

Sustainable travel for Hereford – the way forward

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September 2011**

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FOREWORD

'Sustainable transport for Hereford — the way forward' has been commissioned by Here For Hereford, Cycle Hereford and Herefordshire Friends of the Earth. These local groups all have a stake in the sustainable development of Herefordshire, including a sustainable transport system.

In 2009 Herefordshire Council bid for central Government funding for what was then called 'an outer distributor road' for Hereford to support its role as a 'growth point'. It failed. Explaining its reasons, the Department for Transport cited the 'environmental grounds' which had led to the road being dropped from the national roads programme. It advised Herefordshire Council to 'investigate a full range of options for addressing the transport challenges in the area.'¹

So far the Council has not carried out this investigation. It has recently commissioned studies supporting its choice of a Western alignment for a 'Relief Road' in response to those who have argued for an Eastern alignment. However, it has never shown a similar level of interest in alternatives to road building.

In this report MTRU explain why and how a proper alternative to road building should be tested.

The 'sustainable option package' preferred by Herefordshire Council includes bus lanes on the A49. These have the effect of increasing congestion by removing road space from cars, but without increasing the share of trips made by bus.

MTRU have proposed a variant suited to travel patterns in Hereford. MTRU's proposal has a greater role for cycling but without the bus lanes or the 'Relief Road'. This option would reduce car use more than the Council's proposal, cause congestion to stabilise or fall and still allow for population growth and new development.

MTRU also demonstrate that, given all the recent modelling commissioned by Herefordshire Council, it would be straightforward to model this alternative, No Road, option.

Regardless of the outcome, the test of this alternative should be done. This country's planning system requires that realistic alternatives to proposals within a Core Strategy should be tested and subject to sustainability appraisal in order for the Core Strategy to be justified and shown to be sound. The European Habitats Directive permits damage to a Special Area of Conservation only where no alternative to the development exists and where there is no overriding public interest.

The overriding public interest here is for Herefordshire Council to ensure that

1. it does not waste public money and time promoting a plan that cannot be shown to be sound;

¹ Department for Transport (2009) Regional Funding Allocation Letter to West Midlands Regional Assembly and Advantage West Midlands, 19 July 2009.

2. there is minimal risk of having to abandon a road scheme while paying massive fines for environmental damage; and that
3. the entire county will not be paying over a £100 million for an unnecessary road.

It will not be able to convince on any of these points until it has investigated an alternative like the one put forward here.

Here for Hereford <http://www.hereforhereford.co.uk/>

Cycle Hereford <http://www.cyclehereford.org.uk>

Herefordshire Friends of the Earth <http://www.herefordshirefoe.org.uk/>

1. OVERVIEW AND KEY FINDINGS

This report reviews existing studies and data on traffic in Hereford to assess whether there is scope for less costly and less environmentally damaging ways than road building to address road congestion in Hereford and to permit new development.

It is the second MTRU report on Hereford's traffic in two years.² Each examines the traffic modelling which has been the basis of Herefordshire Council's case that a Relief Road for Hereford is an essential part of its Local Development Framework Core Strategy.

The latest traffic modelling³ commissioned by Herefordshire Council has been considered and the original modelling⁴ revisited for this report. A fresh site visit was also undertaken, including an observation of congested junctions during the pm peak. Local knowledge from previous work in Hereford, dating back to the 1990s, was also used.

The modelling and forecasting work undertaken for Hereford is very revealing in terms of the basic patterns of travel. The most striking feature is the very short distances that people travel by car and bicycle. This is accompanied by a slightly longer than average trip length for walking. Given the compact nature of Hereford and its location this is an entirely plausible result.

Before examining the evidence in more detail, some general comments about future patterns of travel in Hereford and how these could be accommodated without road building are set out below.

Key findings on travel demand in Hereford

The low average trip length for car journeys means that the underlying potential for maintaining high levels of walking, and for bringing levels of cycling up to the most cycle-friendly UK and European cities, is particularly high.

In practical terms, there are significant opportunities for improving and expanding existing networks for walking, and even more so for cycling, which would not require the road space needed for bus priority, and thus not increase congestion. The Council has already implemented some individual schemes, but the next step should be a comprehensive package.

