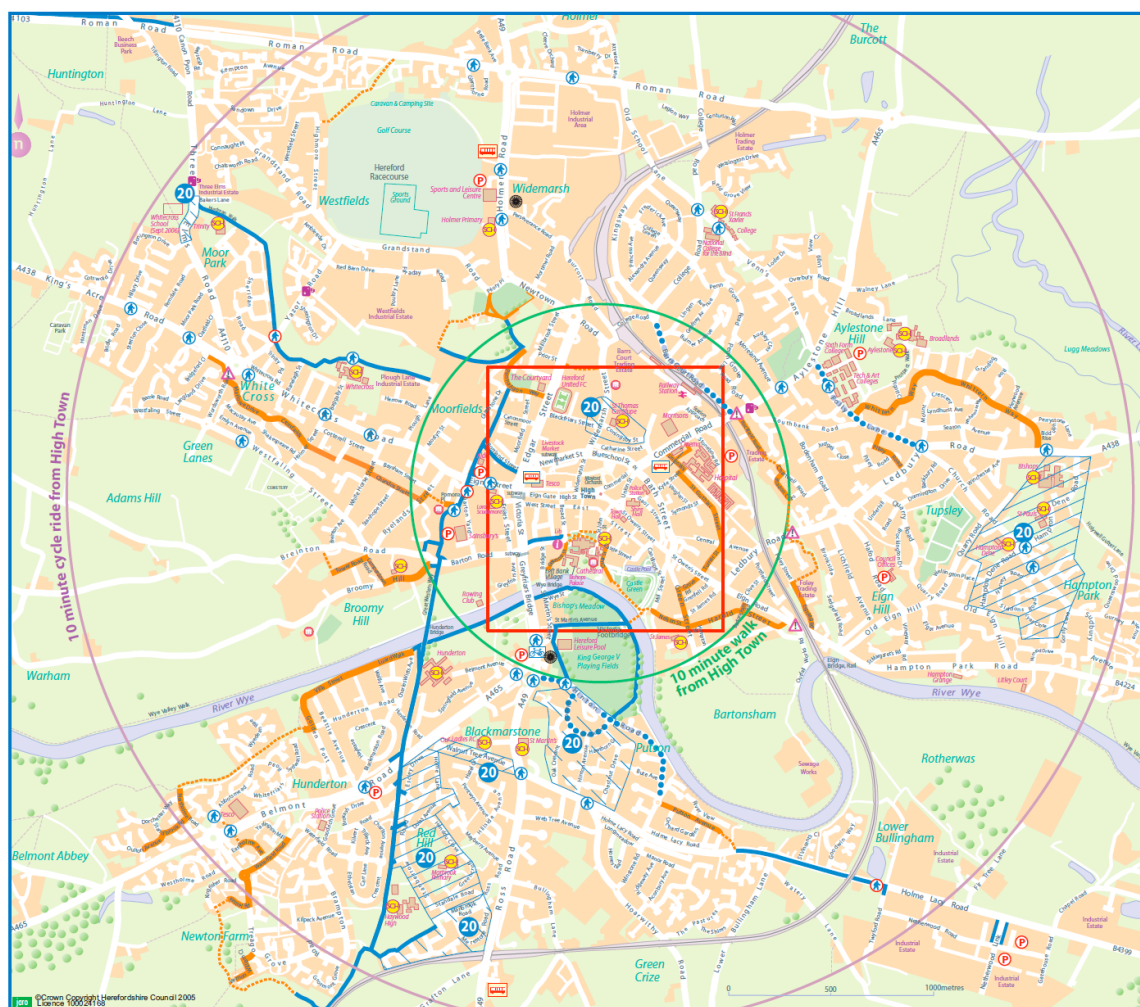


A new sustainable transport option for Hereford

MTRU

September 2010

September 2011 Introduction by Paige Mitchell



Ten Minute Travel Radius for Trips on Foot and Bicycle from or to the City Centre

Source: Herefordshire Council (nd) *Local Transport Plan 2 2006/7 - 2010/11*

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RATIONALE FOR CIRCULATING A SEPTEMBER 2010 REPORT IN SEPTEMBER 2011

The purpose of this introduction is to provide the background and context for '*A new sustainable transport option for Hereford*', a September 2010 report which was submitted to Herefordshire Council in response to the autumn 2010 consultation on the Hereford Preferred Option. It is being republished in advance of a follow on study by MTRU (the Metropolitan Transport Research Unit) to be published before the end of September 2011.

