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HIGHWAYS AGENCY

A34 NEWBURY BYPASS

‘Five Years After’ Evaluation (1998–2003)

July 2006

Hampshire County Council

West Berkshire Council

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Post Opening Project Evaluation

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Glossary

The following table details acronyms and terms used within the context of this report.

Term	Definition
AADT	**Annual Average Daily Traffic.** Average of 24 hour flows, seven days a week, for all days within the year.
AAHT	**Annual Average Hourly Traffic**
AAWT	**Annual Average Weekday Traffic**. As AADT but for five days, (Monday to Friday) only.
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 (between 7:30 and 9:00)
AONB	**Area of Outstanding Natural Beauty**
APLI	**Area of Particular Landscape Importance** (Hampshire)
AQ	**Air Quality**
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.
BAP	**Biodiversity action plan**, UK Government's response to the 1992 Convention on Biological Diversity
BBONT	**Berkshire, Buckinghamshire and Oxfordshire Naturalists' Trust**
BCR	**Benefit to Cost Ratio**, PVB divided by the PVC
Bypass	Within the context of this report, this refers to the new A34(T), Newbury Bypass, which was opened in November 1998.
CC	**County Council**
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.
CRF	**Congestion Reference Flow -** AADT flow at which a road is likely to be congested in the peak periods of an average day.
CPO	**Compulsory Purchase Order**
cSAC	candidate to become a Special Area of Conservation
D2AP	**Dual two lane** carriageway all purpose road
dB (A)	**dB** or decibel is the unit used for the measurement of sound on a logarithmic scale. (A) is the weighting applied to the decibel unit to represent the frequency response of the human ear.
DC	**District Council**

DfT	**Department for Transport**
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 1994 for the appraisal used in this report.
DM	**Do-Minimum.** In COBA, DM is the scheme (or 'option') of the base road and traffic network against which alternative improvements can be assessed.
DMRB	**Design Manual for Roads and Bridges** http://www.standardsforhighways.co.uk/dmrb/index.htm
DoE	**Department of Environment** (1990s)
DoT	**Department of Transport** (1990s)
DS	In COBA, the '**Do-Something**' scheme is the road proposal under consideration. As used in this report it is the Bypass scheme that was built, other proposed routes have not been considered here.
EN	**English Nature**
EST	**Evaluation Summary Table**
Fixed trip matrix	This is one of the basic assumptions of the COBA model. It assumes that the only trip change response to the new scheme is of Reassignment; there is no generation of additional trips or mode change.
Ha	**Hectare:** 10,000m, 2.47 acres
HGV	**Heavy Goods Vehicle**. In the context of this report, the term is used to refer to vehicles greater than 5.2m in length as this is how the ATCs classify vehicles. Shorter vehicles are classified as 'light'.
High Growth / Low Growth	Within COBA, these define the growth assumptions to be applied to traffic, economic and fuel costs.
Highways Agency	An Executive Agency of the Department for Transport, responsible for operating, maintaining and improving the strategic road network in England.
Induced traffic	Additional traffic arising as a result of increased road capacity.
IP	**Inter Peak**, the time between the AM and PM peaks
L10	In noise monitoring, L10 is the noise level exceeded for o.ne tenth of a period of one hour.
Light vehicle	Any vehicle less than 5.2m in length.
Link	In the COBA model, a link is a section of the road network between two junctions.
LHR&MP	**Landscape Handover Report** and **Management Plan**
LNMS	**Local Network Management Scheme**, road improvement schemes costing less than £5m.
LNR	**Local Nature Reserve**
Managing Agent	A Managing Agent is responsible for the operation, maintenance, improvement of the motorway and trunk road network of a Highways Agency area.

MEA	**Manual of Environmental Appraisal,** Department of Transport guidance (1983).
MOD	**Ministry of Defence**
MON4	A form defined by the Highways Agency which specifies a range of information that should be collected for the 'Five Years After' evaluation.
MOV lanes	**Multiple Occupancy Vehicle** lanes.
NATA	**New Approach to Transport Appraisal** (1998) the basis of the standard current DfT appraisal approach.
NCC	**Nature Conservancy Council**, predecessor of English Nature.
NRTF	**National Road Traffic Forecast**
NPV	**Net Present Value** is the difference between the Present Value of Benefits (PVB) and the Present Value of Costs (PVC)
Old route	Within the context of this report, this refers to the route of the A34 through Newbury prior to the opening of the Bypass. This road has since been designated the A339 from Donnington north of the town to the Swan roundabout, and is the B4640 to the junction with the Bypass at Tot Hill.
OPR	**Order Publication Report**
Outturn cost	Expenditure actually incurred.
PIA	**Personal Injury Accident.** A road traffic accident in which at least one person required medical treatment.
PIA/Mvkm	Is the number of **PIA**s 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 (between 16:30 and 18:00)
POPE	**Post Opening Project Evaluation**, before & after monitoring of all **TPI** schemes.
POPE-E	A pilot version of **POPE** which additionally includes environmental assessment.
Preferred Route	The route announced by the Secretary of State as the preferred option on which further design and assessment will take place.
Price base	A consistent price base is required in cost benefit analysis to remove the influence of background inflation on costs which are likely to be quoted in a different year to the price base being used for the benefits. Generally the price base is set as the same year as the discounting base year which is 1994 for the cost benefit appraisal in the report.
PVB	**Present Value of Benefits**
PVC	**Present Value of Costs**
Reassignment	This is where traffic travelling between A and B has transferred to an alternative route between A and B.
Route Corridor	A corridor within which a route may pass, but where the detailed alignment has not been developed.
Route Stress	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.

SAC	**Special Area of Conservation**, a protected site designated under the EC Habitats Directive.
SACTRA	**Standing Advisory Committee for Trunk Road Assessment**
Screenline	A line of points across an area that is designed to intercept all traffic going from one side to the area to another.
Severance	Community severance is the separation of adjacent areas by road or heavy traffic, causing negative impact on non-motorised users, particularly pedestrians.
SSSI	**Site of Special Scientific Interest**
Suppressed demand	Trips may be made when previously travel did not take place – in Newbury, 'before' conditions represented a severe bottleneck and the Bypass could have released such trips leading to infilling of the existing route.
TAG	**Transport Analysis Guidance**, as defined in WebTAG.
TEMPRO	**Trip End Model Presentation PROgram**, DfT software that provides forecast data on trips for transport planning purposes.
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.
TRMM	**Trunk Road Maintenance Manual**
Vehicle hours	Vehicle hours refers to the total time spent by all vehicles using a road and is expressed usually as a yearly value.
Vpd	**Vehicles Per Day**
webTAG	Department for Transport's website for guidance on the conduct of transport studies at http://www.webtag.org.uk/

Executive Summary

0.1 The A34 Newbury Bypass (the Bypass) scheme opened on 17 November 1998. The purpose of this report is to identify and quantify (where feasible) the effects of this scheme five years after opening (to November 2003) in accordance with the Agency's procedures for Post Opening Project Evaluation (POPE). The location of the scheme is shown in Figure 0.1.

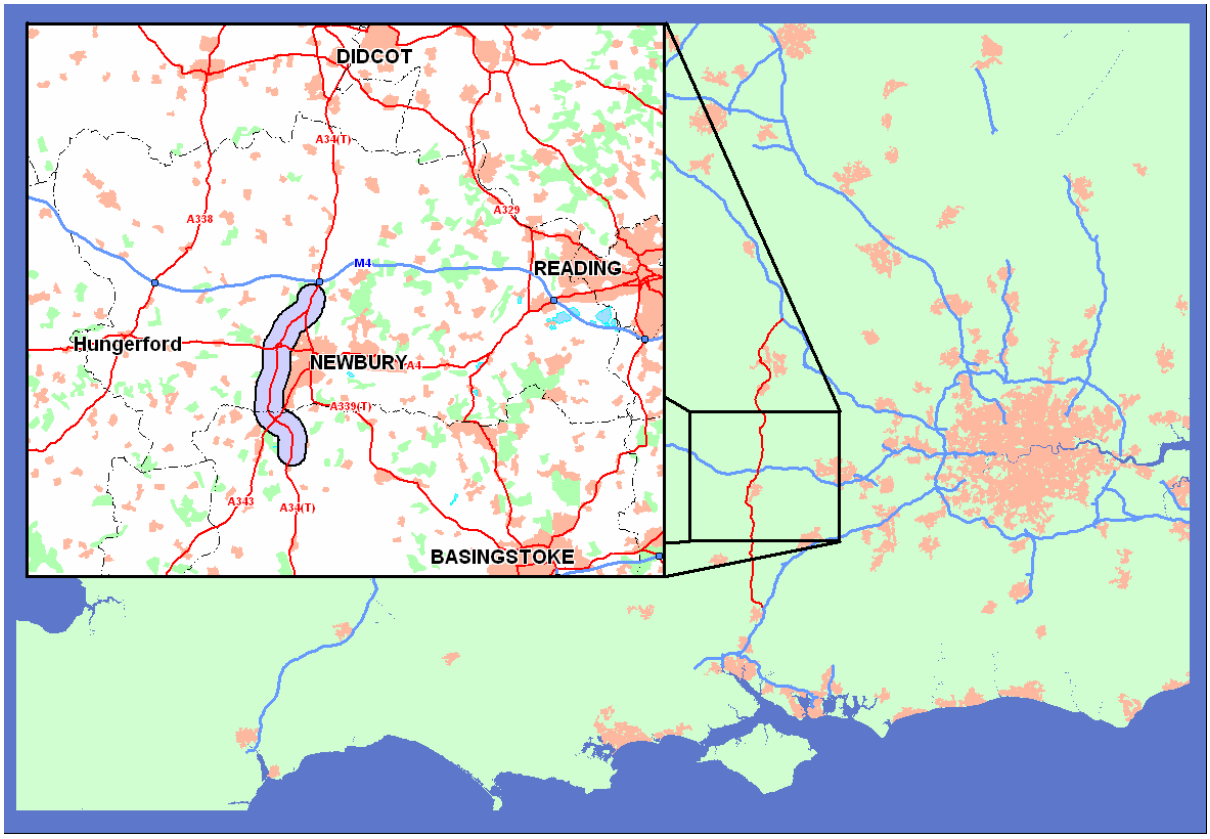

Figure 0.1 – Location of A34 Newbury Bypass

0.2 This Report considers traffic volumes recorded 'before' and 'after' the Bypass scheme opened to traffic and makes comparisons with those predicted during the appraisal process. Assessments are also made about the degree to which the forecast transport benefits of the scheme have been realised against the five Central Government Objectives for Transport, namely: Environment; Safety; Economy; Accessibility; and, Integration.

Traffic

0.3 Figure 0.2 compares observed 1997, 1999 and 2003 Annual Average Weekday Traffic (AAWT) flows.

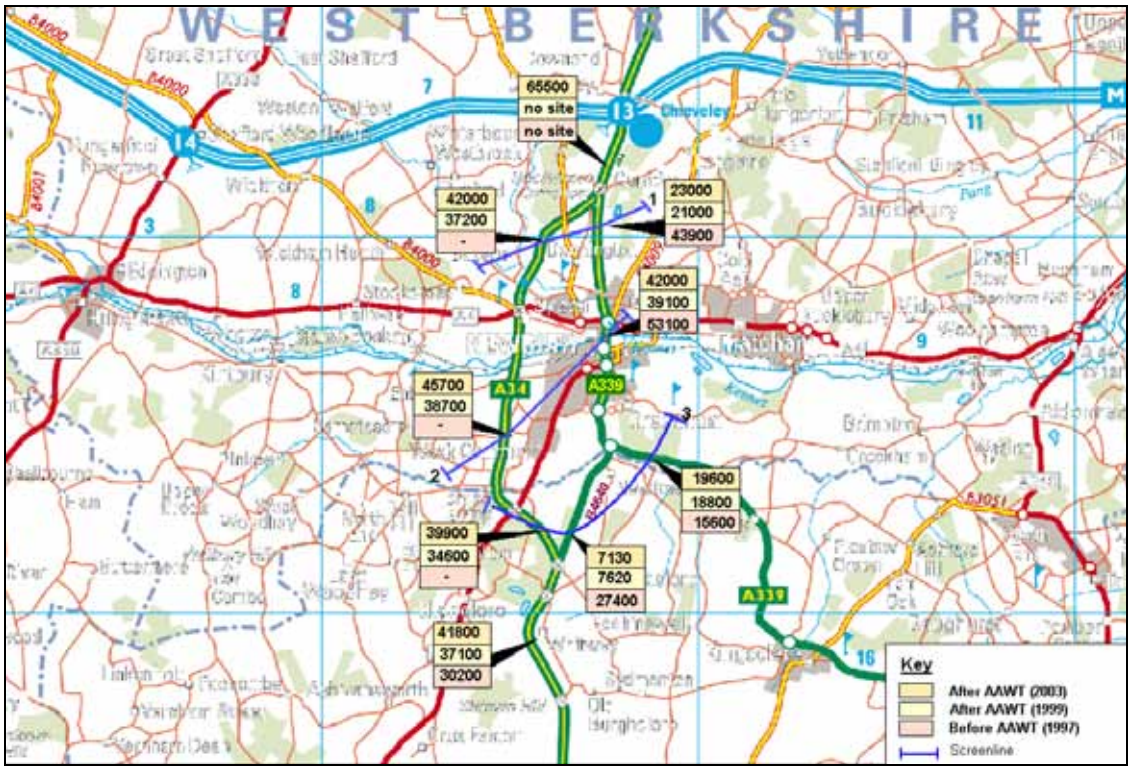

Figure 0.2 – AAWT Flow Changes around Newbury

0.4 The main points arising from the observed traffic volumes as shown in Figure 0.2 are set out below. Comparisons with predicted flows have been added where appropriate.

- In 2003, the Bypass carried around 40 - 46,000 vehicles per day (vpd) on weekdays;
- Traffic volumes on the former A34(T) route through Newbury (hereafter referred to as the old route) reduced significantly after scheme opening. In Newbury town centre flows reduced by 28% (15,000vpd) in the year after opening (1999);
- Since 1999, traffic levels have increased on the old route, although in 2003 flows were still 11,000vpd lower than the levels reached before the Bypass was built. Natural traffic growth has eroded the relief to Newbury town centre only very slightly, a key concern at Public Inquiry;
- Across the narrow corridor (Bypass and old road), traffic volumes have increased by around 50% between 1997 and 2003, significantly higher than regional growth rates in the region of around 14% over the same period, however across a wider assessment of roads from Bath in the West to the M3 in the east, traffic volumes have increased by around 16-19%, which indicates that

the primary response to this scheme has been re-assignment from other strategic routes serving the southern part of England; and

- The majority of this increase ocurred in 1999, the first year after opening, which confirms that re-assignment has been the dominant response to this scheme.

0.5 The observed annual average daily traffic (AADT) flows on the Bypass was 38 - 43,000vpd in 2003, which exceeded the highest flows predicted for 2010 at the 1988 Public Inquiry of 27 -36,000vpd, and there are four reasons why this under-prediction has occurred, namely:

- the small assessment area used in the appraisal process thereby underestimating the level of strategic re-assignment;
- the likelihood of re-assignment from smaller roads in the town that were subject to rat-running before the scheme opened;
- There have been significant land use changes that have occurred in the town since 1999, but these were not considered in the appraisal process; and
- Entirely new trips being made which were not made previously as a result of congestion in the town, this is sometimes referred to as induced traffic.

0.6 In our view, the primary response to the opening of the A34 Newbury Bypass has been strategic re-assignment from a variety of routes in southern England.

0.7 Heavy goods vehicles (HGV) comprise about 20% of the total flow on the Bypass in 2003. On the old route, to the south of Newbury, HGV flows reduced by 84% in 1999 (87% in 2003) consistent with predictions made at the 1988 Public Inquiry.

Environment

0.8 Environmental considerations were given high priority during the construction and immediate post-construction phases of work, and mitigation measures were implemented.

0.9 Initial evaluation of the sub-objectives indicates that most impacts have been as expected, although noise and local air quality impacts have been assessed as worse than predicted due to traffic volumes being higher than predicted.

0.10 Further study would be required to evaluate fully the full range of environmental impacts against the most up-to-date transport analysis guidance.

0.11 For the mitigation measures to fulfil their potential and remain effective, ongoing maintenance and monitoring is essential.

Safety and Economy

0.12 For all transport schemes a cost benefit analysis is undertaken which involves quantifying in monetary terms as many of the costs and benefits of a proposal as feasible taking into account all five Government objectives.

0.13 However, available techniques generally limit analysis to valuing Safety impacts, based on reductions in the number of personal injury accidents (PIA), and Economy impacts, based primarily on savings in journey times.

0.14 On this basis the results of the predicted and outturn cost benefit analysis for the Bypass are summarised in Table 0.1 over a 30 year assessment period (1999 to 2028). All figures presented are in £million at 1998 prices, discounted to 1994.

Table 0.1 – Summary of Predicted and Outturn Economic Benefits of Scheme (30 year assessment period, 1999 to 2028)

	Predicted	Outturn
Journey Time Savings	£365.4m	£583.5m
Vehicle Operating Cost Savings (1)	£4.5m	£4.5m
Accident Savings	£35.3m	£17.0m
Present Value of Benefits (PVB)	£405.2m	£605.0m
Present Value of Costs (PVC)	£74.9m	£104.5m
Net Present Value (NPV) (PVB – PVC)	£330.3m	£500.5m

Note: (1) Vehicle Operating Costs were assumed to be unchanged

0.15 The key points arising from the wider Safety and Economy assessments are:

Safety

- Comparing the periods five years after and five years before opening there have been over 50 fewer PIA and 144 fewer casualties on the Bypass and parallel 'old road'. But, the number of fatalities has increased from 6 to 10 on these roads; and
- Over 30 years, the outturn estimated accident saving of £17.0 million was about half of the predicted figure of £35.3m (as the geographical coverage of the Transport Model was larger than the area used for the outturn results), but in our view, both of these monetary savings are an underestimate as they do not fully consider the effect of wider reassignment, i.e. the accident reductions on routes relieved by the wider re-assignment have not been included.

Economy

- Journey times along the Bypass are about seven minutes throughout the day suggesting that journey time reliability has been significantly improved;
- Estimated[1] journey time savings of 11 minutes in the peak hours for traffic using the Bypass compared to similar journeys along the old route through Newbury

[1] Journey times before the scheme opening were not available and had to be synthesised using the COBA model

before scheme opening are shown, however these are minimum savings as the 'before' journey times are likely to have been underestimated;

- Estimated journey time savings of £583.5m over 30 years, compared with a predicted figure of £356.4m have been calculated;
- Improved journey time reliability for traffic on the A34 strategic route between the south coast and the Midlands; and
- Changes to the general economic conditions in Newbury, leading to significant office, industrial, retail and residential development in the area;

Results of Cost Benefit Analysis

- The outturn benefits of the scheme were higher than predicted, related largely to similar journey time savings applying to a higher outturn levels of traffic;
- The evaluation suggests that the predictions over-estimated the level of accident savings due to the scheme, but under-estimated the level of journey time savings, however it is considered that these outturn benefits are under-estimated due to benefits on links outside of the study area not being considered;
- The outturn cost of the scheme was £104.5m, around 40% higher than the predicted cost of £74.9m. However, unexpected additional costs of £36.2m were incurred as a result of protest action against the Bypass; and
- In summary, the scheme outturn confirmed that the Bypass scheme would meet its Safety and Economy objectives with benefits exceeding costs by £500.5m.

Accessibility

0.16 As predicted, a reduction in severance on the single carriageway section of the old route, Tot Hill Newtown Straight, with a 74% reduction in traffic and 87% reduction in HGVs five years after opening.

0.17 New severance at places along the alignment of the Bypass, although the scheme included new footbridges near Enborne and Bagnor west and north-west of Newbury.

0.18 Access to the public transport system has benefited - improved reliability for buses on the A339 as a result of traffic relief, although bus priority measures have not been introduced on the old route.

Integration

0.19 In terms of national and local [2] policy integration, the scheme is considered to be consistent with transport policies, but not consistent with the environmental policies.

0.20 The scheme predictions indicated the scheme was integrated poorly with environmental policies and well integrated with transport policies. It was always accepted that there would be negative environmental impacts as a result of this scheme, but these could be mitigated to minimise the impacts.

0.21 For the evaluation, West Berkshire Unitary Authority indicated the Bypass had not played a role in the current Local Plan or Berkshire Structure Plan, although it could influence emerging policies.

[2] Including Berkshire County Council, Hampshire County Council and Newbury District Council

0.22 With respect to integration with Government policies, predictions noted the scheme was not in accordance with the then Department of Environment (DoE) policies related to Areas of Outstanding Natural Beauty (AONB) and Sites of Special Scientific Interest (SSSI) but, was in line with the then Department of Transport (DoT) policies to assist economic growth by reducing transport costs, removing through traffic from unsuitable roads and to enhance road safety.

1. Introduction

Purpose of this Report

1.1 The A34(T) Newbury Bypass scheme (the Bypass) was opened by the Highways Agency (the Agency) on 17 November 1998. The purpose of this report is to identify and quantify (where feasible) the impacts of this scheme five years after opening (to November 2003) in accordance with the Agency's procedures for Post Opening Project Evaluation (POPE).

Overview of Post Opening Project Evaluation (POPE)

1.2 The Agency is responsible for improving the strategic highway network (motorways and trunk roads) by delivering schemes in the Targeted Programme of Improvements (TPI). At each key decision stage through the planning process schemes are subject to a rigorous appraisal process to provide a justification for the project's continued development. An Appraisal Summary Table (AST) is produced which records the degree to which the five Central Government objectives for Transport (Environment, Safety, Economy, Accessibility and Integration) have been achieved. The contents of the AST (and where necessary its more detailed supporting documentation) allow judgements to be made about the overall value for money of the scheme.

1.3 During the planning process scheme effects are based on well informed predictions. However, it is vital to identify the strengths and weaknesses in the techniques used for appraising schemes so that improvements can be made in the future. For POPE this was achieved by comparing information collected 'before' and 'after' a scheme opens to traffic with predictions made during the planning process. Outturn impacts are summarised in an Evaluation Summary Table (EST).

1.4 POPE is mandatory for all schemes in the TPI and is carried out generally at one year and five years after opening.

1.5 The POPE Evaluations were originally intended to be carried out for the schemes within the TPI programme. However, it was also decided to undertake an evaluation of the A34 Newbury Bypass, even though this scheme preceded the TPI programme, and preceded the appraisal methodology currently used.

1.6 In terms of the Government's five objectives, POPE is concerned primarily with Safety and Economy, particularly at the one year after opening stage. Environment, accessibility and integration impacts tend to emerge over the longer term and are addressed normally in studies five years after opening.

1.7 All of these five objectives have been evaluated as part of this A34 Newbury Report, however we have focused on Economy, safety and Environment as more information was available on these issues. The appraisal of this scheme was undertaken in the early and mid 1990's hence much information had been archived and was unavailable, however we have evaluated as comprehensively as possible given the available information.

The Evaluation

1.8 In line with the POPE procedures this report compares traffic conditions in 1997 'before' the Bypass opened with those 'after' opening in both 1999 and 2003. The Report summarises traffic impacts as well as the impacts against the five HA objectives.

1.9 The main areas covered include:

- Traffic volumes in the A34(T) corridor and wider area;
- Journey times along the old route through Newbury and the Bypass;
- Personal injury accidents (PIAs);
- Outturn versus predicted economic forecasts;
- Outturn versus predicted scheme costs;
- Consideration of the longer term effects of this scheme, including new development and land use and road network changes; and
- An examination of the impact of the scheme on the environment, including landscape, townscape, heritage, biodiversity and water.

Report Structure

1.10 Following this brief introduction the report is divided into twelve further Chapters as follows:

- Chapter 2 outlines the evaluation approach taken in this report;
- Chapter 3 gives an overview of the background to the Bypass, as this scheme has a complicated history;
- Chapters 4 and 5 set out the traffic flow and journey time changes after the Bypass opened;
- Chapter 6 considers road network and land use changes in the area;
- Chapter 7 presents an evaluation of the Environment objective;
- Chapter 8 presents an evaluation of the Safety objective in terms of changes in Personal Injury Accidents (PIAs);
- Chapter 9 considers the Economy objective;
- Chapter 10 summarises the results of the scheme cost/benefit analysis;
- Chapter 11 considers the Integration objective;
- Chapter 12 considers the Accessibility objective; and
- Chapter 13 presents the combined AST and Evaluation Summary Table (EST) and summarises the main findings five years after the opening of the Bypass.

2. The Evaluation Approach

The POPE Methodology

2.1 Details about POPE are contained in Interim Advice Note 39/01 available on the Agency's website at:

http://www.standardsforhighways.co.uk/ians/pdfs/ian39.pdf

2.2 In addition to considering traffic volumes recorded 'before' and 'after' a new scheme opens to traffic, comparisons are also made with those predicted during the planning process.

POPE-E

2.3 As stated in 1.6, the POPE methodology is focused primarily on assessing Economy and Safety impacts. However an environmental appraisal framework – 'POPE-E' – is being developed by the Agency. For this scheme, an environmental evaluation pilot has been carried out, although it is recognised that more work would be required to deliver quantified environmental performance measures.

Data and Information Sources

2.4 Information for this study was assembled from a range of sources as summarised in Table 2.1. When interpreting Table 2.1, it should be noted that predictions for this scheme were based largely on the results from a transport model developed to show how traffic might use the road network in the future. These results were used to predict the impact of the scheme across a range of operational, environmental, social and economic criteria.

2.5 Analysis of the Economy criteria was undertaken using the Department for Transport's (DfT) computer program COBA (COst Benefit Analysis) which compares the situations with (Do Something) and without (Do Minimum) the new scheme. Further details about COBA are contained in the Agency's Design Manual for Roads and Bridges (DMRB) Volume 13, entitled "Economic Assessment of Road Schemes".

Table 2.1 – Main Sources of Information

	'Before' (1997) and Predictions	'After' (2003)
Traffic volumes	Road traffic counts	Road traffic counts *A34 Newbury Bypass Before and After Traffic Study* (1999)
Journey times	Estimates, using COBA	Journey time surveys
Accidents	5-year 'before' data	5-year 'after' data
Vehicle operating costs	COBA	COBA (unchanged)
Economic impact		Consultations with local authorities
Environmental impact	Public inquiry documents; other documents	Visual inspection / site visit Consultations with local authorities, Environment Agency, English Nature, English Heritage, Area Managing Agent. *A34 Newbury Bypass Landscape Handover Report and Management Plan* (2003) *Statement of Reasons* (1988)
Costs	COBA	Outturn costs from Highways Agency

2.6 The report uses traffic count data obtained from the Agency, as well as that supplied by the three local authorities concerned: West Berkshire Unitary Authority; Hampshire County Council; and, Wiltshire County Council.

Appraisal and Evaluation Summary Tables (AST/EST)

2.7 As stated in Chapter 1, for a new scheme summary information is presented normally in an AST which records the impacts against the five Central Government Objectives for Transport. Under the POPE methodology, an EST is then drawn up (either one or five years after scheme opening) and compared with the AST.

2.8 For this scheme, an AST was not available, hence an AST has been created as best as possible from available reports and information. The resultant AST is based on current web based Transport Analysis Guidance produced by the Department for Transport (DfT) – WebTAG.

2.9 The AST and EST have identical formats as shown in Table 2.2 and we have based our evaluations on this format for this scheme.

Table 2.2 – AST/EST Framework: Impact Objectives and Sub-Objectives

Objective	Sub-Objectives
Environment	Noise
	Local Air Quality
	Greenhouse Gases
	Landscape
	Townscape
	Heritage of Historic Resources
	Biodiversity
	Water Environment
	Physical Fitness
	Journey Ambiance
Safety	Accidents
Economy	Journey times
	Cost
	Reliability
	Wider Economic Impacts
Accessibility	Severance
	Access to the Transport System
Integration	Interchange
	Land-Use Policy
	Other Government Policies

The AST

2.10 For the Bypass, the production of an AST was not a formal requirement of the transport analysis guidance at that time. Therefore it has been necessary to create an AST 'after the event' from available information and documents.

2.11 'Before' information is based on the Proofs of Evidence presented to the 1988 and 1992 Public Inquiries and on material contained in the Pre-Scheme Approval document and the Newbury Preliminary Review Report undertaken in 1995. As no Envrionmental Statement was produced for the A34 Newbury scheme, we therefore had to produce a synthetic AST from the 1995 review which considered all the topics in a consistent manner. However, it is valid to take accounts of statements made at the latest Public Inquiry (PI) as the Secretary of State's decision is based on the assessment presented at the PI, plus commitments made to the Inquiry.

2.12 Therefore, the AST that has been produced may be slightly different from one that may have been produced at the time of the original appraisal.

2.13 The AST created for the purpose of this report is shown in Table 12.2 and the EST, shown in Table 12.3, summarises the actual, or outturn, effects of the Bypass by the fifth year after opening, i.e. 2003. Where possible this mirrors the appearance and process of the AST.

POPE COBA Evaluation

2.14 From previous COBA [3] analysis, it has been identified that the majority of scheme benefits derive from two main areas:

- Journey time savings; and
- Accident savings.

2.15 For the purpose of this report, observed 'before' and 'after' journey time and accident data has been collected for comparison with the predictions based on the previous COBA analysis. The premise of the POPE COBA methodology is that any change in flows, journey times and accidents will have a proportional impact on the Safety and Economy benefits that the scheme achieves.

Pilot Environmental Evaluation

2.16 The pilot environmental evaluation covers the impact of the scheme on environmental sub-objectives, including landscape, townscape, heritage, biodiversity and water. This work has been carried out on a qualitative rather than quantitative basis, based on site visits and consultation with local authorities, statutory bodies, and the Bypass maintenance team. It is recognised that more work would be required to provide a quantified estimate of the environmental impacts of the scheme.

[3] The COBA (Cost Benefit Analysis) tool is used for forecasting a scheme's economic benefits.

3. The A34 Newbury Bypass Scheme

Introduction

3.1 The Bypass is a nine mile section of dual 2-lane all purpose carriageway (D2AP) located to the west of the Newbury. On scheme completion, the old route was renamed the A339 from the north, through Newbury, and the B4640 further south towards Tot Hill.

3.2 To the north of the Bypass is the A34(T) Chieveley junction with the M4 (M4 Junction 13) which has been improved by the construction of an underpass for A34 through traffic. This scheme opened to traffic on 23 September 2004[4].

