

POPE of Major Schemes Summary Report

Scheme Title	M5 J17-18a N/B Climbing Lane (Hallen Hill) M5 J19-20 S/B Climbing Lane (Naish Hill) M5 J19-20 N/B (Tickenham Hill)
Opening Date	October 2005 (Hallen Hill), June 2006 (Naish and Tickenham Hill)
POPE Stage	One Year After

Scheme Description

The M5 motorway west of Bristol has been widened at three locations within the existing highway boundaries from three to four lanes by the addition of climbing lanes. Each of these is a scheme in its own right, but due to their close proximity and similar opening dates, they have been evaluated together. They consisted of the following measures:

- Hallen Hill – New 1.3 mile climbing lane on the northbound incline between J17-18.
- Naish Hill – New 2.1 mile climbing lane on the southbound incline between J19-20.
- Tickenham Hill – New 2 mile climbing lane on the northbound incline between J19-20. Three new overhead sign gantries were also provided.

Objectives (Appraisal Summary Table)

Objective Achieved?

- | | |
|------------------------------------|---|
| • Improve journey time reliability | Yes |
| • Relieve congestion | Further evaluation needed at 5 year after stage |

Key Findings

- The objectives of the scheme were to improve journey time reliability and relieve congestion. Initial evidence from a number of journey time data sources suggests that journey time reliability has improved, but there is currently no conclusive evidence that congestion has been relieved.
- The traffic forecasts overestimated the rate of traffic growth on the M5. This results in monetary journey time benefits which are around 60% lower than expected, although the schemes still represent value for money.
- A lower than predicted increase in traffic could be due to less than expected traffic growth on the M5 resulting from the Bristol Northern Fringe developments, and also some of the traffic flow figures used as the basis for the forecasting appear to be higher than those collected as part of the evaluation.
- Beyond background traffic growth, flows have not increased on the M5 as a result of the additional capacity provided through introduction of the climbing lanes.
- HGV usage of the M5 has remained unchanged at around 20% of the total traffic flows between junctions 18 and 20.
- Journey times appear to have increased slightly since the schemes opened. Although the differences are slight and could be in part related to the data collection techniques and sample size.
- Although indirect taxation benefits have increased by less than expected, they are still substantial and offset a significant proportion of the overall capital costs.
- There is only one year's worth of 'post-opening' accident data and this is not sufficient to provide conclusive evidence of the schemes affect on accidents. However, the key points to note are outline under the 'safety' heading below.
- The construction of the schemes entirely within the highway boundary has limited the adverse impacts on the environment.
- Natural England commented that 'there had been good consultation at the design stage, clear in intent'.

Summary of Scheme Impacts

Traffic

- Traffic levels in the area have increased by around 2-3% on pre-opening levels which is considerably below the 8.5% forecast for rural motorways by the National Road Traffic Forecasts (NRTF). This confirms that the climbing lanes do not appear to have induced any extra traffic onto the M5.
- The forecast traffic volumes in the opening year for all 3 schemes are higher than observed (Naish Hill 4.8%, Tickenham Hill 7.2%, and 11.1% for Hallen Hill). The potential reasons for this are twofold:
 - An additional 5% increase in traffic on the M5 was assumed to account for development of Bristol Northern Fringe which could be an overestimation; and
 - It appears that the traffic forecasts were derived from base year traffic volumes that were slightly higher than actually observed.
- The climbing lanes have had no impact on the number or proportion of heavy goods vehicles (HGV's) using the climbing lane sections.
- The journey time impact of the schemes appears to be negligible as predicted (the observed data shows a slight increase).
- Journey time reliability has improved (as measured by the route stress calculation).

Safety

Due to the low frequency at which motorway accidents occur, 12 months of 'post-opening' data is not sufficient to provide conclusive evidence of the schemes affect on accidents. However, the key points to note at this stage are as follows:

- The number of accidents occurring at each site has increased by between 0.03 and 0.15 accidents per million vehicle kilometres (mvkm). However, this increase is not statistically significant;
- There has been a considerable reduction in accidents at the start of Naish Hill, possibly due to the new onslip layout at Junction 19;
- A quarter of the post opening accidents on Hallen Hill are directly related to the merge at the top of the hill; and
- As expected there has been no observed change to personal security (i.e. the perception or risk of personal injury, damage or theft to vehicles and property).

Environment

- As predicted, it would appear that the schemes have not led to the generation of additional traffic. It can therefore be assumed that the local air quality impacts of the climbing lane improvements on the noise and local air quality are potentially better than expected due to lower than forecast traffic levels.
- The carbon evaluation based on observed traffic flows and speeds show that there has been a negligible impact on carbon emissions in the opening year as expected.
- Landscape and biodiversity mitigation measures have been implemented as expected.
- The impacts on archaeology and built heritage appear to be as expected.
- Based on the information available it is likely that the impacts of the scheme improvements on journey ambience and physical fitness are slightly beneficial and neutral as expected.

Accessibility

- An accessibility evaluation has not been undertaken because no element of the scheme has had an impact on non motorised users (NMU's) or public transport provision.

Integration

- The schemes were part of a number of measures recommended by the London to South West and South Wales Multi-Modal Study (SWARMMS) in 2002 to relieve congestion on the M4/M5 around Bristol.

Summary of Scheme Economic Performance

	Hallen Hill		Naish Hill		Tickenham Hill	
	Pre Scheme Forecast (2002 prices)	Post Opening Reforecast (2002 prices)	Pre Scheme Forecast (2002 prices)	Post Opening Reforecast (2002 prices)	Pre Scheme Forecast (2002 prices)	Post Opening Reforecast (2002 prices)
60 year journey time benefit (PVB)	£24.2m	£14.6m	£75.5m	£49.0m	£54.7m	£34.9m
Cost (PVC)	£9.3m	£6.4m	£12.1m	£8.8m	£10.9m	£10.5m
Indirect Tax ² and Operating costs	-£2.6m	-£2.6m	-£3.9m	-£3.0m	-£2.1m	-£1.6m
Benefit Cost Ratio	3.7	3.9	9.3	8.5	6.2	4.0

1. 60 Year benefit to business and consumer users for journey times. No accident saving included.
2. Indirect Tax here is the change in revenue to the government due to changes in fuel consumption affecting the amount of VAT and fuel duty paid by consumers.
3. All prices in 2002 prices discounted to 2002.

- For all three climbing lane schemes, the 60 year benefits derived in the post opening reforecast are around 60% of what was originally predicted. This is primarily due to observed traffic flows being less than predicted.
- Although indirect taxation benefits have increased by less than expected, they are still substantial and offset a significant proportion of the overall capital costs.
- Since the production of the Appraisal Summary Tables (AST's), the Department for Transport Guidance (DfT) has changed to state that safety benefits should no longer be claimed for climbing lane schemes, hence its omission from the calculations above.
- For all three schemes, the outturn scheme cost was less than originally forecast.

This document summarises the findings of the one year after post opening evaluation study completed in March 2009.