Herefordshire Council

Hereford Transport Strategy Phasing Study

Transport Strategy Review

Report

Hereford Transport Strategy Phasing Study

Transport Strategy Review

Report

JMP Consultants Limited
100 Wellington Street
Leeds
LS1 1BA

T 0113 397 9740
F
E leeds@jmp.co.uk

www.jmp.co.uk

Job No. NEA6100

Report No. 1

Prepared by AS

Verified LW

Approved by LW

Status Draft

Issue No. 4

Date 20th May 2014

Hereford Transport Strategy Phasing Study

Transport Strategy Review

Report

Contents Amendments Record

This document has been issued and amended as follows:

Status/Revision	Revision description	Issue Number	Approved By	Date
Draft	For internal comment	0	LW	22/11/2013
Draft	For issue	1	LW	14/02/2014
Draft Final	Further comments	2	LW	02/05/2014
Final Issue	JC Comments	3	LW	15/05/2014
Final Issue	SB Comments	4	LW	20/05/2014

Contents

1 INTRODUCTION 7
2 STRATEGY REVIEW 8
3 MODELLING OUTPUTS 23
4 CONCLUSIONS 28

Appendix

APPENDIX A - MODELLED STRATEGY ELEMENTS 31

1 Introduction

The need for review

1.1 The Hereford Transport Strategy is an essential building block for the Herefordshire Core Strategy. Delivery of the transport interventions necessary for the Core Strategy to release the planned level of development is essential to ensure that development can be provided in a sustainable way.

1.2 The Council wishes to refine its transport strategy to better reflect its key transport outcomes[1] of:

- Reducing congestion and delay and provide access to development;
- Reducing emissions of carbon dioxide (CO_2) through behaviour change and provide facilities for sustainable transport including public transport; and
- Improving health outcomes by reducing accidents and noise and by encouraging physical activity.

1.3 Initial transport modelling in June 2013 indicated that the outcomes of the strategy were not aligned with the desired policy objectives, with increases in journey times on the A49 through the centre of Hereford and an increase in CO_2 emissions. These outcomes are disappointing not least because the Transport Strategy includes a comprehensive range of sustainable transport measures alongside significant elements of additional highway capacity.

1.4 JMP have been commissioned to undertake a review of the strategy as modelled in June 2013 and make recommendations regarding the direction of travel of the strategy to better reflect the desired policy outcomes.

Our approach

1.5 JMP have facilitated two optioneering meetings with key Herefordshire Council Officers and their professional partners. The meeting supported a strategic review of the strategy elements. This review took account of impact and alignment of the elements with the desired strategy outcomes. Where strategy elements conflict with the transport outcomes JMP are recommending these strategy elements are removed or significantly refined.

1.6 This report is structured as follows:

- Chapter two considers each strategy element included within the original strategy modelling (June 2013). The chapter provides recommendations where appropriate for refinement within the model and a commentary on how effective that strategy element will be in delivering the desired policy outcomes.
- Chapter three provides an overview of the model outcomes for the revised strategy.
- Chapter four makes concluding comments on the strategy choices highlighted.

[1] Taken from LDF Core Strategy Modelling, Non Technical Summary, June 2013

2 Strategy Review

2.1 This chapter considers each strategy element included within the original strategy modelling[2], and provides recommendations where appropriate for refinement within the model together with commentary on how effective individual strategy elements will be in delivering the desired policy outcomes.

Behaviour Change

2.2 This measure includes the introduction of travel plans; covering workplace travel plans, school travel plans and personalised travel planning. The transport strategy proposes the citywide co-ordination of behaviour change initiatives. At a strategic level this covers the key areas expected within a comprehensive behaviour change strategy, although due to the stage of development of the strategy details of the interventions are not available.

2.3 Herefordshire Council is currently delivering a comprehensive behaviour change programme known as Destination Hereford, as part of their Local Sustainable Transport Fund Initiative. Initial monitoring results indicate that the programme is successfully delivering mode shift, although the level is marginal at present.

2.4 It is important that the effects of this strategy element are not double counted as both the Council and individual developers are pursuing interventions in this strategy area. The impacts of behaviour change initiatives have already been factored into the strategic modelling of the city in the with 'Core Strategy development' scenario therefore developers should not claim the benefit of these initiatives additionally within their transport assessments.

2.5 Within the model behaviour change has been represented through an 18% switch of car trips to other modes for work trip attractors. This level of reduction is at the upper end of what would be expected to be achieved through behaviour change initiatives. However, the modelling approach is broadly satisfactory.

2.6 Analysis of the travel characteristics for residents in Hereford suggests that there is significant potential for behaviour change initiatives. The 2001 Census data indicates that 67% of Hereford residents travel less than 5km to work, with 56% of Hereford journeys to work being by car.

2.7 Key to the success of this initiative is appropriate complementary measures including information, infrastructure improvements and parking provision and policy. This is also a risk to the successful delivery of behaviour change, as a number of these complementary measures will be outside the control of Herefordshire Council and delivered through third parties including public transport operators.

2.8 There are a number of risks associated with the implementation and effectiveness of this initiative, the most prominent of which is the financial sustainability of the measure. Behaviour change initiatives should be considered in terms of a long-term programme which reinforces the key messages. The risk to the financial sustainability of the measure is linked to the long term effectiveness and reinforces the need to consider a long term programme to lock in the benefits. It is important to identify future funding sources to support a long-term programme of behaviour

[2] Local Plan Core Strategy Modelling – Non Technical Summary, June 2013

change. These funding sources should include council funding, European funding, central government funding such as Local Sustainable Transport Fund and Section 106.

