected, but never used and removed after some months. Tunnels and badger fence have been provided and of the tunnels visited during the site visit (6 out of 7) there was evidence of use at five. It would appear that badgers are moving from east to west and could indicate that their territory has not been fragmented.

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- 5.20 No information has been available with regard to any impact on grass snakes.
- 5.21 Wildflower seed mixes have been incorporated into the scheme at several locations including a bespoke clay meadow mix at Judges Spinney. At the time of the site visit diverse and species rich areas were not particularly evident. There is no species survey information which would be able to inform on the current status of the sward.

## Heritage – As Expected

- 5.22 For Built Heritage the bypass has resulted in a significant reduction in through traffic on the old A6 and this will have improved the local noise climate and the setting of listed buildings as expected.
- 5.23 An archaeology report 'Iron Age, Roman and Saxon Settlement on the Great Ouse at Oakley Road, Clapham, Bedfordshire' has been published and this confirms that a programme of evaluation and open area excavation in advance of construction was undertaken. The investigations provided evidence for the intensive settlement and utilisation of a section of the Great Ouse gravel terrace immediately west of Clapham.
- 5.24 The report explains that a combination of field artefact collection, geophysical survey and trial trenching identified a previously unknown archaeological site off Oakley Road. An open area excavation was carried out in 2001 prior to construction. A watching brief was also maintained during topsoiling of the land between the archaeological excavation and the river.
- 5.25 Although the ES not include archaeology this is not unusual for the time it was written. The archaeological investigations will have led to a greater understanding of the history of this part of Bedfordshire although the bypass has also resulted in the disturbance of an area of unknown archaeology. Although the remains were important Central Bedfordshire Council does not think that they would ever have been classified as nationally important so that even if they had been known about at the time of the ES, mitigation would always have been investigation in advance of construction.

## Water – As Expected

- 5.26 The As Built drainage drawings indicate that highway drainage and pollution control measures have been incorporated into the scheme. It is understood from the Environment Agency (EA) that it is aware of one pollution incident in May 2004 when a small amount of pollutant entered the watercourse. Spillage containment basins have been provided, and As Built details indicate that these should be emptied regularly, normally twice per year, with reference to the maintenance manual. The local authority has confirmed that it undertakes routine maintenance.
- 5.27 The site visit noted that the majority of ditches have a concrete side wall. It also noted what appeared to be a new or re-stoned French drain in an area of wide verge just south of the Highfield Road over-bridge; which it is understood was undertaken as part of required remedial works.
- 5.28 In line with standard practice the As Built drawings make reference to Health & Safety residual hazards, these were noted as; underlying landfill material, sludge lagoons and excavation and disposal of contaminated material.
- 5.29 The two bridges at the River Great Ouse have been constructed with low profiles as expected to avoid unnecessary visual impact. The site visit noted that vandalism has occurred below both north and south bridge. There is graffiti, areas of block paving have been lifted, mesh access gates forced and at the south bridge a pedestrian gate in the accommodation fence (on the highway boundary) have been removed.
- 5.30 Comments have been made by the EA relating to the impacts of the Scheme on local groundwater although HA considers this to be unlikely. Based on the information available it is considered that impacts on water are moderate adverse as expected– although there have been no significant pollution incidents to date the scheme has allowed a small amount of pollutants to enter a watercourse and in addition there is the possibility that the scheme has had an impact on local groundwater although further study would be required to fully evaluate this issue.

## Physical Fitness – As Expected

- 5.31 Within the countryside west of Clapham bridleway access has been maintained across the bypass at Lower Farm Road and Footpath 16 has been realigned to cross the bypass via the Oakley Road junction over-bridge as expected. Footpath 16 forms part of the John Bunyan Trail. Whereas previously the paths were located within the rural landscape they are now subject to traffic noise.
- 5.32 A bridleway is provided within the highway boundary off the old A6 towards the northern end of the scheme and Highfield Road. It does not appear to cross the carriageway at grade as indicated on the construction landscape drawings but the Highfield Road over-bridge has been provided with high parapets which would allow safe crossing by horses to link into the wider bridleway network.
- 5.33 No surveys have been undertaken for this report which would confirm the level of post opening use of the bridleways and footpaths although those paths visited during the site visit did not appear to be overgrown which could be an indication of use.
- 5.34 For pedestrians and cyclists on the old A6 the reduction in through traffic will have improved the local environment as expected.

## Journey Ambience – As Expected

- 5.35 **Driver stress** – the reduction in through traffic along the old A6 will have reduced congestion and driver stress as expected.
- 5.36 The bypass is understood to be generally free flowing and well signed which should avoid driver uncertainty and fear of accidents. However, it was noted during the site visit that there was a morning build up of traffic at the Manton Lane roundabout at the southern extent of the scheme with queuing on the bypass and the old A6, and this may reduce some of the benefits previously mentioned. A speed camera is in operation at the northern tie in.
- 5.37 **Driver views** – a variety of views from the road provide driver interest including across the flood plain towards Clapham. Cuttings and screen fences limit some views out from the road but these provide necessary screening of traffic from adjacent properties. Judges Spinney at Oakley Hill provides a focal point along the route.
- 5.38 **Traveller care** – one lay-by has been provided either side of the bypass and on the day of the site visit these were well used. The verge at the southbound lay-by was eroded due to overrunning vehicles. Facilities are available within Clapham village easily accessed off the bypass. There is a supermarket close by after the Manton Lane roundabout on the outskirts of Bedford.

## Key Points from Section 5

### Noise

- Reduction in noise for properties adjacent to the old A6, and an increase for properties close to bypass.

### Air Quality

- Improvement adjacent to the old A6 due to the reduction in through traffic. There are very few properties close to the bypass.
- Annual carbon emission increased by 855 tonnes, which is less than forecast.

### Landscape

- Earthworks, cuttings and low profile bridges within the floodplain minimise impact.
- Environmental barriers and new planting will in time screen traffic, but traffic is still visible within the floodplain and from nearby residential areas.
- Planting is generally establishing satisfactorily but will require continuing aftercare. To ensure it fulfils its long term objectives.
- Landscape areas have been handed over to the local authority for maintenance and management. There are no third party commitments for ongoing monitoring, although it is recommended as best practice in the Landscape Management Plan.

### Biodiversity

- Although the ES did not specifically mention protected species these have been mitigated for as part of the scheme.
- Great crested newts were translocated from the route corridor prior to construction.
- Species rich grass areas were not particularly in evidence at the time of the site visit.
- Badgers appeared to be using the badger tunnels.
- Post-opening surveys were not a requirement of the contract.

### Heritage

- Benefit to listed buildings in Clapham as expected.
- An area of unknown archaeology was discovered in the floodplain and the bypass has resulted in disturbance of the archaeological resource, however the archaeological investigation has led to a greater knowledge of the history of settlement in this area of Bedfordshire.

### Water

- Based on the information available it is considered that impacts on water are moderate adverse as expected– although there have been no significant pollution incidents to date a small amount of pollutants have entered the watercourse and in addition there is the possibility that the scheme has had an impact on local groundwater.

### Physical Fitness

- Removal of through traffic has improved the local environment for pedestrians and cyclists.
- Footpath / bridleway links have been maintained across the bypass as expected.

### Journey ambience –

- Driver stress will have improved on the old A6 due to the significant reduction in through traffic, as expected in the ES.
- The bypass is generally free flowing although there would appear to be some morning queuing at the Merton Lane roundabout

# 6. Accessibility & Integration

## Introduction

6.1 Drawing upon a desktop review of local policy documents and key outcomes from the Residents Survey, this section sets out some of wider impacts that the bypass has had on integration and accessibility objectives.

## Accessibility

### Public Transport – As Expected

6.2 The journey time surveys show that times are generally quicker using the bypass, but not using the old route through Clapham. Local services operated by Stagecoach between Bedford, Oakley, Rushden, and Kettering, continue to use the old A6 through Clapham, and therefore will not have benefited from the scheme.

6.3 In the residents’ survey, 24% of those who answered thought that public transport reliability had improved since the bypass opened.

### Severance and Quality of Life – As Expected

6.4 The reduction in traffic on the old A6 has been 60%-87%, confirming that conditions in Clapham are now more favourable for pedestrians crossing the road. In the residents’ survey, 74% of those who answered believed it was easier to cross the road since the bypass opened,

6.5 A bridleway leading east from Lower Farm Rd has benefited from the provision of an overbridge. A footpath designated the John Bunyan Way which crossed the line of the bypass has now been diverted via the Oakley Road grade separated junction, a slightly longer route. No surveys have been undertaken to quantify the severance impact.

6.6 46% thought cycling was easier and safer. A number of respondents mentioned the danger of speeding traffic.

### Pedestrians and Others – As Expected

6.7 In the residents’ survey, 46% of those who answered said they had changed their walking and cycling habits since the bypass opened, and 17% had changed the way they used rights of way to travel to nearby villages and amenities. Some respondents did not like having to use the Oakley Road bridge.

6.8 The following table shows the percentages of respondents living in Clapham more than five years who agreed with certain propositions about Accessibility.