Improving these networks, including maximising the potential of car-free river crossings, would make walking and cycling very attractive as alternatives to the car. In terms of journey times, cycling

² MTRU (2010, 2011 edition) *A New Sustainable Transport Option for Hereford*, the first report, is downloadable as 1.2MB pdf from <http://cyclehereford.files.wordpress.com/2011/09/mtru-2010-2011-edition-a-new-sustainable-transport-option-for-hereford.pdf>

³ TPi (2011) *Hereford Relief Road, Interim Forecasting Report, Revised Eastern Route Options (March 2011)* available at <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

⁴ TPi (2010) *Hereford Relief Road, Interim Forecasting Report, Sustainable Option Packages FINAL* (Appendix 3 of Amey 2010 Study of Options) available at <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

could have a clear advantage for many of the trips in the city. If such a policy promoting low carbon transport were pursued, supported by comprehensive travel planning (often called “Smarter Choices”), congestion would stabilise or fall, even taking into account population growth and new development.⁵ Such a package is supported in general terms in the Council’s transport plans, and some individual elements have been implemented. However this has still not been developed and tested as an integrated package independently from the Relief Road scheme.

To complete such a programme, modest alterations to the highway to improve conditions for all road users should also be pursued. It is best to undertake such a programme in concert with changes to improve walking and cycling. For example, in relation to local buses, specific priority measures, which do not impact on general traffic as much as dedicated bus lanes, could be enabled through this process. As well as benefitting from less peak hour congestion (for example by lower car use for the school run) some key points of conflict on the road network could be addressed to make all road user journeys safer and more reliable.

The short car trip length means that the amount of travel to and from a new road in order to take advantage of any time savings would be a large proportion of total journey time.

This would either limit use of a new road or generate a high proportionate increase in vehicle kilometres, and thus in carbon and other environmental impacts overall. Obviously the number of people and special sites affected by changes in air quality and noise resulting from new road infrastructure on the west of Hereford need further detailed study. Carbon, however, has an effect independent from where it is produced on the transport network.

Recommendation: A further model run — of the untested sustainable option

An option was proposed in MTRU 2010 using the Council’s own traffic reduction target of 20% (known as Sustainable Option 3 or SO3⁶) but had

- a greater focus on cycling,
- no bus lanes on the A49 where they cause traffic congestion, and
- no Relief Road.

This option is likely to be very effective in tackling the traffic problems in Hereford without most of the carbon increases and other significant damage which would be caused by a road scheme. While the existing data strongly suggests this would be the case, as set out below, a specific traffic model run of such an option has not yet been undertaken.

There have been many traffic model runs for many options over the last two years and the one recommended by MTRU in 2010 would require only minor amendment to an existing one. Modelling the sustainable option presented there would provide an obvious benchmark test against

⁵ This was illustrated in the MTRU 2010 report, which reduced car use by 8.4% from the Herefordshire Council preferred Relief Road option, and switched the unrealistically long walk trips to cycle. Overall, car trips in the am peak fell by about 3% even after the new development.

⁶ See TPi 2010.

which to assess the other options and thus would significantly improve the evidence base for the Core Strategy.

Modelling such short distance journeys is challenging, particularly when using a model 'add-on' (in this case called Diadem) which alters the number of trips, distances and modes according to levels of congestion (Variable Demand Modelling: **VDM**). This can be rather opaque and is effectively a mathematical optimisation which may depart from what is possible or even likely in reality. Some of the issues with Diadem were clearly set out in the report by the Council's modelling consultants JMP in 2009.⁷

There is at least one odd highway result from Diadem and clarification has been sought from TPi and their reply is awaited. In addition, it is clear that Diadem significantly reduces public transport use in all the scenarios tested, including the Preferred Option, by between 13% and 16%.

For this reason we would like to see the results of any VDM forecasting accompanied by the non-VDM runs which in any case have to be undertaken before running Diadem. This would make the changes which Diadem is causing more transparent and open to scrutiny.

⁷ JMP (2009) *Hereford Multi-Modal Model Forecasting Report*, para 2.78. The report is available on Herefordshire Council's website at <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

2. INTRODUCTION

MTRU was commissioned in 2010 by Cycle Hereford and Herefordshire Friends of the Earth to consider the forecasting work then available for the Hereford Relief Road and associated sustainable transport measures. Two main source documents were used for the report: the JMP modelling report (JMP 2009) and the TPI forecasting report (TPI 2010).