3.3 The location of the Bypass is shown in Figure 3.1.

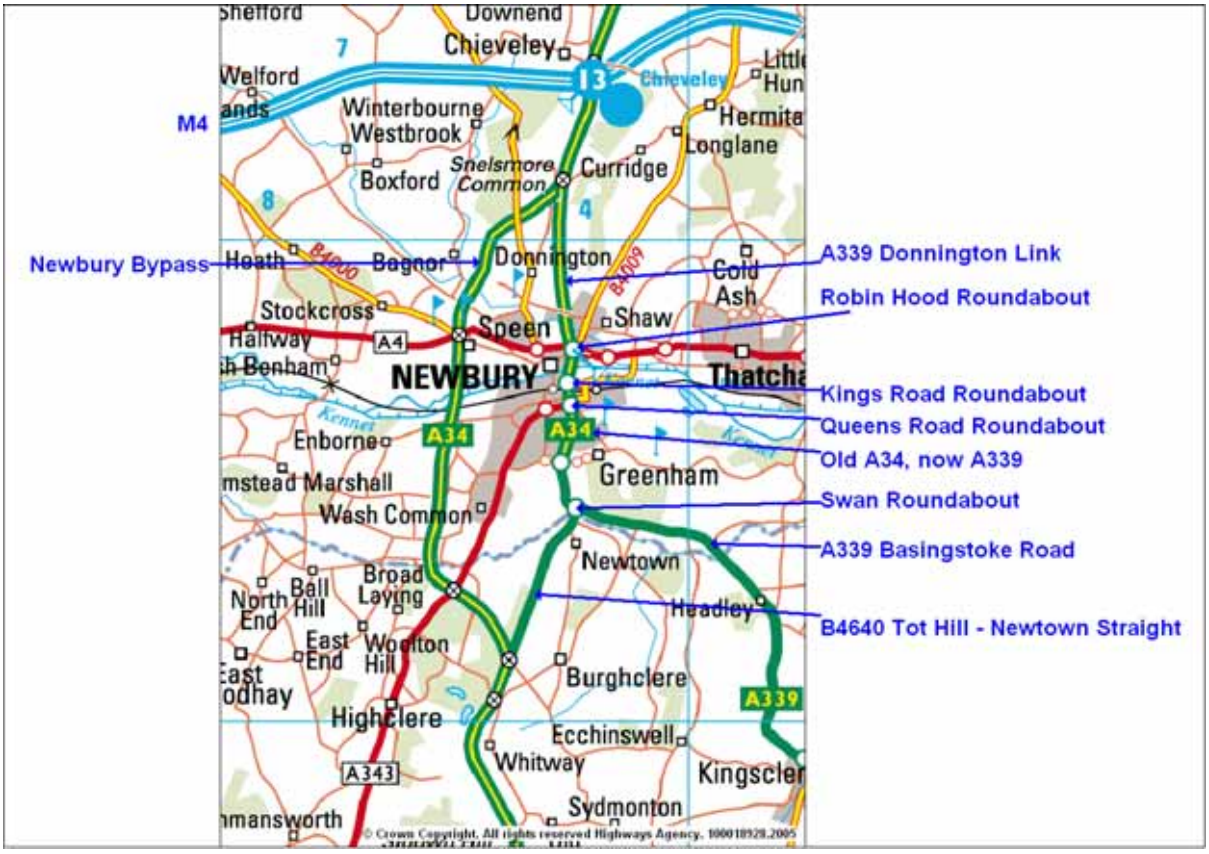

Figure 3.1 – Location of A34 Newbury Bypass

[4] The A34 Chieveley / M4 Jct 13 Improvement is a TPI scheme which was constructed between May 2003 and September 2004.

Scheme Objectives

3.4 The Bypass was designed to relieve the town of Newbury of the heavy volume of through traffic on the A34(T) and was part of the improvements for the strategic A34 trunk route between the Midlands and the South Coast (in particular the port of Southampton).

3.5 The objective of the scheme was to reduce congestion in Newbury town centre and improve journey time reliability by re-routeing strategic, long-distance traffic via a Bypass to the west of the town.

3.6 The Annual Average Weekday Traffic (AAWT) flow on the town centre section of the A34(T) was around 50,000 vehicles per day (vpd) prior to scheme opening, 7,000 of which (14%) were heavy goods vehicles (HGV).

3.7 Prior to opening, strategic traffic on the A34(T) routed through Newbury, where there was - and still is - a dual two lane carriageway with three at-grade junctions and one partially grade-separated junction within less than one mile. In addition, there is a three mile length of single carriageway with frontage access to the south of the town. This was the only section of single carriageway on the A34(T) strategic route between the M3 at Winchester and the M40 Motorway.

3.8 Traffic in Newbury was not only composed of strategic but also local traffic. The level of congestion in the town centre was exacerbated by a concentration of local routes converging in Newbury, with limited crossing points across the River Kennet. The combination of through and local traffic resulted in flows on the A34(T) which were much higher than desirable for a dual two-lane carriageway, resulting in unsatisfactory operating conditions and significant congestion for long periods of the day.

3.9 This network was a major constraint for traffic and extensive queues were common at peak periods on the approaches to Robin Hood and Kings Road roundabouts in the town centre. Severe congestion was experienced on Friday evenings, race days and summer weekends.

History of the Scheme

3.10 The Bypass has a relatively long history: the major events and related reports are summarised in Table 3.1.

Table 3.1 – Chronology of the Scheme and Related Reports

Key Event / Report	Date
Public Consultation	July 1982
Preferred Route Announcement	June 1984;
Draft Orders Published	October 1986
Appraisal Framework	May 1988
Public Inquiry	June 1988
Decision (confirming western route)	July 1990
Additional Draft Orders and CPO Published	September – October 1991
Public Inquiry	March 1992
Orders Made	October 1993
Tenders Invited	June 1994
Secretary of State's Announcement	19 December 1994
Newbury Bypass Review – Preliminary Report	April 1995
Newbury Bypass Review – Working Paper: Induced Traffic	July 1995
Works Begin	Late 1995
Works Completed	1998
Bypass Opens	17 Nov 1998.

Public Consultation

3.11 Public consultation on the proposals took place in 1982. The main issue then was whether the Bypass should be to the east or west of the town or through the centre of Newbury.

Public Inquiries

3.12 The scheme went to Public Inquiry in 1988 and in 1992. The 1988 Inquiry was the more important, where all of the major issues about the scheme were tested including selection of the route corridor. A decision was made to proceed with the western option in 1990. The 1992 Inquiry dealt with some relatively minor design changes to the western Bypass but the scheme was essentially that considered at the 1988 Inquiry.

3.13 On 19 December 1994, the Secretary of State (SoS) for Transport issued a notice of those road schemes on which work should start in 1995/96. In the case of the Newbury Bypass, the SoS concluded that work should be delayed whilst further consideration was given to the proposed route.

The Newbury Bypass Review, 1995

3.14 The Agency reviewed the scheme in early 1995, which involved researching the background to the 1990 decision and changes that had taken place since then. The Newbury Bypass Review - Preliminary Report was issued in April 1995. As part of the review, a working paper on 'Induced Traffic' was compiled and issued in July 1995.

3.15 The concern addressed in the Review was the potential for additional traffic as a result of the overall increase in road capacity, termed 'induced traffic', raised originally by the Standing Advisory Committee for Trunk Road Assessment (SACTRA). Components of 'induced traffic' are explained further in section 4.42 onwards.

3.16 The review highlighted that if the Bypass did not go ahead then there would be no induced traffic but the town would continue to suffer from congestion. The more effective a Bypass (in terms of traffic flow) - it was concluded - the greater the likelihood of induced traffic.

3.17 The review however, did imply that journeys would be suppressed without the Bypass as a result of increased congestion. It was assumed that traffic growth would not continue after 2013. It was forecast that without the bypass, flows on the Inner Relief Road in the town centre could reach 65,000 to 78,000vpd by 2010. However, these predicted flows exceed the maximum capacity recognised for an urban dual carriageway[5].

3.18 As part of the scope of the working paper, and due to the uncertainty regarding the level of induced traffic, a number of sensitivity tests were undertaken. These showed that the scheme still fulfilled its economy objectives even with an element of induced traffic. The 'Worst Case' sensitivity test indicated that there could be an additional 10% of induced traffic on the bypass, whereas the potential for induced traffic on the relieved route was predicted to be 'limited', although no precise figure was given.

3.19 The Review also raised some key concerns regarding Environment, namely:

- Intrusion into the local landscape character and quality particularly the North Wessex Downs Area of Outstanding Natural Beauty (AONB) and Area of Particular Landscape Importance (APLI);
- Impact on the water quality of the Rivers Kennet, Lambourn and Enborne;
- Impact on areas of archaeological potential;
- Noise and visual intrusion;
- Impact on the sensitive wetland sites and meadows, some designated as Sites of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR);

[5] DMRB Volume 5 Section 1 Part 3 TA 79/99 Amendment Number 1, Traffic Capacity for Urban Roads.

- Impact on protected species; and
- Integration of the Bypass into the landscape and provision for footpaths and bridleways.

3.20 The following sections present the evaluation of the impacts of the A34 Newbury Bypass.

4. Changes in Traffic volumes

Introduction

4.1 This Chapter describes the main traffic volume changes that have taken place in the A34(T) corridor 'before' and 'after' the Bypass opened to traffic. Information is provided on the sources and locations of observed traffic flow information, before the main effects of the Bypass are described. Comparisons are also made with predictions where data is available.

4.2 When making comparisons between the before and after situation, consideration should be given to the level of natural traffic growth likely to occur in the area between 1997 (the year before opening), 1999, the year after opening and 2003, 5 years after opening. This is discussed below.

Natural Traffic Growth

4.3 There are two sources of national and regional information, which predict traffic growth, and these have been extracted such that any traffic volume changes as a result of the scheme are put into context against 'natural' traffic growth.

4.4 Predicted percentage increases in traffic by year are published in the National Road Traffic Forecasts (NRTF) which are amended periodically. The latest available version of NRTF was published by the Department for Transport (DfT) in 1997.

4.5 TEMPRO (Trip End Model Presentation Program) is a DfT computer program designed to provide local and regional projections of growth over time. The current version is TEMPRO 4.2. TEMPRO produces growth factors that are region specific, taking into account allocated development sites and the associated growth in traffic.

4.6 In order to make estimates of likely traffic growth specific to the Newbury region, predictions from NRTF were adjusted to reflect local conditions using figures from TEMPRO (details of the method are contained in TEMPRO Guidance). Table 4.1 shows predicted traffic growth in the Newbury and West Berkshire areas. Statistics on observed road traffic growth by vehicle type are available in the *Transport Statistics Bulletin: Traffic in Great Britain.* National growth for the periods covered in this report is shown in Table 4.2 which shows that the growth observed in the local area is higher than national growth estimates.

Table 4.1 – Predicted Regional Traffic Growth

	Newbury	West Berkshire	Berkshire
1997 – 1999	3%	3%	4%
1999 – 2003	5%	8%	9%
1997 – 2003	9%	12%	14%

Table 4.2 – Traffic Growth in Great Britain by road type

	Motorway	Rural A roads	Urban A roads	All roads
1997 – 1999	7%	3%	1%	4%
1999 – 2003	6%	7%	0%	5%
1997 – 2003	13%	10%	1%	9%

Sources of Traffic Flow Information

4.7 Traffic volumes were obtained specifically for this report at a number of locations as shown on Figure 4.1. Further information on data sources is set out below.

'One Year After' Traffic Study

4.8 Mott MacDonald conducted an '*A34 Newbury Bypass Before and After Traffic Study*' (dated March 1999), on behalf of the Agency. Surveys were undertaken immediately before (May 1998) and after (December 1998/January 1999) the opening of the Bypass. However, given the short-term nature of the 'After' counts used in this 'One Year After' Report, results from that study have not been used in this report as more representative annual figures are now available.

'Five Years After' Traffic Study

Highways Agency Traffic Count Sites

4.9 Count data was obtained from the permanent Automatic Traffic Count (ATC) sites maintained by the Agency from 1997 through to 2003 on the motorways and trunk roads in the region around Newbury for the following routes:

- A34 including three sites on the Newbury Bypass and sites north and south of the bypass;
- Old route of A34 (now designated A339 Donnington Link Road, Inner Ring Road, B4640 Tot Hill Newton Straight);
- A339 Basingstoke Road south east of Newbury;
- Four sites on the M4 Motorway east and west of J13 Chieveley;
- Two sites on the M3 Motorway;
- Three sites on the A3; and
- A36 north and south of Salisbury;

*Local Authority SIte*s

4.10 Traffic count information for permanent and temporary count sites was supplied by West Berkshire Unitary Authority, Wiltshire County Council and Hampshire County councils. These covered both the wider area defined for the original COBA analysis and other strategic routes.

4.11 A summary of key local authority sites is as follows:

- Three sites on the A350, including north and south of Chippenham;

- Six sites on the A346/A338 route;

4.12 In addition, ATC surveys were undertaken by West Berkshire Unitary Authority and Hampshire County Council at some sites in September/early October 2003.

4.13 Figure 4.1 shows the locations of these counts, and also shows that parallel counts can be grouped into 'screenlines' to assess the level of traffic volumes switching from one route to another after the opening of the Bypass, and this is discussed later in this section.

4.14 In summary, the traffic volumes used in the evaluation of this scheme have been based on long-term counts on both the Trunk Road and local road networks. These long-term counts enable traffic volumes to be determined for:

- Annual Average Daily Traffic (AADT), which represents an average day including weekends; and
- Annual Average Weekday Traffic (AAWT), which represents an average day, excluding weekends, hence the AAWT traffic volumes tend to be higher than AADT.

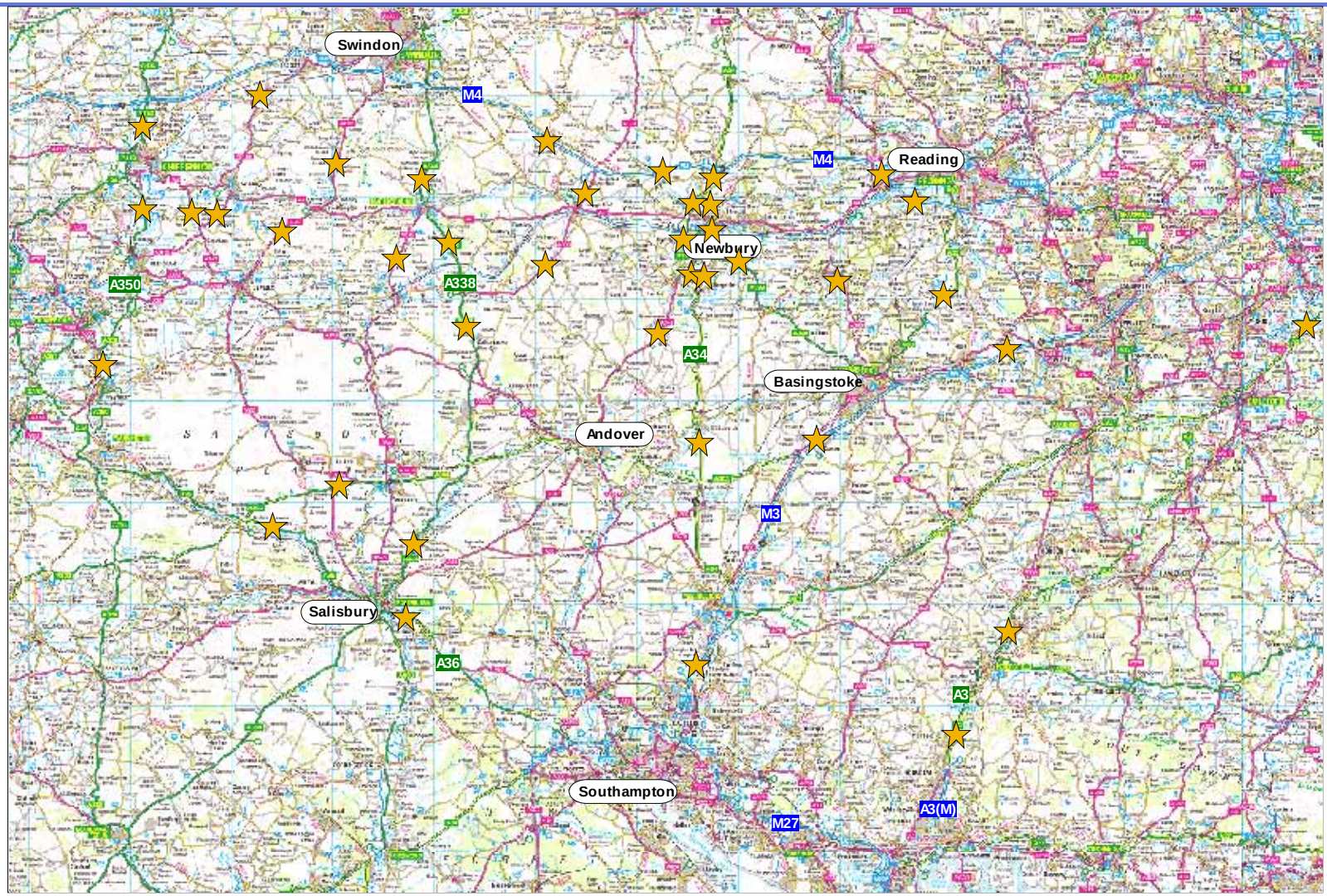

Figure 4.1 – Location of Traffic Count Sites

'Before' Traffic volumes

4.15 The Newbury Bypass Review Preliminary Report (1995) noted traffic growth on the A34(T) approaches to the town of 15% over four years between 1990 and 1994, a period when national growth had been lower. According to DfT data, national growth during this period was 2.6% on all roads, 6.1% on rural A roads and 7.9% on motorways.

4.16 However, in Newbury itself, baseline traffic volumes prior to scheme opening in 1995 and 1997 showed lower growth than on the approaches to the town, particularly in the town centre. These volumes are shown in Table 4.3 below.

Table 4.3 – A34(T) Traffic Volumes Before Scheme Opening

Link	AADT 1995	AADT 1997	AAWT 1997	Increase 1995-97	% Increase 1995-97
A34(T) Donnington Link Road	39,900	42,100	44,300	2,000	5%
A34(T) Newbury Inner Ring Road	50,300	51,200	53,300	1,000	2%
A34(T) Tot Hill Newtown Straight	25,100	26,500	27,100	1,100	4%
A339 Basingstoke Road	Not available	14,600	15,600	-	-

4.17 The following points are noted regarding baseline traffic volumes in 1997 prior to scheme opening:

- The volume of traffic on the town centre section of the A34(T) through Newbury was around 51,000vpd (AADT) and 53,000vpd (AAWT);
- AAWT traffic volumes on Donnington Link to the north of the town centre were 44,000vpd and 27,400 vpd on Tot Hill Newtown Straight to the south; and
- The AADT volumes for 1995 and 1997 show traffic had grown by 5% on the north and south approaches to Newbury over two years, while traffic had grown in the town centre by only 2%, well below the national average showing that existing congestion was limiting growth in the town centre.

After' Traffic Volumes

4.18 The following sections provide a commentary on flow changes after the scheme opened.

4.19 Flow comparisons for 1997, 1999 and 2003 are given in Figure 4.2 for Annual Average Daily Traffic (AADT) flows and Figure 4.3 for Annual Average Weekday Traffic (AAWT) flows for individual count locations. For the latter, traffic volume changes are summarised in more detail in 4.4 with summaries of traffic volumes across both the A34 Bypass and relieved 'old' A34 shown in Table 4.5.

4.20 Traffic volume changes are discussed below, split into A34 Bypass impacts; Old road (previously A34) and 'other' roads.

4.21 It should be noted that all of the traffic volume changes shown in these figures and tables have been factored to represent Annual figures, i.e. the 'Before' traffic volumes for 1997 represent Annual Average Weekday Traffic (AAWT) for the whole year, and similarly for 1999 and 2003.

4.22 In addition, traffic volumes have been evaluated across three screenlines to guage the increase in volumes across a narrow corridor, consisting primarily of the Bypass and the old A34 through Newbury. Screenlines are simply a collection of counts that together form a representative estimate of traffic crossing a cordon, hence incorporate any re-assignment effects of traffic moving between parallel routes. The results of this screenline assessment are shown in Table 4.5.

A34 Bypass

'Year After Opening'

4.23 In 1999, the first year after opening of the Bypass, the following observations can be made regarding traffic volumes (refer to Figures 4.2 and 4.3 and Table 4.4):

- The Bypass carried around 35 - 39,000vpd (AAWT) and 33 - 37,000vpd (AADT) in the first year after opening;
- Traffic volumes on the old route through Newbury town centre reduced significantly after the Bypass opened to traffic:
  - on Tot Hill Newtown Straight (single carriageway with frontage access) traffic volumes showed a considerable reduction of almost 20,000vpd or 74%, which compared well with the predicted 76% reduction stated at the 1998 Public Inquiry.
  - in Newbury, on the Inner Ring Road, traffic volumes reduced from 53,000vpd (AAWT) in 1997 to 38,000vpd in 1999, a decrease of 15,000vpd or 28% (AADT traffic volumes reduced by 28%); however this was less than the predictions given in evidence at the 1988 Public Inquiry of 36%.
  - on the Donnington Link north of the town, traffic volumes reduced by over 50%.
- The traffic on the A339 Basingstoke Road, south east of the town, increased by 20%, indicating a marked change in travel patterns on this route.

'Five Years After' Traffic Volumes

4.24 The key results for the 'Five Years After' evaluation for the Bypass are also shown on Figures 4.2 and 4.3 and Table 4.4 and the main points on the AAWT Figure are:

- In 2003 the Bypass carried around 40 - 46,000vpd (AAWT) and 38 - 43,000vpd (AADT); and
- Between 1999 and 2003, AAWT flows on the Bypass grew by 5 - 7,000vpd (depending on the section); this rate of traffic growth is between 14% and 18% and is higher than the predicted growth for the West Berkshire area of 9%, as shown in Table 4.1.

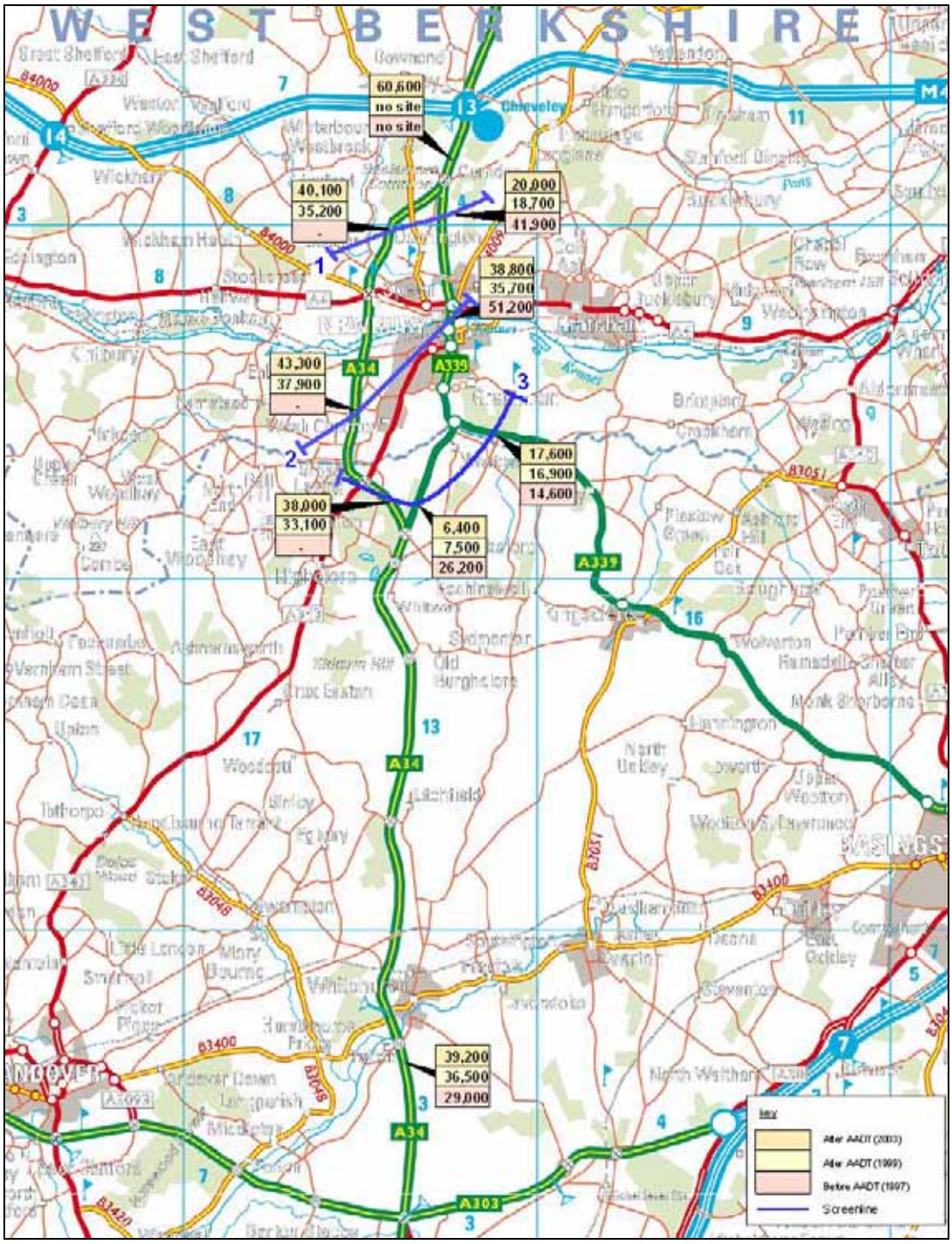

Figure 4.2 – Before and After AADT Volumes in the Newbury Area

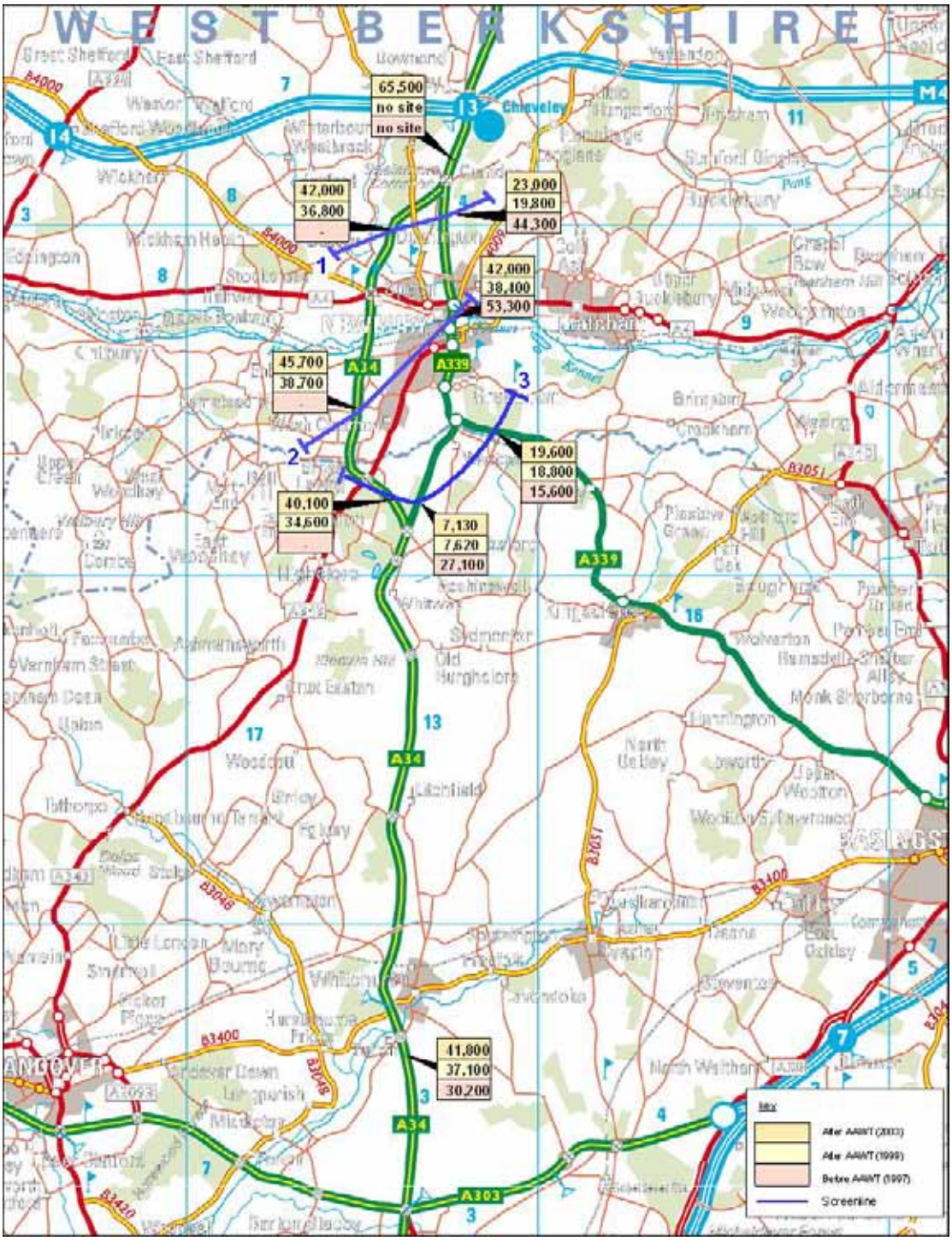

Figure 4.3 – Before and After AAWT Volume Changes in the Newbury Area

Table 4.4 – A34(T) sites on Old and New Route: AAWT Volumes Before and After Opening

Count Site	AAWT 1997 'Before'	AAWT 1999 'One Year'	AAWT 2003 'Five Years'	Change 1997/99	% Change 1997/99	Change 1997/ 2003	% Change 1997/ 2003	Change 1999/2003	% Change 1999/ 2003
The Old Route – now A339									
A34 Donnington Link Road	44,300	19,800	23,000	-24,500	-55%	-21,200	-48%	3,200	16%
A34 Inner Ring Road	53,300	38,400	42,000	-14,900	-28%	-11,300	-21%	3,600	9%
A34 / B4640 Tot Hill Newtown Straight	27,100	7,600	7,100	-19,400	-72%	-19,900	-74%	-500	-6%
A339 Basingstoke Road	15,600	18,800	19,700	3,200	20%	4,000	26%	900	5%
The New Bypass – A34									
North (on screenline 1)	-	36,800	42,000	-	-	-	-	5,200	14%
Central (on screenline 2)	-	38,700	45,700	-	-	-	-	7,000	18%
South (on screenline 3)	-	34,600	39,900	-	-	-	-	5,300	15%

Table 4.5 – A34(T) Corridor Screenlines: AAWT Flows Before and After Opening

Screenline (locations in Figure 4.2)		AAWT (from annual TRADS counts)			Change					
		1997 'Before'	1999 'One Year'	2003 'Five Years'	1997/99		1997/2003		1999/2003	
No	Roads				Change	% Change	Change	% Change	Change	% Change
1	• A34 Newbury Bypass, • A339 Donnington Link Road	44,300	56,500	65,000	12,300	28%	20,700	47%	8,400	15%
2	• A34 Newbury Bypass, • A339 Inner Ring Road	53,300	77,100	87,700	23,900	45%	34,400	65%	10,600	14%
3	• A34 Newbury Bypass • B4640 Tot Hill Newton Straight • A339 Basingstoke Road	42,700	61,000	66,900	18,300	43%	24,200	57%	5,900	10%
	• A34 Whitchurch, south of Newbury (control site)	30,200	37,100	41,800	6,900	23%	11,600	38%	4,700	13%

Old Route through Newbury

'Five Years After' Traffic Volumes

4.25 Traffic flow changes five years after opening were (refer to Figures 4.2 and 4.3 and Table 4.4) :

- AAWT flows through the town centre grew by 3,000vpd, or 9%, between 1999 and 2003, in the years after opening. This is in line with the predicted level of natural traffic growth in the region of 5-9%;
- Since 1999, traffic levels have increased, although 2003 flows were still 11,000vpd lower than the levels reached in 1997 before the Bypass was built. Natural traffic growth has eroded the relief to Newbury town centre only slightly, a key concern at Public Inquiry;
- AAWT flows on Donnington Link were still less than half that before the scheme opening but rose at a slightly higher rate of 16% from 1999 when compared to the predicted level of natural traffic growth of 5-9%. This growth is likely to have been connected with the fact that in 2002, Vodafone, the major employer in Newbury, moved their headquarters from various locations in the town centre to a new office site north of the town (see paragragh 6.14 in the Network and Land Use Changes chapter);
- AAWT flows on Tot Hill Newtown Straight reduced by about 75% after scheme opening and decreased further between 1999 and 2003; and
- Traffic volumes on the A339 Basingstoke Road increased by 5% between 1999 and 2003 (i.e. at half the normal expected regional growth rate), although volumes have increased overall by about 26% on this road since the opening of the Bypass.

