
The Use of Sustainable Travel Planning Strategies within Remote Cities

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Abstract: The paper considers sustainable travel strategies for remote cities that form a regional centre for a wider area. The strategies aim to minimise private vehicle traffic within the city centre arising from both city residents and commuters in from outside regions, but without adversely impacting on the total inflow of people to the city for business, leisure or educational purposes so as not to affect the city's economic viability.

The primary case study within the paper is Hereford, United Kingdom – an ancient Norman city within rural Herefordshire. Significant research has previously been conducted as to the transport problems within the city and such research is summarised and built on in the current paper by proposing potential solutions to the problems.

The paper concludes that sustainable travel strategies in such cities are best aligned in zones, with key strategies for the inner zones being walking and cycling and key strategies for the outer zones being “park and walk” schemes to the inner walking/cycling zones.

Keywords: *Sustainable Travel, Soft Measures, Remote Cities*

1. Introduction

Cities located within a rural area are often the primary source of employment, higher education, retail and other facilities for a wide local area, which may result in a net inflow of daily visitors due to:

- residents of the city remaining within the city for work, shopping and other needs; and
- residents of the rural area outside the city coming into the city on a daily basis for work, shopping and other needs

Should the primary means of transport be private vehicle, this may result in significant congestion within the city (which has consequent detrimental economic and social impacts) as well as other adverse environmental, social and economic impacts such as increased carbon emissions; air pollution; poor public health; and reduced incentive to invest in the area.

Therefore, careful travel planning is essential to minimise private vehicle usage without dissuading people from coming to the city, as it is important (particularly in the current economic climate) to maintain and increase the economic prosperity of the region. The focus in this paper is on sustainable travel solutions for commuters to work, as these form a significant proportion of peak time journeys.

2. Case study: Hereford, UK

2.1. Background

The main case study within the paper is the ancient cathedral city of Hereford, United Kingdom, located within the predominantly rural county of Herefordshire. Hereford has a population of

55,700 whilst the other principal towns within Herefordshire (Leominster, Ross-on-Wye, Ledbury, Bromyard and Kington) have much smaller populations, ranging from 3,200 to 11,100¹. The nearest large city to Hereford is Worcester, which is 21 miles away, whilst the major cities of Cardiff, Birmingham and Bristol are 58, 61 and 65 miles away respectively. These geographical circumstances have led to Hereford becoming the county's centre for employment, administration, health, education facilities and shopping, resulting in significant pressure on its urban highways and its historic city centre, in which it retains an 11th Century cathedral and other historic buildings.

2.2. Geographical Factors

An additional geographical complication for Hereford city is that the River Wye divides the city between the North and the South. There is only one principal road bridge, at which the A49 crosses the river. This crossing point suffers from significant congestion which causes significant delays during peak commuter travel time². There are also two further pedestrian bridges, one of which carries an important cycle route (the Great Western Way).

However, an important positive factor is Hereford's pleasant and compact city centre, with a pedestrian-only main shopping street (High Town) and numerous historic buildings, which make it a very "walkable" environment.

2.3. New Development

Hereford is currently undergoing a significant redevelopment at the Edgar Street Grid, a 40ha site to the north of the city centre, which will entail new residential, retail, office and leisure facilities. Therefore, it is important that any travel planning options take into account the impact of the new development, in terms of additional residents to the area and additional employment opportunities within the city centre. In total, Hereford plans to increase the number of households by 8,500 by 2026 (including those at the Edgar Street Grid)².

2.4. Journeys to Work

76% of Hereford residents work within Hereford and 65% of residents' journeys to work are less than 5km. Therefore, there appears to be significant scope for encouraging more sustainable means of travel to work, given the short distance of typical work journeys. 57% of residents take their private vehicle to work (with an additional 7% being car passengers); 18% walk to work and 8% cycle. Only 6% use public transport to travel to work, all of which consists of bus use.

The figures below² show that the choice of transport mode to work is strongly affected by the area of the city in which the resident lives. The majority of car journeys to work arise from the outskirts of the city whilst the majority of journeys on foot arise from within the city centre. This may indicate that a key employment zone is within the city centre:

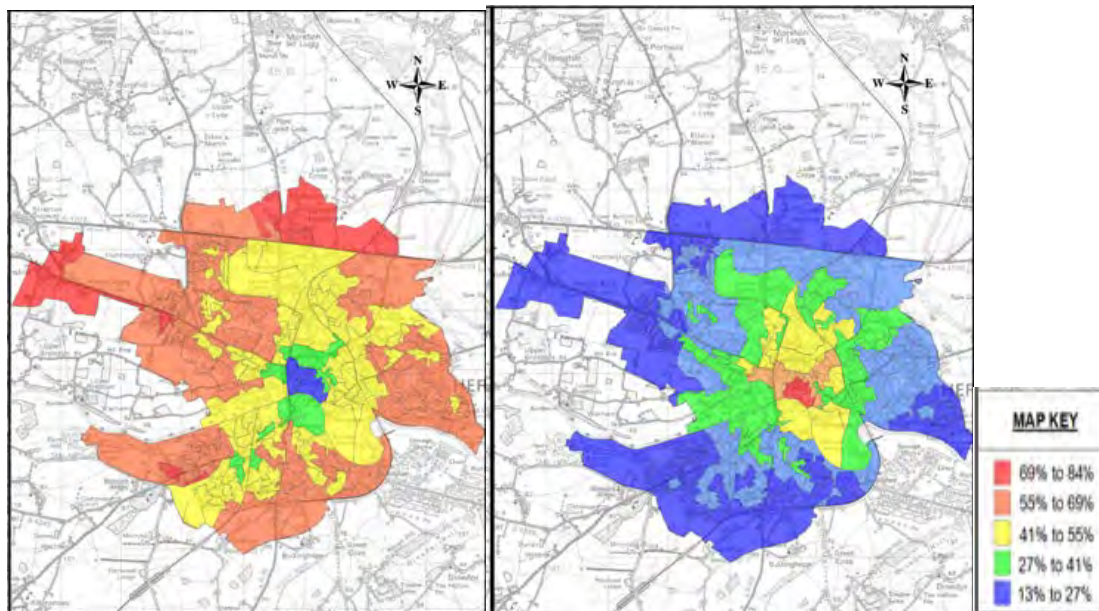


Fig 1: Car journeys to work

Fig 2: Journeys to work on foot

2.5. Hereford Travel Objectives

From the above background, it can be seen that the key objectives for Hereford are to:

- maintain and encourage the relatively high levels of walking and cycling to work within the city centre
- reduce private vehicle use from the city outskirts into the city centre
- protect the city's historic core against increased vehicle use
- reduce the significant congestion on the A49 crossing point over the Wye river

However, due to the current economic climate, and the reduced public sector funding now available for transport issues, low-cost approaches will be favoured to strategies which involve significant capital expenditure or long-term operation and maintenance costs.

3. Methodology

The focus of the research is on “soft measures”. Such measures do not involve investment in new transport infrastructure or technologies but instead focus on changing people's behaviour so that they make better use of currently available resources. Following a review of available soft measures, a city-wide sustainable travel plan is devised to suit Hereford and other similar cities, which is set out in the Discussion.

4. Results

A summary of available soft measures⁴, which can potentially be used to encourage a behavioural change in choice of transport mode, are set out below and discussed in section 5.

Table 1: Available Soft Measures

Strategy	Details	Potential Financial Implications on the Local Authority
Pedestrian-only zones	Converting the city centre to pedestrian-only zones would prevent private vehicle use in the inner zones of the city.	Cost of converting roads into pedestrian-only zones Additional car parking on the outskirts of the pedestrian-only zone
Reduced car parking	Reducing availability of city centre car parking could encourage private vehicle drivers to use different modes of transport due to the inconvenience of locating a parking space.	Reduced car parking income Additional car parking on the outskirts of the city centre
Car parking duration	Limiting city centre parking to a maximum duration (up to 3 hours) could minimise use by commuters without deterring other day visitors such as shoppers.	Reduced car parking income Additional car parking on the outskirts of the city centre
Car parking charges	Increasing city centre car parking charges could minimise use by commuters but could also deter other day visitors.	Reduced car parking income Additional car parking on the outskirts of the city centre Reduced income from day visitors, and potentially reduced business investment
Park and Ride	Car parking on the outskirts of the city centre and public transport connections into the city centre.	Additional car parking facilities and re-routing of public transport vehicles (primarily bus)
Reduced public transport costs	Local authority subsidies of public transport charges to offer reduced rates or season ticket discounts.	Cost of subsidising public transport
Public transport promotion and marketing	Greater awareness of available public transport options could increase public transport use.	Promotion/marketing cost
Walking / cycling promotion and marketing	Campaigns such as “Walk/Cycle to Work Week” can positively encourage people to switch to walking or cycling.	Promotion/marketing cost
Bicycle parking facilities	Availability of good quality and secure bicycle parking can encourage cycle use.	Cost of bicycle stands (approximately £35 to £100 per stand)
Car share schemes	Providing car share websites or other databases allows people living in the same area and travelling to the same area to share their car use.	Cost of maintaining website / databases

5. Discussion

5.1. Reduction of Private Car Use

It is self-evident that converting the city centre into a pedestrian-only zone will prevent private vehicle use within the area. However, such a measure may be unduly restrictive and unworkable for residents and outside visitors. An alternative therefore may be to enforce driving restrictions within the city centre for specific time periods, rather than a full conversion of the city centre into a pedestrian-only zone.