MTRU focussed on the modelling and forecasting outcomes in its 2010 report, and concluded that:

“The modelling, in particular the use of Diadem, needs to be improved to reflect the impact of policies directly.

The current modelling clearly shows that car travel time variations between all options, with and without the Relief Road, are very small and probably not perceivable.

The only option tested by the County which is likely to achieve significant emissions reductions from traffic is the maximum sustainable option with no Relief Road, none of the Relief Road options would achieve such reductions.

A new option, No Road + More Cycling, which reflects the special nature of Hereford’s traffic and the clear opportunities for more cycling could meet targets both for development growth and emissions reductions, and match or exceed the highway performance of the Ring Road options.”

These conclusions were based on analysis of the evidence then available, which identified in particular the shorter than average trip distances for car use in the Hereford area.

This means that the potential for walking and cycling is very significant, walking is already slightly above average in terms of how far people are willing to walk. Cycle journeys tend to be shorter than average in Hereford, again reflecting the compact nature of the city and consistent with the shorter than average car journeys.

The report was submitted in November 2010 as part of the response to the consultation on the Core Strategy Preferred Option for Hereford.

Since then two new reports, by Transport Planning International (TPI)⁸ and Parsons Brinckerhoff (PB),⁹ have been produced for Herefordshire Council, and an earlier report by TRL (Transport Research Laboratory) for Natural England, using the JMP report as its main source, has also become available.¹⁰

The PB report is an 'Independent Review of Hereford Relief Road Technical Studies' but states that it would not 'revisit the need for the road' (para 1.2.3). While it reviewed a number of documents dating back to 2006 neither the TRL report, nor the 2010 MTRU report, were included. The main content of the PB report is concerned with reviewing the conclusions of the Council's 2010 Options

⁸ See Note 2 above.

⁹ Parsons Brinckerhoff (2011) *Independent Review of Hereford Relief Road Technical Studies* available at <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

¹⁰ Palmer, D. and Gibson, H. (2010) *Hereford Multi Modal Study and Outer Distributor Road, FINAL PROJECT REPORT CPR656*, TRL

Study report by Amey,¹¹ that a Western alignment for the Relief Road is preferable to an Eastern alignment. It also reviewed TPI 2011 which had focussed on revised Eastern route options.

TPI 2011 tests the impact of variations on the Eastern alignment for a road developed in a proposal called 'East is Best'. The main changes to the Eastern alignment modelled in 2010 are changing one of the links (two options are modelled) and removing the A49 bus priority from the model. TPI 2011 also explores the impact of reducing the overall housing allocation for Hereford by 2000 houses achieved by removing the White Cross and Three Elms strategic sites on the west and northwest of the city. This is applied to the two road options and thus four new scenarios, all to the East, have been modelled.

The 2010 MTRU report suggested removal of the A49 bus lanes from the modelling since there was no evidence that they attracted any users to public transport and they were a major source of congestion in the model. It also proposed a different sustainable option with greater emphasis on cycling. However, the MTRU recommendations were not pursued. Now that the A49 bus lanes have been removed for the new TPI modelling of the revised Eastern options, much of the work needed to test a No Road sustainable option has been carried out.

This MTRU report reviews its 2010 conclusions set out above in the light of the new and existing evidence.

¹¹ Amey (2010) *Hereford Relief Road — Study of Options* September 2010 available at <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

3. THE TPI REPORTS, 2010 and 2011

Trip lengths and modelling travel demand in Hereford

In the 2010 MTRU report attention was drawn to the trip lengths generated by the modelling in TPI 2010. This is not addressed in TPI 2011. Figure 1 below shows changes in trip length for all modes from both TPI reports.