MTRU's forthcoming report will build on this one and will consider the latest (2011) transport studies commissioned by the Council to support its 'revised preferred option' for the Core Strategy of the Local Development Framework (LDF). The LDF will determine the county's growth up to 2031. One major reason that a revision to the 2010 preferred option is needed is the overwhelming rejection of the Relief Road proposal at the autumn 2010 consultation.

MTRU's latest brief is to examine alternatives to road building and how they should be properly tested in developing the evidence base for the LDF Core Strategy. This is necessary because — despite repeated requests over many years — Herefordshire Council has so far failed to take this step itself and to report the results of a comparison of road building versus sustainable transport measures to the people of the county. A comparison of road building with properly modelled and evaluated alternatives is the only basis for an informed and fair choice on road building, a key element of the Core Strategy.

A fair consultation is essential. The final version of the Core Strategy will be submitted to a Planning Inspector for an Examination in Public. Herefordshire's Core Strategy will be subjected to a test of 'soundness', which requires all development plan documents to be 'justified, effective and consistent with national policy.'

Not only must the choices made in the Core Strategy be 'backed up by facts' but the plan 'should also provide **the most appropriate strategy when considered against reasonable alternatives. These alternatives should be realistic and subject to sustainability appraisal.**'¹

The Council will have to be able to demonstrate either that alternatives to road building were not reasonable or that realistic alternatives were properly tested and rejected on compelling grounds. If it has not done this, the upcoming round of consultation on the Core Strategy will be a costly waste of time and money.

¹ The Planning Inspectorate (2009) 'Local Development Frameworks, Examining Development Plan Documents: Procedure Guidance', p44.

BACKGROUND TO 'A NEW SUSTAINABLE TRANSPORT OPTION FOR HEREFORD'

MTRU first examined Hereford's transport issues in 1993 when they were engaged by the Countryside Commission to be observers at the Hereford Transport Roundtable instigated by the Department of Transport. The Department had lost the case for an eastern bypass at the 1991-92 Public Inquiry and the purpose of the Roundtable was to generate consensus on how to move forward.

The A49 Hereford Bypass had failed at Inquiry on the grounds that the environmental damage the road would cause outweighed its predicted financial benefit. There were two reasons for this finding by the Inspector. The environmental damage would indeed be high. But the economic returns were very low because the amount of traffic forecast to use the road was low.

The 1991-92 Inquiry established that most of Hereford's traffic was generated by Hereford itself. At the same time an alternative to road building, addressing congestion with a 'package' of measures, was beginning to emerge nationally and was advocated by many who attended the 1993 Roundtable.

MTRU's next study of Hereford came in 1996. When it looked likely that the Department of Transport would again promote a bypass of Hereford without considering alternatives, a consortium of six local organisations commissioned MTRU to investigate whether measures to manage demand for travel in Hereford could solve our traffic problems.

The 1996 MTRU report, *'Transport in Hereford: A New Approach'*, concluded that a combination of traffic and demand management measures concentrating on the potential of walking, cycling and public transport could reduce traffic significantly.

In 1998 the new Labour Government undertook a review of the National Trunk Roads Programme. The plan to build the A49 trunk road bypass of Hereford was dropped from the national programme on the basis that a package of transport measures would address the city's traffic problems.

1998 was also the year in which the new rural unitary county council of Herefordshire came into being. Despite the reasons given by central Government for dropping the road, the Council has throughout its existence insisted that solving Hereford's congestion problems requires a bypass (or outer distributor road or relief road). It has unsuccessfully lobbied central Government for funding for the road. In 2006 the Council agreed that Hereford should become a 'Growth Point' on the basis that there would be central Government funding for infrastructure.