Table 6.1 - Proportion of Respondents Agreeing with Accessibility Statements

It is easier to cross the road since the removal of through traffic	74%
Cycling in the area is now easier and safer	46%
Public transport is now more reliable	24%

6.9 Two further questions were asked about changes in walking and cycling habits, and use of rights of way, since the opening of the bypass. As seen in the table below, the majority of people had not changed their behaviour.

Table 6.2 – Responses to Questions on Walking, Cycling, and Rights of Way

Has the bypass changed the way you walk and/or cycle within Clapham?	Yes	26%
	No	62%
	n/a	12%
Has the bypass changed the way you use rights of way to travel to nearby villages and amenities?	Yes	17%
	No	62%
	n/a	21%

6.10 The great majority of comments were concerned with traffic, but the following is a selection from the relatively few comments with a bearing on Accessibility.

*“Because I have limited vision I always cross at the crossings near the shops. I’m sure the bypass has made a great difference.”*

*“The bypass has been a godsend and is very much appreciated. Pity we have more cars. I am sure they could use the excellent bus service we have & only wish more people would use it... “*

*“The bypass has arrived with a number of other measures, which are not connected.. Quality of living is better but not just because of the bypass. School improvements, a growing village and good community relations are main factors.”*



Figure 6.1 – Pedestrian Crossing outside Sainsbury’s

## Integration – Worse than Expected

- 6.11 The AST asserts that the scheme would complement the Bedford/ Kempston package proposals; facilitate the proposed Bedford North rail station with park-and-ride; and assist proposed commercial and residential development.
- 6.12 In response to consultation, Bedfordshire County Council stated that the package referred to bus priority measures and facilities for pedestrians and cyclists, which had been implemented elsewhere, but at locations unrelated to the Clapham Bypass. The Bedford North railway station and park and ride proposals have been dropped.
- 6.13 The AST did not refer to any other planning policies. However, the Bedfordshire Structure Plan 2011 (adopted in 1997) noted the existence of the DfT proposal to build the A6 Clapham Bypass. It stated that the County Council’s support for the scheme would be assessed in the light of other Structure Plan policies; however there was no other reference to the scheme. The Structure Plan lapsed with the change in planning legislation in 2004, by which time the scheme was built. The current Local Transport Plan 2006/7 – 2010/11 post-dates the scheme and does not mention it.

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- 6.14 The construction of the bypass has been accompanied by the expansion of Clapham, in the form of new housing development. The provision of a bypass can be viewed as forming part of the infrastructure making this development possible.
- 6.15 The public consultation had little to say about Integration as such. There were two questions with an indirect bearing on the subject, which produced mainly favourable responses, as shown below.

**Table 6.3 - Responses to Questions with a bearing on Integration**

Question	Response	
<b>Has the local environment improved since the bypass opened?</b>	Agree	72%
	Neither	18%
	Disagree	10%
<b>Has the bypass made Clapham a better place to live?</b>	Agree	50%
	Neither	39%
	Disagree	11%

- 6.16 Some people commented on the increase in development, mostly unfavourably. Some people found this undesirable in itself, and others because of the increased traffic it would generate.

*“I think that people are concerned that the bypass means more building/houses & that the village will become a town before we know where we are. Future planning/consultation with villages is VERY important.”*

*“STOP HOUSING!”*

*“Despite my comments about less traffic, in the past 18 months it has increased due to the building of new houses. If this continues I can see it going back to its former pre-bypass days during peak times.”*

*“The volume of new houses built with the bypass has negated some of the benefits of the bypass to the village. This is because all the hundreds of cars from the new houses still come through the old route, straight through the village.”*



**Figure 6.2 – Housing Development Viewed from Oakham Road East Roundabout**



Figure 6.3 – Commercial Development South of Highfield Road

## Main Accessibility and Integration Conclusions

- Accessibility and Quality of life have improved with the opening of the bypass, owing to the reduction in traffic and congestion and the improvement for pedestrians and cyclists in Clapham.
- The bypass has not significantly furthered all the aspects of Integration given in the AST, because the Bedford/ Kempston Package proposals are situated elsewhere, and the Bedford North station and park-and-ride proposals have not been implemented.
- The construction of the bypass has been accompanied by the expansion of the village. This is thought to have improved quality of life by some residents who were questioned, while others resented the building of more houses and the increased traffic generation.

# 7. Appraisal Summary Table

## Introduction

- 7.1 An appraisal Summary Table (AST) is a one-page summary of the main economic, environmental, and social impacts of a major road scheme. The AST for this scheme is included as Figure 6.1
- 7.2 To summarise the findings in this report, the ‘Evaluation Summary Table’ (EST) has been devised for the POPE process to record a summary of the actual scheme impacts, compared with the predictions in the AST. Where possible the EST mirror the appearance and process of the AST, to enable comparison between the two. The EST is included as Figure 6.2.

## Summary of Impact on Objectives

- 7.3 The success of the scheme against its objectives is also shown in the following table.

Objective	Fulfilment
<b>Improve road safety</b>	Yes
<b>Relieve congestion</b>	Congestion has been relieved in the village, but remains a problem at the southern end of the bypass in the AM peak in school term time.
<b>Provide the opportunity for environmental improvement in Clapham by removing through traffic</b>	Yes

Table 7-1 – AST for A6 Clapham Bypass (dated 22 July 1998)

A6 Clapham, Bedford (GOER)		1996 scheme - 5km D2 bypass			Cost £30.9m
<b>PROBLEMS</b>		Poor safety and environment within Clapham (pop 3,200) where A6 carries up to 21,000 vpd (7% HGV). 300 residential properties + 2 schools front on to the road. Peak hour queuing occurs on length between village and northern outskirts of Bedford.			
<b>OTHER OPTIONS</b>		2 Pelican crossings already provided in village. Large scale traffic calming scheme would have unacceptable noise, air pollution and severance effects. Other options considered include reduced standard single carriageway bypass on proposed line; an eastern bypass and improved rail services to new Bedford North station with park and ride. All have inferior benefits.			
CRITERIA	SUB-CRITERIA	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE		ASSESSMENT
<b>ENVIRONMENTAL IMPACT</b>	<b>Noise</b>	Properties within Clapham benefit from removal of traffic	No. properties experiencing: - Increase In Noise 15 - Decrease in noise 316		301 properties experience net decrease in noise
	<b>Local air quality</b>	Removal of through traffic by bypass will improve air quality within Clapham	No. properties experiencing: - improved air quality 400 - worse air quality 0		-409 PM10 -2549 NO2
CO2 tonnes added 0 - 2000	<b>Landscape</b>	Bypass partially within local areas of Great Landscape Value and would result in loss of pasture land	-		Slight -ve
	<b>Biodiversity</b>	County Wildlife Site affected	-		Slight -ve
	<b>Heritage</b>	No significant impacts.	-		Neutral
	<b>Water</b>	Even with mitigation, there may still be a significant risk of polluting a sensitive watercourse and an aquifer used for public water supply during both construction and operation; and an impact on flood risk as the scheme is within a floodplain and bridges a river.	-		Moderate -ve
<b>SAFETY</b>	-	Bypass reduces pedestrian/vehicle conflict in village and replaces a section of poor standard single carriageway.	Accidents Deaths Serious Slight 311 9 94 359		PVB £10.5m 54% of PVC
<b>ECONOMY</b>	<b>Journey times &amp; VOCs</b>	Faster journey times on new bypass	Peak Interpeak 4.6 mins 3.5 mins		PVB £27.6m 141% of PVC
	<b>Cost</b>				PVC £19.6m
	<b>Reliability</b>		Route Stress Before 104% After 38%		Slight Low rel to PVC
	<b>Regeneration</b>		Serves regeneration priority area?		No
<b>ACCESSIBILITY</b>	<b>Public Transport</b>	Will help to reduce peak journey times of existing local bus services	-		Slight +ve
	<b>Severance</b>	Removes 80% of traffic from village	-		Moderate +ve
	<b>Pedestrian/other</b>	Will improve accessibility for residents to local services			Moderate +ve
<b>INTEGRATION</b>	-	Complements Bedford/Kempston package proposals and facilitates proposed Bedford North rail station with park and ride. Assists proposed local residential and commercial developments	-		Positive
<b>COBA</b>				PVB £38.2m PVC £19.6m NPV £18.5m BCR 1.95	