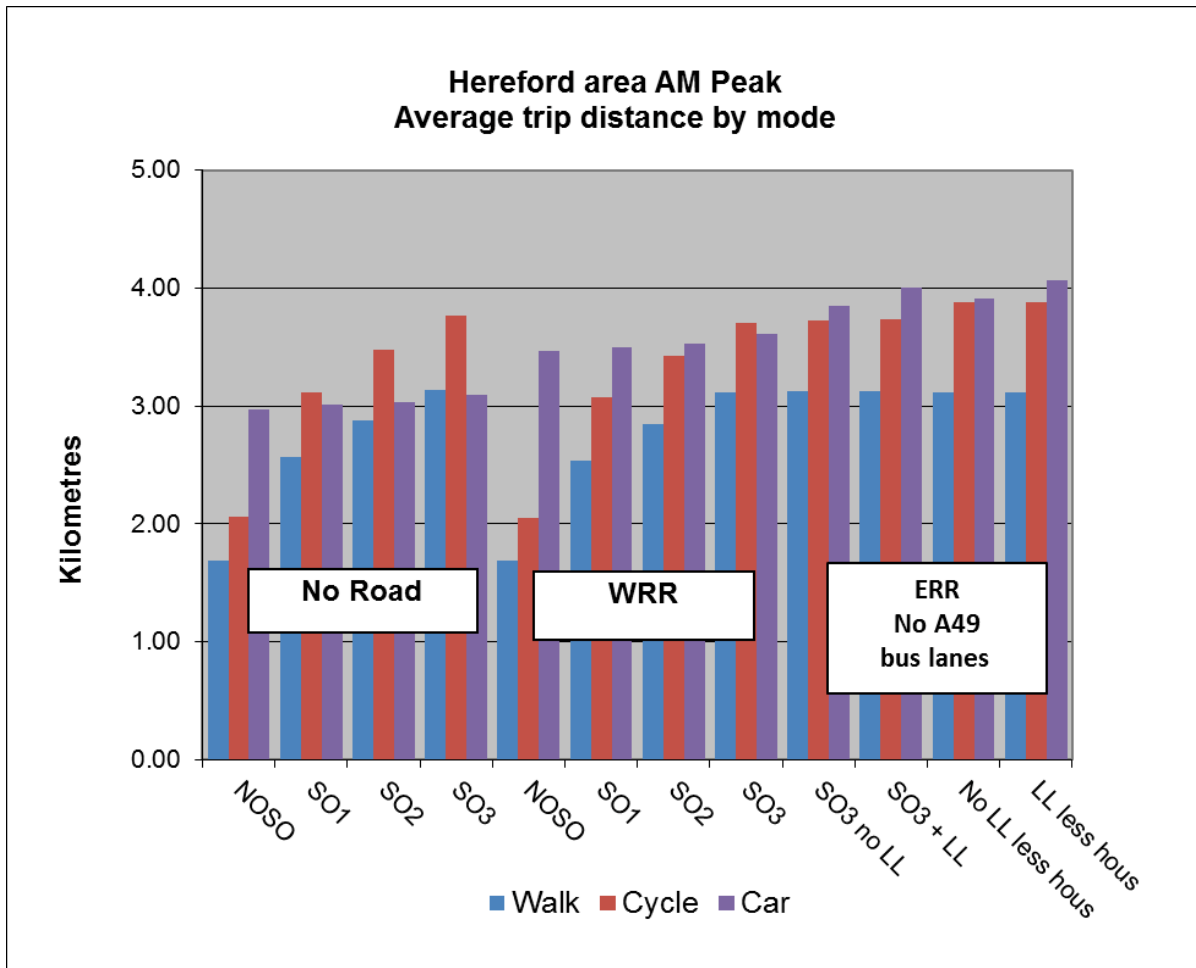


FIGURE 1: Hereford area AM Peak; Average trip distance by mode.

(Source: No Road and Western Relief Road (WRR) from TPI 2010 and Eastern Relief Road (ERR) No bus lanes from TPI 2011; MTRU calculations)

While lower than average trip lengths overall are plausible in a compact city like Hereford, this is not reflected consistently in the model forecasting. In the above chart, trip lengths for walking almost double if sustainable policies are implemented. This supports the MTRU hypothesis that many of these trips would in reality transfer to cycle.

There may also be an underestimation of the role of public transport for some trips, possibly due to the very generalised way in which the model deals with all modes other than car. For example, on the site visit at school closing time, it was clear that at least half the cars queuing at a congested

junction were carrying schoolchildren, and there were serious local parking issues in residential streets. Detailed implementation of school travel plans would create targeted improvements — for example, making school bus services more affordable is likely to be cheaper and less environmentally damaging than trying to build more road capacity.

To illustrate the special nature of trips in Hereford, the average trip lengths and times from the National Travel Survey (NTS) are set out below in Table 1, together with the Hereford “No Road” model run, the Western Relief Road preferred option (WRR) and the revised Eastern alignment (ERR) with Scenario 4 (reduced housing and including the Lumber Lane link). Table 2 shows the same comparisons for average trip time.