Since then the Council has argued that the future of Herefordshire depends on a relief road — one that will have to be entirely funded through developer

contributions since there is no indication that central Government will fund it. This in turn has implications for the amount, location and type of housing that will be built in the county over the next 20 years.

Thus, a 'relief' road for Hereford is now one of the most important and controversial elements of Herefordshire Council's draft Core Strategy for the Local Development Framework (LDF). In its 2010 consultations on the LDF the Council told the people of the county that the case for a road was proven and limited their choice to route alignment, east or west.

One of the Council's arguments for road building is that it will create road space for sustainable transport measures. However the Council's evidence showed that congestion in Hereford would be worse in 2026 and that the car would remain the dominant mode on the road network. The proportion of trips made by bus would decline slightly. And, given the apparently serious support for sustainable measures promised by the Council, the proportion of trips made by bicycle would be very low — less than 5%.²

The low figure for bicycle trips is crucial and should be questioned:

- A higher figure for use of the bicycle in Hereford in 2026 would further weaken the already marginal case for the road.
- All the evidence indicates that the single biggest component of traffic on Hereford's road network is still trips made entirely within the town.
- Recent best practice in Europe shows that, with the right set of policies and some political will, cycling can account for nearly half of urban trips.
- The lifetime of the LDF coincides with the period over which carbon emissions will have to be drastically reduced and oil prices are forecast to rise dramatically: the era of low carbon transport is rapidly approaching.

The low figure for cycling reinforces the view of many people that alternatives to road building have not so far been properly tested. It was for this reason that, during the autumn 2010 consultation on the Hereford Preferred Option, MTRU was once again commissioned to consider Hereford's traffic. This time Herefordshire Friends of the Earth and Cycle Hereford asked MTRU to examine how sustainable transport options had been tested by the County's consultants and what would happen to congestion on Hereford's road network in 2026 with no road but higher levels of cycling.

'A New Sustainable Transport Option for Hereford' was the result of that commission. MTRU assumed what can be considered a 'modest' level of cycling in the European context, 20%. It found that:

² Council statements on the need for a relief road and their relationship to the Council's evidence base are examined in the May 2011 report *'A Relief Road for Hereford — or Not???'* available from <http://questionsquestions.wordpress.com/reports/a-relief-road-for-hereford-—-or-not/>

- The Council's transport modelling needed to be improved to reflect the impact of policies directly.
- Modelling by the Council's consultants clearly showed that car travel time variations between all options, with and without the Relief Road, were very small and probably not perceivable.
- The only option tested by the County likely to achieve significant emissions reductions from traffic was the maximum sustainable option with no Relief Road. None of the Relief Road options would achieve such reductions.
- A new No Road option reflecting 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 Relief Road options.

The Council's response to the MTRU report has only recently been made available in its 'Preferred Option Hereford Consultation Report June 2011'. It dismisses MTRU's work without mentioning the critical finding — a new sustainable option that would 'match or exceed the highway performance of the Relief Road options'.

Under 'Alternative Options' 'not previously considered as part of the Core Strategy Hereford Preferred Option process and its supporting evidence base', the Council's report states:

'Submission of a New Sustainable Transport Option for Hereford.'

'This submitted report suggested that current modelling shows there is hardly any difference in journey times with or without a relief road. Transport studies have confirmed the need for a relief road along with a package of sustainable transport measures to manage congestion and enable planned growth. Modelling has predicted the expected traffic movements in relation to the growth proposals. It indicated the impact upon main junctions and confirms little difference between either road options.' (para 5.1)

The salient question here is whether the Council's transport studies have indeed 'confirmed the need for a relief road along with a package of sustainable transport measures'. Evidence from the Council's consultants, Amey, indicates that *their studies have confirmed no such thing*. Amey recommended in September 2010 that the Council **'should consider whether the sustainable transport packages can be achieved without a Relief Road.'**³

It is therefore timely to republish the MTRU report of September 2010. The version published here has been slightly edited for clarity but the analysis and numbers are as presented to Herefordshire Council during its autumn 2010 consultation.