Parking restrictions within sustainable travel plans have been reported as effective in reducing commuter car use by an average of 24% or more, whilst the reduction in commuter car use was only 10% or more without parking restrictions⁴. From Table 1, the three strategies relating to parking restrictions (reducing car park availability, reducing parking duration, and increasing parking charges) may all be effective in reducing private vehicle use. However, only reduction of parking duration specifically targets commuter driving, whilst the other two methods impact on day visitors as well as commuters.

5.2. Sustainable Travel Alternatives

A potential sustainable alternative to private vehicle use is public transport use. It has been reported that offering public transport discounts can be highly effective in encouraging reduced car use⁴. Hereford has a railway station within its city centre but no other stations in the outskirts of the city, thus preventing commute to work by rail for Hereford residents. Therefore, the primary existing public transport option for Hereford is bus.

As mentioned above, only 6% of residents commute to work by bus, which seems a relatively low proportion. This may, potentially, be explained by the inability (due to space restrictions) to provide bus priority measures (such as exclusive bus lanes) within the historic city centre core. Therefore, bus users may be subject to the same congestion as faced by private vehicle users, but with the added inconvenience of public transport use (such as waiting at bus stops for the bus to arrive).

Given the compact nature and pleasant environment of Hereford city centre, it is therefore considered that sustainable travel options which favour walking and cycling within the city centre, rather than increasing bus use over current levels, are the optimum choices.

5.3. Hereford City Proposal

Figures 1 and 2 above show that private car use and walking are more popular respectively in different parts of the city. It is therefore useful to consider the city centre as “Zone 1” and the outer regions as “Zone 2” with different travel planning strategies for each zone.

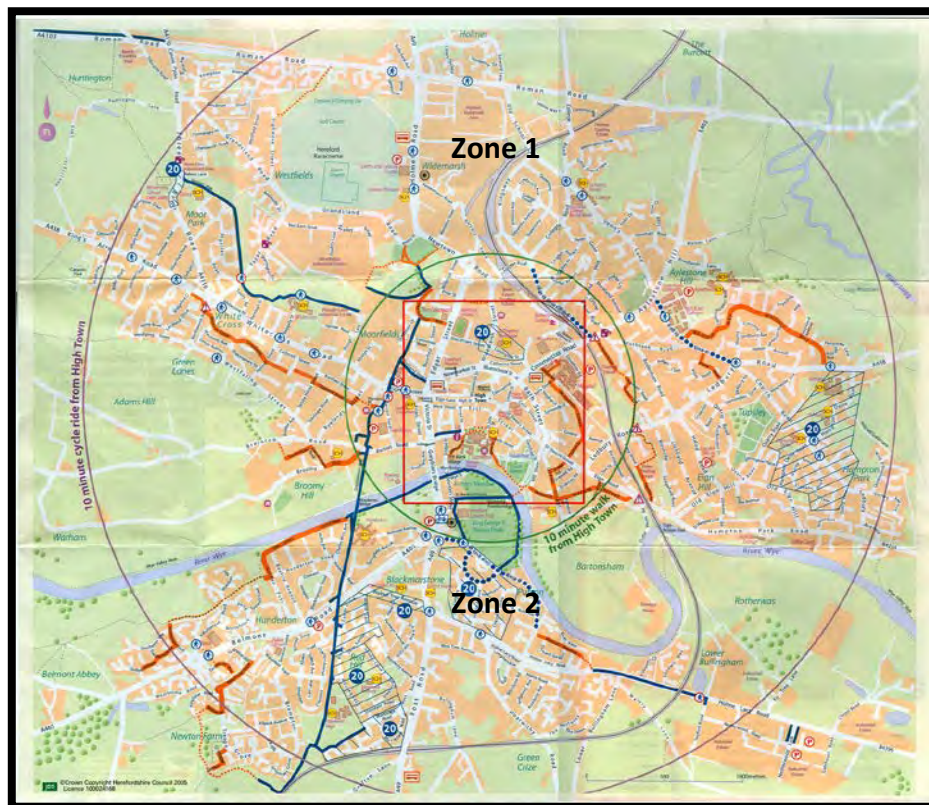


Figure 3: Map of Hereford with travel planning zones⁵

Zone 1 (circled in green - from the Wye Bridge to Hereford railway station) is 0.9 miles in length. The Herefordshire City Council mini-map⁵ states the area within the red square in Zone 1 is within 10 minutes walk from High Town (the main city centre shopping street). From the above discussion, it is considered that the key approach for Zone 1 is to implement some form of parking or driving restriction within Zone 1 and couple this with measures to encourage increased walking and cycling within the Zone.