2.9 Finally the effectiveness of the measure is dependent upon long-term 'buy in' to the process from key stakeholders including local businesses, education and service providers. The LSTF bid provides an initial indication of the strong level of support from local business for behaviour change initiatives.

Recommendations

- **This strategy element includes measures across the board. However it is unclear from the current level of detail how interventionalist the initiatives will be when implemented. It is recommended that significant level of ongoing travel behaviour change activity is required.**
- **Complementary measures are a key factor of this strategy element (information, infrastructure improvements, parking provision and policy).**
- **Financial sustainability is a key issue and the identification of funding opportunities alongside locking in the benefits of behaviour change will be required.**
- **Care should be taken in development management processes not to double-count the effects of behaviour change.**

Cycling and Walking

2.10 This measure includes new walking and cycling links across the city. The proposals are extensive and include both on-street and off-street links and also new and improved crossing facilities. The improvements proposed as part of the strategy aim to supplement the existing network for pedestrians and cyclists and enhance safety at key points on the network.

2.11 Herefordshire Council has been successful in achieving a modest increase in localised cycling in Hereford in recent years against a background of long term decline[3]. The Council has a strong track record of engaging with businesses to introduce cycling infrastructure. There is additional potential to work with education and health providers in this respect.

2.12 The geographical characteristics of the area, being a predominantly flat and relatively compact city, make cycling and walking an attractive and realistic prospect for residents within the city. The strategy needs to focus on the removal of barriers (actual and perceived) for cyclists. The improvements to the physical network go some way towards addressing barriers (such as cycling safety and confidence of new or inexperienced cyclists), although other complementary initiatives are required. A package of measures to improve the environment for walkers and cyclist combined with a comprehensive behaviour change programme has the potential to deliver a positive impact on congestion and delay in the city. Measures should include:

- Training for people of all ages;
- Appropriate facilities at destinations such as workplaces, including showers, changing facilities and lockers;
- Incentives to purchase, hire or trial bicycles;

[3] Census 2011 Ward data.

- Convenient and secure storage facilities at destinations;
- Storage considerations within new residential developments, so bicycles can be securely stored and easily accessed; and
- Measures to reduce severance caused by A49.

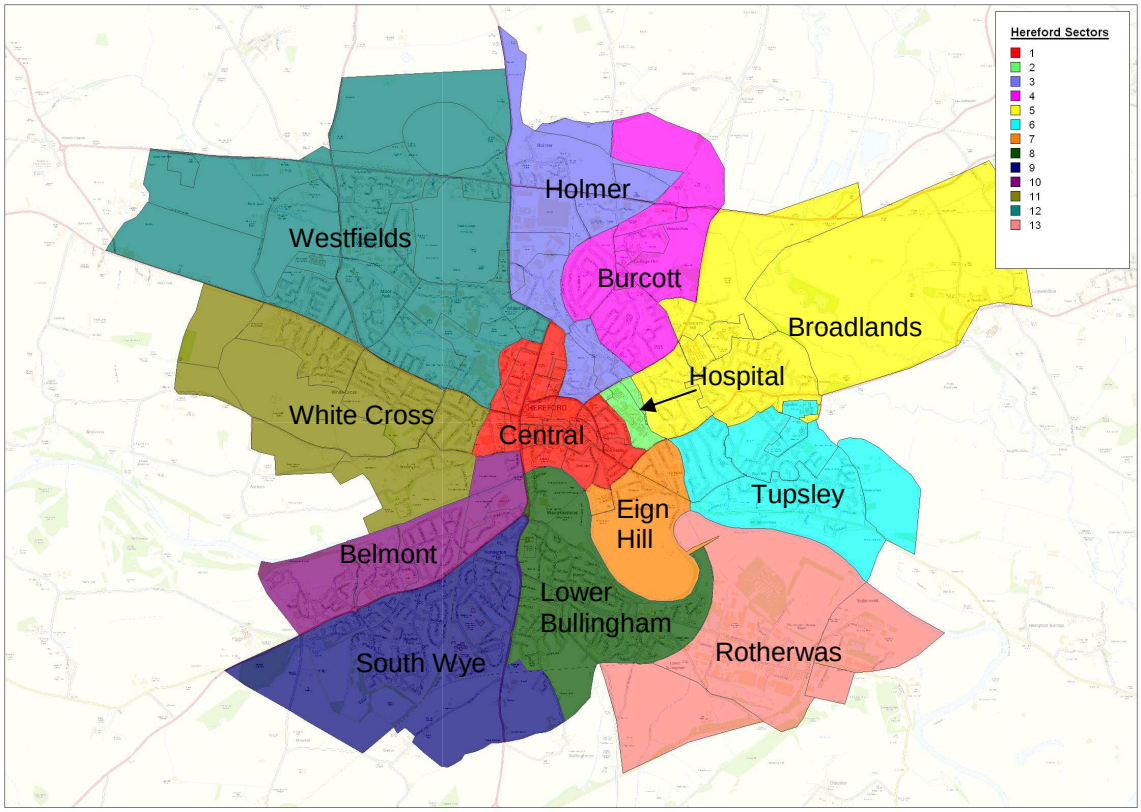
2.13 Measures to improve the quality of the wider network including targeted highway maintenance, should also form part of the strategy to attract and retain cyclists.