³ Amey (2010) 'Hereford Relief Road — Study of Options September 2010', para 5.1.3

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1. MODELLING AND FORECASTING FOR HEREFORD TRANSPORT OPTIONS

1.1 How can sustainable travel options be modelled?

Before beginning a preliminary analysis of the transport options for Hereford and how their impact on travel patterns, now and in the future, has been assessed in the studies commissioned by Herefordshire Council,^{4,5} it is important to understand the current state of play in terms of modelling such options, including sustainable transport measures.

While car journeys, and the networks they use, have a long established set of tools to model them, there are more complex, but equally important, areas of transport modelling and forecasting which are far less well developed. These include:

- changing travel behaviour;
- the inclusion of walking and cycling; and
- the interaction between motorised and non-motorised modes.

This is particularly true in the case of the range of initiatives known as Smarter Choices. These are of two basic types.

The first is destination-based, such as travel plans for the workplace, leisure centres, major venues or retail centres (both in and out of town). These initiatives usually involve a range of incentives, including financial benefits, the provision of information and facilities such as workplace shower facilities for cyclists, secure and weatherproof cycle parking, shopping lockers for bus users, supported by complementary control of parking and parking charges.

The second type of Smarter Choices initiatives is home-based, and involves working with people to look at their travel patterns and helping to inform them of the available choices and how to implement change. These sessions can help

⁴ TPi (2010) *HEREFORD RELIEF ROAD Interim Forecasting Report Sustainable Option Packages FINAL* (Appendix 3 of Amey (2010) Study of Options) available on see <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

⁵ JMP (2009) *Hereford Multi-Modal Model Forecasting Report*. see <http://www.herefordshire.gov.uk/housing/planning/35114.asp>

to identify simple barriers to alternative travel modes, such as not being familiar with using public transport, how much it costs and how to get the best ticket.

Destination- and home-based Smarter Choices are difficult to model using conventional methods which rely on car-based travel costs (such as in-vehicle time and vehicle operation) and do not account for people's attitudes (for example to safety and security), the level of information at their disposal, and their perceived costs – including non-travel costs.

One practical approach to predicting the impact of Smarter Choices begins by comparing the worst, average and best results achieved by Smarter Choices in similar areas to the one being studied. These potential levels of reduction in car driver traffic can then be applied to the existing pattern of trips, and future forecasts. This is often referred to as a "benchmarking approach". Ideally, different journey purposes (such as commuting, shopping or leisure) and different types of area (such as degree of urbanisation) use different benchmarked levels and these can be applied in relation to any policy packages which are being proposed.

1.2 Approach used in Hereford

A simplified benchmarking approach, using 10, 15 and 20% reductions in car traffic has been used in the TPI August 2010 Forecasting Report for Hereford. This has been applied to the highway modelling and forecasting undertaken in 2009 by JMP.

In the TPI approach, the three benchmarked reductions for overall car traffic have been combined with a different method, used in the highway modelling by JMP, to alter the choice of mode (walk, cycle or bus) by people who have a car available. This means that the modelling overall is not specifically related to the policy packages (sustainable options) being proposed for Hereford. Significant interactions between the conventional model and the simplified benchmarking approach produce potentially misleading results which are not immediately apparent.

One important factor in these interactions is the use of a second means of varying choice of mode, a modelling tool called Diadem. In the Hereford case, Diadem is applied after the benchmarking, and only distinguishes between car users and all other modes combined (rail, bus, walk, cycle). It does not appear to deal with the benefits of car sharing (including car club based sharing) at all. The separate mode shares are reconstructed after Diadem has been used, based on the proportions from the Census.

It should be noted that JMP did not initiate the use of Diadem but were asked to use it by the local authority (JMP para 2.18). They also say of Diadem that,

'If, however, the model is to be used to forecast the impacts of improvements to the non-car modes, the demand modelling will have to be modified.' (JMP para 2.78).