Table 7.2 – EST for A6 Clapham Bypass

A6 Clapham, Bedford (GOER)		Cost £39.0m		
CRITERIA	SUB-CRITERIA	QUALITATIVE IMPACTS	QUANTITATIVE MEASURE	ASSESSMENT
ENVIRONMENTAL IMPACT	Noise	Based on traffic flows, there is likely to have been a reduction in noise for properties along the old A6 as a result of the reduction in through traffic, but an increase in noise for the properties close to the bypass.		As expected
	855 extra tonnes of carbon emitted per year	Local air quality	Based on traffic flows, there is likely to have been an improvement for properties along the old A6 as a result of the reduction in through traffic. There are few properties close to the bypass.	As expected
		Landscape	Earthworks, cuttings and low profile bridges in the floodplain help minimise the impact. Environmental barriers have been provided. Planting is generally establishing satisfactorily but will require continuing aftercare.	As expected
		Biodiversity	Protected species have been mitigated for although as post opening surveys were not a contract requirement limited information to evaluate effects is available Species rich grass areas were not in evidence. Badgers appeared to be using the badger tunnels.	As expected
		Heritage	Impact on archaeology within the road line significant and severe (destruction) however this has been mitigated by investigation which produced a record which has enhanced the understanding of the site and the wider contemporary landscape and overall the impact is considered by the local authority to be neutral. Benefit to listed buildings in Clapham.	As expected
		Water	Based on the information available likely that impacts on water are as expected– although there have been no significant pollution incidents to date a small amount of pollutants have entered the watercourse and in addition there is the possibility that the scheme has had an impact on local groundwater.	Moderate adverse as expected
		Physical Fitness	Removal of through traffic on old A6 has improved local environment for pedestrians and cyclists and footpath / bridleway links have been maintained across the bypass as expected	As expected
	Journey Ambience	Driver stress improved on old A6 due to the significant reduction in through traffic. Bypass is generally free flowing, but some morning queuing at the Manton Lane roundabout	As expected	
SAFETY	-	Accident rate reduced by 40%. Most categories of accident reduced, but single vehicle accidents increased.	Accidents Deaths Serious Slight 196 6 59 226	PVB 13.5£m 33% of PVC
ECONOMY	Journey times & VOCs	2-3 minute saving at most times. But AM peak southbound now worse, due to build-up of queues at southern roundabout.	Peak Interpeak 1.3 mins 2.9 mins	PVB £39.8m 97% of PVC
	Cost	Outturn construction cost 3% higher than predicted		PVC £19.6m
	Reliability	The large drop in the Route Stress value indicates an improvement in Reliability	Route Stress Before 104% After 30%	As expected
	Regeneration	No regeneration priority area served.		As expected
ACCESSIBILITY	Public Transport	Local bus services continue to use old A6 through Clapham, which is not now quicker, in most time periods. In the residents' survey, 24% of respondents thought bus reliability had improved.	-	As expected
	Severance	Removal of 60%-87% of traffic from Clapham eases pedestrian crossings. Footpaths & bridleway diverted to road bridges.	-	As expected
	Pedestrian/other	In the resident's survey, 74% of respondents agree it is easier to cross the road and 46% agree cycling is easier and safer. Concern about speeding traffic on old A6.	-	As expected
INTEGRATION	-	The Bedford/Kempston package proposals have been implemented, but are not relevant to Clapham bypass. The Bedford North rail station and park & ride are no longer proposed.	-	Worse than expected
COBA				PVB £53.4m PVC £40.9m NPV £12.5m BCR 1.3

# A.1 Appendix A - Journey Times

Table A.1 – Average Journey Times on New and Old A6 (min:sec)

A6 via Clapham Bypass (Red Route) Southbound

		1-2	2-3	3-4	4-5	5-6	Total
AM	Free Flow	01:24	00:34	00:26	02:05	00:22	04:52
	Queue	00:00	00:00	00:00	02:54	01:51	04:46
	Total Time	01:24	00:34	00:26	04:59	02:13	09:37
IP	Free Flow	01:25	00:33	00:27	01:35	00:36	04:36
	Queue	00:00	00:00	00:00	00:00	00:03	00:03
	Total Time	01:25	00:33	00:27	01:35	00:38	04:39
PM	Free Flow	01:25	00:34	00:27	01:30	00:29	04:25
	Queue	00:00	00:00	00:00	00:04	00:08	00:12
	Total Time	01:25	00:34	00:27	01:34	00:38	04:38

A6 via Old Route through Clapham (Blue Route) Southbound

		1-2	2-3	3-4	4-5	5-6	Total
AM	Free Flow	01:24	00:18	01:40	02:50	00:18	06:30
	Queue	00:00	00:00	00:00	02:40	01:36	04:16
	Total Time	01:24	00:18	01:40	05:30	01:54	10:45
IP	Free Flow	01:24	00:18	01:37	03:08	00:32	06:58
	Queue	00:00	00:00	00:00	00:06	00:07	00:14
	Total Time	01:24	00:18	01:37	03:14	00:40	07:12
PM	Free Flow	01:24	00:18	01:39	03:09	00:23	06:53
	Queue	00:00	00:00	00:00	00:07	00:16	00:23
	Total Time	01:24	00:18	01:39	03:16	00:39	07:17

A6 via Clapham Bypass (Red Route) Northbound

		6-5	5-4	4-3	3-2	2-1	Total
AM	Free Flow	00:31	01:28	00:26	00:39	01:23	04:33
	Queue	00:05	00:00	00:00	00:00	00:00	00:00
	Total Time	00:36	01:28	00:26	00:39	01:23	04:33
IP	Free Flow	00:26	01:31	00:29	00:38	01:23	04:35
	Queue	00:08	00:00	00:00	00:00	00:00	00:00
	Total Time	00:34	01:31	00:29	00:38	01:23	04:35
PM	Free Flow	00:25	01:32	00:29	00:38	01:27	04:42
	Queue	00:11	00:00	00:00	00:00	00:00	00:00
	Total Time	00:36	01:32	00:29	00:38	01:27	04:42

A6 via Old Route through Clapham (Blue Route) Southbound

		6-5	5-4	4-3	3-2	2-1	Total
AM	Free Flow	00:25	03:05	02:03	01:53	01:22	08:48
	Queue	00:12	00:00	00:00	00:00	00:00	00:12
	Total Time	00:37	03:05	02:03	01:53	01:22	09:00
IP	Free Flow	00:33	03:11	02:00	01:49	01:24	08:57
	Queue	00:05	00:00	00:00	00:00	00:00	00:05
	Total Time	00:37	03:11	02:00	01:49	01:24	09:02
PM	Free Flow	00:28	03:15	02:03	01:47	01:24	08:58
	Queue	00:08	00:00	00:00	00:00	00:00	00:08
	Total Time	00:37	03:15	02:03	01:47	01:24	09:06

**Table A.2 – Average Journey Times on Oakley Loop (min:sec)**

Oakley Loop (Green Route) Southbound

		1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	Total
AM	Free Flow	00:12	00:49	00:44	01:15	00:56	00:38	01:07	00:25	00:33	06:56
	Queue	00:00	00:00	00:00	00:00	00:00	00:00	00:10	00:03	00:05	00:00
	Total Time	00:12	00:49	00:44	01:15	00:56	00:38	01:17	00:29	00:38	06:56
IP	Free Flow	00:12	00:49	00:51	01:11	00:56	00:36	01:05	00:26	00:33	06:56
	Queue	00:00	00:00	00:00	00:00	00:00	00:00	00:10	00:02	00:05	00:00
	Total Time	00:12	00:49	00:51	01:11	00:56	00:36	01:16	00:28	00:38	06:56
PM	Free Flow	00:12	00:49	00:55	01:08	00:59	00:39	01:03	00:27	00:34	07:08
	Queue	00:00	00:00	00:00	00:00	00:00	00:00	00:22	00:00	00:00	00:00
	Total Time	00:12	00:49	00:55	01:08	00:59	00:39	01:25	00:27	00:34	07:08

Oakley Loop (Green Route) Northbound

		10-9	9-8	8-7	7-6	6-5	5-4	4-3	3-2	2-1	Total
AM	Free Flow	00:29	00:20	00:58	00:31	00:52	01:30	00:26	00:42	00:10	05:59
	Queue	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
	Total Time	00:29	00:20	00:58	00:31	00:52	01:30	00:26	00:42	00:10	05:59
IP	Free Flow	00:28	00:22	01:01	00:31	00:53	01:29	00:30	00:43	00:11	06:07
	Queue	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
	Total Time	00:28	00:22	01:01	00:31	00:53	01:29	00:30	00:43	00:11	06:07
PM	Free Flow	00:29	00:21	00:59	00:32	00:53	01:28	00:25	00:43	00:11	06:00
	Queue	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
	Total Time	00:29	00:21	00:59	00:32	00:53	01:28	00:25	00:43	00:11	06:00

# Appendix B - Environment

B.1.1 This is the POPE evaluation of the Environmental impacts of the scheme, a summary of which is included as Section 5 of this report. The One Year After report did not evaluate environmental aspects of the Scheme in any detail but did comment on noise and air quality. It stated that the main premise for the benefits identified in the AST was that properties along the old A6 would experience a benefit in noise and air quality due to the removal of traffic onto the bypass and as the traffic reductions in the villages were similar to what was predicted, it was concluded that the noise and air quality impacts reported in the AST were likely to be as expected.

## Data Collection

B.1.2 Table B.1 below lists the background information requested for use in completion of the environmental evaluation.