TABLE 1: Comparative trip lengths (average, in km)

	<i>NTS</i>	<i>No Road</i>	<i>WRR Preferred</i>	<i>ERR Scenario 4</i>
Car Driver	13.5	2.97	3.61	4.07
Walk	1.13	1.69	3.11	3.12
Cycle	4.67	2.06	3.70	3.88

TABLE 2: Comparative trip times (average, in minutes)

	<i>NTS</i>	<i>No Road</i>	<i>WRR Preferred</i>	<i>ERR Scenario 4</i>
Car Driver	21	7.9	7.1	7.1
Walk	17	25.3	46.7	46.7
Cycle	23	8.2	14.8	15.5

The small change in car distances and times suggests that Diadem has transferred some trips which are longer than average to sustainable modes, instead of retaining them for car. This is unlikely in practice and was addressed in the MTRU 2010 sustainable option.

Option comparisons in the TPi 2011 report

There is a specific issue in relation to the TPi 2011 report regarding the ranking of various options. An ambiguity arises in TPi's text as to the comparisons between the Western Route and the Eastern “scenarios”. In the conclusions the report states that:

The revised eastern route options presume that no sustainable transport measures on the A49 can take place without the full construction of the Relief Road. The sustainable transport measures on the A49 have therefore been removed from the sustainable transport option packages for all tested scenarios. (para 11.2).

The sustainable measures referred to are the bus lanes. In fact in TPi's 2010 modelling of Sustainable Option Packages 2 and 3 (with increasing provision of bus lanes) there was little or no transfer to

public transport. Given this finding, it is reasonable for TPi to consider these now to be redundant. This is consistent with the conclusions in the September 2010 MTRU report.

What is not immediately apparent from the text, although it is from the numbers, is that the bus lanes have not been removed from the Western option to be consistent with the treatment of the new Eastern Options. Comparing the numbers from the August 2010 TPi report, Table 5.6 with their March 2011 report, Table 4.5, the Western Route column (SO3) is identical.

This means that Table 11.1 in TPi 2011 must be interpreted with caution. A further qualification to this finding is the behaviour of Diadem, which may generate car trips when congestion is reduced. The Diadem issues, such as mode split and trip length and time, have not been addressed in TPi 2011.

Conclusion on TPi reports

The most obvious step to take in the modelling and forecasting is to run the test suggested by MTRU in 2010. As is shown below, this step would be consistent with what is said in Amey, TRL and PB. TPi 2011 have already done most of the work required for this run by removing the bus lanes which had led to excess congestion in the model.

4. NON-ROAD OPTIONS AND THE AMEY, TRL AND PARSONS BRINCKERHOFF REPORTS

The main focus of this MTRU report is the impact of a sustainable transport option without a Relief Road, based on proven transport planning practice, which would achieve the Council's objectives. The new work commissioned by Herefordshire Council since MTRU's 2010 report makes it very clear that it does not include any study of this critical issue. Therefore, the new work strengthens the conclusion of MTRU's 2010 report that the best performing alternative to a road based solution has not been tested. The new evidence has been examined for this report and continues to indicate a strong performance for such an option, in terms of both congestion and emissions.

Amey report, September 2010

The terms of reference of the Amey report are clear, the first paragraph of the Summary states:

'The Purpose of this study is to identify the engineering and environmental advantages and disadvantages associated with the Relief Road Options. The traffic impact of the Relief Road and packages of sustainable options has also been assessed.'

And in 1.3.3:

'Study of Options for the Hereford Relief Road (This Study) – Identify engineering and environmental advantages and disadvantages of proposed route corridors to inform the planning strategy (This Study).'

No assessment of sustainable options without a relief road is undertaken by Amey. They assert that a road is needed to provide space for sustainable measures (in reality this must refer to the bus priority measures on the A49) but go on to say in para 5.1.3 that:

'Therefore, greater investment in sustainable measures would result in improved overall efficiency and the better performance in terms of environmental indicators such as noise and air quality. The focus of the recommendations should consider whether the sustainable packages can be achieved without a Relief Road.'