Combined traffic in the A34(T) Corridor

Overview

4.26 The 'A34 Corridor' is taken to be the Bypass together with the old route through Newbury.

4.27 Generally there has been a considerable increase in the volume of traffic in this corridor since the opening of the Bypass. The following key points are noted from the screenline results shown in Figure 4.3 and Table 4.5 which compares AAWT flows in 2003 with 1997 along three screenlines, screenline 1, north of the town centre, screenline 2, through the town centre, and screenline 3, south of the town centre:

- An additional 34,000vpd (a 65% increase) was observed between 1997 and 2003 in the A34 corridor across the central screenline 2;
- On a similar basis, traffic levels increased by 47% and 57% on the northern and southern screenlines (1 & 3) respectively; and
- A control site on the A34(T) to the south of the scheme showed an increase of nearly 12,000vpd (or 38%).

4.28 Figure 4.4 – 4.6 show the AAWT traffic volumes on the Bypass and old route of the A34 at the three screenlines in the Newbury corridor. The locations of the three screenlines are illustrated in the map in Figure 4.2. The northern screenline 1 includes a count site on the Bypass, north of the A4, and a count site on the old road north of Newbury, now called the A339 Donnington Link Road.

4.29 Screenline 2 includes the Bypass, south of the A4 and the A339 Inner Ring Road in Newbury town centre, whereas, the southern screenline 3 includes the Bypass, the old road, now the B4640 and the unchanged A339. All AAWTs are based on TRADS count data for the full year, with the exception of the 1998 figures are only up to the end of October factored to a year, i.e. they exclude the short period after the opening of the bypass in the November of that year.

4.30 The annual growth rates of average daily traffic on the Newbury screenlines are compared to the predicted rates in the region and national rate[6] and are shown in Table 4.6 and Table 4.7. AADT has been used for this assessment, as the National and Regional estimates of growth also represent AADT, hence the growth is slightly different when compared to the AAWT growth shown earlier.

Table 4.6 - Annual Changes in Screenline total AADT

Change year on year	Screenline 1	Screenline 2	Screenline 3	National Growth Rural A roads
1997 -98 (pre bypass)[7]	0%	2%	1%	2%
1998 (pre –bypass) – 1999 (post opening)	29%	40%	40%	2%
1999-2000	-2%	1%	-2%	-1%
2000-2001	9%	7%	6%	3%
2001 -2002	4%	3%	4%	2%
2002 -2003	2%	1%	0%	2%

Table 4.7 – Before and After Changes in Screenline Total AADT

	Screenline			TEMPRO			National Growth
	1	2	3	Newbury	West Berkshire	Berkshire	Rural A roads
2 years to 1999 (before /after opening)	29%	44%	41%	3%	3%	4%	3%
5 years post opening to 2003	12%	12%	8%	5%	8%	9%	7%

[6] National traffic growth figures are calculated from the indices specified in *Traffic in Great Britain Q2* 2005.

[7] 1997 and 1998 averages based on January to October only.

4.31 The key points about traffic growth in the Newbury corridor, via the screenline analysis are:

- Between 1997 and 1999, the first year after the opening of the Bypass, there was traffic growth of 29% across the northern corridor screenline and 44% across the central screenline and 41% across the southern screenline compared to the previous year. National and regional annual traffic growth was around 3% for the same period;
- Since 1999, the year immediately after opening, growth in the A34 corridor in the five years to 2003 has been between 12% and 8% compared with a national rate for rural A roads of 7% and Berkshire rates of 9%,
- The three figures clearly show that there was a 'step' change in traffic volumes in the corridor immediately after scheme opening and that since then, growth has been more in line with regional estimates;
- Hence, since the opening of the Bypass, traffic growth in the corridor was significantly above the national rate in the year immediately after the bypass opened but has since reverted to growth rates similar (albeit higher) than national rates. A sudden change in traffic volumes immediately after the opening of a new scheme preceded by a lower growth rate growth indicates that the principal demand response to the bypass has been reassignment
- Although the growth is similar to regional/national rates for the 1999-2003 period, it should be noted that lower growth was observed in 2003, and this was believed to be partly due to the construction works being undertaken for the A34 Chieveley junction improvement to the north of Newbury, hence observed local growth rates for this route may have been lower than regional or national estimates.

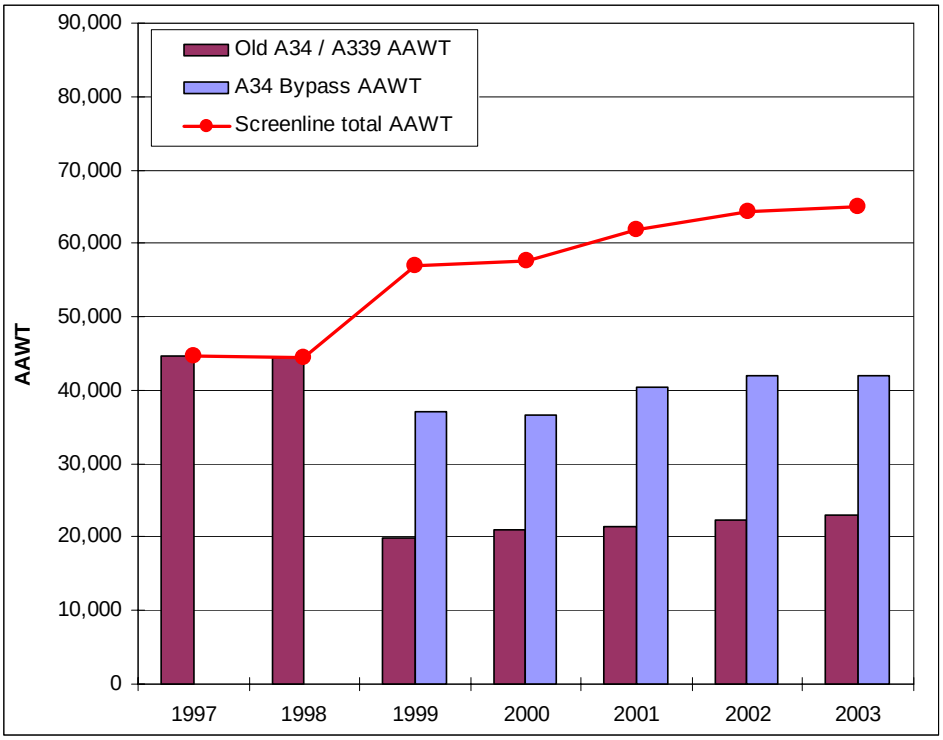

Figure 4.4 – Traffic Growth in A34 Corridor, north of Newbury (screenline 1)

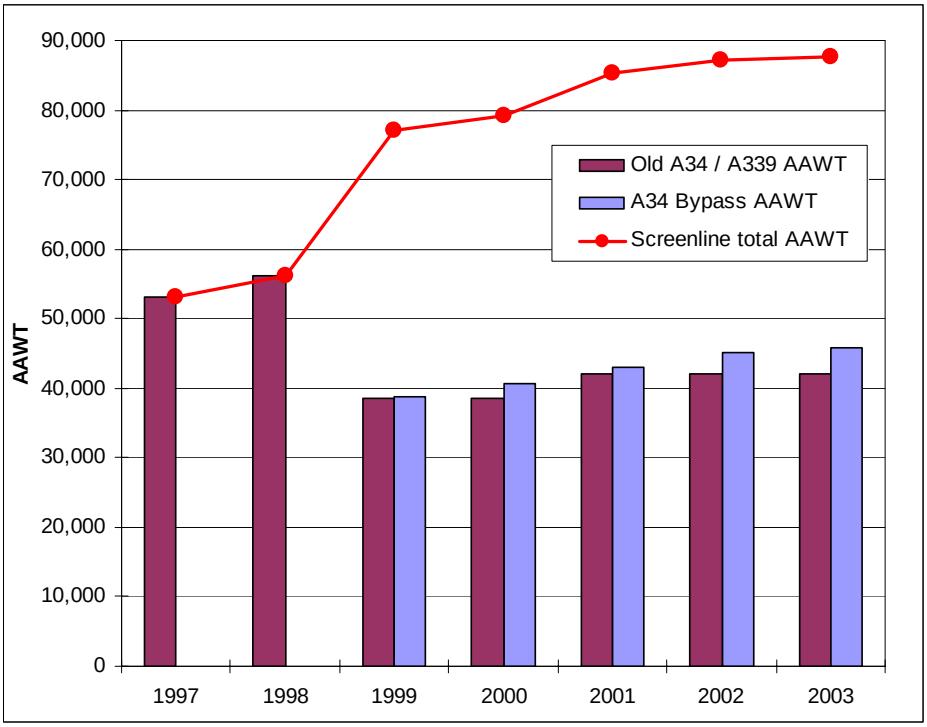

Figure 4.5 – Traffic Growth in A34 Corridor, centre of Newbury (screenline 2)

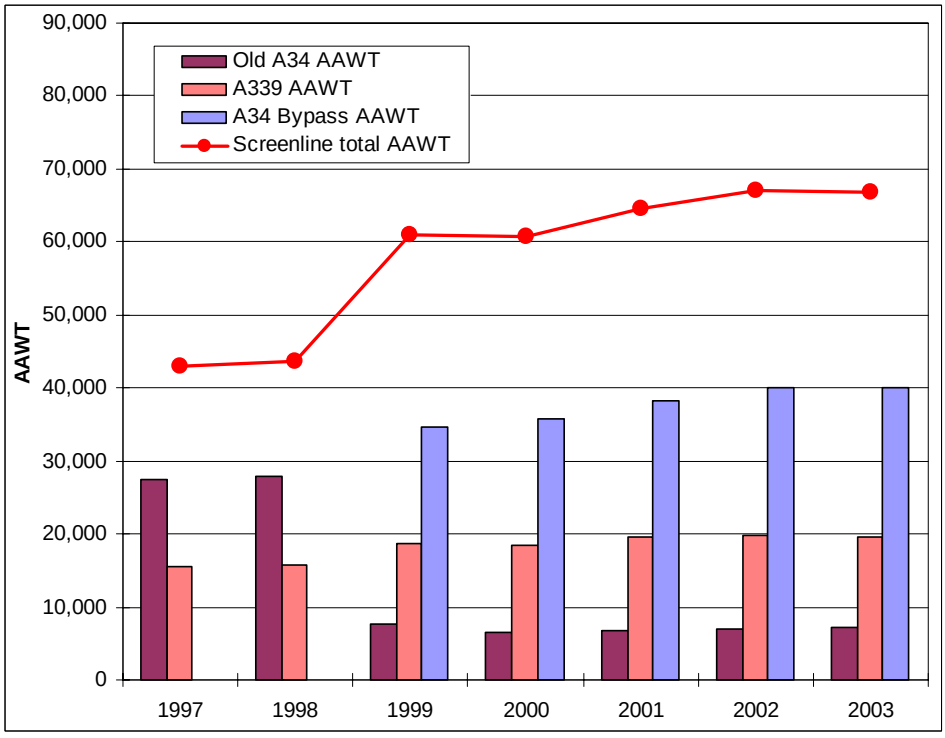

Figure 4.6 – Traffic Growth in A34 Corridor, south of Newbury (screenline 3)

4.32 The increase in traffic in the Newbury corridor between 1997 and 2003 can be explained by a number of factors. These are listed in descending order of importance:

- Traffic re-assignment from other strategic routes across a wider area, taking advantage of the time savings offered by the new scheme;
- Natural traffic growth in the area between 1997 and 2003 (13%) which would have occurred whether the bypass has been built or not;
- Reassignment of traffic from smaller local roads to the relieved old route;
- Additional traffic as a result of changed economic conditions in Newbury after scheme opening. Land use changes are detailed in chapter 6 of this report;
- Redistribution of traffic as a result of reduced congestion in the corridor; and
- Additional trips as a result of reduced congestion in the corridor.

4.33 Strategic traffic reassignment and induced traffic are considered further in the following paragraphs.

Traffic Re-assignment on Strategic Routes

4.34 The opening of the A34 Newbury Bypass scheme has led to a reassignment of traffic from a number of strategic routes across a large part of southern England. The level of traffic reassignment in this wider area has been considered. Additionally, there there will have been some reassignment from local roads after scheme opening, but because count data is not available for these roads, it is impossible to quantify this effect.

4.35 To assess the level of re-assignment, Figure 4.7 illustrates AAWT traffic volume changes between 1997, 1999 and 2003 for strategic routes across southern England, grouping count locations into four strategic screenlines and Table 4.8 shows traffic volumes before and after across the four strategic screenlines.

4.36 The detailed traffic volumes by individual section are contained in Appendix B, but the main points to note on this figure and Table are:

- Screenline 1, north of Newbury shows growth of 12% between 1997 and 1999, before and after opening, against regional growth rates of 4%, which goes someway to explain the increase, but clearly it is higher than regional growth rates;
- Screenline 4 is located some 25 miles to the south of Newbury and is positioned so as to record traffic flows from all the principal strategic routes from which reassignment to the A34 corridor is likely to have taken place. In addition, because it is some distance from Newbury, it will not be affected by reassignment from local roads. Between 1997 and 2003, traffic grew on screeline 4 by 11%, i.e. largely in line with local regional rates. Hence, this shows that there has been no increase in longer trip movements as a result of the bypass. In addition, it also suggests that after the growth step which took place in the A34 corridor in the year following the opening of the bypass, any traffic growth beyond the regional rate has been due to shorter distance movements.

4.37 That local changes in trip movement are an important contributor to traffic growth in the A34 corridor since the bypass opened seems to be borne out with the results of traffic volumes crossing screenlines 2 and 3. These show growths of 19% and 16% respectively between 1997 and 2003 compared with regional growth rates of between 9 and 14%, ie the closer to Newbury then the greater the growth. However, since 1999, growth on screenlines 2 and 3 has been close to the regional rate. This suggests that within the locality of Newbury, the principal local effect has been reassignment from local roads. In summary, traffic growth is obviously significant in the year after opening, particularly in the narrow corridor of the bypass and the old road, but the wider screenline analysis shows that there has been some re-assignment of existing movements from the A350 and A346/A338, A36 through Wiltshire, M3 Motorway north of Winchester and A3 from Portsmouth into the A34 corridor.

4.38 The wider screenline analysis, suggests that longer distance traffic volumes have grown in line with regional growth rates, but shorter-distance Newbury traffic has grown higher than local rates would suggest.

4.39 Figure 4.7 indicates exactly where traffic growth appears to be reduced after opening of the Bypass. The following trends are observed (although the figures quoted are only potential differences in traffic volumes):

- A re-assignment from the A350 - the site on the A350 north of Chippenham shows traffic growth lower than expected from 1999 onwards, such that AAWT volumes in 2003 are potentially 3,000vpd less;
- A re-assignment from the A346/A338 route - the site on the A346 south of Marlborough shows little or no growth from 1997 such that AAWT volumes in 2003 are 3,000vpd less (also shown by next site south);
- A re-assignment from the A36 both north and south of Salisbury;
- A re-assignment from the M3 north of Winchester - M3 traffic volumes in 2003 are potentially 7,000vpd less; and
- A re-assignment from the A3 route, especially north of Havant, where traffic volumes are only 6% than 1999 in 2003.

4.40 This figure shows that re-assignment of around 13,000vpd from other strategic routes could explain part of this additional traffic. However, the likelihood is that re-assignment has taken place from routes even more distant and on which traffic flow data are not available. In the absence of traffic volumes from these other routes, it is impossible to be absolutely sure whether the remainder of this additional traffic is reassigned or induced. However, that most of the additional growth took place immediately after opening is strong evidence that it is due to wider area (or local) re-assignment. This is also supported by the use made of the bypass by HGVs (see next section).

4.41 New developments have also been implemented in the area around Newbury, and some of this additional traffic would also be expected to be as a result of changing economic conditions in the town after scheme opening. This is discussed later in this Report.

Table 4.8 – Strategic screenlines across wider area: AAWT flows before and after opening

Screen-line No (see Figure 4.7**)**	AAWT total across screenline			**1997-99 (1 year before - 1 year after opening)**		**1997-2003 (before – 5 years after opening)**		**1999 -2003 (1 year after – 5 years after opening)**	
	1997	1999	2003	**Change**	%	**Change**	%	**Change**	%
1	115,000	128,400	139,300	13,400	12%	24,300	21%	10,900	8%
2	186,800	210,400	223,200	23,600	13%	36,400	19%	12,800	6%
3	165,300	179,500	192,000	12,200	9%	26,700	16%	12,500	7%
4	172,700	182,200	191,800	9,500	6%	19,100	11%	9,600	5%

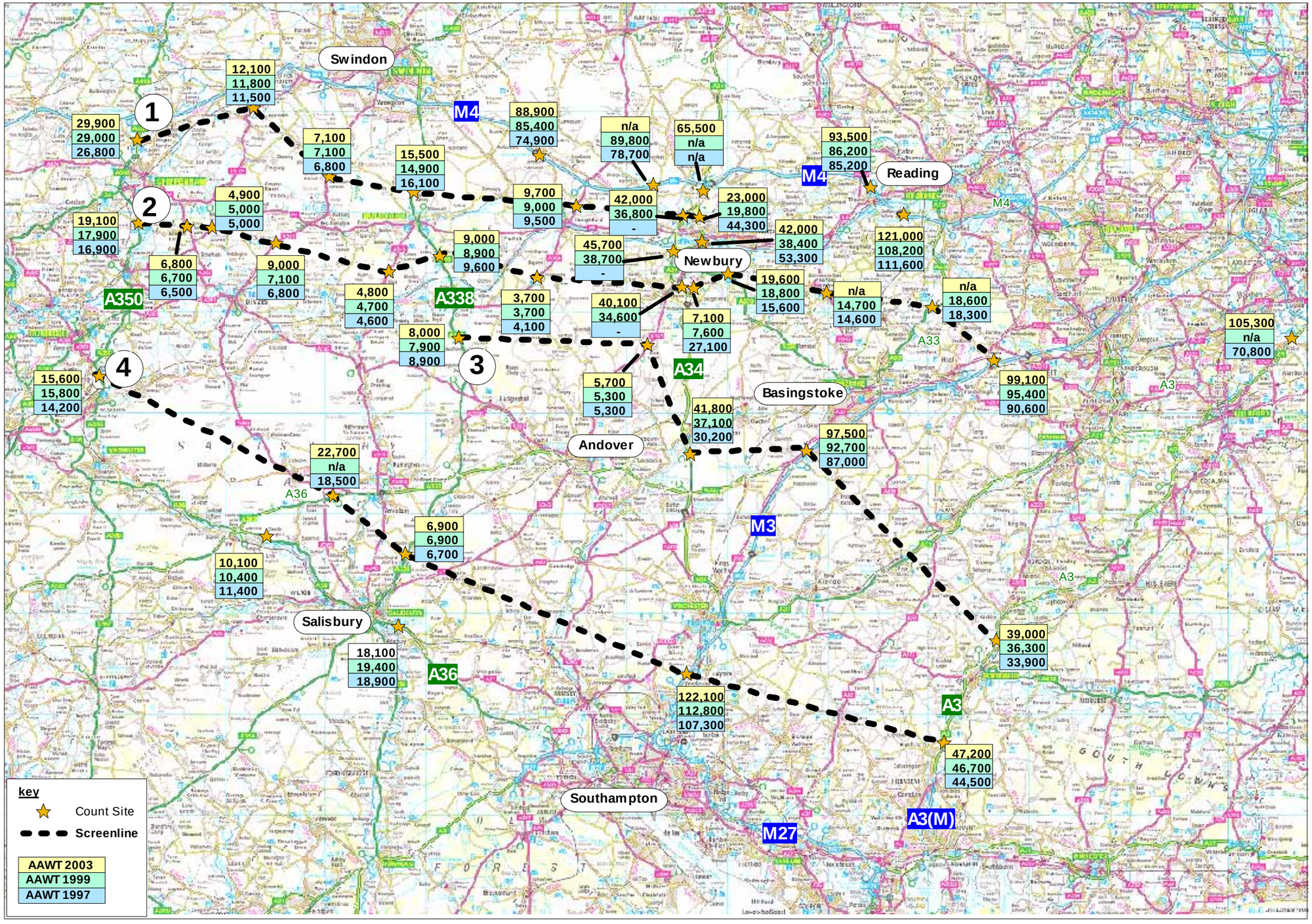

Figure 4.7 – AAWT Flow Changes across Strategic Routes in South England

Induced traffic

4.42 DRMB Volume 12, section 2 describes induced traffic thus:

When a road scheme is opened, a range of responses by travellers can arise. The responses can include all or any combination of the following:

a) change route (reassignment);

b) retime journeys to take advantage of improved conditions at peak times;

c) travel to new destinations for the same purpose as existing journeys, ie redistribution;

d) switch from public transport, cycling and walking to car;

e) reduce the numbers of journeys made as passengers;

f) increase the frequency of some journeys;

g) make entirely new journeys; and

h) change the patterns of land use.

All of these responses can result in extra vehicle kilometrage on the road network - called `induced traffic' - although retiming is compensated for by reduced vehicle trips (and kilometrage) at other times of day and if reassignment involves a more direct route, reduced vehicle kilometrage. The overall amount of induced traffic is the difference in vehicle kilometrage between Do Minimum and Do Something, which is made up of re-assignment effects, plus any suppressed traffic released by the scheme plus any additional traffic induced by the scheme.

4.43 The Working Paper on Induced Traffic for this scheme (1995) cited that the potential for induced traffic was not high on the relieved route other than for re-assignment, as the level of predicted time saving did not significantly reduce the costs of travel for the majority of trips that had the potential to use the bypass. As traffic growth on the A34 corridor, with the exception of the year immediately after opening of the by-pass, has not been significantly higher than that estimated for the Newbury region, then the conclusion reached in 1995, i.e. that induced traffic other than re-assignment will not be significant, has been borne out. Re-assignment, i.e. the transfer of journeys that would have been made in any event to a different route to take advantage of a new facility, is a relatively immediate response and usually largely takes place within a few months of new infrastructure becoming available. That most of the growth in the A34 corridor took place in 1999, the year after the bypass opened, is further evidence that the other components of induced traffic have not been significant and that most of the additional traffic in the A34 corridor since the bypass opened is due to reassignment.

4.44 In summary, in our view, re-assignment has been the dominant response from the opening of the A34 Newbury Bypass. However, from the data available to us, this does not explain the whole increase, particularly in the areas close to the town, and thus in our view, this increase is likely to be a combination of three responses, namely:

- that some movements are now being observed, which previously used smaller unsuitable local roads in the town, i.e. rat-running traffic in the 'before' situation.

This is also reassignment but from roads on which counts were not taken before the bypass opened;

- Increased traffic as a result of new land-use developments close to the town (discussed in Section 6);
- Traffic redistributing to different destinations; and
- Entirely new journeys being made in the town as a result of improved journey times, i.e. induced traffic.

4.45 It is impossible to quantify the relative impacts of each of these responses from the information presented.

Heavy Goods Vehicles

4.46 The A34(T) is a strategic route for HGVs between the south coast (particularly Southampton) and the Midlands. As part of the Five Years After scheme evaluation, HGV traffic has been assessed. Figure 4.8 shows the AAWT flow of HGVs in the A34 corridor in 1997, 1999 and 2003. Note, data is not available for most of the old route through Newbury as the count sites do not differentiate between various types of vehicle.

4.47 The following results are noted regarding HGV traffic:

- The Bypass carried around 8,000 HGV in 2003;
- HGVs comprised 18 - 20% of the total traffic on the Bypass;
- The number of HGVs on the A34(T) south of the Bypass increased by 42% between 1997 and 2003, compared with a smaller, 38% increase in total traffic - this is consistent with the A34 being a more attractive strategic route for HGVs after the opening of the Bypass;
- The number of HGVs on the Bypass increased by 12% between 1999 and 2003, a slightly slower rate of increase than total traffic on the Bypass (i.e. the proportion of HGVs fell slightly in the period); and
- As expected, the volume of HGV traffic on Tot Hill Newtown Straight showed a significant reduction after opening. The observed 84% reduction one year after the scheme is comparable to the predictions given in evidence at the 1988 Public Inquiry, which indicated an 88% reduction in HGVs on this link.

4.48 Traffic data by vehicle type is not available for many of the sites shown in the wider screenline analysis, therefore we cannot comment on whether there has been re-asignment from other roads across the south of England, however it is likely that this has occurred.

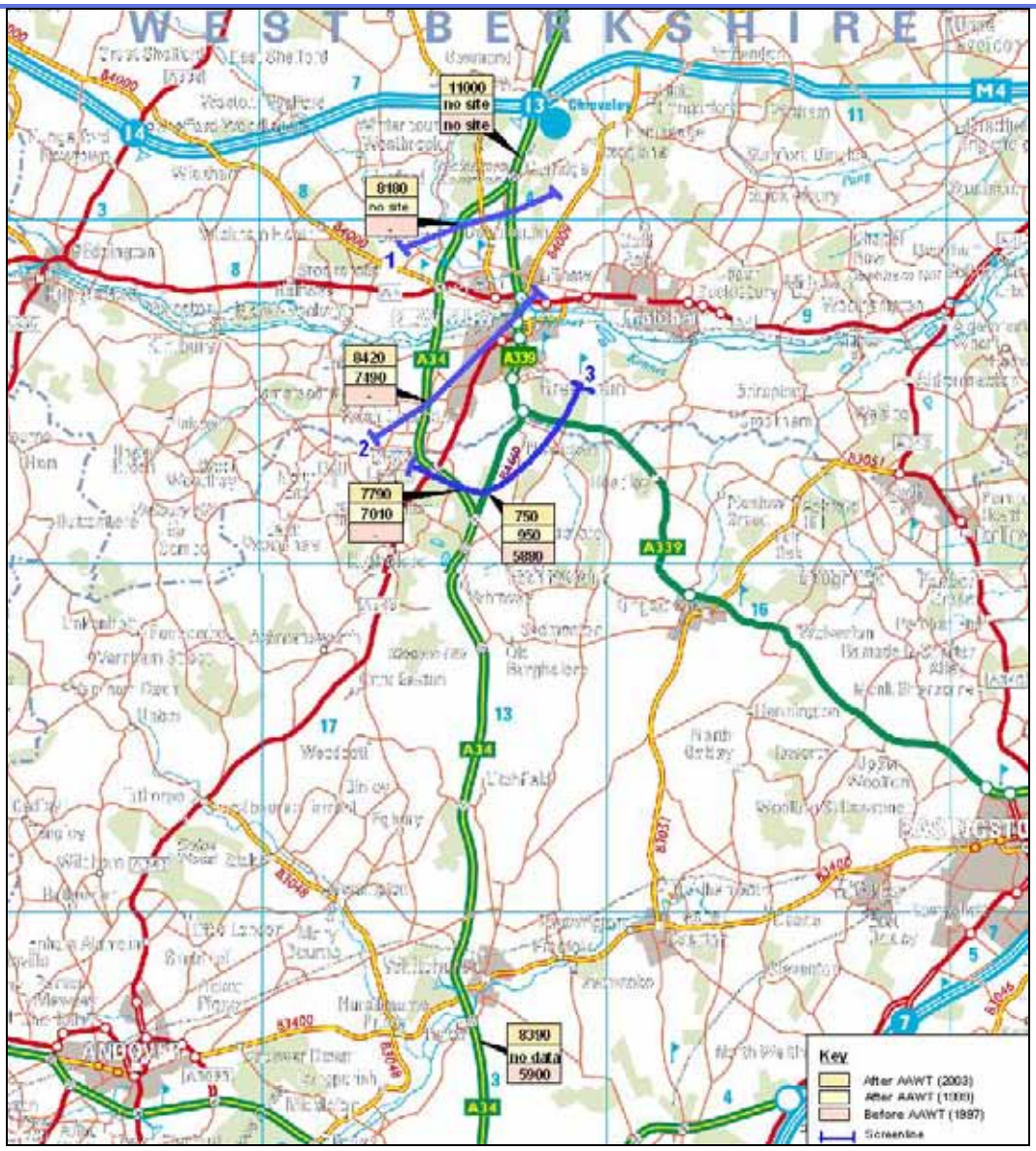

Figure 4.8 – AAWT Heavy Goods Vehicle Flows

Predicted against Outurn Traffic volumes

4.49 The previous sections have outlined in detail the traffic volumes observed both before and after opening of the bypass. This section compares these observed levels with what was predicted before opening, as part of the appraisal of the scheme.

4.50 Following the 1988 public inquiry, new National Road Traffic Forecasts were released, based on revised economic and planning data projections. As a result, the revised traffic model for the 1992 inquiry predicted traffic volumes that were 50-60% higher than used in the 1988 Public Inquiry. The 1992 traffic model was also used for the 1995 review report from which the decision was ultimately made, hence this section is based on traffic volume comparisons from these 1992 predictions.

Old Route: Predicted Flows in 1998, prior to Bypass opening

4.51 The validity of the forecasts (predictions) for the period just before the opening of the Bypass was examined in Mott MacDonald's '*A34 Newbury Bypass Before and After Traffic Study'.* As detailed in Table 4.9, this compares the forecast traffic volumes for high and low growth on the A34 without the Bypass, with the observed flows in May 1998. The 1998 forecast figures were interpolated between the 1990 modelled year and the 2010 design year forecasts preduced for the 1992 inquiry.

Table 4.9 – Comparison of 1998 Observed Traffic Counts and Forecast flows without Bypass

12 hour flows Mon-Thur in May	1998 (before Bypass opening)			
	High/Low Growth	Forecast High Growth 1998	Observed Flow in May 1998, before bypass opening	difference
A34 Donnington Link, north of Newbury	low	31,980	35,671	1% above high growth
	high	35,180		
A34 Inner Ring Road, south of A4	low	44,660	44,304	1% below low growth
	high	48,900		
A34 Tot Hill, south of Newbury	low	17,700	20,650	6% above high growth
	high	19,460		

4.52 This table shows that the counts on the A34 north and south of the town, the Donnington Link and Tot Hill were just above the high growth prediction whilst the flows on the Ring road near the town centre was slightly below the low prediction. These results suggest that:

- Traffic volumes on the Inner Ring Road were predicted to be higher than those observed, showing that traffic movements were being suppressed in the town centre due to existing congestion; and
- The predictions for the situation without the Bypass were in line with observed levels in May 1998, five months prior to the opening of the Bypass.

Old Route: Predicted 'no bypass' Scenario

4.53 Table 4.10 shows the predictions on the A34 old route in 2010 in a situation where no bypass is built, and represents an estimate of how the situation would worsen in these years if the Bypass had not opened.

Table 4.10 – Predicted 12 hour Flows without Bypass

12 hour flows		2010
Road	Growth	Forecast without bypass
A339 Donnington Link, north of Newbury	low	39,300
	high	47,300
A339 Inner Ring Road, south of A4	low	54,800
	high	65,400
B4640 Tot Hill, south of Newbury	low	21,900
	high	26,300

4.54 The key points seen in this table are:

- Traffic volumes on the all of the sections of A34 would increase by around 35% between 1998 and 2010;
- This would result in traffic volumes being higher than the theoretical capacity of the road; hence;
- There would inevitably be in practice a significant re-assignment of traffic away from the A34 onto unsuitable smaller roads (rat-running), or a significant level of trip suppression.