**Table B.1- Information Requested and Received**

Information requested	Comments
Environmental Statement	A6 Clapham Bypass Environmental Statement April 1991, Non-Technical Summary and extract from Employer's Requirements – Schedule 1 Annex 6/1 Environmental Aspects, March 2001
As Built drawings for landscape, ecological mitigation measures, drainage, fencing, earthworks etc preferable electronically or on CD	As Built drawings for earthworks, fencing, drainage, badger fences and tunnels - provided on CD.
Copies of landscape and ecology management plans	Copy of the Landscape Management Plan April 2008 provided, including landscape plans. No other reports required as part of the Contract. In addition Stewart Land, Bromham Aftercare Report May 2008 (restoration of Contractor's borrow pit).
Contact names for consultation	Provided
Archaeology reports	Report provided on CD
Properties eligible for noise insulation	Noise Insulation Regulations report September 2000. School House (boarding house at Bedford Modern School) eligible for noise insulation
Part 1 Claims	Information from HA National Part 1 Team: 89 claims have been made, of which 39 were successful. A further recent claim is being considered. It is understood most claims were for noise or lighting, with a few for fumes.
Any post opening survey or monitoring e.g. for ecology, water quality	Post opening surveys were not a requirement of the Contract and none have therefore been carried out.
Animal mortality data	Requested from managing agents – not available at time of writing
Scheme newsletters etc	Start of Works leaflet and Scheme aerial photographs 2003

## Site Visit

- B.1.3 A site visit was undertaken in May 2009 which allowed the scheme to be viewed from the highway lay-bys, adjacent access tracks, local roads and footpaths.

## Consultation

- B.1.4 Table B.2 shows which organisations have been contacted during the compilation of this report, their field of interest, and the responses received. A summary of their comments is included within each relevant topic in this environment section of the report.

**Table B.2 – Summary of POPE-Environment Consultation Responses**

Organisation	Field of Interest	Comments
<b>Natural England</b>	Landscape and Biodiversity	The protected species licenses pre-dated 2006 when licensing became a NE responsibility and no post-construction monitoring data held by NE for great crested newts. No issues relating to Stevington Marsh on file and presume there were no impacts
<b>English Heritage</b>	Heritage	No significant heritage impacts which EH would have raised or need to address from a statutory point of view
<b>Environment Agency</b>	Water	No response received at the time of writing June 2009
<b>Bedford County Council (now Central Bedford Council)</b>	General	Responded on Biodiversity & Archaeology. No response for landscape.
<b>Bedford Borough Council</b>	General	No complaints received regarding noise or air quality. Not aware of any surveys having been carried out. Commented on drainage. No response received at time of writing for PROW

- B.1.5 Part 1 Claims information has been requested from the Highways Agency and will be incorporated into the report when available.

## Traffic growth

- B.1.6 Three of the environmental parameters noise, greenhouse gases and local air quality are directly related to traffic flows and its assumed growth until the Design Year. An assumption has been made that the level of traffic and the level of traffic noise, greenhouse gases or local air quality associated with that traffic are directly related. Therefore, if the observed level of traffic is as forecast it could be assumed that the impacts are as expected.
- B.1.7 The Non-Technical Summary of the ES stated that the high volumes of through traffic within Clapham village and in particular heavy goods vehicles have undoubtedly had a detrimental effect on the quality of life. Severe congestion and considerable delays were experienced. The provision of the bypass was expected to result in a significant reduction in traffic flow along the existing A6 by about 80% to 96% depending upon location, with about 85% of vehicles removed from the village. This was expected to generally bring environmental relief to many properties. Specific traffic flows were not provided in the ES.
- B.1.8 Based on information in the One Year After report, before the opening of the bypass, the old A6 carried 15,000 to 23,000 vpd. Five years after opening, the corresponding figures are 1,700 to 8,600 vpd, representing reductions of 87% at the north end (where the ES

Figure No.4 predicted -91%) and 60% at the south end (where the ES Figure No.4 predicted -79%). Clearly the bypass has been successful in diverting the majority of vehicles away from the village.

- B.1.9 The 2008 observed traffic flows on the bypass range from 16,500 at the north to 17,500 at the south. This is 23% (north) to 43% (south) less traffic than expected in 1990. The over-prediction is due to the use of future year growth factors which have proved to be too high.
- B.1.10 North of Oakham, the combined flow on the new and old routes is 19,800 vpd, an increase of 48% compared with the 'Before' flow. South of Clapham, the combined flow is 27,600 vpd, an increase of 30% compared with the 'Before' flow. The Clapham Bypass and other A6 improvements are likely to have increased the attractiveness of this route for through traffic.
- B.1.11 There have been increases in traffic at some locations near Oakham, e.g. Church Lane +10% (+49% expected in ES), Lovell Road +21% (-21% expected in ES) and Highfield Road -4% which is as expected in ES. However the flows remain small, and it is not certain that the changes are due to the bypass.

## Noise

### Predicted Impacts

- B.1.12 The AST stated that properties within Clapham would benefit from the removal of through traffic. 15 properties would experience an increase in noise, whilst 316 would experience a decrease in noise.
- B.1.13 The ES noted that many properties in the Clapham area would enjoy a significant decrease in noise levels with the removal of traffic from the village. Some properties on the West side of the village would experience an increase in noise at the rear façade, however, noise fencing was proposed to the south of Oakley Road to mitigate this.
- B.1.14 With regard to noise impacts the ES stated that;
- Of the 116 houses experiencing an increase in noise, 66 would also experience a decrease of above 3dB(A) on the opposite façade;
  - Of the 273 houses experiencing a decrease in noise, 66 would also experience an increase of above 3dB(A) on the opposite façade;
  - The printing works on Cut Throat Lane would experience an increase in noise;
  - Sixteen shops and four offices on the existing A6 would experience a noise decrease;
  - One office on Oakley Road would experience a noise increase;
  - Bedford Modern School would experience a noise increase of between 5-10dB(A).
  - Ursula Taylor School would experience a noise decrease of between 3 – 5dB.
- B.1.15 Mitigation measures included within the ES to reduce noise levels were;
- 2m high acoustic fencing east and west of the bypass south of Oakley Road as far as the river crossing.

### Consultation

- B.1.16 Bedford Borough Council responded that no complaints have been received relating to noise. The council is not aware that any noise monitoring or survey work has been carried out.

### Evaluation

- B.1.17 In line with current HA policy a low noise surface has been used for this scheme. This was not proposed in the ES.

- B.1.18 It is understood that School House a boarding house for Bedford Modern School was the only property eligible for traffic noise insulation. It is not known whether this offer was taken up. A 2m high acoustic barrier has been provided as expected and has also been extended adjacent to the southbound carriageway to the lay-by see Figure B.1. The barrier is timber except over the viaduct where a concrete parapet of similar height is provided. It is understood that the barriers were extended as a result of a Public Inquiry commitment to give some protection to the Folly Park mobile homes west of the bypass near the north Ouse crossing.
- B.1.19 New housing has been constructed on the edge of Clapham near the Oakley Road roundabout since the ES was written and at about the time that the bypass was being built.
- B.1.20 There has been a significant reduction in traffic flows on the old A6 through Clapham since the bypass opened and it is likely that properties have benefited with an improvement in the local noise climate. At the northern end illustrated in Figure B.2 below, the reductions are very similar to predicted, at the southern end although traffic had reduced by 60% the expectation was that it would be 79% less.
- B.1.21 Traffic flows on the bypass are less than expected in the 1990s due to an over-prediction of future growth. No noise surveys have been carried out for this report and based on traffic flows properties close to the bypass will have experienced an increase in noise although this may be less than expected in the ES. The bypass will have introduced a source of noise into the countryside, however, as noted in the ES, the route is close to the existing mainline railway which is also a source of noise.



**Figure B.1 Environmental barriers both sides of the carriageway southbound from Oakley Road junction over-bridge**



**Figure B.2 Old A6 looking south from mini roundabout at Highfield Road – weekday morning**

## Air Quality

### Predicted Impacts

- B.1.22 The AST predicted that the removal of through traffic by the bypass would improve air quality within Clapham. 400 properties would experience improved air quality whilst 0 properties would experience worse air quality.
- B.1.23 Within the ES air quality was only specifically mentioned with regard to benefits to pedestrians using the old A6 with the removal of through traffic expected to bring environmental relief.

### Consultation

- B.1.24 Bedford Borough Council responded that no complaints have been received regarding air quality. The council is not aware that any monitoring or survey work has been carried out.

### Evaluation

- B.1.25 No new air quality monitoring or modelling has been undertaken for this report.
- B.1.26 Based on the significant reduction in traffic flows on the old A6 it is likely that local air quality will have improved for properties along the old road. There are very few properties close to the bypass and it is not thought that any are within 50m.

## Greenhouse Gases

- B.1.27 The AST predicted 0 – 2000 tonnes of carbon dioxide would be added as a result of the scheme. The same is stated in the ASTs for many major schemes.
- B.1.28 This POPE evaluation has calculated the change in tonnes of carbon emitted in accordance with the DMRB method, which takes into account actual vehicle flows, speeds, and HGV proportion. The following table shows the results for 2008.