2.14 Consideration should also be given to cycling as part of the journey, including routes to the railway station and any proposed new transport interchanges, hubs or park and ride sites. Herefordshire Council are already facilitating park and cycle schemes at a number of locations across Hereford.

2.15 Strategy development for walking and cycling should be focused upon key attractors from realistic catchments. For example, whilst some people will cycle from the northern edge of the city to the Hereford Enterprise Zone in the south-east, measures should focus on improvements from the central and southern extents to this site to realise the greatest benefit to the wider strategy. The existing and proposed network provides good strategic coverage of the city though the Great Western Way and Hereford Greenway. There are a number of opportunities for cyclists to utilise traffic free routes to access key destinations. The remaining piece of the offer is to ensure easy and safe access to these routes from residential areas. The principal focus here is around safe crossing of major routes and identifying potential for cycle/walking only exits from residential areas. There are already a number of good examples of this within Hereford.

2.16 To identify the areas with greatest potential for increase in walking and cycling, an analysis has been undertaken of the demand matrix for the base year and 2032 from within the multi modal model. This analysis is based on the sectors illustrated in Figure 2.1 below and specifically focuses on car person trips:

Figure 2.1 Hereford Demand Sectors



2.17 The base year analysis of car person trips indicates the Central zone is the predominant destination for a number of sectors including Tupsley, Lower Bullingham and Westfields area. Other significant movements were from Belmont to South Wye area and within Westfields area.

2.18 The Westfields to central area car person trips provide an opportunity to switch some journeys to more sustainable modes. This movement is within walking and cycling distance and car journeys make up almost two thirds (62%) of journeys from Westfields to central area.

2.19 The movements within the Westfields area again indicate potential for sustainable transport solutions. There is a core of sustainable routes which run through the zone. It is recommended that measures focus on sustainable access to key destinations' within this zone.

2.20 In the future year modelling the central zone is the predominant destination from a number of origin sectors including the Hospital, Broadlands and the Tupsey area. Other significant movements were Broadlands to Holmer, from Belmont to South Wye area, within the Westfields area, Whitecross to Rotherwas and Lower Bullingham to Rotherwas. A number of these movements are orbital rather than radial which indicates the potential particularly with the movements between adjacent and within a particular zone to promote increased uptake of walking and cycling.

2.21 Whitecross to Rotherwas is a particularly car dominated movement with 99% of journeys between these sectors being made by car in 2032. The distance is up to 4 miles which would equate to over an hour walk but only a 20 minute cycle, there is therefore potential to increase cycling uptake here.

2.22 Broadlands to Holmer is again a car dominated movement with 88% of journeys between these sectors being made by car in 2032. The distance however is up to 2 miles so falls within approximately 30 minute walk or 10 minute cycle, with potential therefore to increase usage of

these modes. In 2032 the model indicates 10% walking mode split and 1% cycle mode split for these movements. Given the cycleable distance, this could be a good area to focus on.

2.23 There are a number of risks and deliverability issues associated with this element of the strategy including the allocation of road space to cyclists and issues where the network is constrained. It is clear that some of the highway and junction improvements discussed in more detail later in this chapter may conflict with the aspiration to reallocate road space to cyclists. In addition to the physical elements of the walking and cycling network, this measure needs to be supplemented with complementary 'soft' measures to encourage people to take up active travel modes and ensure those who already travel by active modes continue to do so.

2.24 Overall the delivery risk to the walking and cycling strategy appear to be minimal as the detailed strategy elements appear to form part of existing strategies or funding packages, for example Connect 2 Schemes, Hereford Active Travel Schemes or Destination Hereford.

Recommendations

- **This strategy element is strong in terms of providing significant physical improvement to the network.**
- **The baseline modelling indicates a high level of barriers to cycling; these may be perceived or actual. These barriers need to be address through complementary measures including training and associated facilities. The nature of these measures will need to be informed by research into what Hereford residents identify as their major barriers to cycling.**
- **Strategy development for walking and cycling should be focused upon key attractors from realistic catchments. Development of a comprehensive cycling strategy is needed to achieve the full potential of cycling within Hereford.**
- **The demand analysis has identified the areas with greatest potential to shift trips from car to cycle or walking.**
- **Ensure easy and safe access from residential areas to the strategic routes including crossing points on dominant desire lines and cycle and walk only accesses from new and existing neighbourhoods. This should be implemented alongside convenient and secure storage facilities at both journey origin and destinations.**
- **Address conflicts within the strategy including getting the most out of the highway network alongside providing an attractive environment for pedestrians and cyclists.**

Parking regulation

2.25 The Council has recently developed a parking strategy for Hereford. The strategy includes a commitment to introduce consistent annual increases in parking charges to bring long stay charges for the city of Hereford in line with similar centres. The strategy development included detailed assessment of the current and future parking demand.

2.26 A key issue related to the parking strategy is that only half of the available parking spaces within central Hereford are controlled by the Council or managed in line with the Council's charging

structure. A large proportion of parking in central Hereford is outside the control of the Council and this is a key risk in terms of the effectiveness of parking initiatives introduced by the Council.