Old and New Routes: Observed flows after Bypass opening vs. predicted flows for the bypass scenario

4.55 Table 4.11 compares the predicted and observed flows on the old and new routes for 1999 and 2003.

4.56 The key points shown in this table are:

- Traffic volumes on the Bypass were underestimated significantly by the model, with observed traffic volumes in 1999 being 15-44% below high growth estimates and 52-91% below Low growth estimates;
- In 2003, the under-predictions increase to 43-74% for low growth and 65-101% for high growth;
- The traffic volume predictions for the bypassed section are much closer to observed levels both in the year after opening and five years later;

4.57 In summary, these tables show that traffic volumes predictions were too low on the Bypass itself, but were closer to observed on the bypassed section of A34, particularly in the town centre and to the north of the town.

4.58 In our view, there are four reasons for the under-prediction on the Bypass, namely:

- The appraisal was based on a traffic model, which did not consider wider re-assignment and the previous section shows that this has been the dominant response to the opening of the Bypass. The network used for the appraisal of this scheme in shown in Figure 4.9 and clearly shows that the area used in appraisal was limited to the area around Newbury, extending to Reading to the East. This geographic coverage was not sufficient to assess the impact of wider re-assignment as identified earlier in this section;
- There is likely to have been re-assignment from local roads in the Newbury area, back to the relieved A34, as indicated by the wider screenline analysis, which suggested additional trips across screenlines 1-3, however there are many minor roads crossing this screenline where traffic counts were not available;
- Increased trip making in the local area from land use changes that have occurred since the opening of the Bypass, but were not considered as apart of the appraisal, particularly the re-development of Greenham Common and the re-location of Vodafone next to the relieved 'old' A34; and
- There may have been a certain amount of redistributed traffic for more local journeys, however this is impossible to quantify given the availability of count data in the area.

Table 4.11 – Comparison of 1999 and 2003 Observed 12 Hour Traffic Counts since Bypass opening with Forecast flows

		1999			2003		
		Forecast with Bypass	Observed with Bypass	% diff	Forecast with Bypass	Observed with Bypass	%diff
A339 Donnington Link, north of Newbury	low	17,425	17,102	-2%	18,725	19,137	2%
	high	19,270		-11%	21,390		-11%
A339 Inner Ring Road, south of A4	low	28,235	32,412	15%	30,295	34,924	15%
	high	31,070		4%	34,390		2%
B4640 Tot Hill, south of Newbury	low	3,830	6,713	75%	4,110	6,131	49%
	high	4,190		60%	4,630		32%
A34 Bypass North of A4	low	15,355	29,333	91%	16,535	33,226	101%
	high	20,355		44%	19,070		74%
A34 Bypass South of A4	low	20,700	31,473	52%	22,300	36,719	65%
	high	27,440		15%	25,680		43%
A34 Bypass South of A343	low	15,255	27,391	80%	16,435	31,706	93%
	high	20,210		36%	18,905		68%

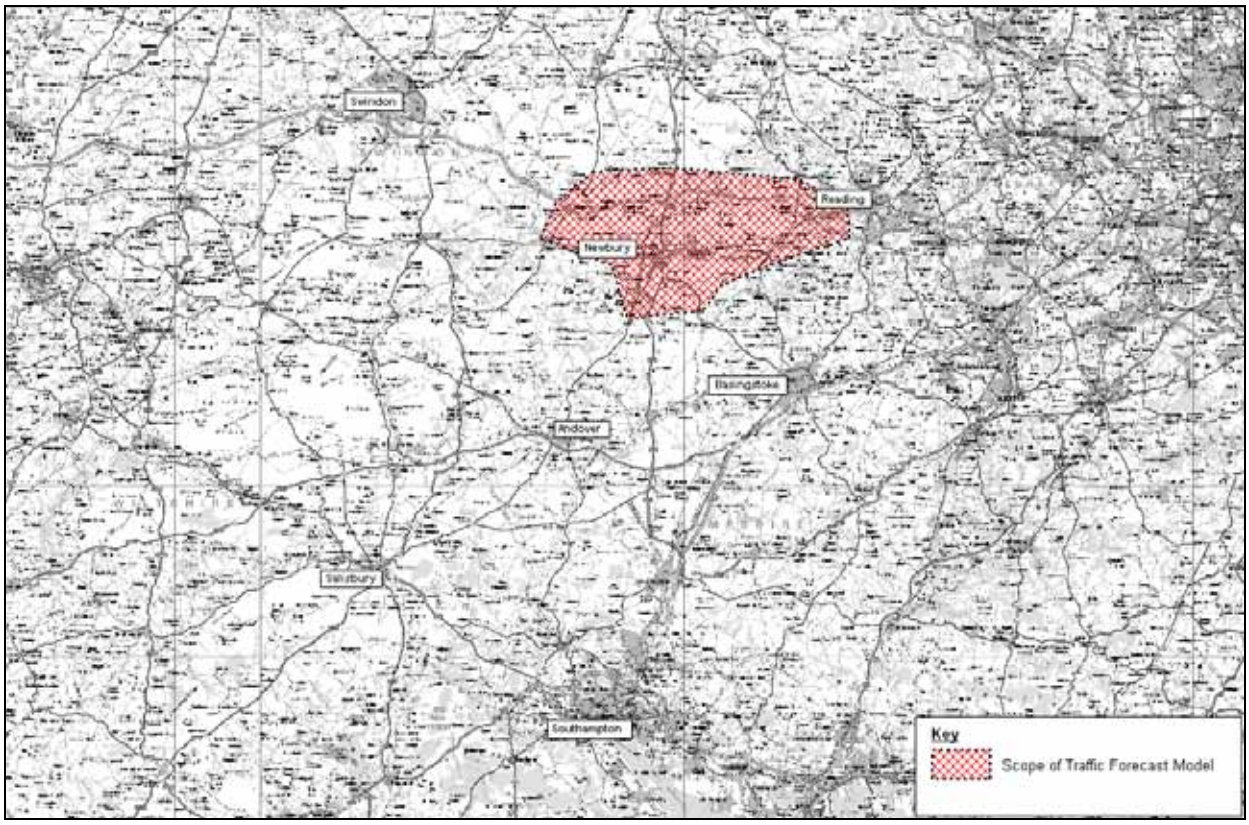

Figure 4.9 – Geographic Area used in the Appraisal of A34 Newbury Bypass

Main Traffic Conclusions

- ***Traffic in the A34 corridor was growing strongly before the opening of the Bypass.***
- ***In the first year after opening, the Bypass carried between 33,000 – 37,000 vehicles per day (vpd) for an Average day (AADT)***
- ***Traffic growth in the A34 corridor (including the Bypass and the old route through Newbury) one year after the opening of the Bypass was 33%-47% (depending on section) and after five years was 48-65%, significantly above regional and national growth forecasts.***
- ***In the year after the Bypass was opened there was a reduction in traffic on the old route through Newbury – significantly, on some links:***
  - ***The level of relief through the town centre was 15,000 vehicles per weekday or 28% of traffic, which is lower than the 36% prediction given in evidence at the 1988 Public Inquiry, suggesting that some local traffic has re-assigned back onto the A34, which previously avoided the route;***
  - ***but on other links the reduction in traffic was 55-72%, in line with predictions.***
  - ***14 substantial developments have taken place in Newbury since the bypass opened. Since these were not taken into account in the forecasts, they will be a significant reason why observed flows on the old and new routes are greater than was forecast.***
- ***However, after the opening of the Bypass there was a 20% increase in traffic on the A339 Basingstoke Road, which is related to both re-assignment of traffic into the A34 corridor and recent developments in the area, which has increased traffic volumes.***
- ***In 2003, the Bypass carried around 38,000 – 43,000 vpd AADT, significantly exceeding the high growth predictions of 27 – 36,000 vpd AADT by 2010.***
- ***There was a step change in the volume of traffic using the A34 corridor in the year imeediately after opening and a reversion to growth rates in line with regional rates in subsequent years. This suggests that reassignment has been the dominant response to the scheme.***
- ***Between 1999 and 2003, traffic levels have grown on the old route after the opening of the Bypass; although by 2003 weekday traffic levels through the town centre were still 11,000 vpd lower than before the Bypass. On other links the significant traffic reductions have been maintained. Current traffic growth has therefore eroded only slightly the relief to Newbury town centre gained by the Bypass, a key concern at Public Inquiry***
- ***The proportion of trucks (HGVs) using the Bypass five years after opening is 18-20%: the proportion of HGVs has fallen slightly over the five years since opening.***
- ***Traffic in the narrow corridor (Bypass and old road) has increased by 10-15% between 1999 and 2003 (compared to 9% regional traffic growth estimated for the region over the same period), hence after the first year of opening, traffic growth has not been dissimilar to 'normal' traffic growth.***
- ***The predictions of traffic volumes for this scheme were low for the Bypass itself, which is explained mostly by the area used in the appraisal, which was too restricted. Our analysis has shown that traffic has re-assigned***

onto A34 from many routes throughout southern England, and this was not taken into account in the appraisal process.

- ***The wider screenline analysis, whereby traffic volumes are counted across a wide cordon in the region has been assessed and shows that the increase since opening relates primarily to a re-assignment of traffic from other strategic routes across southern England, plus additional traffic as a result of changed economic conditions in Newbury; traffic induced solely as a result of increased road capacity is thought to have contributed a relatively small proportion of the growth.***

5. Journey Times

Introduction

5.1 This Chapter considers the journey time changes that have taken place on key routes since the Bypass opened to traffic.

5.2 It has not been possible to locate any journey time data collected just before or just after the scheme opened. The only survey data available for this evaluation are 2003 journey times collected specifically for this report.

5.3 In order to make a comparison of changes in journey times, the 1997 'before' journey times have been estimated using COBA, the Government's economic appraisal program, which estimates journey times based on observed traffic volumes. These have then been compared with the 2003 observed data.[8]

5.4 Finally these estimated outturn time savings have been compared with previous time saving predictions for the first year of operation of the Bypass.

Estimating Journey Times Before Scheme Opening

5.5 It is well established that journeys through Newbury before the Bypass was built were significant and unreliable. At the 1988 Public Inquiry, it was noted that journey times on the old route could be up to 50 minutes over a section which could be negotiated in 5 minutes during periods free from congestion. However, the only data available to us suggested that more typical journey times were between 10 and 20 minutes for journeys through Newbury on the A34.

5.6 Table 5.1 summarises estimated 1997 journey times from the COBA program that was used for the appraisal of this scheme.

5.7 This table shows that the section of A34 between M4 Junction 13 and Litchfield junction, south of Newbury shows that for the Inter-peak periods journey times of 10 minutes are shown in each direction, but vary between 17-20 minutes in the peak hours.

Table 5.1 – Predicted Journey Times (Mins) on Old Route in 1997

COBA 'Do Minimum' (mm:ss)	Low Growth	High Growth
North AM	16:57	17:02
North IP	9:58	10:03
North PM	17:18	17:32
South AM	19:20	19:04
South IP	10:34	10:39
South PM	18:37	18:07

[8] In the following text, 'Do Something' refers to the network with the scheme and 'Do Minimum' is the base network with highway improvements

Journey times in 2003

5.8 Journey time surveys were undertaken on Tuesday 24, Wednesday 25 and Thursday 26 June 2003 along the routes shown on Figure 5.1, namely:

- Bypass: A34(T) Newbury Bypass - M4J13 to junction near Litchfield;
- Old Route: A339/B4640 through Newbury town centre - M4J13 to junction near Litchfield; and
- A4 bisecting the Bypass and A339 in Newbury - A338 Hungerford to M4J12.

5.9 Surveys were undertaken during the morning (07:30 – 09:00) and evening (16:30 – 18:00) peak periods as well as during an inter-peak period (10:00 -11:30). At least six runs in each direction were carried out on the Bypass and route through Newbury and four runs in each direction on the A4.

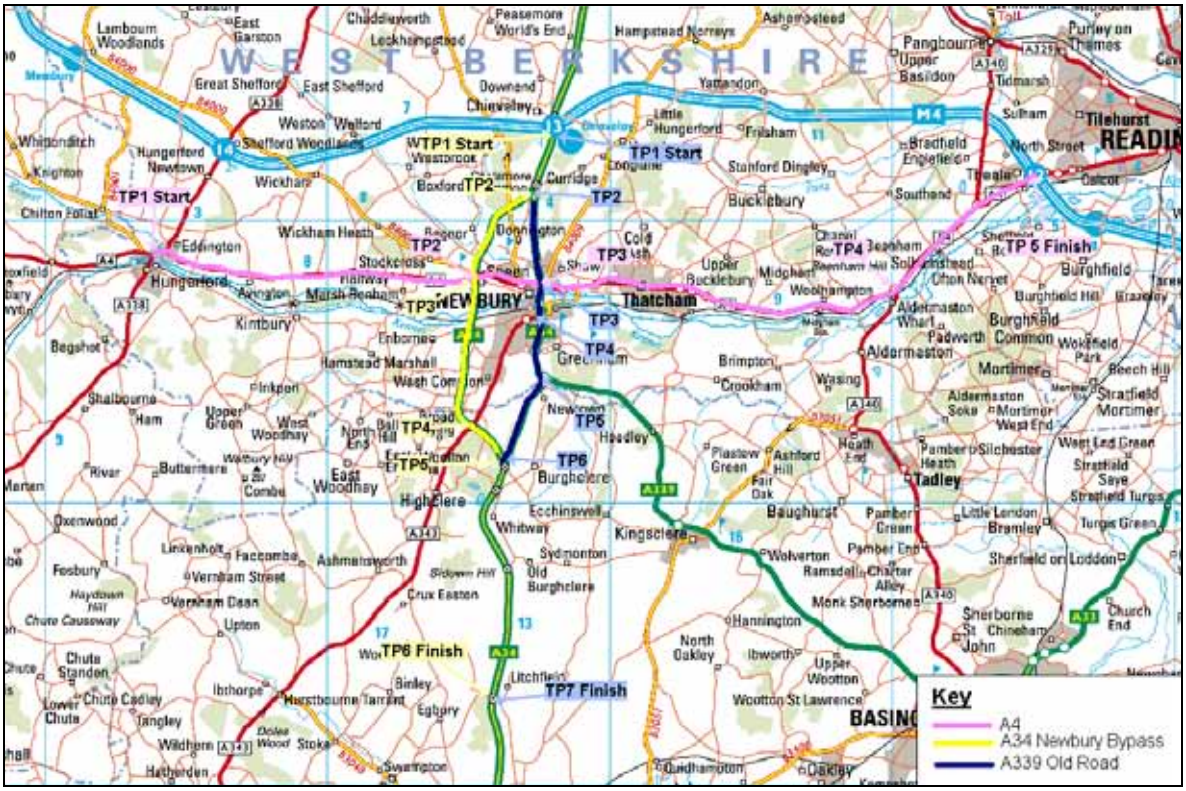

Figure 5.1 – Journey Time Survey Routes

5.10 Averge journey times by time period and direction on the Bypass and the old route through Newbury are shown in Figure 5.2 below.

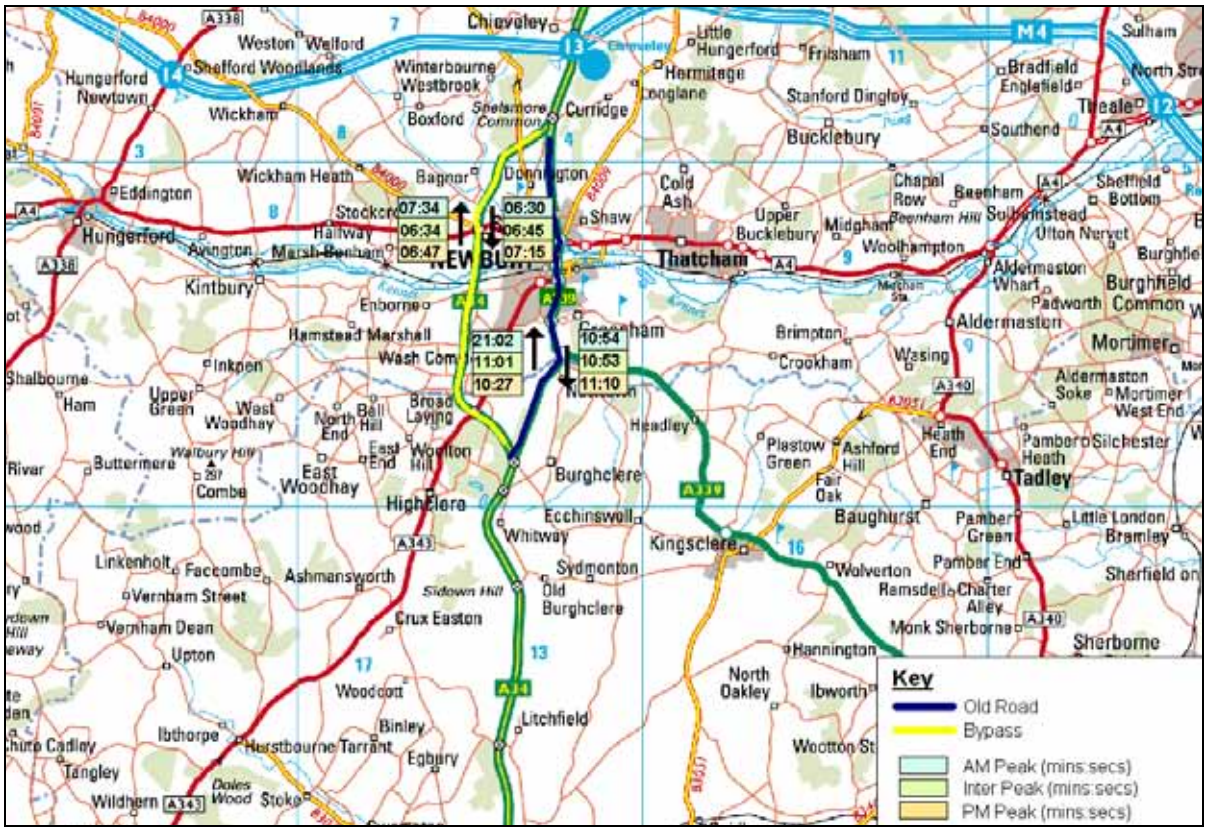

Figure 5.2 – Journey Time Survey Results in 2003

5.11 The key points arising from Figure 5.2 are:

- Journey times on the Bypass were observed to take a constant 6.5 to 7.5 minutes throughout the day;
- Journey times on the old route were around 11 minutes throughout the day for all time periods, however northbound in the morning peak the journey time was 21 minutes; and
- The results indicated a general time saving of around four minutes for through traffic using the Bypass, and 14 minutes for northbound through traffic in the AM peak.

Comparison with COBA estimates

5.12 Journey times for 2003 have also been estimated using COBA and compared to the observed values as summarised in Table 5.2 and Table 5.3 for the Bypass and old route respectively.

Table 5.2 – COBA Estimated and Observed Journey Times on Bypass (2003)

COBA 'Do Something' (mm:ss)	Low	High	*Observed*
North AM	7:13	7:14	*7:34*
North IP	7:14	7:15	*6:34*
North PM	7:13	7:14	*6:47*
South AM	7:01	7:02	*6:30*
South IP	7:02	7:03	*6:45*
South PM	7:01	7:02	*7:15*

5.13 The results in Table 5.3 shows a close match between estimates from COBA and observed values with journey times on the Bypass in the region of seven minutes throughout the day in both directions.

Table 5.3 – COBA Estimated and Observed Journey Times on Old Route (2003)

COBA 'Do Something' (mm:ss)	Low	High	*Observed*
North AM	14:40	14:52	*21:02*
North IP	9:25	9:28	*11:01*
North PM	10:38	14:54	*10:27*
South AM	15:14	15:51	*10:54*
South IP	9:39	9:57	*10:53*
South PM	10:46	11:55	*11:10*

5.14 COBA estimated and observed journey time comparisons on the old route shown in Table 5.3 are less favourable. The observed northbound journey time in the AM peak is around six minutes longer than estimated by COBA and the observed southbound journey times are 4 to 5 minutes faster. Other time periods and directions however show a close fit between COBA predicted and observed times.

5.15 These differences are probably due to the range of factors influencing journey times through the centre of Newbury. Some differences between COBA and observed journey times would be expected as at the time the COBA model was constructed it may not have been possible to predict all the speed limit reductions and traffic calming measures which have been implemented in the town by the local authority.

5.16 Overall the validation indicates broadly the journey times estimated by COBA are of a similar 'order of magnitude' to observed values. However, some discrepancies have been identified for individual peak periods.

'Predicted vs. Actual (Estimated) Journey Time Savings

5.17 The time savings predicted originally for this scheme were:

- 15 minute time savings for traffic in peak periods using the Bypass in the opening year (high growth) compared to the A34 before opening;
- Less significant benefits were predicted outside the peak periods (2 minute time saving), with the junction delays in Newbury being offset by the longer travel time on the Bypass (i.e. due to the longer distance);
- 8 minute time savings were predicted for traffic on the old route through Newbury in the peak periods in the opening year (high growth), a less significant benefit than on the Bypass as a result of traffic growth/infilling on the existing route; and
- Small time savings of 1 minute for traffic in the inter-peak period.

5.18 In the absence of 'before' scheme journey time surveys, this evaluation is based on a comparison between the estimated 1997 journey times and the 2003 actual journey times, as shown in Table 5.4 below. The 'before' journey times are ESTIMATED, and hence care should be taken when comparing observed and predicted journey time savings.

Table 5.4 – Time Savings on Bypass compared to Old Route

(minutes)	Period	Estimated Journey Time (DM) 1997	Observed Journey Time (DS) 2003	Saving (1997/2003)	*Predicted Saving ('High Growth') 1998*
Bypass	Peak	18	7	11	*15*
	Inter-peak	10.5	6.5	4	*2*
Old Route (A339/B4640)	Peak	18	13.5	4.5	*8*
	Inter-peak	10.5	11	- 0.5	*1*

5.19 The predicted saving for Do Something (DS) over Do Minimum (DM) was 15 minutes for the Bypass in opening year, which compares to an estimated outturn 11 minute saving after 5 years.

5.20 It was predicted that journey time benefits would be significant in the peak periods, but much less significant during inter-peak periods. The estimated outturn results confirm this prediction, with inter-peak time savings of 4 minutes for traffic using the Bypass. The predicted saving was 2 minutes.

5.21 Smaller estimated outturn time savings of 4.5 minutes in the peak periods were observed on the old route compared to the predicted value of 8 minutes. However this is more likely due to the traffic calming and speed limit reductions on this route after the Bypass opened (as detailed in Table 6.1) that have been implemented but were not considered in the predictions.

Journey Times Conclusions

- ***Before the Bypass opened, journey times showed variance between peak hours indicating that journey times were unreliable, and on peak days, congestion and delay were significant;***
- ***After the bypass opened, journey times for north-south movements and vice versa were a consistent 6-7 minutes showing that journey times had improved and that reliability had improved***
- ***Journey times on the old route in 2003 had improved to be 10-11 minutes throughout the day, except for AM Peak northbound, which showed times of 21 minutes;***
- ***Actual journey time savings compared to the 'before' situation are difficult to quantify with any certainty given the lack of 'before' journey time data, but estiames of 4-8 minutes are typical, however, given the unreliability of journey times before opening, this should be regarded as a minimum reduction;***
- ***In terms of actual and predicted savings, on the bypass, the 'best' estimate of journey time savings is 11 minutes against a prediction of 15 mins, and on the old road, for nearly all time periods and directions the 'best' estimate of saving is around 9 mins against a prediction of 8 mins, however for the AM peak northbound, the saving is less, but again the 'before' journey time is an estimate and should be treated with caution; and***
- ***Out of peak hours, on the bypass, the 'best' estimate of time savings are 4 mins, against a prediction of 2 mins, with limited savings on the old route in the inter-peak; and***
- ***Again the before journey time represent 'typical' conditions, i.e. no delays due to incidents or accidents or delays caused by trucks/buses making stops etc, and hence these times in our view represent a minimum time and thus, if journey times were available, we would estimate that observed times would be higher.***

6. Network and Land Use Changes

Introduction

6.1 The 'Five Years After' Evaluation considers the longer term effects of the Bypass, including new development, land use changes and road network changes and this section looks at what has changed in the town since opening of the Bypass, and whether the bypass tself has influenced this change.

The MON 4 Form

6.2 For POPE, the Agency specifies a range of information that should be collected for the 'Five Years After' evaluation, called the 'MON 4' form. A copy of this form for the Bypass is included in Appendix A.

6.3 This form requires the following to be listed in terms of network and land use changes:

- Network/land use changes that were considered in the forecasting process, but were not fulfilled;
- Network/land use changes that were not considered and were fulfilled;
- Network/land use changes that were considered and were fulfilled; and
- Network/land use changes that were built and were conditional on the scheme.

Network Changes

6.4 Network changes that have taken place after opening of the Bypass are provided in Table 6.1, and summarised below.

6.5 Network changes include the pedestrianisation of Northbrook Street in 1999. West Berkshire Unitary Authority waited for the Bypass to open before this scheme was implemented. The scheme is considered to be conditional on the Bypass, as the traffic relief as a result of the scheme provided opportunity for West Berkshire to introduce traffic management in the town centre.

6.6 The new roundabout off the A339 Donnington Link Road and changes to speed limits are related to the Vodafone development and were not considered in the forecasting process (COBA DS model does not include a junction for the new roundabout). New at-grade pedestrian crossings on the A339 were provided as part of planning permissions for development.

6.7 In summary, there has been a number of traffic management schemes implemented in the town (largely speed limit reductions) that were not considered at the time of appraisal but have been fulfilled, and hence these will have had an impact on the journey time savings when compared to the 'before' situation.

Table 6.1 – Network Changes in Newbury After Scheme Opening

Name of Scheme	Description	Comments for MON 4
Northbrook Street Pedestrianisation	Pedestrianisation of Northbrook Street in Newbury town centre	Network change that was conditional on the scheme; fulfilled.
A339 speed limits	Speed limits on A339 through Newbury (between Robin Hood and Queens Road roundabouts) have been reduced from 50 to 30 or 40 mph	Not considered but fulfilled
New roundabout on A339 Donnington Link Road	New at-grade roundabout on A339 as part of Vodafone development	Network change that was not considered and was fulfilled
A339 Donnington Link speed limits	Speed limits reduced from 70 to 50 mph on A339 Donnington Link south of the new roundabout for access to Vodafone (and 40 mph over a short section)	Network change that was not considered and fulfilled
Pedestrian crossings on A339	Two new at-grade Toucan crossings on A339 as part of planning permission for developments	Network change that was not considered and fulfilled
Traffic signing for A339 traffic	Traffic signing to route northbound traffic from A339 via B4640 to the Bypass	Not considered but fulfilled

Land Use Changes

6.8 The Working Paper on Induced Traffic, produced following the A34 Newbury Bypass review, noted that the traffic forecasts presented at the 1988 Public Inquiry allowed for the developments anticipated by the local authorities at that time. However, it does not provide the specific details to classify developments on the MON 4 form.

6.9 The Working Paper noted that the Local Plan did not indicate any areas for development which could be linked to the completion of the Bypass, although it was noted that 'greenfield' sites in the vicinity of the Bypass could be subject to development pressures.

6.10 The Working Paper also commented that since the previous Public Inquiries the former Greenham Common Airbase was identified as a development area, however this was not considered as part of the appraisal process, hence this development has been classified as a land use change that was not considered in the forecasting process and was classified as 'fulfilled' on the MON 4 form.

6.11 Table 6.2 summarises the major developments that have taken place in the Newbury area in the last five years (since the bypass has opened) including office, industrial, retail and residential development.

Actual Development

6.12 The developments that have taken place were not considered to be conditional on the construction of the Bypass or the result of the additional road capacity. The developments are related largely to changed economic conditions in Newbury, as a result of the traffic relief to the town centre with improved journey times and enhanced reliability.

Table 6.2 – Major Developments in Newbury After Scheme Opening

Name of Development	Use Class, Brownfield/ Greenfield	Size of Site, Gross Floor Area	Description
Vodafone	B1 Greenfield	17 ha 51,560m^2	Vodafone headquarters relocated from sites in Newbury town centre to Greenfield site off A339 north of town
New Greenham Park	B2 Brownfield	4 ha 5,900m^2	Industrial development on former airbase site (planning permission also granted for B1 and B8 use)
Pinchington Lane Retail Park	A1 Greenfield		Retail park off A339 south of Newbury town centre
Industrial development, Hambridge Road	B1, B2 and B8 Brownfield	1 ha 3,967m^2	Redevelopment of former BP depot. Office development completed, general industrial and storage and distribution permitted
Newbury Business Park	B1 Greenfield	2 ha 4,641m^2	Phase 6 of development
Newbury Racecourse	D2 Brownfield	1 ha 3,004m^2 (net gain)	Redevelopment of two grandstands, includes exhibition facility and restaurant/bars
Waitrose superstore	A1 Brownfield	2 ha 4,157m^2	Retail food store on site of former Vodafone offices and former residential
Newbury and Thatcham Hospital	C3 Greenfield	9 ha 8,274m^2	New hospital development on Greenfield site
Newbury College	C2 and D1 Greenfield	16 ha 20,920m^2	Educational college and residential conference/training centre
Woodlands Housing Development	C3 Greenfield	7 ha 201 dwellings	Phase 10 of residential development, Dunston Park, Thatcham
Housing development Kings Road, Newbury	C3 Brownfield	1 ha 98 dwellings	Housing development on former BT site
Kennet Heath Housing Development	C3 Brownfield	26 ha 654 dwellings	Housing development on former MOD site, Thatcham (some under construction, some permitted)
Housing development, Newbury racecourse	C3 Greenfield	11 ha 180 dwellings	Housing development on part of Newbury Racecourse land under construction
Housing development, Oxford Road	C3 Brownfield	4 ha 127 dwellings	Housing development on former site of Newbury College under construction

Note: ha = hectares, A1 = retail, B1 = office, B2 = general industrial, B8 = storage and distribution, C3 = residential, D1 = non-residential institutions, D2 = leisure

6.13 Table 6.2 shows the range of development that has taken place, both on 'greenfield' and 'brownfield' sites, although a large number of the developed 'greenfield' sites are near the A339 on the old route. It is clear therefore that these land use changes will lead to increased traffic on the old A34, further explaining traffic increases compared to the Before situation and the comparisons between actual and predicted traffic volumes as these land use changes were NOT considered in the original appraisal process.

6.14 The Vodafone development, located off the A339, is a new development on a Greenfield site out of the town centre, although Vodafone's relocation to this site was as a result of a rationalisation of operations as the company was based previously across several offices in the town centre. A new roundabout was constructed for access to this development off Donnington Link Road. A Travel Plan with measures to encourage access by sustainable modes was a condition of the planning permission, which includes a bus service between the site and town centre, funded by Vodafone as part of a Section 106 Agreement. West Berkshire Unitary Authority does not consider this development to have been conditional on the scheme.

6.15 The Greenham Park development on the former Greenham Common Airbase site is another example of a new development after opening of the Bypass, although again this scheme was not said to be conditional on the scheme. This is an industrial development and Greenham provides a bus service for access to the site.

Network and Land Use Conclusions

- ***In the five years since opening, there have been only relatively minor network changes in the area affected by the Bypass, and these are traffic management changes implemented by the Local Authority, such as the pedestrianism of Northbrook Street which was implemented after opening of the bypass as well as changes resulting from new access junctions to the new developments.***
- ***The reduction in road traffic volumes on the old route has not been used to develop bus priority.***
- ***There have been a number of new land-use developments since the opening of the Bypass, including redevelopment of GreenhamPark and relocation of Vodafone to a new location on the A339 north of the town centre;***
- ***After discussion with the Local Authority, these land use changes were not demmed to be related directly to the Bypass itself.***
- ***Hence, there has been significant land use change in Newbury following the opening of the bypass, and these changes were not considered in the appraisal process, hence this is a major factor in the fact that after traffic volumes are higher in the town compared to predictions.***

7. The Environment Objective

Introduction

7.1 The purpose of including environmental sub-objectives in the POPE 'Five Year After' report for the Bypass is to expand the 'after opening' evaluation to cover environmental issues.