**Table B.3 – Emissions of CO<sub>2</sub>-related Carbon in 2008**

	Predicted	Actual
Do Minimum	3028	2073
Do Something	4229	2928
Change	1201	855

- B.1.29 Using forecast data, the prediction was for an additional 1201 tonnes of carbon to be emitted as a result of the scheme. Using actual data, only an extra 855 tonnes have been emitted.
- B.1.30 There is insufficient data to perform calculations for each of the years that the bypass has been open. However, the cumulative value for each of the five years would be very close to five times the values given above.

## Landscape

### Predicted Impacts

- B.1.31 The AST stated that the Bypass would be partially within a local area of Great Landscape Value and would result in loss of pasture land with a slight adverse impact predicted.
- B.1.32 The ES noted that the local landscape character varied from the floodplain of the River Great Ouse to more open agricultural land north of Oakley Road and on to an area of Great Landscape Value north of Highfield Road. The landscape proposals would combine earth bunding, planting and fencing to integrate the bypass into the landscape and reduce visual intrusion.

## Consultation

- B.1.33 No consultation comments have been received for landscape.

## Evaluation

- B.1.34 A Landscape Management Plan (LMP) has been produced in accordance with the contract requirements. This confirms that landscaping was subject to a five year aftercare period and includes a November/December 2007 summary of planting plot condition and identifies establishment and maintenance issues at the time of scheme handover to the local authority (in the Pre-Handover Works Schedule). The LMP includes recommended maintenance and management prescriptions for a 30 year period following the opening of the road to allow the maintaining agent to continue the effective management of the scheme after handover.
- B.1.35 It is understood that the landscape areas have been handed over to the local authority and are therefore no longer the responsibility of the Highways Agency. The LMP states that it 'demonstrates how the landscape scheme is intended to develop and be managed following handover of the improvement scheme to the maintaining agent. The strategy includes for objectives, method and operations for each landscape plot and area over a 30-year period following the opening of the road, to allow the maintaining agent to continue effective management of the scheme after handover'. To ensure that the planting continues to develop and fulfil its long term objectives – predominantly for screening and integration the recommendations within the LMP would need to be followed. The LMP states that 'whilst, in line with best practice, the ongoing development towards maturity of the landscape planting within the soft estate will require ongoing monitoring to review the interval, scope and extent of management interventions to ensure that the objectives are met and identify problems that would deflect from their achievement, there are no specific third party commitments to monitoring of the landscape scheme. Nevertheless, Plot 40 (*planting adjacent to the railway line*) is to be maintained to comply with the requirements of the railway authority which is to be established by annual liaison'. It is understood that the local authority is undertaking routine maintenance.
- B.1.36 At the time of the site visit the managing agent did not think that it was in possession of a copy of the LMP. It has since been confirmed that a copy of the LMP has been forwarded to and subsequent to this Bedford Borough Council.
- B.1.37 The site visit confirmed that planting is generally establishing satisfactorily and is providing a framework for the road. Growth rates vary and canopy closure has not been reached in many plots see Figure A.3. Stakes, ties and guards have been retained on most plants as a precaution against rabbit damage but that does mean that in some instances shrubs are developing a 'lollipop' habit see Figure B.4. Ties and stakes were noted to require adjustment for some of the larger stock. Mulch mats are still in place and coming to the end of their natural life.



Figure B.3 Variety of rates of establishment in plot adjacent to Lower Farm Road bridge



**Figure B.4 Example of plants developing 'lollipop' habit at Manton Lane roundabout**

- B.1.38 At the time of the site visit noxious weed e.g. thistle was becoming evident in grassed areas throughout the site.
- B.1.39 The acoustic fences also act as screen fences and as noted in the noise section have been provided to a greater extent than expected in the ES on the eastern side. Some traffic is still visible above the fences but this should be fully screened as planting matures see Figure B.5. At the time of the site visit it was noted that some of the personnel gates providing maintenance access to the rear of the fences were not bolted shut.



**Figure B.5 View from old Oakley Road near properties with lorry visible above screen fence, planting should provide screening once mature**

- B.1.40 The bypass is lit at the Oakley Road junction and southbound to the Manton Lane roundabout as expected. A night-time evaluation was not undertaken but it is likely that the lighting will be visible from nearby properties and within the local landscape see Figure B.6.



Figure B.6 View north east towards properties at edge of Clapham from Lower Farm Road bridge. Planting establishing satisfactorily. Bypass lit along this section.

B.1.41 Table B.4 summaries the landscape evaluation.

**Table B.4 – ES predicted Effects, proposed Mitigation and the Evaluation of the Landscape sub-objective**

	<b>Effect predicted in ES</b>	<b>Proposed Mitigation</b>	<b>Evaluation of the Landscape sub-objective</b>
North of Highfield Road	The route forms shallow cuttings and embankments on the north facing slope of Oakley Hill. Area of Great Landscape Value designated by Bedfordshire CC	To mitigate its effect the side slopes would be planted with species complementing the existing planting pattern to the north and along the riverside.	Planting provided as expected and establishing satisfactorily including hedges at highway boundary. Routine maintenance has been carried out.
Highfield Road Junction	Land severed by the junction. Impact of the cutting on the ridge line Judges Spinney an important ecological asset and strong visual focus on the crest line of Oakley Hill Views to vehicles using the over bridge	Bunding introduced to increase the depth of cutting to the north west of the junction. This would allow increased planting on side slopes to screen the cutting from the river valley and reduce the skyline notch effect of the cut from the south. The land severed by the junction arrangement and the cutting slopes would be densely planted. The integrity of Judge's Spinney would be maintained by limiting forestry species to the area immediately surrounding the Spinney. The lower slopes and cuttings would be planted with native shrub species to maintain apparent severance of woodland as the new planting establishes. Dense planting south and west of the existing depot on the west of Judges Spinney would mitigate the impact of the cutting on the ridge line and benefit the views from the south by screening the depot. The view of vehicles on the upper sections of the southbound on-slip would be reduced by the introduction of dense native shrub planting bounding the southern edge of the carriageway. This planting would relate to the strong hedgerow pattern within the area	Bunding and planting provided which in time will screen traffic using the Highfield over bridge. Judges Spinney remains intact and new edge planting has been provided. Dense planting has been provided around the junction and although a few failures were noted the plots were establishing satisfactorily. Guards still in place and mulch mats appeared to be coming to end of life. Noxious weed was evident in some plots Planting above low gabion wall at mini roundabout on old A6 adjacent to bridleway and footpath not well established see Figure B.14 in Physical Fitness and Journey Ambience section. The LMP noted that replanting was required on the pre-handover works schedule and should continue until established
Highfield Road to Oakley Road	Broad bland landscape defined by the developed area of Clapham on east and mainline railway on west	A mixture of dense and intermittent planting would be keyed into the existing hedgerow pattern to provide visual breaks along the road.	As expected
Oakley Road Junction	Visual intrusion for properties on Oakley Road	Concentrated dense planting on land skirting and enclosed by the junction would mitigate intrusion when viewed from houses on Oakley Road immediately east of and west of the proposed line. This would also integrate structures and earthworks within the area. Roadside planting would be provided in association with the screen fencing proposed to the south of Oakley Road to assimilate the fence into the surrounding area.	Planting establishing satisfactorily on the whole, one small area less well established and shelters leaning. Roundabouts have been planted and sponsored, establishment was variable. Houses on the old Oakley Road have benefited by traffic being further away from the front of properties, however the junction is a greater area of road space, elevated and lit at night. New housing has been constructed near the junction at about the same time as the bypass was built.
Oakley Road to A6 Cut Throat Lane	Low lying floodplain of River Great Ouse, arable and pasture land with former gravel workings The southern section of the scheme would be lit from Oakley Road including	Screen fence to reduce visual intrusion to houses both east and west of the by-pass. 2m high fencing proposed immediately south of the existing Oakley Road as far as the river crossing with planting to the protected side of the fence to soften the impact of the screen. The embankments at the northern river crossing, adjacent to the railway would be densely planted to mitigate broken views to the south from housing	Screen fences have been provided and to a greater extent than expected in the ES on eastern side. Some traffic still visible until planting matures. Planting does soften the fences Dense screen planting has been provided to the embankment slopes and in time this should screen

	<b>Effect predicted in ES</b>	<b>Proposed Mitigation</b>	<b>Evaluation of the Landscape sub-objective</b>
	<p>the junction to the Manton Roundabout</p> <p>Visual intrusion for properties on Oakley Road</p> <p>High embankments for river crossings would be visible</p>	<p>on Oakley Road and from the southern end of Folly Caravan Park.</p> <p>The narrow band of land between the proposed road and existing railway line as far as Lower Farm Road would be densely planted.</p> <p>The proposed intermittent and dense planting on embankments between Lower Farm Road and the southern river crossing would reflect the dispersed planting pattern within the flood plain.</p> <p>Dense planting on high embankments between the river crossing and A6 would screen views of this elevated section from the south-west.</p>	<p>traffic using the bypass. Fast growing species on west side have done well, some evergreen species included in the mix.</p> <p>Planting between the railway and bypass has been planted, although immediately south of the north Ouse crossing the embankment is narrow and very steep and planting is limited by space available. Grass is also slower to establish cover here.</p> <p>The scheme has been lit as expected and lighting columns are visible during daytime and night-time lighting will be visible from properties on the edge of Clapham, Oakley and other small villages nearby.</p>
Folly Caravan Park	Visual intrusion for properties at Folly Caravan Park	The embankments at the northern river crossing, adjacent to the railway would be densely planted to mitigate broken views to the south from housing on Oakley Road and from the southern end of Folly Caravan Park. Intermittent off-site planting adjacent to the southern car park at the Folly caravan Park would mitigate intrusion	The embankments are densely planted as noted above the screen fence has been extended. In time traffic using the bypass should be fully screened.
A6 Cut Throat Lane to Manton Lane roundabout	Visual intrusion Loss of existing vegetation	The west facing bank opposite Cut Throat Lane and 88-98 Clapham Road would be densely planted to replace the young planting on the existing slope.	Planting has been undertaken on the embankment slopes at the roundabout but will take time to screen traffic which is above the planting. Open areas were seeded with wildflowers, and other areas below electricity lines have shrubs only. Some shrubs in shelters were developing 'lollipop' form and some larger trees have burst their shelters. An area of recent planting was noted on the NE quadrant embankment slope.