2.27 The initial strategic transport modelling (June 2013) has represented the parking policy as an increase in parking charges at 10% above inflation. This level of increase over the plan period is felt to be relatively conservative. For the purpose of the revised modelling exercise parking charges have been assumed to double in real terms over the plan period.

2.28 Further more restrictive measures require consideration should the current initiatives within the parking strategy fail to provide demand changes. These further measures could include a 'City Core' access management and road charging regime.

2.29 The longer term parking strategy (2021 – 31) features measures to encourage the movement of commuter parking from the city centre to the edge of city centre. The long-term strategic aim could be a city centre historic core largely free from traffic except servicing and deliveries.

2.30 There is an opportunity to enhance the central historic core of Hereford through removal or better management of parking within the historic core and within areas in close proximity to the historic core which impact upon the setting. Herefordshire Council are currently reviewing the on street parking charges and existing parking arrangements in the historic core. Change to the parking management within the historic core has not been represented within the model and the zoning system as currently configured does not lend itself to effectively modelling such an initiative.

2.31 Modelling approach aside, parking pricing alone is unlikely to be sufficient to remove traffic from the historic core particularly if the pricing structure is the same across the whole of the city. A number of suggestions have been put forward for managing the city centre parking including the introduction of a Road User Charging Zone covering the historic centre. An example of a similar scheme has been introduced in the historic core at Durham, where a charge of £2 is payable for vehicles wishing to access the historic core between 10am to 4pm Monday to Saturday. Monitoring of the Durham scheme has indicated an 85% reduction in vehicles within the charging zone. Again complementary measures would be required to support such an initiative including measures to manage displaced vehicles and encourage a switch to sustainable modes.

2.32 A number of enhancement should be considered to optimise the effectiveness of the strategy. Potential enhancements to the strategy include:

- Consideration of additional permit and residential parking.
- Further work is required to establish the optimum parking charges for the different parking zones to be created in the longer term, parking charges should also take into consideration the relative cost of travel by public transport. This is key if the strategy is to be successful in encouraging people to use public transport as an alternative to private car.
- A further consideration in terms of parking charges is the potential to introduce a peak charging rate to encourage a peak spreading effect and manage demand on both the network and for parking spaces.
- Better information provision relating to the availability of parking in order to address the issue of circulating traffic looking for available on street parking.

- Measures to remove parking from the historic core and remove the impact of parking within close proximity to the historic core.[4]

2.33 The current parking policy has been approved by the Council and includes a commitment to increase long stay parking charges in line with comparable centres. Any changes to the parking strategy in the longer term would require approval through the Council, there are therefore risks in terms of delivery related to political support for the initiative.

2.34 There are currently gaps in the evidence base supporting the parking strategy. These gaps require further work in order to provide the justification for the initiative and provide a more thorough understanding of the effectiveness.

Recommendations

An increase in parking charges at 10% above inflation is felt to be relatively conservative. For the purpose of the modelling exercise parking charges have been assumed to double in real terms over the plan period.

The Council should introduce measures to remove parking from the historic core and remove the impact of parking within close proximity to the historic city core. Hereford Council are currently undertaking a review of existing parking arrangements and on street charges in the historic core.

A number of enhancements to the strategy should be considered to optimise the effectiveness of the strategy. Potential enhancements to the strategy include:

- **Consideration of additional permit and residential parking zones.**
- **Further work is required to establish the optimum parking charges for the different parking zones to be created in the longer term, parking charges should also take into consideration the relative cost of travel by public transport. This is key if the strategy is to be successful in encouraging people to use public transport as an alternative to private car.**
- **A further consideration in terms of parking charges is the potential to introduce a peak charging rate or manipulate the long/short stay price differential to encourage a peak spreading effect and manage demand on both the network and for parking spaces.**
- **Better information provision relating to the availability of parking in order to address the issue of circulating traffic looking for available on street parking.**

Traffic calming regulation

2.38 This measure includes the introduction of 20mph zones on Newmarket Street / Blueschool St, A49 / A438 Inner Ring Rd and a number of outer residential areas. These measures have not currently been included within the modelling, their impact is therefore not accounted for in the modelling outcomes.

[4] Herefordshire Council are currently reviewing the existing parking arrangements and on street charges in the historic core.

2.39 The rationale for this is that the existing speeds in the model are so low that the effect of coding these interventions would be negligible. Future development proposals indicate a large proportion of trip attractors adjacent to this route it is therefore unlikely that average speeds along this route will increase over the plan period.

2.40 Herefordshire Council have already introduced a number of 20mph zones throughout the city including across central areas of the historic core and in selected residential areas including Red Hill and Hampton Park.

2.41 The development of 20mph zones around Hereford has followed a self enforcing approach. It is therefore critical that complementary measures are introduced alongside 20mph zones as part of the strategy. There is evidence that 20mph zones are effective in reducing the collision frequency on a route (by around 60%) and there is also a reduction in the likely severity of the collision. 20mph zones also encourage use of healthier and more sustainable modes such as walking and cycling and associated reduction in traffic flows (up to a quarter). However to achieve these impacts the zones must be self enforcing, signing only of 20mph limits generally lead to only limited change.

2.42 Aside from the traffic levels on Newmarket Street / Blueschool St, the current appearance of the route does not reinforce the 20mph limit, as this is currently a key artery through the city centre and while the introduction of the Edgar Street Grid Link Road will play a part in alleviating traffic from this route, there is a need to consider the whole environment along this route if it is to be an effective 20mph corridor (particularly outside the peaks). Herefordshire Council are currently bringing forward a design aimed at reducing speeds including shared space concepts.