7.2 The environmental evaluation summary included in the 1988 Statement of Reasons says; '*By way of summary, the proposed Bypass would provide a route for through traffic, particularly lorries, away from the urban area of Newbury and the residential areas adjoining the Newtown Straight. In achieving theses advantages, the Bypass would intrude into countryside, parts of which are designated as AONB and SSSI. However, the Department [of Transport] considers that the balance of advantage lies with the provision of the Bypass.'*

7.3 One of the Government's five main criteria for transport is environmental impact where the objective is to 'protect the built and natural environment'. [9] The 'environmental protection' objective involves *reducing* the direct and indirect impacts of transport on the environment of both users and non-users.

7.4 Environmental protection is defined more widely than protection of the local environment – it includes the reduction of impacts of transport on the global environment particularly with regard to carbon dioxide emissions.

Environment Sub-Objectives

7.5 Ten environmental sub-objectives are identified in the New Approach to Appraisal (NATA) process (see WebTAG) which should be included within the Appraisal Summary Table (AST) to record the impacts of a scheme based on established assessment techniques.

7.6 An Environmental Statement was not produced for the Bypass and impacts were not assessed and scored as they would be today. It is therefore difficult to predict accurately how the impacts identified at the Public Inquiries in 1988 and 1992 should be fitted in to the NATA guidance and scoring criteria.

7.7 The objectives and actions stated in the Agency's Environmental Strategic Plan 'Towards a Balance With Nature' can also be used to measure how well the mitigation measures, implemented as part of the Bypass, help the Agency protect the environment. The ten NATA environment sub-objectives are defined in the following table.

[9] Source: the Department for Transport's web-based Transport Analysis Guidance ('Web TAG')

Table 7.1 – Environmental Sub-Objectives

NATA Sub-Objectives	Agency's Environmental Strategic Plan
To reduce *noise*	Noise management – to take practical steps to minimise noise and disturbance including making more use of noise reducing technologies
To improve local *air quality*	Air Emissions Management – to take practical steps to minimise emissions
To reduce *greenhouse gases*	
To protect and enhance the *landscape*	Landscape and Townscape (urban) – to use a townscape plan for trunk roads in urban areas to enhance the townscape quality and minimise the adverse effects of trunk roads in urban areas
To protect and enhance the *townscape*	
To protect the *heritage of historic resources*	Heritage – to ensure that the planning and resourcing of trunk road projects there is an appropriate response to any adverse effects on the historic environment and that the historic fabric of our landscape is respected
To support *biodiversity*	Biodiversity – to manage our network in a particular way which promotes the maintenance and enhancement of biodiversity and manage our estate so as to add to its existing value as a refuge and a linking feature for wildlife
To protect the *water environment*	Water Environment – to identify and implement practical steps to manage the drainage of our network, we aim to minimise the impact of traffic and of our maintenance operations on watercourses, ground water and flooding
To encourage *physical fitness*	No reference
To improve *journey ambience*	No reference

Approach

7.8 In order to provide a baseline AST from which to evaluate the actual environmental impacts of the Bypass, it has been necessary to review historic data. Obtaining such information has not been straightforward and it has not been possible to acquire data for all topics as part of this Report.

7.9 To evaluate the actual environmental impacts of the Bypass, the following methodology has been employed:

- Review of historical documents;
- Landscape drawings 1 to 21 dated June 1994 Doc Ref.0003/RC/33 RevB and On Site Planting drawings Contact 1 (6 drawings), Contract 2 (3 drawings), Contract 3 (4 drawings), Contract 4 (5 drawings), Contract 5 (6 drawings);
- Site visit undertaken by a Landscape Architect and an Ecologist;

- Consultation questionnaire to the Countryside Agency, English Nature, English Heritage and the Environment Agency;
- Follow up meeting with the Environment Agency;
- Consultation with the Agency's managing agents for the Bypass;
- A34 Newbury Bypass Landscape Handover Report and Management Plan Volume 1 November 2003 RevC and Volume 2 March 2003 RevB;
- Consultation questionnaires to West Berkshire Unitary Authority and Hampshire County Council environmental officers; and
- Contact with Atkins Oxford office regarding the ongoing joint monitoring of the Speen and Bagnor translocation cSAC sites for Desmoulin's Whorl snail.

Environmental Capital Approach

7.10 TAG states that;

7.11 "The methodology developed for appraising Landscape, Heritage of Historic Resources, Biodiversity and Water Environment is based on a qualitative 'environmental capital' style approach, in contrast to the more quantitative methodologies for noise and air quality. This approach has been developed by the statutory environmental bodies (Countryside Agency, English Nature, English Heritage and the Environment Agency) in co-operation with DfT. The four main elements of the approach are:

- *to describe sequentially the characteristic environmental features being appraised;*
- *to appraise the environmental capital, using a set of indicators, by assessing:*
  - *the importance of these characteristic features;*
  - *why they are important and to who; and*
  - *their inter-relationships with other environmental attributes;*
- *to describe how proposals impact on the environmental features, including effects on its distinctive quality and substantial local diversity; and*
- *produce an overall assessment score for the Appraisal Summary Table (AST) on a standard textual seven point scale (Slight, Moderate or Large Beneficial or Adverse, plus Neutral). "*

7.12 The TAG methodology developed for townscape is analogous to the environmental capital approach developed for landscape (TAG unit 3.3.6, para 1.1.1 and 1.1.2).

Noise

7.13 Information from the 1988 Appraisal Framework assessed noise impacts is shown in the following Table.

Table 7.2 – Noise: From the 1988 Appraisal Framework

Group	Effects	Units	Published Route	Do Minimum	Comments
Residential	Dwellings experiencing increase of :- • 3 – 5 dB (A) • 5- 10 dB (A) • 10 – 15 dB (A) • 15 – 20 dB (A) • More than 20 dB (A) Dwellings experiencing decreases of :- • 3 – 5 dB (A) • 5 – 10 dB (A) • 10 – 15 dB (A)	Number Number	 59 54 44 15 10 492 79 1		1. Increases in noise are between the levels forecast for the published route at the year 2009 and existing levels. Decreases are between the levels forecast with the published route and 'do minimum' both at 2009. 2. The units are dB (A) L_{10} 18 hour (6am to midnight). 3. Forecasts are derived from 'high growth' traffic predictions. 4. Increases in noise levels to frontage dwellings on existing A34 of approximately 1 dB (A) between 1991 and 2009 high growth in 'do minimum' situation.
Commercial	Properties subject to decrease of:- • 5 – 10 dB (A)	Number	The Swan Inn, Newtown	The Swan Inn would suffer approx 1 dB (A) increase between 1991 and 2009	
Schools, churches etc	Property subject to increase of :- • 15 – 20 dB (A)	dB (A)	Snelsmore House		1. Snelsmore House is a retreat of the Order of the Cross
			Mary Hare School – provision of earth banks along boundary with the school, screen school as far as possible from the Bypass and eliminates noise increase		1. A grammar school for children with hearing impediments. 2. See separate report on Mary Hare School by National Physical Laboratory[10]. 3. Route moved further 50 m approx away from school since Preferred Route stage.
Snelsmore Common Country Park	Area subject to greater than 5 dB (A)	Hectare	9.6		

[10] The Mary Hare School separate report has not been studied as a part of this evaluation.

7.14 TAG for Plan level states that;

The entries in the Quantitative column should show the estimated numbers of people who are likely to be annoyed in the longer term in the 'do-minimum' scenario and the 'do something' scenario fifteenth year. (TAG unit 3.3.2, para 1.4.5)

The entry in the Overall Assessment column (quantitative) should show the net difference in the estimated population who are likely to be annoyed in the longer term as a result of the option compared to the do-minimum scenario in the fifteenth year. (TAG unit 3.3.2, para 1.4.6)

A qualitative entry in the AST should be used to highlight any factors which cannot be readily understood from the numbers in the Quantitative and Overall Assessment columns. An indication can be given whether there is an overall improvement or worsening of conditions as a result of an option compared to the do-minimum and the main factors causing any change in conditions. (TAG unit 3.3.2, para 1.4.7)

7.15 It was assumed before construction, that there would be an overall beneficial impact for noise by removing significant volumes of traffic, particularly heavy lorries, from the existing routes through Newbury. It was deemed that this would outweigh the increases in noise for individual properties and settlements along the route of the Bypass as well as the introduction of a new noise source into what had hitherto been a peaceful rural area. If the actual volumes of traffic are not as forecast then the predicted impacts will be different.

Noise - Evaluation

7.16 It has not proved possible to locate the Scheme Noise Report prepared after the 1988 Public Inquiry: this would have provided an indication of the 'pre- opening' predicted noise impacts.

7.17 However, as traffic volumes on the Bypass in 2010 are predicted to be around 50% higher than forecast, the noise impact along the Bypass route is likely to be worse than expected.

7.18 Traffic volumes on the old route have reduced significantly and are around the forecast level and the local authority has lowered speed limits. Therefore the level of noise impact is likely to be as expected i.e. the beneficial effects of the scheme on those properties close to the old route will have been realised.

7.19 Noise mitigation measures would appear to have been implemented, including;

- Porous road surface – it is understood that this has been replaced more than once in parts. It is possible that the present surface may be a thin wearing course which may have a slightly worse acoustic performance than the porous asphalt originally laid;
- Bunds and ground contouring; and
- Noise barriers.

7.20 In the May 1988 Appraisal Framework, both Snelsmore House – at the time a retreat of the Order of the Cross - and The Mary Hare School (the national grammar school for deaf children) were noted as particularly likely to suffer adverse noise impacts.

7.21 Snelsmore House now appears to be a golf course / hotel and was not visited as part of this study. The predicted increase of 15 – 20dB (A) within the 1988 Appraisal Framework document has not been assessed.

7.22 The Mary Hare School is visible from the adjacent minor roads. Significant earth contouring and noise fences have been incorporated into the scheme. No detailed information has been made available for this study regarding noise levels at the School pre- and post-construction.

7.23 The 1988 Statement of Reasons indicated that despite noise mitigation measures, some 20 to 30 properties may have had a residual noise level which required the Department to make an offer of insulation in accordance with the Insulation Regulations 1975. No evidence has been made available to date, as part of this study, which would confirm whether such measures were necessary and whether any local residents were offered insulation.

7.24 As part of the site visit several public footpaths were walked, including those near Bagnor and along the towpath of the Kennet and Avon Canal. There was constant background noise from traffic using the Bypass.

7.25 The 1988 Appraisal Framework indicated that noise increases would be greater than 5dB (A) in Snelsmore Common Country Park. Low traffic noise was noted during the site visit at the country park car park and it is assumed that this would increase nearer to the Bypass.

Air Quality

7.26 At the time of the 1988 Inquiry, The Statement of Reasons stated that the procedures in the Manual of Environmental Procedures were followed using a graphical method to estimate the concentration of carbon monoxide, which was used as a surrogate to indicate the level of vehicle pollution. No problem sites were indicated.

7.27 The Newbury Bypass Preliminary Review (1995) refers to air quality assessment work, although this is no longer available.

7.28 TAG for Plan level states that;

The approach to assessing local air quality is based on a quantification of the change in exposure at properties in the opening year (or 2005 if the option would be operational at this time). (TAG unit 3.3.3, para 1.1.4)

Air Quality - Evaluation

7.29 No observed air quality data from before scheme opening has been located and it is therefore not possible to score this sub-objective in accordance with the TAG guidelines. Nevertheless, as traffic volumes on the Bypass in 2010 are estimated to be around 50% higher than predicted, the air quality impact along the Bypass route is likely to be worse than expected.

7.30 Traffic volumes on the old route are around the forecast level, therefore the level of impact is probably as expected and the benefits to properties close to the old route will have been realised.

7.31 Although the predicted traffic volumes for the old route are as expected, changes in the composition of vehicles, improvements in vehicle engine technology and vehicle speeds between the before and after situation would affect the impact, and hence these natural changes will likely to have improved air quality in the area.

7.32 Finally, again, this assessment has been based on the Bypass and old road only, and there has been reduced growth on a number of other routes, however these traffic volume changes will not have impacted on air quality as the thresholds that determine noticeable change will not have been attained.

Greenhouse Gases

7.33 This sub-objective was not assessed at the time of either Public Inquiry. Further modelling would need to be undertaken to assess the impact of the scheme on greenhouse gases, and such modelling has not been undertaken as part of this evaluation.

Landscape

7.34 The Review Report 1995 confirmed that the 'landscape effects were always understood to be a major adverse aspect of the Western Bypass and these were explored fully at the Inquiry'.

7.35 Particular areas of concern were:

- Intrusion into the North Wessex Downs AONB in two locations;
- Proximity to an Area of Particular Landscape Importance (near The Chase);
- Impact on the Enborne, Kennet and Lambourn river valleys;
- Encroachment upon Snelsmore Common SSSI Country Park;
- Bisection of Rack Marsh Nature Reserve;
- Visual impact on properties; and
- Impact on local landscape character and quality.

Figure 7.1 – Looking south towards River Lambourn Valley

7.36 The landscape design guidelines included within the Landscape Proof of Evidence at the 1992 Public Inquiry stated that, as far as is practicable:

- The road with its junctions, crossings and structures should be designed to limit adverse impact on views from properties, public rights of way, amenity areas and locations designated as having heritage or conservation value;
- The road earthworks should be designed to reduce from the outset the visual prominence of the road by screening views, by being integrated into proposals for noise attenuation and surface water containment and by being married into the surrounding landform, whilst respecting the need to avoid unnecessary land take and loss of existing vegetation;
- The planting proposals should be an integral part of the scheme design and should relate to the existing pattern of vegetation to form a cohesive result;
- The planting proposals should be designed to conceal, limit or soften views of the road and traffic from surroundings;
- The planting proposals should create a pleasant environment for the road users and, where possible, emphasise or frame attractive views; and
- The planting proposals should replace or supplement existing wildlife habitats.

7.37 Types of landscape proposal were identified as:

- Environmental screens;
- Contouring;
- Planting – both on site and offsite by agreement; and
- Drainage ponds.

7.38 The conclusions contained within the Landscape Proof of Evidence were that the Bypass would lead to significant visual impact on property and the landscape in some locations. Earth mounding and contouring would be effective immediately, whereas the benefit from planting would increase with time. It was accepted that some adverse impacts would remain whatever landscape proposals were put forward and that although in some places landscape proposals might screen intrusive views of the road and traffic, would in themselves be intrusive, albeit less so.

7.39 It was not possible to locate the Visual Impact Study Report as part of this evaluation.

7.40 Information relating to predicted visual impact included in the 1988 Appraisal Framework is shown in the following Table.

Table 7.3 – Landscape: From the 1988 Appraisal Framework

Group	Effects	Units	Published Route	Do Minimum	Comments
Residential	Dwellings subject to visual obstruction:- • Slight • Moderate • High	Number	 35 18 7		Assessed in accordance with MEA Section B2
	Dwelling subject to visual impact:- • Slight • Significant • Severe	Number	 426 71 57		1. Figures abstracted from Visual Impact Study Report 2. Extensive landscaping will be provided to ameliorate this effect
Schools, churches etc	Subject to visual impact:- • Slight • Significant • Severe	Number	 3 schools 4 churches 1 school 1 school		See Visual Impact report for details
Public Houses	Subject to visual impact:- • Slight • Significant • Severe	Number	 2 2 1		Details in Visual Impact Study Report
Ramblers	Visual Impact		Details included within the Appraisal Framework May 1988		1.Extensive landscaping has been planned carefully to minimise the impact of the scheme 2. The screening potential of the disused railway earthworks, through the Hampshire section, has been utilised as much as possible. 3. Across the open land of the Kennet valley embankment slopes have been graded out to 1in8 to reduce perceived visual severance. 4. Impact on Speen Ridge reduced by curving the road as it passes through the ridge and by provision of extensive dense planting on the side slopes.
Vehicle travellers	View from the road		To the south of the Kennet Valley, pastoral and woodland views through rolling downland countryside with occasional glimpses of residential and farm buildings. The northern section of the route passes through topography which is undulates more steeply with deeper cuttings and higher embankments.	Do Minimum Initially views of woodland and occasional houses in the Tot Hill area leading to increasing numbers of residences as Newbury is approached. The central section of the route (approx. one third) lies within the heavily built up area of Newbury. North of the town there will be views of downland, screened partially by the road cuttings.	

Landscape - Evaluation

7.41 The Countryside Agency and Hampshire County Council have been consulted as part of this study but declined to comment.

7.42 West Berkshire Unitary Authority's views of the impacts of the Bypass on landscape are broadly as follows;

- On the effect of the embankment crossing over the Kennet Valley – visually intrusive and out of keeping with the local landscape character - as expected. It has resulted in severance of landscape and visual continuity along the Kennet Valley;
- On the effect on the natural beauty and character of the North Wessex Downs AONB – worse than expected. The character of the AONB north of Arlington Manor/Mary Hare School has been changed considerably;
- On the suitability of the materials and finishes to structures – generally successful - better than expected;
- On the effectiveness of mitigation measures in reducing visual impacts and integrating the scheme into the surrounding landscape – as a driving experience the landscape design and mitigation of the road scheme has been successful, - as expected. Too early to comment on effectiveness of landscape planting. Opportunities to create a new built form of design merit which enhances visual experience and contributes to the quality of the landscape in its own right has not really been achieved.

7.43 Mott MacDonald, the Agency's Managing Agent for Area 3 which includes the Bypass has been consulted as part of this study and provided a written response to the consultation questionnaire.

7.44 The A34 Newbury Bypass Landscape Handover Report and Management Plan 2003 Volumes 1 and 2 (LHR&MP) were consulted. Within the Introduction, paragraph 2.1 states that;

This report provides a framework to enable the Highways Agency to fulfil the commitments made at public inquiry for the long term-maintenance and management of the On Site planting works associated with the A34 Newbury Bypass.

7.45 The review of data, together with the site visit, confirmed that the landscape mitigation measures have been implemented. In the time available on site it was not possible to look in detail at the entire scheme: sample plots were observed from footpaths and easily accessible locations to provide an overview of the general condition of the site works.

Figure 7.2 – Vegetated screening mound above bridge over River Lambourn at Bagnor

7.46 However, it was possible to confirm that landscaping appeared to conform generally to that indicated on the drawings which had been made available to us at the time. Subsequent to the site visit, a copy of the LHR&MP was provided for information and includes the landscape handover plans notated to include environmental aftercare prescriptions as well as plot by plot planting details. Volume 2 confirms that on site planting was undertaken in 5 separate contracts by 3 different landscape contractors between 25/1/1999 and 21/6/2000 with 3 years' aftercare (4 for contract 1) until spring/summer 2003. Volume 2 of the Handover Report confirms that off-site planting by agreement was undertaken at various locations in 1994 and 1998, both contracts included 3 years aftercare.

7.47 From the Report, it would appear that planting at the A343 Andover Road junction is under Hampshire County Council management. The actual landscape maintenance carried out by Hampshire has not been confirmed as part of this study, although the site inspection revealed that tree ties had not been adjusted in some plots (NW quadrant) with resultant damage to trunks.

Figure 7.3 – Damage to tree

7.48 Planting is an important element in mitigating the effects of any road scheme on the landscape and integrating it into its surroundings. Expectations included within the Landscape Proof of Evidence at the 1992 Public Inquiry were that new tree planting would reach at least 6m in height after 15 years and this was apparently displayed graphically in sections at the Inquiry. The evidence from the site visit indicates that plant establishment generally may not be as far forward as would be expected. For example; properties to the west of the A34 on Enborne Street (near Hill Farm Cottages and Ivy Cottage) still had clear views of the Bypass. Also, walking along the Kennet and Avon Canal tow path, lorries are clearly visible on embankment. In plots near chainage 10,500, trees appeared to be generally below 3m and shrubs below 2m with holly not above the 600mm shrub shelter. In some plots near chainage 4,250, tree species appeared sparse and about 3 to 4m height with some Oak at 1m, shrubs generally 1 to 2m tall. Other plots were better established.

Figure 7.4 – Properties on Enborne Street have views of the Bypass

7.49 The Managing Agents consider that slow growth in some plots is due to poor soil conditions and a series of dry summers.

7.50 Routine maintenance is undertaken for visibility splays, the central reserve and balancing ponds as part of the general Agency Area 3 network maintenance.

7.51 The LHR&MP includes plot by plot maintenance schedules and special management for species, habitat and road runoff control / balancing ponds. However, the managing agents explain that this work is subject to funding – implementation of the recommendations is through Local Network Management Schemes (LNMS) projects associated with the Area 3 BAP, or through the Trunk Road Maintenance Manual (TRMM).

7.52 From the limited site visit:

- noxious weed was evident in many plots, some of these areas may be outside the areas now maintained on behalf of the Agency;
- gorse would appear to be colonising many plots at the southern end of the scheme at the expense of the designated plot species;
- where shrub shelters were still in place they were not always weed free, canopy closure was not reached in most plots but there was no evidence of weed-free areas around plants (this may not have been a contract requirement); and
- cutting slopes had not been recently cut.

Figure 7.5 – Planting and Created Chalk Downland

7.53 The Managing Agents note in their written response that in some areas there have been problems with establishment, notably control of Gorse around Tot Hill and thistle in the mid section.

7.54 It is essential that the landscape mitigation measures are given every opportunity to become established fully by providing appropriate management and monitoring. The timetables for maintenance of the Bypass soft estate are included in the Special Management for Habitats section of the LHR&MP, with dates when certain activities should start.

7.55 The LHR&MP states that Adjacent Land Considerations were important factors in determining the position, landscaping and ecological provisions of the Bypass and makes reference to this where such Considerations affected the landscape planting and management plans, including reference to Public Inquiry documentation.

7.56 Earth modelling, ground contouring and environmental barriers have been implemented and these all contribute to reducing visual impacts at a local level. However, the overall impact of the Bypass on the local landscape character and quality is deemed to be adverse, especially for areas within the AONB and SSSIs. The tranquillity of the area has been affected adversely, as has the pattern of the landscape.

Townscape

7.57 This aspect was not covered as a topic at the Inquiries.

7.58 TAG states that:

given that 'townscape' is a complex mix of physical features, patterns, and cultural understandings, the level of detail to which townscape assessment and appraisal is undertaken depends very much upon the purpose of the exercise and the type of townscape in question (TAG unit 3.3.8, para 1.2.2).

Analysts should ensure the benefits resulting from traffic relief to existing roads is considered TAG unit 3.3.8,para 2.1.3.

7.59 One of the conclusions given in the Review Report for the traffic to be removed from the centre of Newbury was that this would 'give a new approach to traffic and transport management in the town'.

Townscape - Evaluation

7.60 To evaluate any changes (positive or negative) to the Newbury townscape since the Bypass was built, it would be necessary to undertake further study and consult with the local authority.

7.61 However, the most clear benefit is that Northbrook Street in Newbury town centre was pedestrianised in 1999 after the opening of the Bypass. It is closed to traffic during the day between 10:00 and 18:00. This has been an improvement in townscape and therefore a beneficial impact has been scored for this sub-objective.

Figure 7.6 – Northbrook Street Pedestrianisation

Heritage of Historic Resources

7.62 The Review Report explained that, in line with current advice at the time of the Public Inquiry in 1988, relatively little work was done to assess the impact of the route upon archaeology.

7.63 However, a comprehensive programme of archaeological survey and evaluation work was undertaken by Wessex Archaeology after the Inquiry, which confirmed that the route would cross nine sites of district or regional importance and, in the case of the Lambourn valley, of possible national importance.

7.64 As a result of the survey work along the Bypass route before construction, two sites were preserved in situ; one on the northbound carriageway between Enborne Road and the railway, the other site is adjacent to pond K. A record of the work undertaken was written up and published in 1994[11].

7.65 The main areas of archaeological interest along the western route were;

- 1643 First Battle of Newbury registered on English Heritage 'Register of Historic Battlefields' – Civil War battlefield site;
- 1644 Second Battle of Newbury – not registered;
- Donnington Castle – Scheduled Ancient Monument;
- Archaeological sites – archaeological and geological deposits of the late glacial and Mesolithic dates.

7.66 The 1988 Appraisal Framework identified the following impacts;

- Route passes within 120m of Bagnor Conservation Area;
- Meadow Way Grade II listed building within 100m of route at Snelsmore;
- Route crosses areas of archaeological significance:

  a) 750m through areas near Bagnor of prehistoric and Roman settlements,

  b) the line of a Roman road north of Belmont,

  c) 300m through area to the north of Bath Road of prehistoric and Roman settlement activity;
- Route crosses area of high archaeological potential

  a) some 100m across Lambourne valley,

  b) 800m across Kennet valley.

Heritage - Evaluation

7.67 English Heritage has been consulted as part of this study and provided a written response to the consultation questionnaire. A follow up telephone conversation for clarification of certain points also took place.

7.68 The English Heritage view of the impacts of the Bypass are broadly as follows;

[11] Excavations in Newbury, Berkshire, 1979-1990 (A.G. Vince, S.J. Lobb, J.C. Richards & Lorraine Mepham) 1997.

- On the setting of Donnington Castle – no impact, the site visit confirmed that there are no views of the Bypass, although background traffic noise was noticeable;
- On the site of the Newbury Civil War battlefield – no impact;
- On archaeological remains along the route – impact as expected. In discussion with English Heritage it was confirmed that it considers that adequate archaeological mitigation was undertaken and that crucially, the results have been written up and published;
- On listed buildings – English Heritage are not aware of any impact on listed buildings within their remit;
- On the landscape – adverse impact as expected, English Heritage consider that the north-south route cuts across the natural and historic landscape lines.

7.69 The LHR&MP notes that for the two archaeological sites preserved in situ, the location is important for consideration of their continued protection. It explains that tall trees and their roots, earthworks and changes in hydrology all have the potential to damage to such sites. Management prescriptions necessary to avoid damage are included in the report.

7.70 West Berkshire Unitary Authority views on the impacts of the Bypass on historic environment are broadly as follows:

- Construction of the Bypass has had an impact on the historic environment along its route; the most significant impacts are on the sites of the two battles of Newbury. First battle site – reduced ability to understand the landscape of the battle, also area under pressure for residential development between town and the Bypass. Second battle site lost under the A4 Speen junction; and
- Considers that little thought went into the design of bridges, fencing and other structures along the route. A greater understanding of these issues could have allowed the scheme to sit more comfortably within its historic and landscape context.

Figure 7.7 – Donnington Castle

Biodiversity

7.71 According to the Review Report, nature conservation issues were explored very thoroughly at the 1988 Inquiry. However, since then and the Newbury Bypass Review in 1995 there were changes in local circumstances e.g. new SSSIs and the discovery of protected species. Badgers, dormice and bats were discovered and mitigation measures were agreed with English Nature which included animal underpasses, deer and badger fences, bat boxes etc.

7.72 In spring 1994, English Nature published a list of rivers in England which it proposed for designation as SSSIs, the Rivers Kennet and Lambourn were included in the list. There were already known areas of wildlife value on both rivers and it was thought that adjacent habitats may also be designated within the proposed SSSIs.

7.73 Areas of particular concern were;

- Impact on water quality;
- Impact on sensitive wetland sites and meadows;
- Impact on protected species;
- Integration with ancient semi-natural woodlands, Snelsmore Common (SSSI, Local Nature Reserve) and Great Pen and The Chase woodlands;

7.74 The 1988 Appraisal Framework identifies the impacts on biodiversity shown in the following Table.

Table 7.4 – Biodiversity: From the 1988 Appraisal Framework

Group	Effects	Units	Published Route	Do Minimum	Comments
Snelsmore Common Country Park SSSI	Land take	Hectare	2.8		1. Replacement land to be provided contiguous with existing common 2. Total area of Snelsmore Common is 93 Ha
	Severance	Hectare	Approximately 2Ha of common severed to the south of the route		1. Severance mitigated by B4494 Wantage Road bridge
Nature reserves	Amenity (also covered under Policy)		1. Environment of 'The Chase' affected by the route passing close to the north east boundary. No land take 2. Adverse affect on the environment of Rack Marsh, Bagnor		1. The Chase is managed by Hampshire and Isle of White Naturalists' Trust on land leased from the NT 2. Rack Marsh managed by Berkshire, Buckingham and Oxfordshire Naturalists' Trust
	Land take and severance (also covered under Policy)	Hectare	Rack Marsh, Bagnor:- 0.5Ha land take 0.7Ha severed on east side of route		Severance mitigated by provision of pedestrian access through the river Lambourne bridge.
Policy:- Berks CC Hants CC Nature Conservancy Council	To safeguard habitats of value to nature conservation		Less than 1Km of route passes through areas of ecological value in the Kennet valley. Land of ecological value is crossed by the route in the Kennet valley, in Elmore Plantation, Speen and at Bagnor. Route crosses possible ancient woodlands at Balls Plantation, Burghclere, Whittle Copse, near Belmont and Hill's Pightle and Packers Copse, both at Snelsmore.		See various CC local and structure plans. Land of ecological value identified by NCC Possible ancient woodlands identified by NCC See 'An Ecological Appraisal of Alternative Routes for Newbury Bypass' by the Institute of Terrestrial Ecology.

Biodeiversity - Evaluation

7.75 The LHR&MP states that the 'ecological aspects of the scheme were a fundamental consideration and, in some instances, were the primary concern. Special provisions and management plans were made for species and habitats'. The species management/mitigation included;

- Reptiles: Provision of hibernacula;
- Desmoulin's snail: Provision of wetland;
- Dormouse: Management in sympathy with dormouse interest of previously (and possibly currently) occupied sites on adjacent land;

- Field Cricket: Management in sympathy with field cricket interest on adjacent land;
- Otter: Provision of passes or tunnels or along ledges by rivers;
- Deer: Provision of deer leaps, deer fencing;
- Badger: Provision of dry culverts and artificial setts, badger fencing;
- Bats: Provision of roost boxes offsite and under bridges over water, special bat tunnel preserved under road and consideration of bat flight paths;
- Sand Martin: Provision of towers during road construction.

7.76 Habitat provision included translocated and re-created wetland for Desmoulin's snail, heathland re-creation, downland and regenerated species rich grassland sward, and some areas suitable for management as woodland, coppice and standard or informal hedgerow and trees.

7.77 The detailed response from the Managing Agents provided information on current levels of management and monitoring of habitats. It is understood that the Bypass will also come under the general environmental strategy for Highways Agency Area 3.

7.78 English Nature has been consulted as part of this study and provided a written response to the consultation questionnaire.

7.79 The English Nature response is broadly as follows;

- Snelsmore Common SSSI – no direct information although not aware of any impacts as a result of the Bypass;
- River Kennet SSSI – no comment;
- River Lambourn SSSI and candidate SAC – aware of a problem with a balancing pond previously, they understand that this was resolved – no comment on impact;
- Kennet and Lambourn Floodplain SSSI and candidate SAC – EN note several management issues which have resulted in a deterioration of the Desmoulin's Whorl snail habitat. They note significant adverse impacts. EN requested more rigorous and frequent inspection regimes and to be provided with feedback by the Managing Agents. They have had an input into a management plan but are not aware whether the prescriptions for management and maintenance are being followed and would welcome more communication with Highways Agency / Managing Agents;
- Ancient woodlands – no information;
- Rack Marsh – part of the Kennet and Lambourn Floodplain SSSI and candidate SAC managed by Berks, Bucks and Oxon Wildlife Trust, EN have no evidence of adverse impacts. Consulting the Wildlife Trust would provide with direct information relating to this area;
- Animal crossings and protective fences, creation of new habitats outside the SSSIs – no comment, EN does not monitor these aspects.