## Biodiversity

### Predicted Impacts

- B.1.42 The AST noted that a County Wildlife Site would be affected and predicted a slight negative impact.
- B.1.43 The ES did not include much detail of the effects on biodiversity. The Non-Technical Summary noted that the route did not pass through or near any areas of especial sensitivity. The Appraisal Framework made reference to Bedfordshire County Council policies which noted that the route occupied areas of scenic interest and would pass through natural wildlife interest sites and riverside meadows – these were identified on the ES Environmental Plan.
- B.1.44 Judges Spinney was mentioned as being an important ecological asset which would be very close to the Highfield Road junction and was identified on the ES Environmental Plan as a local Wildlife Trust reserve.
- B.1.45 Stevington Marsh SSSI was noted as being worthy of a high level of protection as wetland and marsh areas were under threat nationally and globally, although the scheme was not expected to impact on the SSSI as it was 3km away from.
- B.1.46 Other species were not specifically mentioned in the ES which was dated 1991. Based on an extract from the Employer's Requirements (March 2001) for this scheme there was a Pre-Construction Ecology and Nature Conservation Assessment carried out in June 2000. Biodiversity mitigation measures were agreed with English Nature (now Natural England) and were incorporated into the scheme design. Impacts on protected species were identified in the Employer's Requirements as;
- The loss of three outlier badger setts;
  - The interruption of badger paths at several points along the bypass route, with the subsequent potential fragmentation of territories;
  - The loss of part of a breeding pond for great crested newt; and
  - The loss of habitat for grass snake and potential direct harm to grass snake.
- B.1.47 No evidence of water voles or otters were found but there were a couple of trees with potential for bat roosts were which would be removed as part of the scheme. The contractor was to ensure that the works would have no significant effect on Judges Spinney and that no contamination would occur to Stevington Marsh SSSI 3 km downstream.

Mitigation would include;

- Badger – closure of setts under licence, provision of artificial sett, tunnels under the bypass and badger fencing;
- Great Crested Newt (GCN) – translocation of newts from pond and within route corridor and temporary amphibian fencing. Although the licence application to DETR included provision of a replacement pond adjacent to the highway boundary; the Employer's Requirements explain that the land was not available and replacement facilities as achievable should be within the land available within the highway boundary;
- Grass snakes – avoid direct harm in areas between the two river crossings by mowing/strimming grass to 100mm.Consultation

### Consultation

- B.1.48 Natural England commented that current staff have no local knowledge of the scheme. The protected species licences were issued by DETR pre 2006 when this role was taken over by NE. No post construction monitoring data is held on great crested newts. For Stevington Marsh there are no issues in the files in relation to the bypass scheme and NE assumes there were no impacts.
- B.1.49 Bedfordshire County Council commented that;

- Judge Spinney was protected from development and the new tree planting adjacent to it will eventually considerably expand the area of woodland;
- No evidence of successfully established species rich grass areas;
- GCN were translocated from the route corridor and fencing put in place. No information on whether additional habitat was created. Separate to the on site works a potential new breeding pond has been created as part of the borrow pit restoration but it is not known whether any GCN are using the habitat;
- BCC was not aware of the artificial sett. Badger sett to the west abandoned and disused for years afterwards. The road may have changed the behaviour patterns of badgers to the east and cut them off from land to the west. Aware of one badger death on the new bypass and there are plenty of deaths each year along the road north of Milton Ernest (*this is north of the scheme*). . *It should also be noted that the Consultee was not aware of the badger tunnels or the fact that there appears to be evidence of use*).

### Evaluation

- B.1.50 It is understood that there was no requirement within the contract for any post opening monitoring and this has meant that there is very little information available to POPE to enable a full evaluation of biodiversity. The Landscape Management Plan makes reference to the protected species impacted on by the scheme with regard to ongoing maintenance of the Scheme.
- B.1.51 Judges Spinney which is a County Wildlife Site and has been avoided by the Highfield junction as expected see Figure B.7. A bespoke clay meadow grass mix was sown on verges at Judges Spinney. There is no post opening survey information that would inform on the current status of this mix.



**Figure B.7 Judges Spinney retained adjacent to Highfield Road junction**

- B.1.52 GCN - translocation of newts from the road corridor and temporary exclusion newt fencing was undertaken as expected. It is understood that no compensation habitat was established with the highway boundary as it was considered that there was sufficient suitable habitat already existing alongside the Scheme.
- B.1.53 It is understood that a permanent newt pond has been established as part of the overall restoration proposals of the Contractors borrow pit adjacent to the works. No information is available on the current status of newts in this location and it should be noted that this work was outside the control of the HA and was subject to separate planning approval from Bedfordshire County Council.
- B.1.54 Badger- it is understood that the artificial sett was provided but never used and removed after some months. Tunnels and badger fence have been provided and of the tunnels visited during the site visit (6 out of 7) there was evidence of use at five. It would appear that badgers are moving from east to west and could indicate that their territory has not been fragmented. An area of badger fence near the new house east of the Oakley Road junction was in a poor state of repair.

- B.1.55 Animal Mortality data has been requested from the managing agent for Bedfordshire CC and will be incorporated in the report if made available.
- B.1.56 No information has been available with regard to any impact on grass snakes.
- B.1.57 Wildflower seed mixes have been incorporated into the scheme at several locations including a bespoke clay meadow mix at Judges Spinney. At the time of the site visit diverse and species rich areas were not particularly evident. There is no species survey information which would be able to inform on the current status of the sward.

## Heritage

### Predicted Impacts

- B.1.58 The AST stated that there would be no significant impacts on heritage with a neutral impact predicted.
- B.1.59 The ES Appraisal Framework notes the Bedfordshire County Council policy for the protection of the historic and architectural character of towns and villages and particularly conservation areas. Various sites within Clapham village were expected to benefit from the reduction in through traffic and three listed buildings close to the old A6 were marked on the ES Environmental Plan.
- B.1.60 Archaeology was not specifically mentioned in the ES. It is unlikely that very much information about the route would have been available at the time from the Historic Environment Record and it is unlikely that any archaeological evaluation would have been undertaken.

### Consultation

- B.1.61 English Heritage commented that there were no significant heritage impacts which EH have raised or need to be addressed from a statutory point of view.
- B.1.62 Central Bedfordshire Council (CBC, previously Bedfordshire County Council) comments are summarised as follows;
- Considering the density of archaeological sites and features in the general area of the Clapham Bypass, the impact of the scheme on archaeology was relatively slight. The main impact was on the Roman settlement at Oakley Road where it was possible to mitigate the impact through excavation in advance of the scheme;
  - Adequate evaluation was undertaken prior to construction and CBC are not aware of any unforeseen impacts. However CBC considers that the 'no significant' impact' in the AST is wrong as the impact on archaeological remains was both significant and severe: their destruction. However this impact was mitigated by investigation so overall the impact could be considered to be neutral overall ;
  - It is considered that the archaeological field work was undertaken very efficiently and effectively. However, it is the CBC opinion the post-excavation and publication programme has been very slow and deadlines have been missed. The report is now ready for publication but the reporting process has been too drawn out and at times lacked momentum. There should have been stronger project management for the main contractor/HA and possible some form of sanction in the contract with the archaeological sub-contractor to ensure completion of the post excavation and reporting in a timely fashion; and
  - Arrangements have been made to lodge the finds, paper and digital archive with Bedford Museum and this would be expected to happen once the report has been published.