Recommendations

- **Need to consider the whole environment along Newmarket Street / Blueschool St, if it is to be an effective 20mph corridor. Herefordshire Council are currently bringing forward a design aimed at reducing speeds including shared space concepts.**

Public transport improvements

2.43 This original proposed strategy includes the implementation of a public transport hub at the rail station, a public transport interchange at Three Elms, an increase in bus frequency on existing routes and below inflation increase in bus fares, which would represent a decrease in bus fares in real terms. In terms of bus priority the strategy also includes road widening at St Martins and the utilisation of SCOOT UTC signal system to give priority to approaching buses.

2.44 The below inflation increase in bus fares has not been included within the revised modelling. A key concern with the fares element is how this would be financed, it is likely to require a significant level of Local Authority subsidy especially in the light of bus operational costs rising at or above inflation. This raises significant concerns in terms of the ongoing viability and sustainability of this particular measure. It is therefore recommended that the below inflation increase in bus fares measure is removed from the strategy as there is a high risk of it being undeliverable.

2.45 An outline public transport strategy has been developed to support the delivery of the Local Plan. The outline strategy includes an action plan of measures and interventions to support the delivery of the Local Plan including:

- Re-routing bus services – to make best use of the current bus network with modifications where appropriate;

- New bus services to improve accessibility of development sites;
- Higher frequency bus services – to support the bus as a viable alternative;
- Bus priority – to improve reliability and journey times on key routes and provide more direct routes at the growth areas;
- Improved interchange between bus and other modes;
- Improved passenger information; and
- Park and ride.

2.46 There are two bus stations currently within Hereford city centre, the County bus station off Commercial Street which is a short walk from the rail station and the City bus station located more centrally within the city. The introduction of a formal transport hub at the rail station would significantly improve the interchange between rail and bus and have mutually reinforcing benefits for both modes.

2.47 An additional transport hub within the development proposed for the Three Elms would make public transport an attractive mode for both employment and residential development locating here. The local plan indicates that the development site at Three Elms would be masterplanned to form a series of interrelated neighbourhoods, it is important that the new transport hub is accessible by all modes (with the exception of rail) in order to maximise the effectiveness of the measure.

2.48 The original strategy includes an increase in bus frequency on existing routes. In the June 2013 modelling this has been represented as routes with a frequency of between 1 to 3 buses per hour increasing to 4 buses per hour and routes which currently have 4 buses per hour increasing to 5 buses per hour. The implication therefore in the model is to reduce the wait time for public transport, making it more attractive. The reality of an increased bus frequency is likely to be more complex than this, with the rationale focusing on making best use of the existing services. The modelled scenario (June 2013) is likely to overestimate the likely improvements to the lower frequency services, it therefore provides the best case for these services. JMP have also highlighted within the Herefordshire LDF Risk Assessment that the network included within the current strategy would result in a cash shortfall in 2032 of circa £450,000 p.a. It is therefore recommended that a more targeted approach to bus frequency enhancement is required. This should be based on the origin and destination information now available to provide links where there is the strong potential for bus use.

2.49 The measures within the original transport strategy broadly align with those in the outline public transport action plan, but the outline action plan goes further and takes a more sophisticated approach to the network in terms of frequency. The local plan includes a number of urban expansion areas, the result is that Hereford will look quite different by the end of the plan period. The public transport network must evolve to reflect this if it is to maintain existing users and attract new ones. The re-routing of bus services and introduction of new services is vital so that the network reflects the changing demand and new journey destination. A key element of this is service provision to the Hereford Enterprise Zone which is a key area of employment growth over the plan period and therefore provides one of the greatest potential areas for bus patronage growth.

2.50 A review of existing provision indicates that most areas to the south of the river are covered by a service that operates at least every 30 minutes, with the exception of the Rotherwas area (a key

focus of future development). North of the river frequencies along King's Acre and Whitecross Road are at least every 30 minutes as are services from Westfields, to the east Hampton Park area and College Green similarly have services at least every 30 minutes but the rest of the city have less frequent services. A targeted review of frequencies is recommended in the outline public transport strategy, creating high frequency services on key routes.

2.51 It is too simplistic however to simply consider frequency, it is important that the frequency is viewed in combination with journey time, operating hours and service capacity. In terms of frequency and journey time, due to the size of Hereford there is a real issue with making low frequency routes attractive, especially where the journey is a realistic option for walking and cycling.

2.52 Any significant change in frequency must consider the capacity of the public transport infrastructure, particularly city centre stops. Significant increases in frequency may trigger the need for a redesign or extension of public transport interchanges and stops. Alternatively measures to reduce boarding times such as smart ticketing or to enable a higher turnover of buses per stop need to be considered.

2.53 In terms of public transport infrastructure an outline scheme is being developed to deliver an increase in public transport interchange facilities along Newstreet and Blueschool Street as part of the City Centre Transport Package. This scheme has been included in the recently submitted Marches Strategic Economic Plan.

2.54 The Destination Hereford initiative has a wealth of public transport information supporting it, although consultation with Hereford Council has indicated that there is a need to address information and transparency of the process and usability of public transport for first time and infrequent users. This is particularly important if the strategy is to be effective in attracting people to use public transport instead of private cars.