Whilst parking restrictions may encourage reduced private car use, driving restrictions would guarantee reduced private car use, and may therefore be the more effective option. However, it is not desirable to adversely impact on day visitor numbers to the city. Instead, the key target is commuters into the city for work to tackle peak time congestion. Therefore, a potential solution is to enforce driving prohibitions in the city centre only during peak commuter travel time. A proposed time frame could be, for example, 7.30am to 9.30am and 4.30pm to 6.30pm. The driving restrictions would only be within the red square in Zone 1, so as not to exceed a reasonable walking distance for most people. Naturally, there would be exceptions for disabled drivers, emergency vehicles and buses.

Enforcement of the driving restrictions could involve the placement of CCTV cameras at key road junctions within the city which would record vehicle use. Residents of Zone 1 who need to commute outside of Zone 1 during peak hours may apply for a special permit to be displayed on their vehicle to avoid receiving any penalty should they be recorded on the CCTV cameras. As it is only a relatively low proportion of Hereford residents who commute outside of Hereford for work (and not all of them live within the city centre) it is considered that their vehicle use would not detract from the overall advantages of creating the peak time driving restriction zone within the city centre.

Outside of peak time hours, shoppers, tourists and other day visitors would be permitted to use their private vehicles. Whilst this may be disadvantageous from an environmental viewpoint, the potential adverse impact from an economic viewpoint of deterring such visitors may counter-balance this.

This system would therefore reduce road traffic congestion (a significant concern within Hereford); create a more pleasant walking atmosphere; and reduce carbon emissions. In order to encourage residents to accept and appreciate the change (rather than feeling that it has been imposed upon them) promotion and marketing campaigns ought to be used in the lead-up to the change, to promote the positive outcomes of the peak-time pedestrianisation.

Due to the driving restrictions to be implemented within Zone 1, drivers into the city centre from Zone 2 (as well as from outside Hereford) will need parking facilities on the outskirts of Zone 1. It is proposed that such facilities be located just before the A49 road bridge crossing the river Wye, which is currently the main congestion hotspot in the city area. This, it is anticipated, will lead to drivers from Zone 2 who wish to reach the city centre driving up to the parking facility and then walking or cycling into the city (using the pedestrian footbridges) rather than attempt to drive across the river on the A49 road bridge.

Therefore, the only drivers who will continue to use the A49 river crossing will be those who do not intend to drive into the city centre, but will instead continue past the city centre heading either to the north or south of the city.

Reducing vehicle numbers on the river crossing in this way would, it is anticipated, result in reduced congestion, so as to allow drivers who wish to bypass the city centre and reach the north or south of the city to move more easily. This would therefore alleviate the economic and social adverse impacts caused by congestion, as well as to reduce carbon emissions by the reduced private vehicle users.

Additional strategies suitable for Zone 2 include strategies to encourage cycling within the city centre. For example, efficient, smart-card operated bicycle hire facilities could be made available at the river crossing car park, to enable drivers to hire a bicycle daily to continue their commute to work once parked. At the city centre, secure bicycle parking would also need to be provided at key locations to assist such additional cyclists.

Further, the setting up and promotion of car share schemes could be valuable in encouraging reduced private vehicle use from Zone 2 (and beyond) to the river crossing facility.

6. Conclusions

Whilst it is a straightforward matter to set out a list of potential travel planning “soft measures” which may encourage sustainable transport use, a more complex issue is selecting which measures are suitable for particular circumstances. In the case of rural cities, such as Hereford, the importance of the city as a centre for a much wider local area cannot be underestimated, and so any selection of measures must take into account and balance the economic impacts, as well as the environmental and social considerations. As such, it is considered that the package of measures proposed above can be applied effectively to rural cities in the same or similar circumstances as Hereford, and can achieve the appropriate balance between environmental, economic and social aims.

The focus in this paper has been on reducing congestion and carbon emissions from private vehicle traffic caused by commuters to Hereford city centre for work. The proposals do not resolve other travel issues which may affect Hereford, primarily the concern that the A49 currently takes “through traffic” directly into the city centre. Current proposals include the development of a new bypass road to allow outside traffic passing through Hereford to bypass the city centre. However, these issues are beyond the scope of this paper.

The views expressed in this paper are mine alone, as an independent researcher, and do not represent the views of Hereford Futures Ltd or Herefordshire County Council.

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