A further issue is that the modelled highway capacity has been reduced to a major extent in order to provide bus priority (and some other facilities). This is not well related to the predicted mode transfers which are very low for public transport, and, as will be set out later, do not appear to improve bus travel time. This leads the strongest sustainable option package (SO3) suggested by the County to cause serious, and almost certainly exaggerated, levels of congestion.

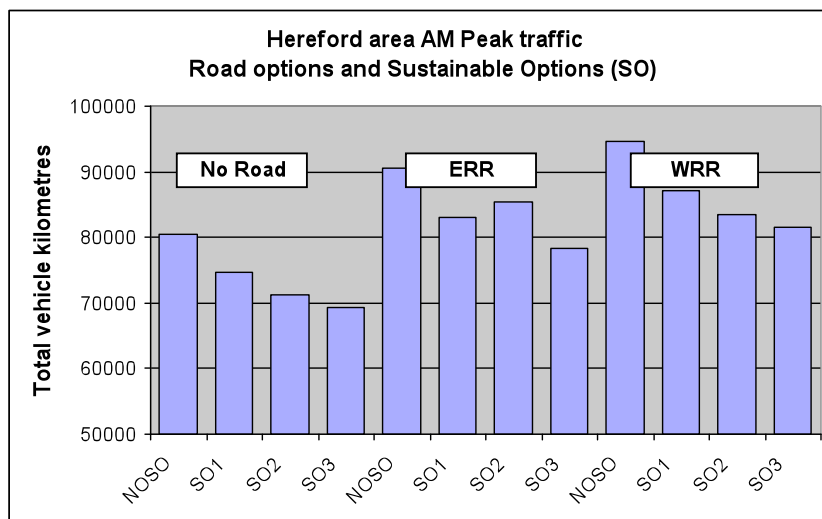
As a result, the performance of what should be the most effective sustainable options is weak and counter-intuitive. For example, a 10% reduction in local traffic through Smarter Choices is predicted to produce an increase in average car travel speed of 2.6 kph in the 2026 AM peak. The even greater reduction in local traffic of 15%, speeds it up to a far lesser extent, by only 1.8 kph. The reason is that the options depend on different assumptions about the amount of roadspace they remove from general traffic use. Even a 20% reduction of car traffic only increases speed by 2.0 kph.

This very significant factor is not explicit in the TPI report Tables, although there is a passing reference to this being the result of bus priority (TPI 7.9). At the very least, the sustainable options should have been run with the same, Option 1, level of roadspace reduction.

Without this assumed reduction in road capacity, the no-road sustainable options tested would perform much better in terms of reducing traffic congestion. Indeed, given that they reduce significantly the total traffic in Hereford, they already perform well in this regard (see Figure 1).

Overall this suggests that a sustainable option which avoided the worst congestion impacts might perform better than sustainable policies plus new road capacity.

Figure 1: Hereford Area AM Peak Traffic, 'No Road' compared to Eastern Relief Road (ERR) and Western Relief Road (WRR), All Options



Source: TPI Forecasting report 2010

1.3 Sustainable options, emissions and highway demand

In terms of a realistic sustainable option for Hereford, there are two key questions. The first is whether the options currently considered achieve the stated objectives for the County, in particular, catering for new development and reducing carbon emissions. The second is whether the best sustainable option has been tested.

1.3.1 Performance of modelled options against stated objectives of accommodating growth and reducing carbon emissions

The current base year statistics compared to those for 2026 show that building a Relief Road will fail to meet the emissions objective. This is the case even when the Relief Road is combined with the strongest currently proposed sustainable option (SO3).

The reason for this is the large amount of extra kilometres driven if the Relief Road is built. Even with Option SO3, almost all of the expected improvements in vehicle efficiency (around 30% by 2026) will be absorbed in extra traffic. In fact, by 2020 emissions would have to be significantly lower to meet local and national targets. The Department for Transport is committed to a 14% reduction by 2020.⁶ According to the TPi figures, only SO3 with no Relief Road comes close to meeting the target.