2.55 There are a number of risks to the implementation of this strategy element which are summarised below:

- Delivery of a significant amount of this strategy element is dependent upon public transport operators.
- Some of the elements being considered may lead to significant implications in terms of subsidy of public transport services and this should be given careful consideration in terms of any changes to the bus network in terms of routes, frequency and hours of operation.
- As highlighted previously significant changes to the frequency or number of services will need to be considered in the context of the capacity of the public transport infrastructure to accommodate these changes.

Recommendations

- **The level and location of future development highlights the need for a recast of the public transport network, this should seek to maximise the potential of new markets created in the urban extensions.**
- **It is acknowledged that the realistic market for increased use of public transport is relatively limited given the size of Hereford and the likely journey distances which indicate a greater potential for walking and cycling journeys.**
- **One of the areas of greatest potential patronage increase is linked to the large amount**

of employment proposed within the Hereford Enterprise Zone.

- **Policies around the level of public transport fares should be developed with the level of likely subsidy required in mind and should consider the ongoing financial sustainability of such strategy elements. A number of these measures are also broadly outside the control of the Council, therefore the partnership work with bus operators is critical to the effectiveness and success of these measures. It is therefore recommended that the below inflation increase in bus fares measure is removed from the strategy as there is a high risk of it being undeliverable.**
- **Whilst a number of improvements to public transport interchanges are included within the strategy, significant changes to the frequency or number of services will need to be considered in the context of the capacity of the public transport infrastructure to accommodate these changes.**

Bus Park and Ride combined with Bus Lanes on Park and Ride routes

2.56 Park and ride and its associated priority measures are part of the wider public transport strategy. However, as the park and ride proposals for Hereford are extensive they are therefore considered as a separate element of the strategy for the purpose of this review.

2.57 Three park and ride sites have been considered in the current Transport Strategy for implementation by 2032. These sites are:

- A49 North at Holmer West (350 spaces);
- A438 North West at Three Elms (150 spaces); and
- A49 South at Lower Bullingham (350 spaces).

2.58 The original strategy proposes that all three sites are accompanied by bus lanes on the key arterial routes into Hereford.

2.59 It is conventional to locate sites on radial routes on the edge of the urban area to intercept inbound motorists. In a survey of bus based park and ride schemes in the UK the average distance from the city for park and ride site was two to three miles[5]. All of the park and ride sites proposed for introduction within Hereford are within the two mile boundary, consideration should be given to the effect on likely interception rates given the proportionate length of distance to be travelled on the park and ride service.

2.60 Parking controls in the city centre are an integral part of the park and ride strategy. The effectiveness of park and ride will be adversely affected without tight controls on on-street parking within the city centre. Park and rides with the highest utilisation tend to offer a huge discount in cost of parking compared with town centre parking (18 - 19% of the town centre rate at peak times). These issues need to be considered in terms of both the long term parking strategy for Hereford and the pricing structure for the park and ride sites.

2.61 Frequency and reliability of service are critical factors with a 10 minutes frequency recommended by good practice guidance alongside a competitive journey time when compared with cars. The modelling currently indicates a 15 minute service frequency for the park and ride services with a

[5] TAS: Park and Ride Great Britain (2007)

dedicated service and competitive journey times owing to the significant provision of bus priority currently indicated within the strategy. The specification does not include linking the park and ride services with existing bus services. This would appear to be a potential avenue for increasing patronage and spreading operating costs.

2.62 There are concerns regarding the ongoing financial revenue implications of the proposed park and ride operations, the service is estimated to incur a loss in the region of £0.6m per year. The service is therefore likely to require support from the Council. More information on this issue is presented in the JMP Report "Herefordshire Core Strategy Park and Ride Review".

2.63 Utilising the model origin destination matrices the overall market (i.e. external trips from outside of Hereford to the central area) is relatively limited with approximately 25% of trips to the central area being from outside Hereford, another 25% of trips to the central area are from within the central area and the remaining 50% are from in between the central area and outside Hereford. A proportion of these trips may be attracted to the park and ride as walk up or cycle up trips.

2.64 Given these concerns it is recommended that the park and ride strategy shifts from a focus on three large strategic sites with a dedicated bus service towards a 'micro site' approach made up of a number of smaller sites on key radials which may be developed from new or existing car park facilities utilising existing bus services, with key facilities provided for park and share, park and cycle and park and walk. This gives the opportunity in conjunction with a more flexible tone to the current policy to integrate the park and ride bus operations in with the 'normal' bus service network. This approach would reduce the revenue exposure based on the patronage for three sites predicted by the initial transport model runs in June 2013 and would assist in tackling the bus network revenue shortfall noted above.

2.65 We recommend that a site identification process is undertaken to identify sites of up to 100 spaces that would interact with the future, end of Core Strategy, bus network and be located near the urban fringe.

2.66 Turning to the current level of bus priority included within the strategy, such extensive bus priority lanes are undeliverable, due to a variety of reasons not least physical limitations with the road network. This level of bus priority was included within the strategic model exercise of June 2013 and was a primary cause of the increase in journey time on the A49 even in the with relief road scenario. All the JMP analysis has indicated that even with the relief road by 2032 the level of vehicles on the A49 is likely to be at the same level as within the base. It is therefore not feasible to remove significant amounts of capacity along the A49 and other key radials without triggering significant increases in journey times.