7.80 The key issue of concern for English Nature is the current lack of environmental monitoring. They state that 'this period of monitoring and close co-operation between English Nature, the Agency and the Environment Agency and the project engineers was in place for a five year period from the start of construction but has not been carried forward to address the key question of whether the operation of the road has had damaging impacts'.

Figure 7.8 – Badger tunnel exit near Bagnor

7.81 The West Berkshire Unitary Authority view on the impacts of the Bypass are broadly as follows;

- Unable to comment in detail on biodiversity impacts, positive or negative due to no data available for the before and current situation. Consider this to be a weakness of current road design, as without post-construction monitoring of biodiversity, how can lessons be learnt;
- Planting appears to be establishing;
- Wildflower planting not yet visible to drivers, but new grasslands may be good habitats if surveyed in detail;
- Only obvious negative effect is that gorse has spread widely at the southern end of the Bypass and many grasslands and trees are now being swamped. Better management of topsoil requirements could have avoided this maintenance problem.

7.82 Other issues which require further investigation are:

- Snelsmore Common SSSI – was the replacement land contiguous with the common actually provided? Also consult local Wildlife Trust regarding impacts;
- The Chase (National Trust) – would need to consult further to evaluate impacts;
- Rack Marsh – would need to consult local Wildlife Trust regarding impacts;
- Ancient woodlands – would need to consult further to evaluate impacts;

- Limited information is available regarding monitoring of protected species, balancing ponds and ecological mitigation measures and it is therefore difficult to evaluate fully the impacts of the Bypass on biodiversity.

Figure 7.9 – Footpath and animal underpass adjacent to River Lambourn

Water

7.83 It was understood at the time of the Public Inquiries that potential impacts of the scheme were on very high quality water courses and sensitive underground aquifers and that high levels of protection would have to be built into the scheme.

7.84 The 1988 Statement of Reasons stated that the main water courses crossed by the Bypass would be maintained by bridging or culverting. These include the Rivers Kennet, Lambourn and Enborne and the Kennet and Avon Canal. Adequate measures would be taken to protect the water quality and that the capacity of openings for the canal and river crossings would be such that flood conditions would not be worsened.

7.85 There were no specific references to protecting riverside habitats, although a reduction in amenity for anglers due to visual and noise effects where the route bridges the rivers and canals was picked up in the Appraisal Framework.

7.86 The River Kennet and River Lambourn River Corridor Surveys 1992 was concerned that habitats would be fragmented and flight patterns of species using the river corridors would be affected heavily. The river corridors formed major access routes between existing woodland blocks and between grassland as well as 'green corridors' by linking important feeding and breeding sites for birds and insects.

7.87 Recommendations were made for improving habitats, minimum sizes for bridge openings and bank profiles.

Water – Evaluation

7.88 The LHR&MP contains a section detailing the special management plans for road runoff control / balancing ponds. It is understood that the management of runoff control ponds is currently under review as the experience and knowledge of the

systems increases and the guidance changes. Routine management or maintenance of the ponds is carried out.

7.89 Within the Kennet valley the landscape planting included using species of willow in keeping with the river setting. Management prescriptions outlined in the LHR&MP include for pollarding the willows and mosaic mowing to consider invertebrates.

7.90 The Environment Agency has been consulted as part of this study and provided a written response to the consultation questionnaire. A follow up meeting also took place for further discussion and clarification.

7.91 The Environment Agency explained that as well as work relating to Desmoulin's snails there was much wildlife mitigation undertaken for species associated with the water environment and terrestrial species in agreement with English Nature. These included underpasses for otters, hibernacula for reptiles and bat roosts installed under bridges. However, they do not consider that the bridge openings are sufficiently broad or high enough to allow free passage of wildlife without impacting adversely on movement and migration patterns.

7.92 The Environment Agency view on impacts of the Bypass is broadly as follows:

- The adverse impact on the landscape and natural environment remains as expected;
- Rivers Kennet and Lambourn – no change in water quality has been detected post-construction, impacts as expected;
- Floodplains – due to poor maintenance of the Desmoulin's Snail habitat at Bagnor Island, the impact is worse than expected;
- Canals – no impacts have been recorded, impact as expected;
- Still waters – Rack Marsh nature reserve, no direct knowledge of any impacts; but as upstream unlikely to have suffered any impact;
- Ground water – no evidence of impact, as expected;
- Balancing ponds – from the limited monitoring that the Environment Agency undertakes it would appear that the balancing ponds are as effective as expected. However, the Environment Agency are concerned about monitoring and management of these facilities by the Highways Agency;
- Porous asphalt road surface – as effective as expected;
- Embankment materials – as effective as expected;
- Capacity of openings – less effective than expected;
- Measures to limit silt entering watercourses – one serious event during construction; and
- Ongoing monitoring / maintenance / management – the Environment Agency are disappointed with the level of communication and involvement after opening, there is concern that the mitigation features will only remain effective if managed properly and monitored and to date they have little information to be able to have confidence that this will happen. – less effective than anticipated.

Physical Fitness

7.93 Mention is made in the Statement of Reasons that measures are proposed to facilitate movement across the route including the provision of overbridges for footpaths nos. 8 and 15 at Bagnor; underpasses for footpath no. 2 in the Kennet Valley and highway bridges for Enborne Street and Wheatlands Lane.

7.94 The 1988 Appraisal Framework identifies the impacts on pedestrians and cyclists as shown in Table 7.5.

Table 7.5 – Pedestrians and Cyclists – From the 1988 Appraisal Framework

Group	Effects	Units	Published Route	Do Minimum	Comments
Pedestrians	Amenity and safety along A34:- Newtown Straight and Newtown Common Newtown Road		The potential for walking along the A34 footways increased by traffic flow reductions:- All Vehicles HGV's 76% 88% 44% 66%	Traffic growth of 28-62%(low growth to high growth) on Newtown Straight/Common and Newtown Road between 1983 and 2009 creating worse environment	1. Method of assessment described in MEA Section B9 2. % relief compares 1983 'do minimum' with 1983 'do something' 12 hour May weekday flows. % growth compares 1983 'do minimum' with 2009 forecasts of 12 hour flows. 3. The 'current' high proportions of Heavy Goods Vehicles (HGV's), 23% on Newtown Staright and 18% on Newtown Road provide a considerable deterrent to pedestrians.
	Effects on public rights of way		1. Loss of footpath along disused railway between tot Hill and Station Road, Washwater. 2. Two footpaths combined into one 'at grade' crossing at Skinner's Green. 3. Ten footpaths and one bridleway diverted via structures.		
Cyclists	Amenity and safety along existing A34		A34 relieved by 36 – 76% all vehicles and 63 – 88% of HGV's	Traffic growth of 28 – 70% (low growth to high growth) on A34 between 1983 and 2009 an increasing deterrent to cyclists	There area few cyclists on the A34. High proportion of HGV's (13 – 23%) are a deterrent.

Physical Fitness – Evaluation

7.95 No specific data has been collected relating to journey times or level of use for non-motorised users as part of this study, however it was noted during the site visit that footpath links had been maintained across the Bypass either by footbridges e.g. near Foxgrove and at Bagnor, or in association with over or under road crossings. The river crossing of the Lambourn at Bagnor also provided for continuation of the footpath as well as providing an animal underpass adjacent to the river. It is still possible to walk the Kennet and Avon Canal towpath under the Bypass and joggers were noted using the tow path during the site visit.

7.96 The LHR&MP drawings indicate footpath and bridleway locations and include them in the section – Considerations of Adjacent Land Use, with any Public Inquiry reference if appropriate.

7.97 West Berkshire Unitary Authority note in their written response to consultation that at the time the Bypass was constructed the way that public rights of way were dealt with meant that many routes were severed and several anomalies created which are only now being resolved. A lot of work was created for the Authority to get the network back to a satisfactory standard. They note one outstanding problem on Footpath 2 at Speen which floods every winter. West Berkshire conclude that overall, the Bypass has not been good for the rights of way network and circular walks that were attractive from the town centre are now less so.

7.98 The reduction in traffic on the old route benefits cyclists and the pedestrianisation of Northbrook Street in the town centre has improved the opportunity for access on foot.

Figure 7.10 – Kennet and Avon Canal towpath looking east to Bypass

Journey Ambiance

7.99 It is noted in the Statement of Reasons that the existing A34 inhibits movement between the communities and facilities to the east and west. It states that the removal of the 'through traffic' especially the HGV traffic would bring relief particularly in future years.

7.100 The Bypass Review Report notes that the (then) existing conditions on the A34 through Newbury with frequent queuing and delays, increased driver stress. The vehicle traveller's view would be improved by using the Bypass; however, noise would increase on footpaths in the vicinity of the Bypass.

7.101 The following Table 7.6 shows the impacts on driver stress identified in the 1988 Appraisal Framework.

Table 7.6 – Driver Stress – From the 1988 Appraisal Framework

Group	Effects	Units	Published Route	Do Minimum	Comments
All Vehicle Travellers	Driver stress on : Published Route		Low Throughout	……..	1. Grades of driver stress defin Part B Section 11, Manua Environmental Appraisal (M Average journey speeds derived Flow Group 4 (peak Flows) da COBA output.
			1994 2009	1994 2009	
	Existing A34;				
	Newtown Straight		Low Low	High High	
	Newtown Road		Moderate High	High High	2. Grades assessed on high g traffic volumes for opening and d years.
	Sandleford Link		Low Low	Low Low	
	Greenham House to Kings Road		Moderate High	High High	3. MEA method in Tables 11.2 11.3 provides guidance but doe take account of numbers and typ junctions etc which acknowledges have an effec driver stress. Sections on junc accesses and speed limits therefore included to cover aspect.
	Kings Road to Robin Hood		Moderate High	High High	
	Donnington Link		Low Low	Low Low	
	Junctions encountered on route:			Existing A34	
	Grade-separated	Number	4	2 5	
	Roundabouts	Number	-	10	
	Priority	Number	-		
	Vehicle accesses encountered on route:				1. Agricultural accesses are to f fields and woodlands.
	Residential Agricultural Others	Number Number Number	- - -	35 18 18	2. Other accesses include thos industrial, commercial, educa and medical establishments.

Journey ambiance – Evaluation

7.102 Minutes of the meeting with West Berkshire Unitary Authority state that there are clear benefits for cyclists after scheme opening in terms of highway safety and local air quality, and for pedestrians with the pedestrianisation of Northbrook Street and the introduction of at-grade pedestrian crossings on the A339. The Authority also notes that there have been some land management and access issues for Sutton Estates whose land is on either side of the Bypass.

7.103 Minutes of the meeting with Hampshire County Council state that there have been environmental and safety benefits on Tot Hill to Newtown Straight as a result of traffic relief and a reduction in accidents following scheme opening.

7.104 In contrast, walking, cycling and horse riding in the countryside adjacent to the route corridor has been impacted adversely upon in terms of noise pollution.

Main Environment Objective Conclusions

- ***During the construction and immediate post-construction phases of the Bypass environmental considerations appear to have been dealt with adequately and expediently. This process was enhanced by the co-operation of the joint environmental team. On the whole, mitigation measures would appear to have been implemented;***
- ***The environmental impacts cannot be evaluated fully with the current information. The EST cannot be scored adequately without further study being undertaken as indicated within this evaluation e.g. consulting with the local wildlife trusts would greatly inform on any impacts on habitats adjacent to the route corridor;***
- ***While noise and air quality benefits for those properties close to the old route should have been achieved, the additional traffic growth on the Bypass would mean that adverse impacts on properties in the Bypass corridor are worse than anticipated.***
- ***Where bio-diversity mitigation measures are provided offsite e.g. bat boxes, it would appear that ongoing monitoring and management can be problematic. Both access to the sites and funding to undertake the work may be difficult to achieve;***
- ***For the landscape and biodiversity mitigation measures to fulfil their potential, ongoing management and monitoring is essential.***
- ***Both English Nature and the Environment Agency consider that significant adverse impacts have already occurred within the internationally recognised Desmoulin's Whorl snail habitat;***
- ***The important balancing pond network requires continuing management in order to function as intended. Monitoring is required to confirm that the systems are working.***
- ***Measures should be taken to ensure that the two sites of archaeological interest preserved in situ do not suffer damage.***

8. The Safety Objective

Introduction

8.1 This Chapter examines the changes that have occurred in the number and severity of PIAs occurring on the A34 and on the roads in the wider area covered by the COBA model.

8.2 TAG defines that for accidents:

The quantitative entry (on the AST) is the change in number of total PIA, and casualties by severity, over the 30 year assessment period.

8.3 The 'Safety Objective' evaluation has considered:

- accidents predicted by COBA;
- outturn statistics on accidents on the Bypass and the old route through Newbury; and
- an analysis of accident rates in the Newbury area, taking account of the higher than predicted traffic volumes.

Accidents Predicted by COBA

8.4 Road schemes generally lead to a reduction in accidents, as usually the safety qualities of the road concerned are improved, or traffic is transferred to an inherently safer new road.

8.5 As part of the initial scheme evaluation, the COBA model generates predictions of road accident savings over 30 years and calculates the economic benefit of these savings.

8.6 For the Bypass, the COBA analysis covers accidents over a wide area, including the M4 and A4 from Reading to Hungerford.

8.7 The COBA model predicted that - on this wider network - over the 30 year assessment period there would be an accident saving of 985 accidents, 1,319 casualties and 24 fatalities (assuming a weighting of 60% low growth and 40% high growth).

Outturn Statistics on Accidents in the Newbury Area

8.8 A detailed analysis of PIAs has been carried out, covering the Bypass and the old route in the Newbury area.

8.9 The usual time frame for evaluation of road traffic accidents is five years, which is consistent with the time frame under evaluation.

8.10 Two time periods have been compared, therefore:

- 1994 - 31 October 1998 (prior to scheme opening); and
- 1999 – 2003 (after scheme opening)

8.11 Table 8.1 presents a summary of accidents 'before' and 'after' opening of the Bypass. The information relates to traffic accidents (i.e. incidents, which may involve more than one person) that involved personal injuries, categorised by the severity of the most seriously injured person.

8.12 The locations of these accidents are mapped in Figure 8.1 and Figure 8.2 for before and after scheme opening.

Table 8.1 – Personal Injury Accidents in the Newbury Area, by Severity

Severity	Before (1994 –31 Oct 1998)	After (1999 – 2003)	Change	%
Fatal Accidents	5	8	+3	+60%
Serious Accidents	25	37	+12	+48%
Slight Accidents	274	206	-68	-25%
Total	**304**	**251**	**-53**	**-17%**

8.13 Although there has been an overall 17% reduction in PIAs in the Newbury area, this has been primarily because of a 25% reduction in the number of 'slight' injury accidents: the numbers of 'serious' and 'fatal' injury accidents combined have increased by 50%.

8.14 Table 8.2 summarises of the number of individual people injured or killed in the accidents shown in Table 8.1.

Table 8.2 – Casualties in the Newbury Area

	Before (1994 –31 Oct 1998)	After (1999 – 2003)	Change	%
All Casualties	455	311	-144	-32%
Fatalities	6	10	+4	+67%

8.15 The comparison of *casualties* in the two periods is even starker. Even though the total number of casualties has fallen by a third (32%), the number of fatalities has increased by two-thirds, however, this represents an increase from 6 fatalities to 10.

8.16 This change in the pattern of road PIAs may be due to the higher speeds both on the Bypass and the old route within Newbury since congestion was removed despite the introduction of reduced speed limits by the local authority on the old route.

8.17 The factors involved with serious and fatal accidents are discussed in more in paragraphs 8.23 onwards.

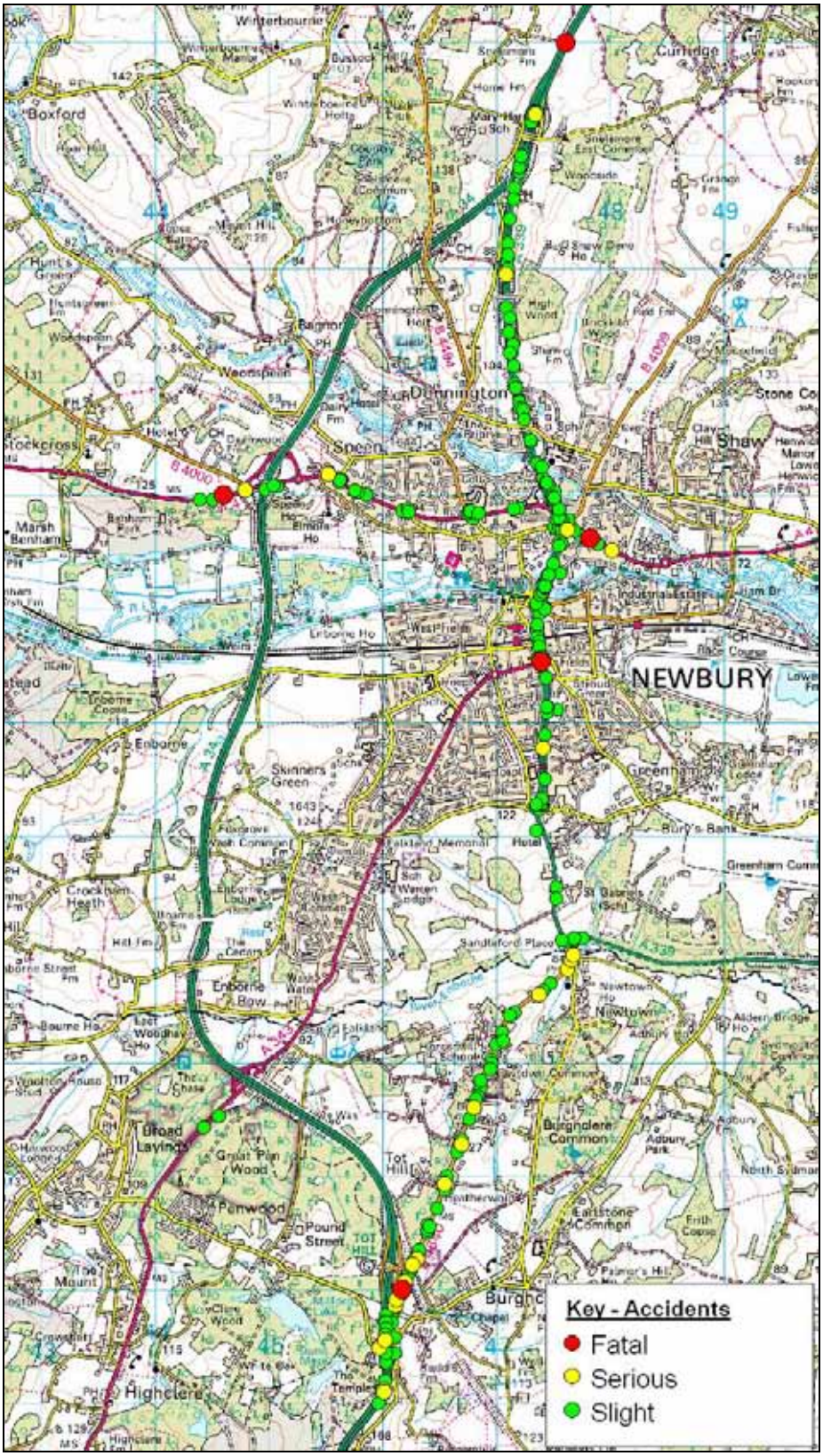

Figure 8.1 – PIAs Before Opening of the Bypass

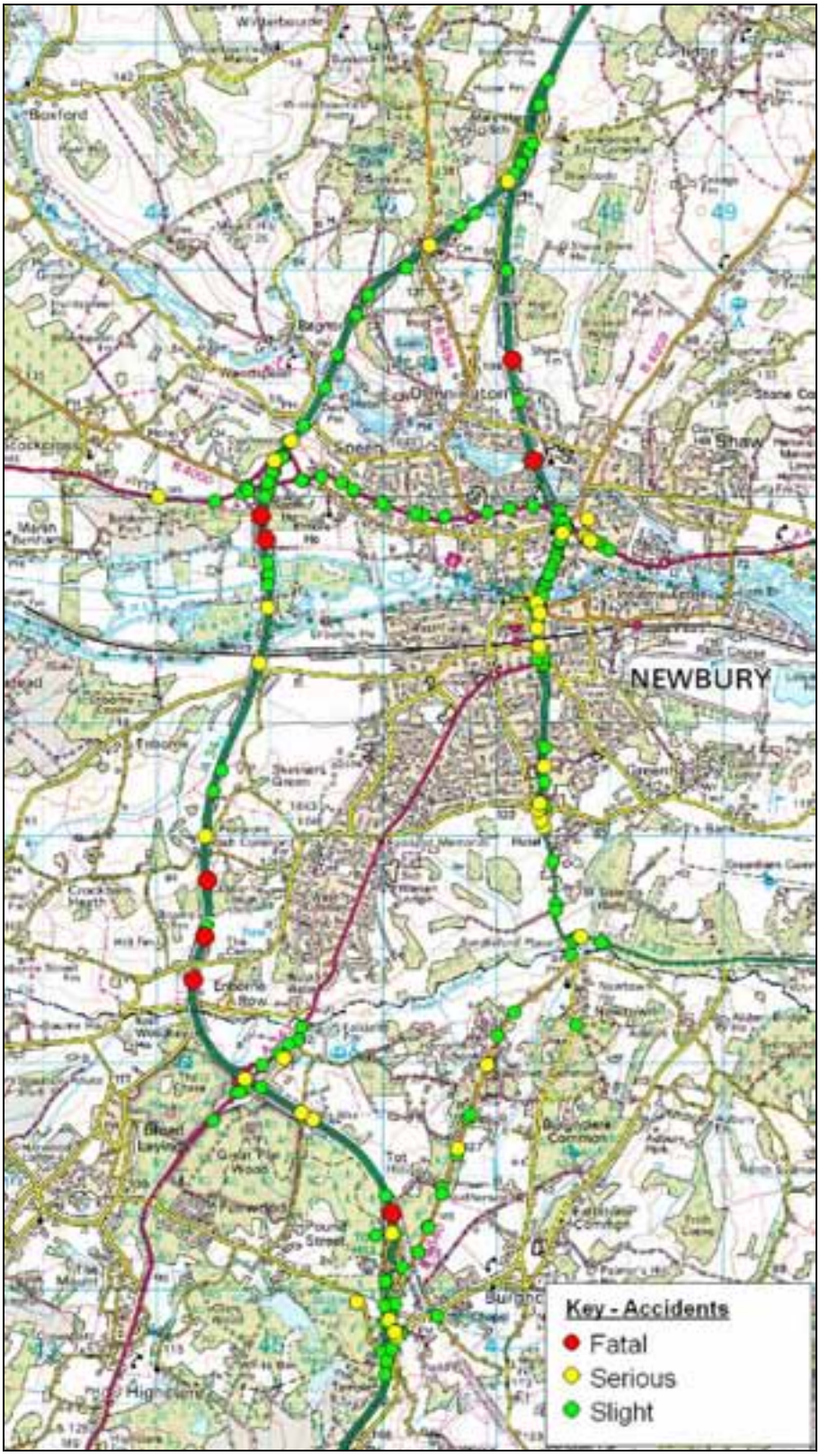

Figure 8.2 – PIAs After Opening of the Bypass

Accident Rates in the Newbury Area

8.18 Flows in the A34 corridor have increased by 50-65% in the five years since the Bypass opened, largely due to re-assignment from other routes across the south of England. These increasing traffic volumes will clearly have had an impact on the numbers of accidents in the Newbury area, therefore it is more reasonable to use accident rates as a measure of impact.

8.19 Table 8.3 compares accident rates before and after the opening of the Bypass. Accident rates are expressed in PIA/Million vehicle kilometres (PIA/Mvkm). National average rates are taken from DfT Guidance and are dependent upon the road type and the speed limits[12]. Accident rates differ between the before and after cases for a number of reasons. Some roads will have been reclassified or had a revised speed limit. The national rates are also subject to revision to reflect long term trends. hence may change between the before and after situations.

Table 8.3 – No. of PIAs on the A34 (Old and New routes)

Link	Dist (km)	Before (1994 – 31st Oct 98)			After (1999 – 2003)		
		No. of PIA	Accident Rate PIA/Mvkm (95 – 31 Oct 98)	National Average (1998)	No. of PIA	Accident Rate PIA/Mvkm	National Average (2003)
A339 Inner Ring Road	1.2	61	0.532	0.239 / 1.037	62	***0.724***	0.957
A339 Newtown Road	2.6	32	0.365	0.239	28	0.251	0.208
B4640 Tot Hill Newtown Straight	3.8	43	0.254	0.402	8	0.184	0.402
A339 Donnington Link Road	3.8	70	0.234	0.239	13	0.098	0.208
Old Route Total	**11.5**	**206**	**0.309**		**111**	**0.298**	
North of A4 junction	3.5				30	0.126	0.121
South of A4 junction	5.6				22	0.054	0.121
South of A343 junction	2.6				13	0.075	0.121
Bypass Total	**11.7**				**65**	**0.079**	**0.121**
A34 south of scheme	1.2	48	0.847	0.138	22	0.259	0.121
A34 north of scheme	1.6	35	0.281	0.138	57	***0.346***	0.121

[12] Default accident rates rates are specified in DMRB Vol 13 section 1 part 2 chapter 4: *The valuation of Accidents on Links.* The rates for 1998 and 2003 are factored from the 2000 rates using the given rule for the declining trend in accident rates over time.

Note: Accidents at junctions are included in respective links i.e. link and junction combined
The accident rate is Personal Injury Accidents/Million vehicle kilometres or PIA/Mvkm

8.20 The area of evaluation comprises the old route through Newbury (renamed the A339 and B4640 after scheme opening), the Bypass and the A34 north and south of the scheme. Accident rates before opening are based on the period 1995 – 31 October 1998, as AADT volumes are not available for 1994 (the two months either side of scheme opening are also omitted).

National Averages

8.21 National averages for different road types (link and junction combined) in 1998 and 2003 are shown in Table 8.3 for comparison purposes. The classification of road types is based on the following:

- The section of the old route through Newbury was built in the 1960/70s and has therefore been classified as an 'older dual two-lane road';
- Speed limits on the central section of this road changed from 50 to 30 or 40 mph after scheme opening, hence the accident rate is different between before and after opening;
- The B4640 Tot Hill Newtown Straight (formerly the A34) is a single carriageway road with a 50 mph speed limit; and
- The Bypass section has been classed as a 'modern dual two-lane road with hard shoulder'.

Observations on Accident Rates

8.22 The main points arising from Table 8.3 are:

- The number of PIA on the old route as a whole almost halved, dropping from 206 to 111, after the Bypass opened. However, traffic levels on this road reduced and the accident rate shows no significant change;
- The accident rate on the Bypass in the first five years after opening was 0.079 PIA/Mvkm, which is lower than the national rate of 0.121 PIA/Mvkm for a road of this type;
- On the B4640, Tot Hill Newtown Straight, there was a significant reduction in the accident rate and in the number of accidents after the Bypass opened. Traffic levels reduced considerably on this section and a series of highway safety measures have been implemented;
- On the A339 Donnington Link Road to the north of the town, there has also been a large reduction in both the accident rate and number of PIAs;
- In contrast on the A339 Newbury Inner Ring Road, there has been no real change in the number of accidents but, due to the lower traffic levels, there has been an increase in the accident rate, with a higher number of serious injury accidents. Although the speed restriction through the town centre was changed from 50mph to 30 or 40mph after the Bypass opened, there has been a general increase in traffic speeds due to reduced congestion;
- On the A34(T) south approach to the Bypass, the number of injury accidents and corresponding accident rates reduced by over 50%; and
- Conversely on the A34(T) north of the scheme there was an increase in the number of PIAs and corresponding accident rate. However, these figures may

have been affected by the major roadworks associated with the M4/A34 Chieveley junction improvement scheme between May 2003 and September 2004.

- Section 4 of this Report showed that traffic volumes have re-assigned into the A34 corridor from many other routes in the south of England, and these other routes have therefore seen reduced growth. The implication of this is that there will be accident and casualty reductions on these routes also that have not been assessed as part of this review. Therefore, although there has been an increase of serious/fatal accidents across the narrow corridor, a wider analysis may show this not to be true. Hence these results should be considered in this context.

Causes of Accidents

8.23 Notwithstanding the fact that there may be wider safety benefits than have been assessed in this report, a further analysis of the significant factors in the individual fatal and serious accidents in the Newbury area (detailed in Table 8.4) has been undertaken and shows:

- The number of head-on collisions was reduced from five to zero. Four of these collisions occurred on the Newtown Straight which, after the opening of the new scheme, has significantly lower traffic volumes;
- Conversely accidents which occurred during lane-changing and overtaking rose from one to seven. Four of these occurred on the Bypass; and
- Accidents which involved non-motorised users increased from one in the 'before' situation to ten in the 'after' situation, seven involving pedestrians and three involving cyclists. Eight of these accidents occurred on the old route

Table 8.4 – Factors in Serious and Fatal Accidents in the Newbury Area

Factor	'Before' (1994 –31 Oct 1998)	'After' (1999 – 2003)	Difference
Pedestrian	1	7	6
Changing lane	1	7	6
Cyclist	0	3	3
Loss control	9	11	2
Rear shunt - at junction	1	3	2
Parked car	2	3	1
Roundabout	1	2	1
Other	1	2	1
Left turn	2	2	0
Rear shunt-not junction	4	4	0
Right turn	3	1	-2

Head-on collision	5	0	-5
Total	**30**	**45**	**15**

Fatal Accidents on the Bypass

8.24 A further analysis of the individual fatal accidents on the bypass only is given in Table 8.5.

Table 8.5 – Factors in Fatal Accidents on the Newbury Bypass (1999-2003)

Factor	Crashes	Fatalities
Vehicle in Lay By hit by passing vehicle	1	1
Broken down vehicle struck by another	3	4
Moving vehicle struck by following vehicle	1	2
Pedestrian hit	1	1
Total	**6**	**8**

8.25 This table and preceding diagram shows that there is not a consistent cause or location of fatalities and a variety of causes are shown with no evident trends or a single common cause. It is likely therefore that the fatalities which have ocurred on the bypass between 1999 and 2003 are due to random factors. This is borne out by the availability of more recent accident data covering 2004 which suggests that there were no fatalities in this year.

Accident Cost Savings

8.26 TAG defines that for accidents:

The Present Value of Benefits (PVB) for accidents should be expressed in 2002 market prices, discounted to 2002 (TAG Unit 3.4.1 para 2.1.2).

8.27 However, for the purposes of this report and consistent with work previously undertaken for the Bypass, any costs and benefits are expressed in 1998 prices discounted to 1994.

Predictions

8.28 Table 8.6 shows the predicted accident savings obtained using COBA for the full extent of the transport model area over the 30 year assessment period.

Table 8.6 – Predicted Savings in PIAs over 30 Year Assessment Period

Scenario	Low Growth	High Growth
Do Minimum	11,393	11,795
Do Something	10,424	10,786

Accident Saving	969	1,009
PVB	£32.5m	£39.5m

Comparison with Actual Accident Savings

8.29 The premise of the POPE COBA methodology is that any change in flows and accidents will have a proportional impact on the Safety benefits that the scheme achieves

8.30 For the POPE evaluation, it was not possible to compare accident savings over such a wide area. As a result, a comparison between predicted and outturn accident savings has been undertaken for the Bypass and old route through Newbury for the period 1999 – 2003.

8.31 In Table 8.7 below, the predicted savings have been taken from the 30-year COBA assessment (but only the 5-year before and 5-year after results have been extracted to be comparable with the observed data) used in the appraisal of the scheme, and the number of PIAs shown is taken from the specific links from which we had comparable observed data, i.e. the A34 Bypass and parallel old A34 road.