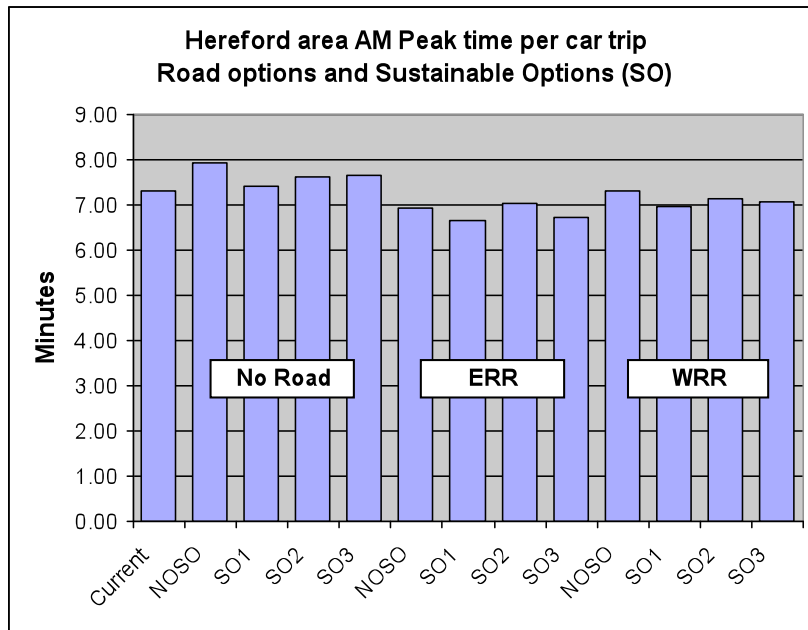
In relation to the objective of accommodating growth and the resulting increase in traffic, the average time taken by a Hereford driver to complete their journey in the morning peak would fall by about 14 seconds with the Relief Road. Without the road, the best sustainable option tested would increase this time by 7 seconds. The AM Peak results for all options are shown in Figure 2 below.

These are really not significant and are unlikely to be valued in any meaningful way.⁷

⁶ Department for Transport (2009) *Low carbon future: sustainable transport*

⁷ See the Department for Transport's original research on Values of Time in 1997 and the NATA Refresh.

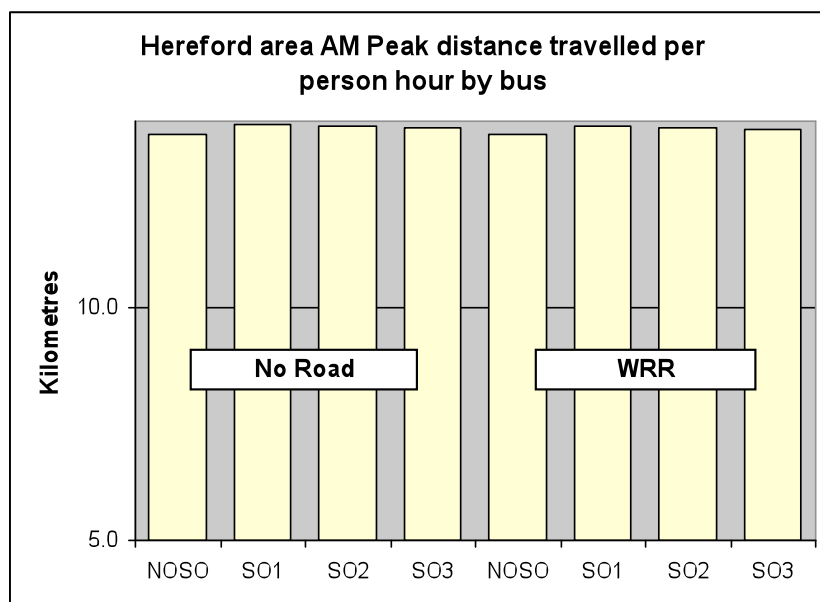
Figure 2: Hereford Area AM Peak travel time per car trip, 'No Road' compared to Eastern Relief Road (ERR) and Western Relief Road (WRR), All Options



Source: TPI Forecasting Report 2010

There are no figures for improved journey times for walking and cycling, and average journey speed for public transport is virtually unchanged across all options. Even dramatic bus priority (in Options SO2 and SO3) does not improve it. This is shown in Figure 3.