2.67 The level and type of bus priority requires more detailed assessment giving consideration to the desirable level of priority versus the feasibility of what is deliverable on the ground.

Recommendations

- **There are concerns regarding the ongoing financial revenue implications of three strategic park and ride sites in Hereford. The service is estimated to run at a loss in the region of £0.6m p.a. and would therefore require significant subsidy from the Local Authority or alternative sources of revenue.**
- **The relative proportion of trips in scope for park and ride is relatively limited in terms of trips made from outside of Hereford to the central area.**
- **The park and ride strategy should therefore move away from focusing on three large strategic sites with a dedicated bus service towards a micro site approach made up of a number of smaller sites on key radials which may be developed from new or existing car park facilities utilising existing bus services, with key facilities provided for park and share, park and cycle and park and walk. This gives the opportunity to integrate the park and ride bus operations in with the 'normal' bus service network. This approach would reduce the revenue exposure based on the patronage for three sites predicted by the initial transport model runs in June 2013.**
- **JMP recommend that headline site locating process is undertaken to identify sites of up to 100 spaces that would interact with the 2032 bus network and be located near the urban fringe.**
- **The level of bus priority within the strategy requires refinement. The current level is undeliverable in terms of physical limitations on the network. Also a balance needs to be struck between the amounts of road space allocated for car and public transport. The current forecast for private car trips compared with the potential market for park and ride indicates that the current level of bus priority needs to be refined to reflect the pressures on the network whilst also providing an incentive to use sustainable modes. The reallocation of road space within the original transport strategy in Hereford to bus priority is one of the principle factors in increasing congestion and delay within Hereford in the initial modelling from June 2013. It is therefore recommended that the level of bus priority is significantly reduced from the level indicated in the original transport strategy.**

Highway Capacity

2.68 A significant increase in highway capacity is included within the strategy.

2.69 One element is the Edgar Street Grid Link Road which is scheduled to open 2016. This will be a single carriageway link with a 30mph speed limit. This route will provide a link between A49 Edgar Street and A465 Commercial Street, a key outcome of this new route will be alleviating the traffic flow on A438 Newmarket St / Blueschool St.

2.70 In addition, the Western Relief Road will provide additional highway capacity, with the overall aim of providing an additional river crossing for Hereford and therefore alleviating pressure on the existing A49 through the centre of Hereford. The level of strategic traffic (with both an origin and destination outside of Hereford) is fairly minimal, however with the urban extensions proposed within the local plan to the North, South and West of Hereford it is important to provide alternative route choice for those crossing the city. However consideration should be given to the configuration

of the junctions on the Western Relief Road to make the Western Relief Road attractive to those accessing these strategic development sites.

2.71 It is envisaged that the implementation of the relief road will provide the capacity within central links to reallocated road space to more sustainable modes. The strategy is therefore aiming to strike a balance between a targeted increase in capacity to facilitate development and alleviate pinch points combined with a subsequent decrease in highway capacity in central areas and key radials to facilitate an increased use of sustainable modes. As highlighted in the park and ride review the level of reallocation of road space is ambitious and needs to be considered holistically across the networks. The outcomes from the modelling indicate that the level of reallocated road space in the original transport strategy is leading to an unacceptable level of delay to journeys on the A49 in Hereford in the future year.

Recommendations

- **As highlighted in the park and ride recommendations the level of reallocation of road space to sustainable modes is ambitious and needs to be considered holistically across the networks.**
- **With the urban extensions proposed within the local plan to the North, South and West of Hereford it is important that the Western Relief Road provides alternative route choice for those crossing the city. The configuration and design of the route and junctions should consider this.**
- **Consideration should be given in the development and design of the Western Relief Road of the Highways Agency's role with the A49 and the potential role for the Highways Agency with the new relief road, this includes consideration of design standards and configuration of the route and its junctions.**
- **The current outline plans for the Western Relief Road indicate it could be a nationally significant infrastructure project and attract the requirement to seek a Development Consent Order. This will affect process and funding options.**

Junction capacity

2.72 A number of junction improvements are included within the strategy, there are three junction improvements programmed for the Strategic Road Network in Hereford at the following locations:

- A49/A465 Asda;
- A49/A438 Newmarket Street; and
- A49/A4103 Roman Road.

2.73 These junctions improvements have been awarded funding through the Highways Agency pinch point programme and will be delivered by 2015.

2.74 In addition there are a number of improvements which are identified but have not yet got an identified funding source, including:

- A4465 Belmont Rd widening - 2 lanes each way south of A49 / Asda gyratory and green time reallocation;

- A4103 Roman Rd pelican crossing west of A49 Starting Gate re location;
- Holme Lacy Rd green time reallocation;
- Barton Rd reduced green time and widening;
- A438 Eign St extension of 2-lane approach Eastbound at A49 Victoria St and green time reallocation;
- Grimmer Rd reduced green time; and
- A49 Newtown Rd / Edgar St widening.

2.75 These improvements by their nature will address pinch points on the network. However care should be taken to implement the junction capacity improvement as a package in order to deliver the maximum benefit from the improvements. Improvements to junctions bring benefits for all users so will be effective in delivering the policy outcomes. Consideration should be given in detailed design where possible to maximising benefits for sustainable modes.

2.76 A risk within this strategy element is therefore that the sequential approach to improvement may lead to a transfer of the pinch point or move delay from one part of the network to another.