8.32 The actual or outturn savings come from the analysis of accident records reported previously in Table 8.1 and shows that actual accident savings is roughly half of what was predicted on the Bypass and old road.

Table 8.7 – Comparison of COBA Predicted and Actual Personal Injury Accidents

	Scenario	Personal Injury Accidents	
		Low Growth[1]	High Growth[1]
COBA Prediction	Do Minimum	404	423
	Do Something	296	310
	Saving	108	113
Actual	Do Minimum 1994 – 31 Oct'98	304	
	Do Something 1999 – 2003	251	
	Saving	53	

Note: (1) Injury Accidents for the Bypass and bypassed links only, over five years

8.33 From the 5-year COBA assessment for the Bypass and old A34, a saving of 108 PIAs was predicted for the Low Growth scenario and 113 PIA's for the High growth scenario, whereas there has been an observed saving of 53 accidents over the same period, and same links.

8.34 The comparison of accident savings has been converted to a monetary benefit using the assumption that the same relationship between observed links also applies to the other links in the 'predicted' scenario.

8.35 Table 8.8 below shows that the predicted accident benefits were reported to be £32.5 million for low growth, and £39.5 million for high growth for the area covered by the transport model. Thus, as the actual results are only half of what was predicted, the outturn weighted benefit is £17.0million. However, this is a conservative figure because other links in the network have not seen traffic growth as high as recorded on the A34 corridor. Consequently, accident numbers on these links will be lower than has been assumed.

Table 8.8 – Comparison of Predicted and Outturn Accident Benefits

	Predictions		POPE Outturn	
	5 Year Accident Saving	PVB 30 Years	5 Year Accident Saving	PVB 30 Years
Low Growth	108	£32.5m	53	£16.0m
High Growth	113	£39.5m		£18.5m
Weighted Benefit		£35.3m		£17.0m

8.36 The weighted benefit, based on 60% of low growth and 40% of high growth is shown in Table 8.9 together with predicted and outturn accident, casualty and fatality figures. The main conclusion that can be drawn from this analysis is that outturn accident benefits on the Bypass and the old route through Newbury were about one-half of those predicted..

8.37 It should be noted that outturn traffic levels in the A34 corridor were higher than predicted, largely due to re-assignment for a variety of roads in the region. Therefore, the safety impacts of traffic re-assignment in the wider area has not been evaluated as part of the above calculation. Additional traffic in the Newbury corridor, is likely to have re-routed from roads which typically have a higher accident rate (for example the A338 and A346 which are single carrigeway A roads) and therefore the actual accident benefit in both actual accidents and monetary benefit are likely to be higher than shown in this assessment.

8.38 Therefore, it is clear that this is a conservative assessment and outturn accident benefits will have been higher than indicated in the above table.

Table 8.9 – Predicted and Actual Accidents Comparison for AST/EST (30 Year Assessment Period)

	Reduction in Accidents	Reduction in Casualties	Reduction in Fatalities	Present Value of Benefits (PVB)
Predicted	660	1019	17	£35.3m
Actual	318	864	-24	£17.0m

Accident Cost Savings: Main Conclusions

- In the five years since the opening of the Bypass, there has been a saving of over 50 personal injury accidents in the Newbury area, compared with the five years before opening.
- This corresponds to a saving in 140 casualties over the same period, however, even though there has been a significant reduction in the number of slight casualties, there has been an increase of 15 serious/fatal casualties in the assessment area of the A34 Bypass and parallel old road.
- The assessment of this increase in serious/fatal casualties is that the increase is due to a variety of causes however there has been an increase in pedestrian/cyclist serious injuries in Newbury.
- The accident rate on the Newbury Bypass is about 20% lower than the national rate for roads of this type, and other accident rate reductions are shown on the old route through Newbury apart from the Inner Ring Road section.
- For the whole of the region modelled in the appraisal of this scheme (i.e. including the M4 and the A4 from Hungerford) there was a predicted saving of over 1,000 casualties, including 12 fatalities with the scheme, with a forecast benefit of £35m over thirty years (1998 prices discounted to 1994);
- Based on this observed accident saving, the outturn accident benefit has been estimated at £17 million (1998 prices discounted to 1994) over thirty years,– about half the benefit predicted;
- However, this understates the value of the accident savings, as the Newbury Bypass has attracted traffic from routes outside the evaluation area. These routes will generally be less safe than the Newbury Bypass but the consequential accident savings have not been included in the evaluation.
- Notwithstanding this wider effect, there has been an increase in fatalities close to the bypass, particularly for non-motorised modes of travel, and this should be considered further to minimise this effect. It is reassuring that there were no fatalities on the A34 Bypass in 2004.

9. The Economy Objective

Introduction

9.1 TAG specifies that the Economy objective is divided into five sub-objectives for the AST, namely:

- Public Accounts;
- Business Users and Providers;
- Consumer Users;
- Reliability; and
- Wider Economic Impacts.

9.2 However, for the purposes of this analysis, due mainly to a lack of sufficient information, the following sub-objectives are considered, consistent with a previous older version of the AST:

- Costs;
- Journey times;
- Reliability; and
- Wider economic impacts.

9.3 Each of the above is considered separately below.

Scheme Costs

Outturn Costs

9.4 The outturn costs are shown in Table 9.1. It has been assumed that the costs provided (by the Agency) are in 1998 prices consistent with the scheme opening year.

Table 9.1 – Outturn Scheme Costs

	Outturn Costs (£m, 1998 Prices)
Construction	75.0
Land and property	Not Available
Preparation	4.0
Supervision	5.9
Sub-Total	**84.9**
Cost associated with protest action	45.0
Total	**129.9**

Assumptions

9.5 The following assumptions have been made regarding the timing profile of the outturn costs in order to define these costs in a consistent price basis:

- Scheme construction costs were split evenly over the three year construction period – 1996, 1997 and 1998 (1995 was ignored as construction started late in 1995);
- Preparation costs were incurred prior to construction in 1995;
- Supervision costs were split evenly over the construction period – 1996, 1997 and 1998; and
- The costs as a result of protest action occurred throughout the construction period (split evenly over the three years).

Comparison with Predicted Costs

9.6 Table 9.2 shows the present value of predicted scheme costs. The Table includes three previous cost predictions, all at different stages of project implementation.

9.7 To compare the outturn costs with the predictions, they need to be converted into a consistent price and discounting base. The outturn costs were rebased to enable a direct comparison with the 1995 pre-works estimate as this provided the most up to date predictions of the final scheme cost. For comparison with these predictions, the outturn costs have therefore been converted from a 1998 to 1994 price base using the Retail Price Index, and discounted to 1994 using an 8% discount rate (the rate used in 1995).

9.8 The comparison shows that scheme costs were estimated to be £66.3 million (at 1994 values and prices), whereas the outturn costs converted to the same price base were £92.5 million, around 40% higher than expected. However, the costs incurred as a result of the protest action against the Bypass accounted for just over a third (34.5%) of the total scheme costs and it would have been difficult to predict costs of this magnitude before construction.

9.9 For the AST/EST, the costs were rebased to 1998 prices discounted to 1994. On this basis the outturn cost of the scheme was £104.5 million, compared to a predicted cost of £74.9 million.

Table 9.2 – Present Value of Predicted Scheme Costs

Source	Price Base	Total
Appraisal Framework (1998) for Public Inquiry	1979 prices discounted to 1979	£10.8m
A34 Newbury Bypass Preliminary Review (1995)	1988 prices discounted to 1988	£31.0m
Before works (1995)	1994 prices discounted to 1994	£66.3m
	1998 prices discounted to 1994	**£74.9m**
Outturn	1994 prices discounted to 1994	£92.5m
`	1998 prices discounted to 1994	**£104.5m**

Scheme Cost: Main Conclusions

- ***The scheme cost estimate was £66.3m (1994 values and prices) or £74.9m (1998 costs, discounted to 1994).***
- ***The scheme cost outturn was £92.5m (1994 values and prices) or 104.5m (1998 costs, discounted to 1994).***
- ***The scheme outturn cost was therefore 40% higher than estimated.***
- ***However, just over one-third of total outturn cost was due to protest action, which was probably not foreseeable, and thus excluding this exogenous factor, the actual cost of the scheme was in line with predictions.***

Journey Time Savings

Opening Year Time Savings

9.10 For the AST, peak and off-journey time changes in the *opening year* should be specified in the quantitative column. This should only be recorded for the trunk road and refers to Do Something over Do Minimum saving in 1998.

9.11 The predicted journey time savings as reported for this scheme were as follows:

- 15 minutes - peak (high growth); and
- 2 minutes - off-peak (high growth).

Outturn Time Savings

9.12 The outturn savings based on observed journey times *five years after opening* were:

- 11 minutes for the peaks; and
- four minutes during the inter-peak period, which is higher than the predicted two minute saving.

'Vehicle Hour' Benefit Approach

9.13 This section attempts to quantify these benefits for both the predicted stage and actual journey time savings, however the 'before' journey times have been estimated using the COBA appraisal program, and therefore these results should be treated with caution.

9.14 A two stage approach has been used, namely:

- Calculation of benefits for vehicles that would be in the corridor if no re-assignment from outside the model areas, redistribution or induced traffic had occurred, i.e. the fixed trip element; and
- Calculation of benefits (using 'rule of half') for additional trips in the corridor.

9.15 This is described in the next section, and this assessment is based on applying a monetary benefit to the changes in 'vehicle hours' or the time spent on the network by traffic in the Do Minimum (Before) AND Do Something (after) scenarios.

9.16 Savings in 'vehicle hours' for the 'fixed trip' element have been estimated using COBA and observed information as appropriate. Predicted and outturn 'vehicle hour' benefits were derived for the Bypass and the old route through Newbury only. COBA generates 'high' and 'low' growth predictions. It was normal at the time of the Order Publication Report (OPR) and later assessments for COBA 'low' and 'high' growth outputs to be weighted to create an average figure, by using 60% of the low growth result and 40% of high growth. This approach has been adopted in this evaluation.

9.17 In order to quantify benefits, scenarios were considered as follows:

- Predicted Vehicle Hours, Do Minimum (DM) 1997: taken from COBA which was run for both low and high growth options, with the journey time year in the input data file set to 1997;
- Predicted Vehicle Hours, Do Something (DS) 2003: taken from COBA which was run for both low and high growth options, but with the journey time year set to 2003;
- Outturn Vehicle Hours, Do Minimum (DM) 1997: estimates made using a combination of observed flows and information taken from the DM COBA as observed journey times were not available for 1997; and
- Outturn Vehicle Hours, Do Something (DS) 2003: estimates made using observed traffic volumes (from the before scenario) and results from journey time surveys after opening.

Changes in Vehicle Hours

9.18 Table 9.3 below shows the saving in vehicle hours for the Bypass and the old route through Newbury for the 'fixed trip' element (referred to in 9.14 above). The table

compares the predicted vehicle hour saving obtained using COBA (both low and high growth) to the outturn savings derived from observed traffic flow before opening. The before opening flows were then applied to the outturn observed journey times for the Do Something. The Before flows were allocated to the two routes in proportion to those that had been observed. This approach provides an estimate of the hours saved based on the fixed traffic element. Hence, this approach excludes benefits from any additional traffic in the corridor.

9.19 The results indicate that the annual saving based on observed information for the Bypass and old route through Newbury was 388,000 vehicle hours.

9.20 In comparison, the predicted savings were 379,000 vehicle hours for low growth, and 92,000 vehicle hours for high growth.

Table 9.3 – Comparison of COBA Predicted and Observed Vehicle Hour Savings (Bypass and Old Route Links Only)

Predicted / Outturn	Scenario	Total Vehicle Hours per Year on Bypass and bypassed links on old route	
		Low Growth	High Growth
COBA Prediction	Do Minimum 1997	2,356,000	2,407,000
	Do Something 2003	1,977,000	2,315,000
	Saving	379,000	92,000
Actual	Do Minimum 1997	2,800,000	
	Do Something 2003	2,412,000	
	Saving	388,000	

9.21 Benefits have been evaluated by using the COBA assessment for the modelled wider area, not just the Bypass and old route, i.e. the same relationship between observed and predicted vehicle hour savings as shown in Table 9.3 is also applied to the overall time benefits predicted by COBA. The COBA assessment for the wider area showed journey time benefits for this scheme were £125 million for low growth and £160 million for high growth (1998 prices discounted to 1994).

9.22 A weighted benefit has been calculated by using 60% of the low growth result and 40% of high growth. Applying this approach, the predicted journey time benefits for the Bypass are £139 million.

9.23 Using the relationships between vehicle hours saved (on the Bypass and bypassed links) and economic benefit (for all the links), the observed 388,000 hours saved can be equated to £204 million of benefits over 30 years as summarised in Table 9.4.

Table 9.4 – Comparison of Predicted and Outturn Link Transit Time Benefits

	COBA Predictions		POPE Outturn	
	Annual Vehicle Hours Saving	30 Year Link Transit Time Benefits (1998 prices disc to 1994)	Annual Vehicle Hours Saving	30 Year Link Transit Time Benefits (1998 prices disc to 1994)
Low Growth	379,000	£125 m		
High Growth	92,000	£160m		
Weighted 60:40		£139m	388,000	£204m

9.24 COBA also calculates benefits for junction delay. The inclusion of these benefits adjusted to 1998 prices (but discounted to 1994), is shown in Table 9.5 below. Using the relationship between COBA forecast and POPE outturn gives a total time benefit of £536m

Table 9.5 – Predicted and Outturn Time Benefits Comparison for AST/EST (30 Year Appraisal Period)

£million (1998 prices discounted to 1994)	COBA Predicted PVB	POPE Outturn PVB
30 Year benefits (weighted)	£365m	£536m

9.25 Thus, the outturn journey time benefits are estimated to be nearly 50% higher than were predicted.

Induced and Reassigned Trips

9.26 The calculation of outturn vehicle hour savings in the above sections was based on a comparison between the DM situation in 1997 and the DS situation in 2003 assuming no reassigned and induced traffic above natural traffic growth.

9.27 However, additional traffic volumes are clearly observed in the corridor, and benefits should also be calculated for this. Additional traffic is defined as the difference in vehicle kilometrage between DM and DS, and is made up of several elements:

- **Re-assignment**, where traffic travelling between A and B has transferred to an alternative route between A and B – there is clear evidence for reassignment of traffic from a number of strategic routes across the south part of England to the A34. Sometimes the new route can be shorter than the old;

- **Re-distributed,** traffic that changes destination due to the reduction in congestion or shorter journey times on the bypass;
- **Change in mode** – it is possible that some foot/bicycle/bus trips transferred to car to make use of the newly available road space;
- **Land Use Changes** - there are likely to be additional trips in the Newbury area as a result of changing economic conditions in Newbury facilitating new development in the area. Land use changes will also have had the effect of redistributing trips, eg the new Vodafone HQ; and
- **Additional traffic induced** by the scheme as a result of the reduced travel costs due to faster journey times on the bypass and less congestion in Newbury. This will include suppressed traffic and induced or generated trips*;*

Rule of a Half

9.28 Additional benefits are accrued from this reassigned or induced traffic, although conventional economic methods requires that they are credited with only half the benefits of pre-existing traffic, under the economic *rule of a half*:

9.29 The annual vehicle hours saving for 2003 on reassigned and induced traffic on a subset of the network links in Newbury has been calculated using observed flows of additional traffic in the corridor multiplied by half of the journey time savings. This gives an annual total of 242,000 vehicle hours saved for this additional traffic.

Based on the relationship between vehicle hours saved and economic benefit, as shown in Table 9.4, the benefit per annual vehicle hour saved is £526. Applying this value to the savings for reassigned and induced traffic gives an estimated additional £127 million of economic benefits. The vehicle hour savings accruing from the reassigned and induced traffic are summarised in

9.30 Table 9.6.

Table 9.6 – Outturn Journey Time Benefits with Benefits for Reassigned and Induced Traffic

£million (1998 prices discounted to 1994)	Annual Vehicle Hours Saving (2003)	30 Year Link Transit Time Benefits	*Benefit per Annual Vehicle Hour Saved*
POPE Fixed traffic	388,000	£204m	*£526*
POPE Additional Traffic	242,000	£127m	
Junction Benefits	-	£252m	
TOTAL		£583m	

9.31 Some caveats with this result should be borne in mind:

- Journey time savings for additional trips on the Bypass is based on the difference between the journey time on the Bypass (DS) and journey time on the old route (DM), as it is not possible to determine the DM journey times of trips that have reassigned from other strategic routes; and
- Savings on the old route are based on DS outturn journey times minus forecast COBA DM journey times, as journey times were not undertaken pre-scheme opening. However, the results from these calculations show some unexpected negative values on some links which are unlikely to be the case.

Journey Time Savings: Main Conclusion

- Journey time benefit over 30 years is estimated to be £583 m (1998 costs discounted to 1994), made up of the time benefits on links and junctions from the fixed trip element as well as the benefits from the additional vehicles- 60% higher than predicted.

Cost Benefit Analysis

Summary of Results

9.32 Table 9.7 below compares the predicted and outturn costs and benefits for the Bypass. As stated previously, the analysis is limited to Safety and Economy, The values below are presented in 1998 prices, discounted to 1994.

Table 9.7 – Summary of Predicted and Outturn Economic Benefits of Scheme

	Prediction	Outturn	% Difference
Journey Time Benefits	£365.4m	£583.5m	+60%
Vehicle Operating Costs	£4.5m	£4.5m	0%
Accident Benefits	£35.3m	£17.0m	-52%
Present Value of Benefits (PVB)	£405.2m	£605.0m	+49%
Present Value of Costs (PVC)	£74.9m	£104.5m	+40%
Net Present Value (NPV)	£330.3m	£500.5m	+52%
Benefit to Cost Ratio (BCR)	5.4	5.8	

Note: 1998 prices discounted to 1994

9.33 The vehicle operating costs (VOC) presented are the weighted COBA predictions result. An outturn figure has not been obtained. However the proportion of total

benefits relating to VOC change is small, hence this is not biaising results to any great extent.

9.34 The outturn results indicate a higher level of benefits than predicted, related largely to higher journey time savings. Overall, this evaluation suggests that predictions over-estimated the level of accident benefit, whilst under-estimating the level of benefit as a result of journey time savings. However the study area as defined in the appraisal process did not take all the observed effects into account, hence the outturn benefits as shown here are likely to be under-estimated).

9.35 Scheme costs were under-estimated, mainly as a result of the costs incurred due to protest action against the Bypass.

BCR

9.36 Table 9.7 also shows that the partial BCR (i.e. BCR based only on aspects of Safety and Economy) for the scheme outturns at 5.8 compared to a predicted value of 5.4.

9.37 It should be noted that BCR is not an input to the AST, but nevertheless in this particular provides another indication that the Bypass scheme meets its objectives in terms of Safety and Economy. However, this partial BCR takes no account of other significant costs and benefits some of which cannot be presented in monetised form.

Main Economics Conclusions

- ***The level of benefit from accident savings was lower than predicted, but the observed journey time savings were higher than predicted and thus overall the outturn time and accident benefits were higher than predicted.***
- ***The outturn cost of the scheme was £104.5m, compared to a forecast cost of £74.9M, around 40% higher than expected: this difference is attributed largely to the costs incurred as a result of the protest action against Bypass (which accounted for a third of the outturn scheme costs).***
- ***In summary, the scheme represented good value for money with a benefit to cost ratio of 5.8 compared to predicted of 5.4.***
- ***In our view, this outturn set of benefits are likely to be underestimated, as it excludes benefits from other strategic roads outside the study area where growth has been reduced since the bypass opened.***

Reliability

9.38 TAG defines the reliability sub-objective as follows:

This criterion summarises the assessments made of a proposal's impact on the objective to improve motorised road users' journey time reliability. … Work carried

out for HETA suggests that reliability is reduced as flows approach capacity, either through junctions or on links. The concept of 'stress' has been developed to provide a broad indication of the relationship between flows and capacity on a road. Thus, stress is, with some limitations.., considered to be a reasonable proxy for reliability.

9.39 Stress is calculated to be the ratio of the AADT flow to the Congestion Reference Flow (CRF) expressed as a percentage. The lower the percentage, the higher the likelihood that journey time reliability is better.

9.40 The CRF is defined in the *DMRB* Volume 5 section 1 Part 3 as:

CRF = CAPACITY * No of Lanes * WidthFactor * 100/PeakFLow * 100/PeakDirectionSplit * AADT/AAWT

9.41 The results of the route stress calculations for the Bypass and old route, and are given in Table 9.8 .

Table 9.8 – Assessment of Route Stress for EST

	Route Stress	
	Before (1997)	**After (2003)**
Old Route (Newbury, south of A4)	79%	58%
Old Route (Tot Hill, south of Newbury)	113%	61%
A34 Bypass	-	73%

9.42 TAG explains that:

This approach is based on the change in stress (within the range 75% to 125%) as a result of the proposal, combined with the number of vehicles affected. Where a proposal provides a new route, the approach takes account of improvements in reliability for those remaining on the old route as well as those transferring to the new (TAG Unit 3.5.7 para 2.1.1).

9.43 This approach gives an assessment score for reliability impacts of moderate beneficial.

Reliability: Main Conclusions

- ***The Bypass has led to significant improvements to journey reliability for traffic on the A34 strategic route***
- ***The 'route stress' measure is moderate beneficial.***

Wider Economic Impacts

9.44 The Wider Economic Impacts to be examined for the AST include:

- existence of regeneration areas;
- new developments as a result of the scheme; and
- other economic impacts.

Existence of Regeneration Area

9.45 TAG recommends that for scoring Wider Economic Impacts:

If a transport scheme being appraised does not affect a Regeneration Area, then a statement to that effect should be made in the Qualitative Impacts column of the AST and the score in the Assessment column should be shown as neutral (TAG Unit 3.5.8 para 9.1.2).

9.46 The scheme does not affect a regeneration area, and therefore, based on the current guidance, the scoring for the AST and EST should be neutral.

New Developments

9.47 Changes to the road network and new developments were reviewed in Chapter 6. As part of the evaluation major new developments in the area have been considered.

9.48 Major new developments in the Newbury area include:

- Vodafone – a new office development off A339 Donnington Link Road;
- New Greenham Park – industrial development on the former Greenham Common Airbase site;
- Pinchington Lane retail park off A339;
- Redevelopment of former BP depot, Hambridge Road for office (B1) use;
- Newbury Business Park (phase 6 of development);
- Redevelopment of two grandstands at Newbury racecourse;
- Waitrose superstore;
- Newbury and Thatcham Hospital;
- Newbury College; and
- A range of residential developments in the area.

9.49 Even though the Local Authority does not view the bypass as being the crucial factor in determining these land use changes, in practice, the Bypass appears to have contributed to changing significantly the economic conditions in Newbury. The Bypass has been effective in removing traffic congestion and rerouting HGVs, thereby improving the ambiance of the town and improving local road access.

9.50 The Bypass has created economic conditions for development, such that there has been considerable new development in the area after scheme opening. West Berkshire Unitary Authority has indicated that the Bypass has allowed development to be focused in the urban area.

Other Economic Impacts

9.51 Hampshire County Council indicated in their consultation meeting, that the haulage industry is the main commercial sector to have benefited from the shorter journey times as a result of the scheme. There are also associated benefits for continental ferry traffic via Portsmouth and the tourist industry.

Wider Economic Impacts: Main Conclusions

- ***The development of the Bypass appears to have contributed towards making Newbury a more attractive centre for investment, by reducing traffic congestion and diverting much HGV traffic.***
- ***A range of developments have been implemented since the opening of the Bypass, although the permission for none of them has been based on theexistance of the Bypass itself.***
- ***The opening of the Bypass appears to have benefited a number of groups outside the Newbury area, including the haulage industry, tourism and the freight and ferry ports on the South Coast, particularly Southampton and Portsmouth, which have all benefited from reduced (and more reliable) road journey times.***

10. The Integration Objective

Introduction

10.1 As part of this evaluation, Integration and Accessibility impacts have not been fully assessed, but have been evaluated in simple terms against WebTAG Guidance. Within TAG, the Integration Objective consists of three main elements:

- interchange with other transport modes
- land-use policy
- other government policy

Transport Interchange

10.2 TAG defines that for transport interchange the AST requires:

A qualitative description of the ways in which passenger interchange would be improved by the strategy or plan in the study area and on particular modes should be given in the qualitative column. An entry in the quantitative column of the AST should include the number of interchanges improved, the number of new interchanges created and the approximate number of users affected (TAG Unit 3.7.1 section 1.2).

10.3 Transport interchange was not assessed in the appraisal of the Bypass scheme. Improvements to transport interchange were not implicitly planned following the scheme, although the opportunity for improved bus-rail interchange has not been taken. Interchange between the rail and bus station in Newbury is currently poor, lacking a clearly-defined pedestrian route. The following Figures illustrate Newbury's rail and bus stations.

Figure 10.1 – Newbury Rail Station

Figure 10.2 – Newbury Bus Station

Land Use Policy

10.4 For land use policy, TAG defines that:

This sub-objective summarises the assessments made of the extent to which the proposal is integrated with land use proposals and policies and with proposals and policies concerning transport (all modes). The assessment of proposals in the context of national, regional, strategic and detailed local planning policies is included in the current recommended appraisal practice (TAG Unit 3.7.2 para 1.1.1).

10.5 The A34 Newbury Bypass Appraisal Framework (1988) cited a number of policies of Berkshire County, Hampshire County and Newbury District Councils of relevance. These policies and the impact of the Bypass route are:

- Areas of special architectural, historic, or townscape character to be safeguarded and enhanced (Berkshire CC, Newbury DC) – route passes within 120 metres of Bagnor Conservation Area;
- To protect buildings of special architectural or historic interest (Berkshire CC, Newbury DC) – Meadow Way, a Grade II listed building is within 100 metres of the route at Snelsmore;
- To safeguard important archaeological remains and investigate those not meriting preservation prior to damage/destruction (Berkshire CC, Newbury DC) – route crosses areas of archaeological significance as follows:
  - (i) 750 metres through areas near Bagnor of prehistoric and Roman settlements;
  - (ii) The line of a Roman road to the north of Belmont; and
  - (iii) 300 metres through area to the north of Bath Road of prehistoric and Roman settlement activity;

  Route crosses areas of high archaeological potential as follows;
  - (i) Some 100 metres across Lambourn Valley; and
  - (ii) 800 metres across Kennet Valley.
- To safeguard habitats of value to nature conservation (Berkshire CC, Hampshire CC) – land of ecological value is crossed by the route in the Kennet Valley, at Elmore Plantation, Speen and at Bagnor, route crosses possible ancient woodlands;
- To protect Kennet and Avon Canal as an important recreational resource, to seek designation of the Kennet and Avon Canal as a Conservation Area (Berkshire CC, Newbury DC) – route crosses the canal with visual and noise effects in the locality;
- To reduce traffic congestion in urban areas (Berkshire CC) – reduced traffic volumes will reduce congestion in Newbury and provide 'breathing space' for local authorities to improve the local road network;
- To investigate and implement measures designed to promote road safety for all road users (Berkshire CC) – route would reduce the number of accidents;
- To develop a hierarchy of roads and encourage traffic to use most suitable routes (Berkshire CC, Hampshire CC) – improves a national primary route; and
- To take account of the needs of cyclists when roads are designed and improved (Berkshire CC, Hampshire CC) – adequate provision for cyclists within the

standards of the Bypass, the old route safer for cyclists with less traffic and lower proportions of HGVs.

10.6 TAG states that the qualitative box in the AST should draw out the key policies where the plan or strategy is integrated well or badly.

10.7 The above appraisal indicated the scheme integrated badly with the environmental policies but was well integrated with transport polices, as recorded in the AST.

10.8 As part of the 'Five Years After' evaluation, consultations have been undertaken with the local authorities, West Berkshire Unitary Authority and Hampshire County Council, to determine how the Bypass has impacted on land use and transport policy in their areas.

10.9 West Berkshire noted that the Bypass had not played a role in the current Local Plan or Berkshire Structure Plan (2001 – 2016), although it could influence emerging policies. The Bypass could have a role in the Regional Development Framework for 2006 – 2016. In the Regional Spatial Strategy, Newbury was recognised as a hub and a good location for housing development and urban extension, as a result of its accessibility by all modes.

10.10 Hampshire County Council felt that the Bypass had not impacted on land use and transport policies in their area.

Other Government Policies

10.11 For Other Government Policies, TAG defines that for appraisal:

The impact of transport proposals on other Government policies should be considered, in order to assess the effect on overall policy integration within Government. A review should be carried out to identify whether the strategy or plan as a whole either a) contributes to and is consistent with, b) has no overall contribution or c) is inconsistent with other Government policies beyond transport (TAG Unit 3.7.3 para 1.1.1).

10.12 The A34 Newbury Bypass Appraisal Framework (1988) cited a number of policies from the Department of Environment and Department of Transport (Government organisations at that time) of relevance for the scheme. These policies and the impact of the Bypass route are:

- To protect AONB as being of national importance (Department of Environment) – 3.5km of route follows disused railway which forms the boundary between the Hampshire area of the North Wessex Downs AONB, route briefly touches the AONB between Speen and Bagnor; and
- To protect SSSI and Nature Reserves (Department of Environment) – route severs Berkshire, Buckinghamshire and Oxfordshire Naturalists' Trust (BBONT) Nature Reserve at Rack Marsh, Bagnor, route runs through edge of Snelsmore Common SSSI;
- To assist economic growth by reducing transport costs (Department of Transport) – improvement to strategic route from Midlands to south coast reducing journey times;
- To improve the environment by removing through traffic (especially lorries) from unsuitable roads in towns and villages (Department of Transport) – would

provide environmental benefits for both the rural and urban residential areas along the existing A34 at the expense of smaller numbers of people living near the published route; and

- To enhance road safety (Department of Transport) - will reduce accidents.

10.13 In terms of evaluation, the Bypass has had an impact on the North Wessex Downs AONB and SSSI around the Kennet and Lambourn Rivers, although it is not considered to have had an impact on the Snelsmore Common SSSI. The scheme has improved journey times for traffic on the A34 between the South Coast and the Midlands and removed through traffic from the old route through Newbury. There has also been a reduced number of accidents in the five years after opening. In summary, as recorded in the AST, the scheme is consistent with these transport policies although it is not consistent with environmental policies.

Main Integration Conclusions

- ***The scheme predictions indicated a dichotomy in policy integration: the scheme was integrated poorly with environmental policies and well integrated with transport policies; this finding applied to both local (Berkshire County Council, Hampshire County Council and Newbury District Council) and national policies in these areas.***
- ***For the evaluation, West Berkshire Unitary Authority indicated the Bypass had not played a role in the current Local Plan or Berkshire Structure Plan, although they noted that it could influence emerging policies.***
- ***With respect to integration with Government policies, the scheme predictions noted the scheme was not in accordance with Department of Environment (DoE) policies related to Areas of Outstanding Natural Beauty (AONBs) and Sites of Special Scientific Interest (SSSIs), although was in line with Department of Transport (DoT) policies to assist economic growth by reducing transport costs, remove through traffic from unsuitable roads and to enhance road safety.***
- ***The evaluation bears out this prediction: the scheme contributes to transport policy objectives but not environmental policy objectives.***

11. The Accessibility Objective

Introduction

11.1 Again, a detailed assessment of the Accessibility objective is not part of the POPE process at present, but has been evaluated in simple terms against TAG Gudance. The Accessibility Objective consists of two main elements:

- severance; and
- access to the transport system.

Severance

11.2 TAG recommends noted that:

This sub-objective is concerned with severance as it affects those using non-motorised modes, especially pedestrians (TAG Unit 3.6.2, para 1.1.1).