Figure 3: Hereford Area AM Peak distance travelled per person hour by bus, 'No Road' compared to Western Relief Road (WRR), All Options



Source: TPI forecasting Report 2010

1.3.2 Has the best sustainable option been tested?

The second key question is whether the best sustainable package has been tested. This is even more important, given the poor performance of the Relief Road options in meeting key objectives.

There are two main issues in relation to option development. The first is whether there is a need to divert road traffic, rather than manage demand, in order to provide space for new facilities for non-car users.⁸ The second is whether the best performing package has been tested.

Addressing the first issue is straightforward in that demand in established urban areas can usually be managed to fit the road network through a combination of pricing and the provision of reasonable and improved alternatives. While there is an issue of whether pricing is politically acceptable, in reality congestion becomes a form of demand management in itself. This is not explored in the documents seen so far and there seems to be little discussion of congestion constraint in the forecasting. More importantly, as set out above, the changes in average trip time are extremely small.

However, it is possible that the issue of constraining demand through price does not need to be addressed at all. This is because there is No Road sustainable option which was not tested by the County's consultants but which could equal the performance of the road-based options. This new option is set out below and has been prepared using the data from the current model, existing County proposals for sustainable transport measures and straightforward extensions to these.

The new No Road sustainable option would avoid the obvious conflict in Relief Road proposals of providing significantly more attractive driving conditions while trying at the same time to persuade people out of their cars. The first must by definition make the other far more difficult and expensive.

2. Developing a new 'No Road' sustainable option

2.1 Special nature of travel in Hereford

The first step in developing a new No Road sustainable option is to consider the overall pattern of travel in Hereford. According to the modelling by TPi, the average car journey is very short, 3.88 kilometres, taking an average 7.3 minutes on the network. The times have been shown earlier, but the distances for the options tested are shown in Figure 4.

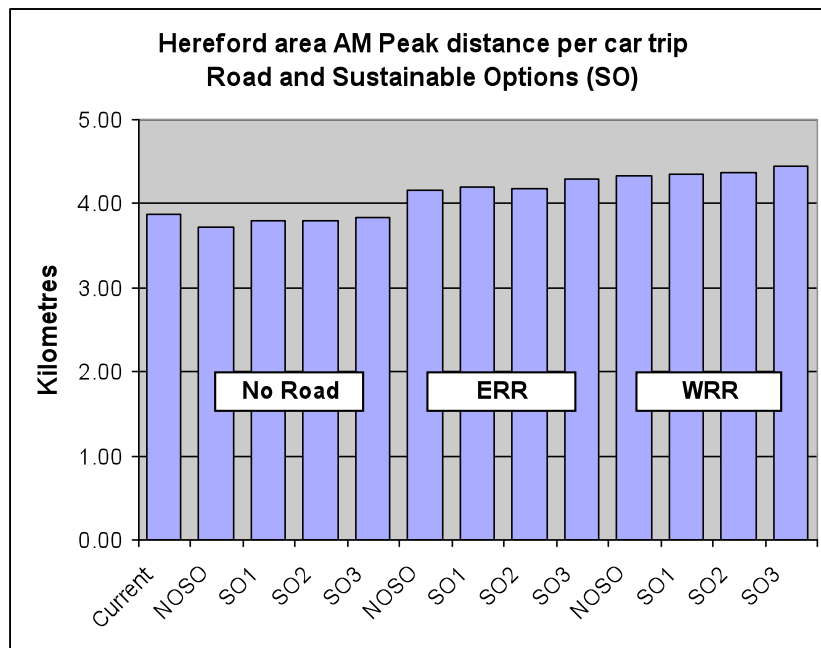
⁸ [The test recommended by Amey; see page 5 above.]