Parsons Brinckerhoff report, July 2011

The Parsons Brinckerhoff (PB) report is equally clear on its limited terms of reference, saying in its Introduction:

'The focus of the exercise is to confirm (or otherwise) that the conclusion reached by Amey (that the preferred route corridor for the Hereford Relief Road was an inner western route) was based on good practice and was solid. In addition, the validity of the "East is Best" option on environmental grounds was also to be considered and the potential environmental impacts from the option summarised.'

In para 1.4.1 a full list of documents 'made available by HC' is given. This does not include the TRL report, or the MTRU 2010 report (or, in fact, the 2010 TPI report). The MTRU 2010 report was

submitted as part of the consultation in November. However, another document submitted during this consultation, 'Why East is Best', was considered by PB. In view of the technical analysis contained in the MTRU report the fact that it too was not considered by PB is somewhat surprising and inevitably limits the value of the PB review.

Despite the omission of the MTRU report, PB conclude, in reference to the 'East is Best' options, that differences between Eastern and Western route options in the traffic model 'in reality are too small to differentiate between' (para 2.6.8). The lack of differentiation between road options is of the same order in the options tested in 2010 and was identified in the MTRU 2010 report. PB's parallel observation in relation to the detailed model output thus support a key finding of the MTRU 2010 report.

TRL report, March 2010, commissioned by Natural England

The Transport Research Laboratory (TRL) report pre-dates some of the work undertaken by the Council and thus some of the questions it raises have been answered. It comments mainly on the initial modelling undertaken by JMP in 2009 and calls for more work on public transport. It also describes the then DfT methodology for appraising transport schemes (NATA, the New Approach To Appraisal) in some detail. Two substantive conclusions in Section 9 are still valid:

- *' [I]t has not been shown by the study that the relief road is essential for the scale and distribution of growth planned.'*
- *'[T]here are likely to be credible alternative sustainable transport package options that should have been, and could be, considered.'*

The first cannot be proven until the best performing alternative has been developed and tested. The second is linked to the first and is supported by the Council's own modelling, which shows that sustainable measures always make a significant improvement in terms of reduced congestion and carbon and, because of this, they are considered by the Council to be an essential accompaniment to road building. The question that has not been answered is whether road building is an essential accompaniment to a sustainable transport package.

TRL also concur (Section 7.5) with the MTRU 2010 report's findings in saying

'Highlighting carbon impacts: There will be a new Reduce Carbon Emissions goal in DaSTS that will emphasise the need to reduce carbon dioxide emissions. The Hereford ODR seems likely to increase carbon.'

The data from the TPi reports shows that the road options generate 12-17% more vehicle kilometres than comparable no road options and most likely an equivalent increase in carbon emissions. It must be remembered that, by 2026, the improvements in fuel efficiency currently entering the vehicle fleet, such as stop start engine control, various hybrid/electric options and regenerative braking will have worked their way through. These are all focussed on improving efficiency in low

speed and congested conditions. Vehicle kilometres will provide a more accurate approximation for carbon emissions than today.

In this sense, the question for Natural England, of whether there was an alternative which would allow for growth without a road scheme, has still not been addressed in the work commissioned by Herefordshire Council. In fact, the evidence shows that such an alternative may even be the best option for car users, while delivering superior performance in terms of environment, carbon, and health.

5. CONCLUSIONS

In view of the failure to fully address the option generation stage of the appraisal process, or to test an obvious alternative which would be likely to perform very well against all objectives, it has not been proved that a road is essential to allow for new development or to address congestion in Hereford.

Detailed outputs from the existing modelling already show that a sustainable package without a Relief Road would be more likely to meet Council objectives and national carbon targets than a road scheme combined with such a package. The detailed programme of sustainable measures could be targeted to meet specific needs even more effectively than the generic list of measures given in the Council's sustainable options.

In this context, and given the nature of travel in Hereford, it is surprising that there has so far been no published test of a sustainable package with no Relief Road and an emphasis on encouraging cycling rather than bus use.

This could be undertaken relatively easily, given that the latest TPI report has set up the modelled network to run without the A49 bus lanes, but with other sustainable measures.

Any such test should clearly show results with and without the model 'add-on' Diadem – the original consultants were clear that the way in which Diadem was used for Hereford could result in serious discrepancies in the share of walking, cycling and public transport. These discrepancies have almost certainly occurred.

The analysis for this report is, however, substantially positive. A sustainable package would be in tune with much of the work already undertaken and a comprehensive approach would maximise benefits from existing individual schemes.