To ensure a consistent approach, classification should be based on pedestrians only (para 1.1.3).

11.3 Assessment of severance is based on a change in severance between the DM and DS cases and the numbers of people likely to be affected by the changes.

11.4 It was predicted, as stated in the Newbury Bypass Appraisal Framework (1988), that there would be substantial relief to the residential area of Newtown Straight and increased potential for walking along the A34 footways by traffic flow reductions of 76% and an 88% reduction in heavy goods vehicles. Five years after opening, weekday traffic volumes have reduced by 74% and heavy goods vehicles by 87%, almost identical to the forecasts. Severance on Tot Hill Newtown Straight has improved significantly due to the reduction in the volume of traffic.

11.5 The Appraisal Framework (1988) cited that reduced traffic volumes would reduce congestion in Newbury and provide 'breathing space' for local authorities to improve the local road network. The Newbury Preliminary Review in 1995 also identified that by removing a large component of the traffic on the A34, the Bypass would offer an opportunity for a significant change in the management to be applied on and around the existing road. It was anticipated that traffic management measures would ensure that any relieved capacity benefited non-car users.

11.6 Traffic management measures on the old route include a reduction in the speed limit between Robin Hood and Queens Road Roundabouts from 50 to 30 or 40 mph. Two new at-grade pedestrian crossings have been introduced on the A339, although these were part of planning permissions for development. West Berkshire pedestrianised Northbrook Street, the main street in the town centre in 1999.

11.7 Slight severance along the line of the Bypass was predicted at Enborne Row, Enborne Street and Lambourn Road. The public rights of way officer at the local authority has advised that whilst the footpath routes in these locations are no longer

as convenient, the scheme included new footbridges at Skinners Green, Enborne and near Bagnor.

Access to the Transport System

11.8 Access to the transport system considers access to a car and access to the public transport system.

11.9 For this evaluation, consideration has been given to access to public transport. TAG recommends appraisal using distance or walk time from a public transport service, plus consideration to service frequency, speed of travel and quality of the public transport service.

11.10 The Newbury Preliminary Review (1995) highlighted that within the local area, public transport was road based and affected by network conditions to the same extent as private vehicles. It noted that the removal of through-traffic was not expected to significantly change the balance between modes. The local authority had a policy of improving accessibility by public transport and therefore it was anticipated that any capacity relieved by the Bypass could be taken up by traffic management measures.

11.11 West Berkshire has not as yet introduced any bus priority measures on the A339, although it has indicated that multiple occupancy vehicle (MOV) lanes are now being considered.

11.12 As a result of capacity relief on the A339, there is now good journey time reliability for buses on the A339, including the public services and buses provided by Vodafone and Greenham Park. Hampshire County Council also noted that reliability of bus services on the A339 between Newbury and Basingstoke had improved after scheme opening.

11.13 It is difficult to ascertain whether there has been any change in the balance between modes with the removal of through traffic. Any possible transfer from bus travel to car would be masked by the general decline in the level of bus patronage in the South East region.

11.14 With respect to rail, patronage has increased between 1998 and 2003, and it is possible that in the last few years more people drive from Thatcham to use Newbury rail station's park and ride.

Main Accessibility Conclusions

- ***As predicted, there has been a significant reduction in severance on the single carriageway section of the old route, Tot Hill Newtown Straight, with a 74% reduction in traffic and 87% reduction in the number of heavy goods vehicles five years after opening.***
- ***However, there has been new severance at places along the alignment of the Bypass, although the scheme included new footbridges at Enborne and near Bagnor.***
- ***Access to the transport system has been improved – reliability for buses on the A339 has improved as a result of traffic relief, although bus priority measures have not been introduced.***

12. Evaluation Summary and Conclusions

Introduction

12.1 This section brings together the findings of the previous sections in the framework of the structured into two appraisal tables: the AST ('predicted' impacts) and EST ('five years after' outturn impacts).

Table 12.1 – AST/EST Framework: Impact Objectives and Sub-Objectives

Objective	Sub-Objectives	Text Section
Environment	Noise	7.13
	Local Air Quality	7.26
	Greenhouse Gases	7.33
	Landscape	7.34
	Townscape	7.57
	Heritage of Historic Resources	7.62
	Biodiversity	7.71
	Water Environment	7.83
	Physical Fitness	7.93
	Journey Ambiance	7.99
Safety	Accidents	8
Economy	Journey times	5
	Cost	9.1
	Reliability	9.38
	Wider Economic Impacts	9.45
Accessibility	Severance	11.2
	Access to the Transport System	11.8
Integration	Interchange	10.2
	Land-Use Policy	10.4
	Other Government Policies	10.11
COBA Economic Outputs	Net Present Value, Benefit/Cost Ratio	9.32

Summary Tables

12.2 The two summary tables – AST and EST – are given on the following pages.

Table 12.2 – Appraisal Summary Table

Description 11.7km D2 bypass		**Appraisal Summary Table (AST)** i.e. predicted	**Problems** Heavy flow of through traffic on A34(T) through town of Newbury	**Present Value of Costs and Present Value of Benefits in 1998 prices discounted to 1994**
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	The proposed route would have an effect on the existing noise climate leading to an increase in traffic noise for the individual properties and settlements scattered along the route and a decrease where traffic is diverted from along the line of the A34 – *From Statement of Reasons May 1988*	See table 1 from 1988 Appraisal Framework ref B	Beneficial for existing A34. Adverse for Bypass route corridor
	Local Air Quality	Any existing Air Quality problems on the existing A34 (1995) offset by improved vehicle exhaust output. Bypass not expected to have AQ problems in its own corridor, whilst further improving AQ on existing A34 corridor – *From Review Report 1995*		Beneficial
	Greenhouse Gases	No references to Greenhouse Gases		N/A
	Landscape	Landscape effects always understood to be a major adverse aspect – *From Review Report 1995*	See table 2 from 1988 Appraisal Framework ref B	Adverse
	Townscape	Bypass would give an opportunity for a new approach to traffic and transport management in the town. However, continuing growth will reduce relief over time – *From Review Report 1995*		Beneficial
	Heritage of Historic Resources	1988 procedures resulted in an impact of high potential significance being under represented at the Inquiry – *From Review Report 1995*		Adverse
	Biodiversity	Discovery of protected species after Public Inquiries, impacts of scheme were underestimated. New SSSIs designated, severity and form of impacts uncertain– *From Review Report 1995*		Adverse
	Water Environment	Changes in local circumstances since 1988 Public Inquiry. Potential new SSSIs to be designated and protected species discovered – *From Review Report 1995*	See table 3 from 1988 Appraisal Framework ref B	Adverse
	Physical Fitness	Effects on public rights of way noted – loss of footway along disused railway at Washwater, two footpaths combined at Skinners Green, ten footpaths one bridleway diverted. Also, the potential for walking along the old route increased by traffic flow reductions. – *From Appraisal Framework 1988*		Neutral / Beneficial
	Journey Ambiance	Driver stress on the Bypass estimated as low. For existing A34 – low to moderate (1994), for 2009 as 1994 or increasing depending on link. Views from the Bypass are described as rural. Noise increases were identified on footpaths in the vicinity of the Bypass. A34 improved for cyclists – relieved by estimated 36-76% all vehicles and 63-88% of HGV's. – *From Appraisal Framework 1988*		Beneficial
SAFETY	**Accidents**	Reduction in accidents and casualties.	Accidents reduced by 660 Casualties reduced by 1019 Fatalities reduced by 18	PVB £35.3m
ECONOMY	**Journey times**	Improved journey times for A34 through traffic on the Bypass. Benefits for traffic in the peak periods and less significant benefits outside the peak periods. Savings given for 1998 opening year.	Peak Inter-peak 15 mins 2 mins	PVB £365.4M
	Cost			PVC 74.9M
	Reliability	Improved journey time reliability for traffic on the A34 between the south coast and the Midlands.	Route stress not calculated	
	Wider Economic Impacts	Not assessed.		
ACCESSIBILITY	**Severance**	Substantial relief to residential area along Newtown Straight from traffic flow reduction of 76% and 88% heavy goods vehicles. Slight severance due to Bypass at Enborne Row, Enborne Street and Lambourn Rd.		Beneficial
	Access to the Transport System	Not assessed.		
INTEGRATION	**Interchange**	Not assessed.		
	Land-Use Policy	The Appraisal Framework (1988) listed relevant policies of Berkshire County, Hampshire County and Newbury District Councils. The proposal was integrated badly with environmental policies and well integrated with transport policies.		Neutral
	Other Government Policies	The Appraisal Framework (1988) noted the scheme was not in accordance with DoE policies related to AONBs and SSSIs, although was in line with DoT policies to assist economic growth by reducing transport costs, remove through traffic from unsuitable roads and to enhance road safety.		Neutral

COBA		For information purposes only. Based only on aspects of Safety and Economy	PVB £405.2m PVC £74.9m NPV £330.3m BCR 5.4

Table 12.3 – Evaluation Summary Table

Description 11.7km D2 bypass		**Evaluation Summary Table (EST)** i.e. actual	**Problems** Heavy flow of through traffic on A34(T) through town of Newbury	**Present Value of Costs and Present Value of Benefits in 1998 prices discounted to 1994**
OBJECTIVE	**SUB-OBJECTIVE**	**QUALITATIVE IMPACTS**	**QUANTITATIVE ASSESSMENT**	**ASSESSMENT**
ENVIRONMENT	**Noise**	2010 traffic forecast flows on Bypass will be 50% higher than expected, could assume that impact from noise worse than expected. Predicted flows on old route about as expected.	No data	Worse than expected for Bypass route corridor
	Local Air Quality	2010 traffic forecast flows on Bypass will be 50% higher than expected, could assume that air quality worse than expected. Predicted flows on old route about as expected.	No data	Worse than expected on Bypass, as expected on A34
	Greenhouse Gases	Not assessed	No Data	N/A
	Landscape	Mitigation measures slow to establish and road corridor remains intrusive in the local landscape		Adverse
	Townscape	Northbrook Street in Newbury pedestrianised since opening of Bypass		Neutral / Beneficial
	Heritage of Historic Resources	Impact worse than expected at Public Inquiries, full investigation written up but Bypass cuts across historic landscape lines		Adverse
	Biodiversity	Impacts on SSSIs and Desmoulin's Whorl Snail. Lack of monitoring protected species		Adverse
	Water Environment	Impact on water quality as expected to date, worse than expected for snails and capacity of openings and monitoring		Neutral for water quality. Adverse for habitats
	Physical Fitness	Footpath links maintained.		Neutral
	Journey Ambiance	Driver stress, view and care on Bypass beneficial. Use of footpaths / bridleways in route corridor adverse for views, noise and air quality. Improvements for cyclists on existing roads. Traffic relief and safety benefits at Tot Hill Newtown Straight.		Beneficial
SAFETY	**Accidents**	Reduction in accidents and casualties.	Accidents reduced by 318 Casualties reduced by 864 Fatalities increased by 24	PVB £17.0M
ECONOMY	**Journey times**	Improved journey times for A34 through traffic on the Bypass. Savings given for Do Something (Bypass) in 2003 over Do Minimum (old route) in 1997.	Peak Inter-peak 11 mins 4 mins	PVB £583.5M
	Cost			PVC £104.5M
	Reliability	Greatly improved journey time reliability for traffic between the south coast and the Midlands, Bristol and south Wales.	Do Minimum (DM) Stress = 113% Do Something (DS) Stress = 73%	Beneficial
	Wider Economic Impacts	The scheme does not serve a regeneration area. However, the Bypass has changed the economic conditions in Newbury leading to development.		Beneficial
ACCESSIBILITY	**Severance**	Reduced severance Tot Hill Newtown Straight with 74% reduction in traffic and 87% heavy goods vehicles. New severance at places along alignment of Bypass, although the scheme included new footbridges at Enborne and near Bagnor.		Beneficial
	Access to the Transport System	Improved reliability for bus services on the A339. No bus priority measures implemented on the A339, although West Berkshire Unitary Authority is now considering multiple occupancy vehicle (MOV) lanes.		Beneficial
INTEGRATION	**Interchange**	Opportunities to improve bus-rail interchange in Newbury as a result of capacity relief not taken.		Neutral
	Land-Use Policy	The Bypass had not played a role in the current Local Plan or Berkshire Structure Plan, although it could influence emerging policies. Newbury seen as a good location for urban extension in the Regional Spatial Strategy, as a result of its accessibility by all modes.		Neutral
	Other Government Policies	The scheme is consistent with transport policies and not consistent with environmental policies.		Neutral

COBA		For information purposes only. Based only on aspects of Safety and Economy	PVB £605.0m PVC £104.5m NPV £500.5m BCR 5.8

Conclusions

12.3 The key findings of the 'Five Years After' evaluation for the Bypass are as follows:

Traffic

- Traffic in the A34 corridor was growing strongly before the opening of the Bypass.
- In the first year after opening, the Bypass carried between 33,000 – 37,000 vehicles per day (vpd) for an Average day (AADT)
- Traffic growth in the A34 corridor (including the Bypass and the old route through Newbury) one year after the opening of the Bypass was 28%-45% (depending on section) and after five years was 47-65%, significantly above regional and national growth forecasts.
- In the year after the Bypass was opened there was a reduction in traffic on the old route through Newbury – significantly, on some links:
  - The level of relief through the town centre was 15,000 vehicles per weekday or 28% of traffic, which is lower than the 36% prediction given in evidence at the 1988 Public Inquiry, suggesting that some local traffic has re-assigned back onto the A34, which previously avoided the route;
  - but on other links the reduction in traffic was 55-72%, in line with predictions.
- However, after the opening of the Bypass there was a 20% increase in traffic on the A339 Basingstoke Road, which is related to both re-assignment of traffic into the A34 corridor and recent developments in the area, which has increased traffic volumes.
- In 2003, the Bypass carried around 38,000 – 43,000 vpd AADT, significantly exceeding the high growth predictions of 27 – 36,000 vpd AADT by 2010.
- Analysis of the traffic growth patterns since the bypass opened and of the screenlines across the A34 corridor give strong indications that much of the additional traffic is due to wider area reassignment.
- Between 1999 and 2003, traffic levels have grown on the old route after the opening of the Bypass; although by 2003 weekday traffic levels through the town centre were still 11,000 vpd lower than before the Bypass. On other links the significant traffic reductions have been maintained. Current traffic growth has therefore eroded only slightly the relief to Newbury town centre gained by the Bypass, a key concern at Public Inquiry
- The proportion of trucks (HGVs) using the Bypass five years after opening is 18-20%: the proportion of HGVs has fallen slightly over the five years since opening.
- Traffic in the narrow corridor (Bypass and old road) has increased by 10-14% between 1999 and 2003 (compared to 9% regional traffic growth estimated for the region over the same period), hence after the first year of opening, traffic growth has not been dissimilar to 'normal' traffic growth.
- The predictions of traffic volumes for this scheme were low for the Bypass itself, which is explained mostly by the area used in the appraisal, which was too restricted. Our analysis has shown that traffic has re-assigned onto A34 from many routes throughout southern England, and this was not taken into account in the appraisal process.

- There are several minor roads within Newbury which prior to the opening of the by-pass carried rat running traffic. This traffic was not counted before the by-pass opened but its transfer to the old A34 after opening will have contributed to the impression of additional growth on the A34 corridor.
- The wider screenline analysis, whereby traffic volumes are counted across a wide cordon in the region has been assessed and shows that the increase since opening relates primarily to a re-assignment of traffic from other strategic routes across the whole of the southern part of England, plus additional traffic as a result of changed economic conditions in Newbury; traffic induced solely as a result of increased road capacity is thought to have contributed a relatively small proportion of the growth.

Journey Times

- Before the Bypass opened, journey times showed variance between peak hours indicating that journey times were unreliable, and on peak days, congestion and delay were significant;
- After the bypass opened, journey times for north-south movements and vice versa were a consisitent 6-7 minutes showing that journey times had improved and that reliability had improved
- Journey times on the old route in 2003 had improved to be 10-11 minutes throughout the day, except for AM Peak northbound, which showed times of 21 minutes;
- Actual journey time savings compared to the 'before' situation are difficult to quantify with any certainty given the lack of 'before' journey time data, but estiames of 4-8 minutes are typical, however, given the unreliability of journey times before opening, this should be regarded as a minimum reduction;
- In terms of actual and predicted savings, on the bypass, the 'best' estimate of journey time savings is 11 minutes against a prediction of 15 mins, and on the old road, for nearly all time periods and directions the 'best' estimate of saving is around 9 mins against a prediction of 8 mins, however for the AM peak northbound, the saving is less, but again the 'before' journey time is an estimate and should be treated with caution; and
- Out of peak hours, on the bypass, the 'best' estimate of time savings are 4 mins, against a prediction of 2 mins, with limited savings on the old route in the inter-peak; and
- Again the before journey time represent 'typical' conditions, i.e. no delays due to incidents or accidents or delays caused by trucks/buses making stops etc, and hence these times in our view represent a minimum time and thus, if journey times were available, we would estimate that the before observed times would be higher.

Environment

- During the construction and immediate post-construction phases of the Bypass environmental considerations appear to have been dealt with adequately and expediently. This process was enhanced by the co-operation of the joint environmental team. On the whole, mitigation measures would appear to have been implemented.
- The environmental impacts cannot be evaluated fully with the current information. The EST cannot be scored adequately without further study being

undertaken as indicated within this evaluation e.g. consulting with the local wildlife trusts would greatly inform on any impacts on habitats adjacent to the route corridor.

- While noise and air quality benefits for those properties close to the old route should have been achieved, the additional traffic growth on the Bypass may mean that adverse impacts on properties in the Bypass corridor are worse than anticipated;
- Where bio-diversity mitigation measures are provided offsite e.g. bat boxes, it would appear that ongoing monitoring and management can be problematic. Both access to the sites and funding to undertake the work may be difficult to achieve;
- For the landscape and biodiversity mitigation measures to fulfil their potential, ongoing management and monitoring is essential.
- Both English Nature and the Environment Agency consider that significant adverse impacts have already occurred within the internationally recognised Desmoulin's Whorl snail habitat;
- The important balancing pond network requires continuing management in order to function as intended. Monitoring is required to confirm that the systems are working.
- Measures should be taken to ensure that the two sites of archaeological interest preserved in situ do not suffer damage.

Safety

- In the five years since the opening of the Bypass, there has been a saving of over 50 personal injury accidents in the Newbury area, compared with the five years before opening.
- This corresponds to a saving in 140 casualties over the same period, however, even though there has been a significant reduction in the number of slight casualties, there has been an increase of 15 serious/fatal casualties in the assessment area of the A34 Bypass and parallel old road.
- The assessment of this increase in serious/fatal casualties is that the increase is due to a variety of causes. However there has been an increase in pedestrian/cyclist serious injuries in Newbury.
- The accident rate on the Newbury Bypass is about 20% lower than the national rate for roads of this type, and other accident rate reductions are also shown on the old route through Newbury apart from the Inner Ring Road section.
- For the whole of the region modelled in the appraisal of this scheme (i.e. including the M4 and the A4 from Hungerford) there was a predicted saving of over 1,000 casualties, including 12 fatalities with the scheme, with a forecast benefit of £35m over thirty years (1998 prices discounted to 1994);
- Based on the observed accident savings, the outturn accident benefit has been estimated at £17 million (1998 prices discounted to 1994) over thirty years,– about half the benefit predicted.
- However, The Newbury Bypass has attracted traffic from routes outside the appraisal area. These routes will generally be less safe than the Newbury Bypass but the consequential accident savings have not been included in the evaluation.

- Accident rate assessment methods have changed since the forecasts were undertaken to reflect the long term trend for accidents to reduce. Had current methods been employed for the forecasts then fewer accident savings would have been forecast.
- Notwithstanding this wider effect, there has been an increase in fatalities clsoe to the bypass, particularly for non-motorised modes of travel, and this should be considered further to minimise this effect. It is reassuring that there were no fatalities on the A34 Bypass in 2004.

Economy

- Outturn journey time benefits were higher than predicted £583.5 million (over thirty years), compared to a predicted £365.4 million (1998 prices discounted to 1994) – an increase of about 60%;
- There was significantly improved journey time reliability for traffic on the A34 strategic route between the south coast and the Midlands;
- The development of the Bypass appears to have contributed towards making Newbury a more attractive centre for investment, by reducing traffic congestion and diverting much HGV traffic;
- A range of developments have been implemented since the opening of the Bypass, although none of them has been quoted as being dependent on the Bypass itself; and
- The opening of the Bypass appears to have benefited others outside the Newbury area, including the haulage industry, tourism and the freight and ferry ports on the South Coast, particularly Southampton and Portsmouth, which have all benefited from reduced road journey times.

Cost/Benefit Analysis

- The level of benefit from accident savings was lower than predicted, however the observed journey time savings were higher than predicted and thus overall the outturn time and accident benefits were higher than predicted.
- The outturn cost of the scheme was £104.5m, compared to a forecast cost of £74.9M, around 40% higher than expected: this difference is attributed largely to the costs incurred as a result of the protest action against Bypass (which accounted for a third of the outturn scheme costs).
- In summary, the scheme represented good value for money with a benefit to cost ratio of 5.8 compared to predicted of 5.4.

Accessibility

- As predicted, there has been a significant reduction in severance on the single carriageway section of the old route, Tot Hill Newtown Straight, with a 74% reduction in traffic and 87% reduction in the number of heavy goods vehicles five years after opening.
- However, there has been new severance at places along the alignment of the Bypass, although the scheme included new footbridges at Enborne and near Bagnor.
- Access to the transport system has been improved – reliability for buses on the A339 has improved as a result of traffic relief, although bus priority measures have not been introduced.

Integration

- The scheme predictions indicated a dichotomy in policy integration: the scheme was integrated poorly with environmental policies and well integrated with transport policies; this finding applied to both local (Berkshire County Council, Hampshire County Council and Newbury District Council) and national policies in these areas.
- For the evaluation, West Berkshire Unitary Authority indicated the Bypass had not played a role in the current Local Plan or Berkshire Structure Plan, although they noted that it could influence emerging policies.
- With respect to integration with Government policies, the scheme predictions noted the scheme was not in accordance with Department of Environment (DoE) policies related to Areas of Outstanding Natural Beauty (AONBs) and Sites of Special Scientific Interest (SSSIs), although was in line with Department of Transport (DoT) policies to assist economic growth by reducing transport costs, remove through traffic from unsuitable roads and to enhance road safety.
- The evaluation bears out this prediction: the scheme contributes to transport policy objectives but not environmental policy objectives.

Appendix A

Before and After Monitoring

FORM MON4 - RECORD OF THE FIVE YEAR 'AFTER' DATA COLLECTION

Highways Agency	File …… Contact Vanessa Kovacevic…… Date 24 December 2004……

HA Use Only

Part A - General Information	
1. (I) H A Region: Area 3 (iv) Contact name: Phil Richards (ii) POPE Consultant: Atkins Transport Planning (v) Telephone No: 0121 483 6190 (iii)Counts carried out by: HA, West Berks, Hants, Wilts	
2. . (i) Route numb er and name of scheme: A34 Newbury Bypass…….. (ii) County (Or unitary authority) West Berkshire Unitary Authority……. (iii) Grid Ref:……	
3. HAMIS Number: 25011B ……..	
4. Date of completion of most recent MON1: TAM 01/12/1986 ……. Date of completion of most recent MON2: Not available ……. Date of completion of most recent MON3: MON 3 not prepared …….	
5. Date of opening to public traffic: 17 November 1998 ……. Out-turn cost £142.1 Million.....	
6. Were any sensitivity tests carried out during scheme preparation which assumed the actual network and land use conditions that existed when the 'five year after' counts were taken? If so, give below, or attach a summary of these predictions: Diagram should be compatible with that submitted with MON1, MON2 and MON3 (Please state traffic flow units).	

Part B – Details of the Journey Time Surveys	
7. Routes that are significantly affected by the scheme. (Please list) Scheme – A34 Newbury Bypass: Route: A34 Newbury Bypass; Between: Junction 13 of M4 Motorway and junction near Litchfield A339/B4640 Old Route: Junction 13 of M4 Motorway and junction near Litchfield A4: A338 Hungerford to junction 12 of M4 Motorway	

8. Number of journey time runs? Journey time surveys 24 – 26 June 2003 AM Peak Period 9 bypass, 6 old route, 4 A4 route…….. Inter Peak Period 7 bypass, 6 old route, 4 A4 route…….. PM Peak Period 8 bypass, 6 old route, 4 A4 route……..	

Part C - Details of the After Accidents	
9 Accident information on significantly affected roads should be attached for each of the 5 years after opening for: 1. Number of Accidents by Severity 2. Number of casualties 3. Accident rates (PIA/mvkms)	

Part D – Details of the Five-year 'After' Counts	
10. Dates of Five-Year After Counts – 2003 yearly data, plus data from temporary counts in September 2003	
11. Factors to convert to same base as original model date	
12. Network/Land Use Changes List network/land use changes that were considered in the forecasting process, but were not fulfilled: List network/land use changes that were not considered and were fulfilled: *Network Changes* New at-grade roundabout on A339 Donnington Link Road Speed limit reduced from 70 to 50 mph on A339 Donnington Link Road to south of new roundabout (and 40 mph over a short section) Two at-grade pedestrian crossings on A339 *Land Use Changes* New Greenham Park List network/land use changes that were considered and were fulfilled: *Network Changes* *Land Use Changes – information not available to determine if considered in forecasting process* Vodafone, Pinchington Lane Retail Park, redevelopment of former BP depot for B1 use, Phase 6 of Newbury Business Park, redevelopment of Newbury Racecourse, Waitrose superstore, Newbury & Thatcham Hospital, Newbury College, Woodlands housing development and Kings Road residential development. List network/land use changes that were built and were conditional on the scheme Pedestrianisation on Northbrook Street, Newbury town centre	

13. Any comments? (on the differences between the 'before' and 'after' counts, or on why the predictions were accurate/inaccurate, for example)	
14. Please review the extent to which the Appraisal Summary Table adequately quantifies the effect of the scheme. Please Comment below. 15 Who carried out the review? Atkins Transport Planning 16 Who was consulted about the review? West Berkshire Unitary Authority, Hampshire County Council, Countryside Agency, Environment Agency, English Nature, English Heritage. 17. Date of review? 24 December 2004	
17. Additional Actions **Attach Tables and Plans showing After Journey Time Results** **Attach Tables and Plans showing Accident Locations and Rates** **Attach Survey Report and/or plans showing the measured '5 year after' counts.** (Diagrams should be compatible with those submitted with MON1 and MON2 (Please state traffic flow units))	

Appendix B

Table 12.4 – Strategic Screenline 1

Strategic screenline 1 – north of Newbury			Perm-anent ?	AAWT			1997-99		1999-2003		1993-2003	
Road	Location	Source		1997	1999	2003	Change	%	Change	%	Change	%
A350	North of Chippenham	WCC	y	26,800	29,000	29,900	2,200	8%	900	3%	3,100	12%
A3102	Tockenham Corner	WCC	n	11,500	11,800	12,100	300	3%	300	3%	600	5%
A4361	Winterbourne Monkton	WCC	n	6,800	7,100	7,100	300	4%	0	0%	300	4%
A346	North of Marlborough	WCC	n	16,100	14,900	15,500	-1,200	-7%	600	4%	-600	-4%
A338	South of M4 J14	WBUA	y	9,500	9,000	9,700	-500	-5%	700	8%	200	2%
A34	Newbury Bypass (N of A4)	HA	y	-	37,200	42,000	37,200		4,800	13%	42,000	
A339	Donnington old A34	HA	y	44,300	19,800	23,000	-24,500	-55%	3,200	16%	-21,300	-48%
Screenline total				115,000	128,800	139,300	13,800	12%	10,500	8%	24,300	21%

Table 12.5 – Strategic Screenline 2

Strategic screenline 2 – central Newbury			Perm-anent ?	AAWT			1997-99		1999-2003		1997-2003	
Road	Location	Source		1997	1999	2003	Change	%	Change	%	Change	%
A350	S of Chippenham	WCC	y	16,900	17,900	19,100	1,000	6%	1200	7%	2,200	13%
A342	Derry Hill	WCC	n	6,500	6,700	6,800	200	3%	100	1%	300	5%
A3102	Mile Elm	WCC	n	5,000	5,000	4,900	0	0%	-100	-2%	-100	-2%
A361	W of Beckhampton Rbt	WCC	n	6,800	7,100	9,000	300	4%	1,900	27%	2,200	32%
A345	N of Pewsey	WCC	n	4,600	4,700	4,800	100	2%	100	2%	200	4%
A346	S of Marlborough	WCC	n	9,600	8,900	9,000	-700	-7%	100	1%	-600	-6%
A338	Shalbourne Down (S of Hungerford)	WCC	n	4,100	3,700	3,700	-400	-10%	0	0%	-400	-10%
A34	Newbury Bypass (S of A343)	HA	y	-	34,600	40,100	34,600		5,500	16%	40,100	
B4640	Tot Hill Newton Straight (Old A34 S of A339)	HA	y	27,100	7,600	7,100	-19,500	-72%	-500	-7%	-19,500	-72%
Screenline total, excluding M3				96,200	115,000	124,100	18,800	20%	9,100	7%	27,900	29%
A340	*Tadley*	*HCC*		*14,600*	*14,700*	*n/a*	*100*	*1%*				
A33	*Stratfield*	*HCC*		*18,300*	*18,600*	*n/a*	*300*	*2%*				
M3	J4A-J5	HA	y	90,600	95,400	99,100	4,800	5%	3,700	4%	8,500	9%
Screenline total with M3				186,800	210,400	223,200	23,600	13%	12,800	6%	36,400	19%

Table 12.6 – Strategic Screenline 3

Strategic screenline 3 – south of Newbury			Perm-anent ?	AAWT			1997-99		1999-2003		1997-2003	
Road	Location	Source		1997	1999	2003	Change	%	Change	%	Change	%
A338	South of Burbage	WCC	y	8,900	7,900	8,000	-1,000	-11%	100	1%	-900	-10%
A343	Highclere	HCC	y/n	5,300	5,300	5,700	0	0%	400	8%	400	8%
A34	S of Whitchurch	HA	y	30,200	37,100	41,800	6,900	23%	4,700	13%	11,600	38%
M3	J7 - J8 (S of Basingstoke)	HA	y	87,000	92,700	97,500	5,700	7%	4,800	5%	10,500	12%
A3	Liss (N of Petersfield)	HA	y	33,900	36,500	39,000	2,600	8%	2,500	7%	5,100	15%
Screenline total				165,300	179,500	192,000	14,200	9%	12,500	7%	26,700	16%

Table 12.7 – Strategic Screenline 4

Strategic screenline 4 – south of Winchester			Perm-anent ?	AAWT			1997-99		1999-2003		1997-2003	
Road	Location	Source		1997	1999	2003	Change	%	Change	%	Change	%
A350	Heywood, (N of Westbury)	WCC	n	14,200	15,800	15,600	1,600	11%	-200	-1%	1,400	10%
A303	*E of Longbarrow Rbt*	*WCC*	*y*	*18,500*	*n/a*	*22,700*					*4,200*	*23%*
A338	N of Winterbourne Gunner, (N of Salisbury)	WCC	y	6,700	6,900	6,900	200	3%	0-	0%	200	3%
M3	J11-J12, (S of Winchester)	HA	y	107,300	112,800	122,100	5,500	5%	9,300	8%	14,800	14%
A3	S of Petersfield	HA	y	44,500	46,700	47,200	2,200	5%	500	1%	2,700	6%
Screenline total				172,700	182,200	191,800	9,500	6%	9,600	5%	19,100	11%