### Evaluation

- B.1.63 For Built Heritage the bypass has resulted in a significant reduction in through traffic on the old A6 and this will have improved the local noise climate and the setting of listed buildings as expected.
- B.1.64 Although archaeology was not considered in the ES, evaluation was undertaken prior to construction, and the Oakley Road site was identified at this stage. An archaeology report 'Iron Age, Roman and Saxon Settlement on the Great Ouse at Oakley Road, Clapham, Bedfordshire' has been published and this confirms that a programme of evaluation and open area excavation in

advance of construction was undertaken. The investigations provided evidence for the intensive settlement and utilisation of a section of the Great Ouse gravel terrace immediately west of Clapham.

- B.1.65 The report explains that a combination of field artefact collection, geophysical survey and trail trenching identified a previously unknown archaeological site off Oakley Road. An open area excavation was carried out in 2001 prior to construction. A watching brief was also maintained during topsoiling of the land between the archaeological excavation and the river.
- B.1.66 The archaeological investigations have led to a greater understanding of the history of this part of Bedfordshire although the bypass has also resulted in the disturbance of an area of unknown archaeology. Although the remains were important Central Bedfordshire Council does not think that they would ever have been classified as nationally important so that even if they had been known about at the time of the ES, and mitigation would always have been investigation in advance of construction.

## **Water**

### **Predicted Impacts**

- B.1.67 The AST stated that even with mitigation, there might still be a significant risk of polluting a sensitive watercourse and an aquifer used for public water supply during both construction and operation and an impact on flood risk as the scheme is within a floodplain and bridges a river. A moderate adverse impact was predicted overall.
- B.1.68 The ES noted that south of Oakley Road the route would cross a low lying meander in the River Great Ouse. The area of the meander comprised low grade arable/pasture land interspersed with former gravel workings, operational sludge lagoons and small scale refuse disposal.
- B.1.69 Mitigation measures noted in the ES were;
- All storm water from the proposed bypass would pass through oil interceptors meeting the requirements of the National Rivers Authority (NRA pre-cursor of the EA) before entering the River Great Ouse
  - The two river crossings at the Great Ouse would be designed to minimum soffit levels, stipulated by the NRA to avoid unnecessary visual intrusion to views from Clapham. Long viaduct crossings to the requirements of the NRA would be provided to safeguard the existing flood regime of the river.
  - Stevington Marsh SSSI was noted to be 3km downstream of the most northerly proposed outfall to which a relatively small area of road would discharge. Protection would be provided by a proposed oil interceptor but it was not expected that any contamination of the SSSI would occur as a result of the scheme.
  - Measures would be incorporated in the drainage system to protect Anglian Water's extraction wells, in the vicinity of the southern roundabout at Manton Lane, from accidental contamination.

### **Consultation**

- B.1.70 The EA has provided a detailed written response which has been forwarded to the HA. The response is summarised as follows:
- With regard to local water resources including surface water and ground water there was a steep change in water levels during the period of road construction in June 2001 at an EA observation borehole (TL 05/084) which monitors groundwater within the Blisworth Limestone major aquifer. Building the bypass involved excavating significant quantities of rock as the road cuts into the side of the Ouse Valley. The water levels now average 20cm (0.2m) lower than before 2001. No new permits have been issued in this area and EA considers that the only change has been the building of the bypass;

- A reduction on pore pressure has been noted at borehole TL05/84 of 0.2m and more detailed analysis is needed to confirm whether this is due to drainage of groundwater from the cutting or a reduction in the overburden on the Blisworth Limestone;
- With regard to the Anglian Water extraction wells near Manton Lane roundabout the EA confirms that proposals for the bypass resulted in Anglian Water needing to vary their groundwater abstraction licence due to the proximity of the boreholes to the proposed road. The quality of the abstraction was also at risk due to the presence of landfill. New boreholes were commissioned and the license varied to allow pumping at lower quantities than licensed previously. The license has since been revoked and EA suggest that POPE contact Anglian Water to discuss its views as to whether the loss of resource was as a result of the bypass;
- EA unaware of any other impacts on local water resources;
- Only one pollution incident since the road opened – a car fire in May 2004 where a small amount of petrol and fire fighting foam entered the watercourse. It was not serious enough for EA to attend;
- The River Great Ouse crossings and the impacts on the floodplain were assessed and agreed through the planning process and through Flood Defence Consents. To date there have been no reports of any problems with the works that took place; and
- For biology the nearest downstream sampling point is on the Ouse at Bromham, sampled in 2004 and results consistent with historical data. No information regarding impact on fisheries has come to light.

B.1.71 Bedfordshire Borough Council confirmed that it is carrying out routine maintenance e.g. drain cleaning etc but has not accepted responsibility for the major structure of the roads.

#### **Evaluation**

B.1.72 With regard to the EA consultation response it is understood from the HA that the ES borehole is some 600m east of the northern tie-in of the scheme and about 40m higher than the road. The cuttings for the bypass were in cohesive material and not rock and during construction there were no significant problems with water in the excavations as would be expected if the aquifer had been affected by the works.

B.1.73 Anglian Water has not been contacted for this POPE report as this is outside the normal scope of consultation. It is understood from the HA that the work to amend the boreholes was undertaken by Anglian Water and it was thought that this work was completed and that boreholes were operational. HA has no information on why the licence was revoked although it is thought that the boreholes were not being used for general water abstraction, but were retained as a backup supply for the brewery.

B.1.74 It would appear that there has been one pollution incident as a result of the scheme, although this was not considered significant by the EA.

B.1.75 The As Built drainage drawings indicate that highway drainage and pollution control measures have been incorporated into the scheme. Spillage containment basins have been provided see Figure B.8 and As Built details indicate that these should be emptied regularly, normally twice per year, with reference to the maintenance manual. It is understood that routine drainage maintenance is being carried out.

B.1.76 The site visit noted that the open ditches have a concrete side wall profile see Figure B.9. It also noted what appeared to be a new or re-stoned French drain in an area of wide verge just south of the Highfield Road over-bridge, see Figure B.10. It is understood that this was part of the remedial work required for the scheme.



**Figure B.8 Spillage containment basin north of south Ouse bridge**

B.1.77 In line with standard practice the As Built drawings make reference to Health & Safety residual hazards these were noted as; underlying landfill material, sludge lagoons and excavation and disposal of contaminated material.



**Figure B.9 example of concrete side profile drainage ditch**



**Figure B.10 French drain on southbound carriageway near Highfield Road bridge**

B.1.78 The two bridges at the River Great Ouse have been constructed with low profiles as expected to avoid unnecessary visual impact see Figure B.11. The site visit noted that vandalism has occurred below both north and south bridge see Figure B.12. There is graffiti, areas of block paving have been lifted, all the mesh access gates have been forced open, and at the south bridge a pedestrian gate in the accommodation fence (on the highway boundary) is removed.

B.1.79 Comments have been made by the EA relating to the impacts of the Scheme on local groundwater although it is understood from the HA that significant problems with water entering excavations were not encountered during the works. It would appear that a small amount of pollutants entered the watercourse as a result of an incident in May 2004. It is understood that some remedial work has been required to the highway drainage e.g. within the verge near Highfield Road overbridge.. Based on the information available it is considered that impacts on water are moderate adverse as expected– although there have been no significant pollution incidents to date the scheme has allowed a small amount of pollutants to enter a watercourse and in addition there is the possibility that the scheme has had an impact on local groundwater although further study would be required to fully evaluate this issue.



Figure B.11 South Ouse crossing illustrating low profile bridge to minimise visual impact within the floodplain



Figure B.12 Example of vandalism at north Ouse crossing

## Physical Fitness and Journey Ambience

### Predicted Impacts

- B.1.80 At the time the AST was compiled Physical Fitness and Journey Ambience were not sub-objectives included in the appraisal methodology.
- B.1.81 The ES included information relevant to both topics as follows;
- Bridleway access would be maintained across the bypass between Lower Farm Road and Clapham by means of a new farm access accommodation bridge;
  - One footpath would be crossed by the bypass (Footpath No.16) and would be re-aligned either side of the bypass to cross over the proposed road on the new bridge at Oakley Road junction;
  - There would be substantial improvements in pedestrian amenity with a considerable reduction of traffic flow on the old A6 resulting in a decrease in noise levels, air pollution and pedestrian/vehicle conflict. Pedestrian safety would be also be substantially improved as a consequence of lower traffic flow;
  - Cyclist safety would be substantially improved as a consequence of lower traffic flow on the old A6; and
  - Driver stress was expected to decrease from high to moderate as a result of the scheme.
  - Consultation
- B.1.82 The local authority has been consulted and any feedback will be incorporated into the report when made available.

### Evaluation Physical Fitness

- B.1.83 Within the countryside west of Clapham bridleway access has been maintained across the bypass at Lower Farm Road and Footpath 16 has been realigned to cross the bypass via the Oakley Road junction over-bridge as expected. Footpath 16 forms part of the John Bunyan Trail. Whereas previously the paths were located within the rural landscape they are now subject to traffic noise.
- B.1.84 A bridleway is provided within the highway boundary off the old A6 towards the northern end of the scheme and Highfield Road see Figure B.13. It does not appear to cross the carriageway at grade as indicated on the construction landscape drawings but the Highfield Road over-bridge has been provided with high parapets which would allow safe crossing by horses to link into the wider bridleway network.
- B.1.85 A bridleway gate gives access to the northbound highway verge for a short length near the northern extent of the scheme.
- B.1.86 No surveys have been undertaken for this report which would confirm the level of post opening use of the bridleways and footpaths although those paths visited during the site visit did not appear to be overgrown which could be an indication of use.
- B.1.87 For pedestrians and cyclists on the old A6 the reduction in through traffic will have improved the local environment as expected see Figure B.14. Refer also to chapter 6, paragraphs 6.7 – 6.9.