This shows that there is a very large number of journeys which can easily be walked, and even more which can be cycled. The average Hereford car journey can be cycled in 15 minutes with no walk to and from car parking.

In addition, there is a lack of steep gradients, and there are major opportunities presented by the existing and planned non-motorised (the Connect2 Hereford Greenway) river crossings. These could provide, by 2026, six crossings compared to the two for motorised traffic.

Taken together, Hereford's travel patterns, geography and highway network open up the possibility of creating a flagship scheme for non-motorised modes, and cycling in particular.

Figure 4: Hereford Area AM Peak distance per car trip, 'No Road' compared to Eastern Relief Road (ERR) and Western Relief Road (WRR), All Options



Source: TPI forecasting Report 2010

2.2 Must the sustainable options cause congestion?

In the modelling by TPI the possibilities for walking appear to be reflected in the sustainable options, with commonly predicted increases in the range of 2-4,000 extra trips. For cycling, the projected increases are far smaller, in the range 350-750. As noted before, public transport increases (which include rail) are significantly lower than cycle.

This suggests that removing amounts of roadspace for bus priority which cause delays to traffic is simply not justified. Yet it is this capacity reduction which seems to be driving the need for additional capacity in the form of the Relief Road.

As an alternative we have constructed a new No Road sustainable option which is less optimistic about the growth in walking and public transport, but more optimistic about cycling. The most extreme proposals for bus priority are therefore not included.

2.3 Nature and impact of the new No Road sustainable option

The TPi model analyses three sustainable packages: reductions of 10, 15 and 20%. These reductions are not wholly reflected in the TPi final results, because other elements have obscured their effects (as discussed above). Nevertheless they can be used to identify changes in mode share and total distance travelled under the new option presented here, No Road + More Cycling.

The No Road + More Cycling option assumes that it will be possible over the next 16 years to bring cycling in Hereford up to a level achieved as a matter of routine in Germany, Denmark and the Netherlands.⁹ It adopts the level of increase for walking and public transport in the lowest sustainable option, but then reduces the share for walking still further to allow for some additional capture of walking trips by the cycle mode.

The two tables below show the absolute numbers of trips and percent mode share, based on data from the County's model.

Table 1: Relief Road + TPi Sustainable Option 3 (SO3) compared to No Road + More Cycling; number of trips by mode: AM Peak

	<i>Walk</i>	<i>Cycle</i>	<i>Public Transport</i>	<i>Car</i>
Base year	6043	850	3005	19921
Relief Road + SO3	10578	1964	3583	22362
No Road + More Cycling	8235	7697	3245	19310

Source: TPI Forecasting Report, MTRU recalculations

Table 2: Relief Road + TPi Sustainable Option 3 (SO3) compared to No Road + More Cycling; percentage mode share: AM Peak

	<i>Walk</i>	<i>Cycle</i>	<i>Public Transport</i>	<i>Car</i>
Base year	20.3%	2.9%	10.1%	66.8%
Relief Road + SO3	27.2%	5.0%	9.2%	58.6%
No Road + More Cycling	21.4%	20.0%	8.4%	50.2%

Source: TPI Forecasting Report, MTRU recalculations

⁹ For example, see Figure 3 in *Making cycling irresistible: Lessons from the Netherlands, Denmark and Germany*, Pucher, John and Buehler, Ralph, Transport reviews 28 (2008)

To summarise, the No Road + More Cycling option has the following outcomes:

- Base year car travel is reduced by attracting existing users onto more sustainable modes.
- This creates space for some car travel from new development leading to overall stability or slight reduction.
- Cycling is the flagship mode for growth.
- Growth in walking is lower than in any of the County “sustainable” options – basically more walking in future years, due to overall growth in trips, but similar mode share.
- Public transport use is low, and thus dramatic priority is not needed, but this uses the existing Hereford Traffic model and is an area where further work is required.
- Cycle use is still lower than in many cities in the Netherlands and Denmark where active encouragement has been provided.

3. Conclusions

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 sustainable 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 Relief Road options.