### Evaluation Journey Ambience

- B.1.88 Driver stress – the reduction in through traffic along the old A6 will have reduced congestion and driver stress as expected see Figure B.15.
- B.1.89 The bypass is understood to be generally free flowing and well signed which should avoid driver uncertainty and fear of accidents. However, it was noted during the site visit that there was a morning build up of traffic at the Manton Lane roundabout at the southern extent of the scheme with queuing on the bypass and the old A6. A speed camera is in operation at the northern tie in.
- B.1.90 Driver views – a variety of views from the road provide driver interest including across the flood plain towards Clapham. Cuttings and screen fences limit some views out from the road but these

provide necessary screening of traffic from adjacent properties. Judges Spinney at Oakley Hill provides a focal point along the route.

B.1.91 Traveller care – one lay-by has been provided either side of the bypass and on the day of the site visit these were well used. The verge at the southbound lay-by was eroded due to overrunning vehicles see Figure B.16. Facilities are available within Clapham village easily accessed off the bypass. There is a supermarket close by after the Manton Lane roundabout on the outskirts of Bedford.



Figure B.13 Bridleway access provided within highway boundary. New hedge planting adjacent to fence on right very small within the grass.



Highfield Road



Figure B.15 Old A6 weekday afternoon; traffic free flowing with some on street parking possible for residents

## Key Points for Environment

**Noise** – Based on traffic flows it is likely that there has been a reduction in noise for properties adjacent to the old A6 as a result of the significant reductions of through traffic and an increase in noise for properties close to the bypass.

**Air Quality** – Based on traffic flows air quality will have improved adjacent to the old A6 due to the reduction in through traffic. There are very few properties close to the bypass.

**Greenhouse Gases** - Using forecast data, the prediction was for an additional 1201 tonnes of carbon to be emitted as a result of the scheme. Using actual data, only an extra 855 tonnes were emitted.

**Landscape** – Earthworks, cuttings and low profile bridges within the floodplain have helped minimise the impact of the scheme on the wider landscape. Environmental barriers have been provided and new planting will in time screen traffic and integrate the bypass into the local landscape; traffic is still visible within the floodplain and from nearby residential areas. Planting is generally establishing satisfactorily but will require continuing aftercare to ensure that it fulfills the long term objectives primarily screening and integration. As the bypass has been de-trunked the landscape areas have been handed over to the local authority for ongoing maintenance and management. It is understood that there are no third party commitments for ongoing monitoring of the landscape although it is recommended as best practice in the Landscape Management Plan prepared as part of the Scheme requirements.

**Biodiversity** – Although the ES did not specifically mention protected species these have been mitigated for as part of the scheme. Great crested newts were translocated from the route corridor prior to construction. Post opening surveys were not a requirement of the Contract and there is limited information available to fully evaluate this sub-objective. Species rich grass areas were not particularly in evidence at the time of the site visit. Badgers appeared to be using the badger tunnels.

**Heritage** – The reduction in through traffic on the old A6 will have benefited listed buildings in Clapham as expected. Archaeology was not mentioned in the ES (not unusual at the time the ES was written in the early 1990s) and there were expected to be no significant impacts in the AST with a neutral overall impact; through a programme of evaluation an area of unknown archaeology was discovered west of Clapham within the floodplain and the bypass has resulted in the disturbance of the archaeological resource, however the archaeological investigation has led to a greater knowledge of the history of settlement in this area of Bedfordshire and the overall impact is considered neutral as expected. Regarding archaeological reporting - the local authority considers that the post-excavation and publication programme has been very slow and deadlines have been missed

**Water** – Based on the information available it is considered that impacts on water are moderate adverse as expected– although there have been no significant pollution incidents to date a small amount of pollutants have entered the watercourse and in addition there is the possibility that the scheme has had an impact on local groundwater.

**Physical Fitness** – The removal of through traffic on the old A6 has improved the local environment for pedestrians and cyclists and footpath / bridleway links have been maintained across the bypass as expected in the ES.

**Journey ambience** – Driver stress will have improved on the old A6 due to the significant reduction in through traffic, as expected in the ES. The bypass is generally free flowing although there would appear to be some morning queuing at the Manton Lane roundabout.

# Appendix C – Survey Form

# A6 Clapham Bypass - Residents Survey

Thank you for taking a few moments to complete this short questionnaire. In December 2002 the Highways Agency opened the Clapham Bypass (Paula Radcliffe Way). We are now assessing the impact of the scheme on the local area and want to hear the opinions of

We want to know how the road has affected your daily life and how you travel. We would also like to know whether there have been any other impacts and whether these impacts are expected. All comments received will be included in our '5 Years After' evalua

Please return the questionnaire in the pre-paid envelope provided. **By returning the completed form you can be entered into a prize draw to win £50 worth of High Street Gift vouchers.**

Please indicate your answer with a tick (✓). There is space after some of the questions to make comments if you wish. At the end there is a larger space to make further comments. **All your responses will be treated in confidence.**

<b>1. How long have you lived in the Clapham area?</b>	
More than 5 Years <input style="width: 50px; height: 15px; background-color: yellow;" type="checkbox"/>	Less than 5 Years <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/>
Please go to <b>Question 2</b> Below	Please go to <b>Question 3</b> Below
<b>2. Were you opposed to the construction of the Clapham Bypass?</b> <input style="width: 50px; height: 15px; background-color: yellow;" type="checkbox"/> Yes <input style="width: 50px; height: 15px; background-color: yellow;" type="checkbox"/> No <input style="width: 50px; height: 15px; background-color: yellow;" type="checkbox"/> Don't Know  Please Give Details (Optional) <hr/> <hr/> <hr/> <hr/> Please go to <b>Question 5</b> below	<b>3. Were you aware that Clapham had a Bypass when you moved here?</b> <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/> Yes <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/> No <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/> Don't Know  <b>4. Did the fact that Clapham had a Bypass influence your decision to move here?</b> <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/> Yes <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/> No <input style="width: 50px; height: 15px; background-color: pink;" type="checkbox"/> Don't Know  Please go to <b>Question 11</b> overleaf

**5. Safety for road users and pedestrians has improved since the Bypass opened**

Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

Please give details (optional) \_\_\_\_\_  
 \_\_\_\_\_

**6. The local environment has improved in the Clapham area since the Bypass opened (air pollution, noise etc)**

Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

Please give details (optional) \_\_\_\_\_  
 \_\_\_\_\_

**7. Do any of the options listed below apply since the opening of the Bypass? (Tick all that apply)**

- Vehicles still use the old route through Clapham rather than the Bypass
- Traffic Congestion has improved in Clapham
- Traffic speeding through Clapham on the old route
- Cycling in the area is now easier and safer
- Clapham village centre amenities have improved
- It is easier to cross the road following the removal of through traffic
- Lack of suitable car parking
- Public transport is now more reliable
- New development has been attracted to the area

**8. Has the Bypass changed the way you walk and/or cycle within Clapham?**

**Yes** Please give details (optional) \_\_\_\_\_

**No** \_\_\_\_\_

**Not Applicable** \_\_\_\_\_

**9. Has the Bypass changed the way you use rights of way (footpaths, bridleways, cyclepaths) to travel to other nearby villages and amenities?**

**Yes** Please give details (optional) \_\_\_\_\_

**No** \_\_\_\_\_

**Not Applicable** \_\_\_\_\_

**10. The bypass has made the Clapham area a better place to live (For example - The sense of community in the village has improved)**

Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree

Please explain why Clapham is now a better or worse place to live \_\_\_\_\_

**11. If you have any further comments you would like to raise in relation to the Clapham Bypass, please write them in this box. If you require a response please give a method of contact.**

Please continue on an additional sheet if necessary and attach firmly

**Win £50 High Street Gift Vouchers**

If you would like to enter the prize draw we require a few details which will only be used for the purpose of the draw

**Name:** \_\_\_\_\_

**Daytime Telephone Number:** \_\_\_\_\_

**Thank you for taking the time to complete this questionnaire**

**Please return your completed questionnaire by 16/05/08 using the prepaid reply envelope or send to: Highways Agency, Clapham Bypass Survey, FAO L.Wooton (GC), Federated House, London Road, Dorking, Surrey, RH4 1SZ**

Data Protection Act 1998: The Highways Agency is bound by the principles for the data protection Act 1998. Our policy is that personal information about you will: Not be used for any purpose other than that specified on collection, be held in a secure man

For further information about this survey please contact: Stuart Law. Tel 0121 483 5416 or E-Mail stuart.law@atkinglobal.com