Recommendations

- **Junction improvements should be undertaken with a holistic framework with consideration to the sequential approach. This approach should avoid the transfer of pinch points from one part of the network to another.**
- **Consideration should be given in detailed design where possible to maximising benefits for sustainable modes.**

3 Modelling outputs

3.1 The Council wishes to refine its transport strategy to better reflect its key transport outcomes[6] being to:

- Reduce congestion and delay and provide access to development;
- Reduce emissions of CO_2 through behaviour change and provide facilities for sustainable transport including public transport; and
- Improve health outcomes by reducing accidents and noise and by encouraging physical activity.

3.2 Initial transport modelling undertaken by AMEY indicated that the outcomes of the transport strategy were not aligned with the Council's desired policy outcomes. This work identified increases in journey times on the A49 through the centre of Hereford and an increase in CO_2 emissions at the end of the Core Strategy period which suggested that the wider Core Strategy policy objectives of economic development and environmental improvement would be challenging to achieve.

3.3 JMP have made a number of refinements to the model since the initial modelling exercise of June 2013. These refinements include but are not limited to the following points, further details of the changes can be found in 'Hereford Transport Strategy Phasing Study Modelling Issues Report'' (February 2014):

- Revision to the growth assumptions, changing the growth assumptions to the central "most likely" case.
- Incorporated a factor into the forecasting to reflect forecast changes in car availability.
- Changed how committed schemes, including the HA pinch point schemes, are coded in base network (e.g. A49 / Edgar Street, Asda roundabout) to better reflect the schemes delivered / to be delivered.
- Included changes to represent new DfT forecasts showing reductions in car occupancy.

3.4 This chapter provides an analysis of the conditions without transport strategy referred to as the Do Minimum[7], alongside a refined version of the original transport strategy taking on board key recommendations made within Chapter two of this report. A full list of measures modelled within the 'With Transport Strategy' scenario can be found in Appendix A of this report.

3.5 For context Table 3.1 illustrates the level of change in trip making for the two peak periods represented in the demand model. The data is presented by time period, forecast year and journey purpose:

- HBW – Home based Work,
- HBE – Home based Education,
- HBO – Home based Others,
- EMB – Employers Business,
- NHB – Non Home based,

[6] Taken from LDF Core Strategy Modelling, Non Technical Summary, June 2013.

[7] Further analysis of the Do Minimum is provided within the Hereford Transport Strategy Phasing Study. This report concludes that intervention is required by 2027 in order to accommodate the growth within the Local Plan – Core Strategy.

- LGV – Light Goods Vehicles and
- OGV – Other Goods Vehicles.

3.6 Person trips represent the sum of all non goods vehicle movements.

Table 3.1 Forecast Change in Travel

Time Period / Year	Journey Purpose							
	HBW	HBE	HBO	EMB	NHB	LGV	OGV	PERSON
Morning Peak								
2012	12630	2298	8705	3148	4111	2836	1467	30892
2032	14651	2868	11667	4026	5660	4711	1943	38872
Evening Peak								
2012	12402	1251	9777	2715	4500	2263	713	30646
2032	16605	1722	12827	3454	5893	3759	943	40501

3.7 The above numbers are based on an interpolated draft Core Strategy growth rate to develop from today to full build out of the Core Strategy by 2032. The growth is applied pro-rata across all sites for this assessment.

3.8 The model outputs below (Table 3.2) indicate that compared with base the combined direction journey time on the A49 by 2032 increases by 37% in the AM and 44% in the PM for the Do Minimum scenario. The With Transport Strategy scenario produces journey times on the A49 which are comparable with the base year.

3.9 The journey time on the Western Relief Road (WRR) itself in 2032 With Transport Strategy scenario is 11 minutes faster in the AM and 13 minutes faster in the PM peak than journey times on the A49 with the strategy measures in place.

Table 3.2 Combined direction journey time (minutes)

Minutes	Base		2032 Do Minimum		2032 With Strategy	
	AM	PM	AM	PM	AM	PM
A49	28	36	39	51	31	35
WRR					20	22

3.10 The traffic flows crossing the River Wye are illustrated in the table below:

Table 3.3 Two Way Traffic Flow Crossing the River Wye

	Base		2032 Do Minimum		2032 With Strategy	
	Vehicles	% change from base	Vehicles	% change from base	Vehicles	% change from base
AM	4072	-	4530	11%	5809	43%
PM	4335	-	4510	4%	6271	45%

3.11 This table illustrates that traffic crossing the River Wye increases by 11% by 2032 with the Do Minimum scenario in the AM peak, however the With Transport Strategy scenario highlights an increase of 43% in the AM peak. The relatively limited increase in the Do Minimum scenario reflects the fact that this river crossing is operating at or close to capacity within the model, throughout the plan period. The level of vehicles that wish to use the river crossing but cannot due to capacity restrictions is represented within SATURN via Queued Flow. Thus the increase in the With Transport Strategy scenario reflects the release of queued traffic that is unable to cross the river in the Do Minimum scenario.

3.12 Additional analysis is provided below in Table 3.4 and 3.5 illustrating the modelled vehicle km and vehicle travel time in minutes. It can be seen that there is a significant increase in vehicle km and minutes between the Base and the Do Minimum. The With Transport Strategy scenario demonstrates a reduction in vehicle km from the Do Minimum, this is a result of the increase uptake of sustainable modes. The reduction in vehicle minutes between the Do Minimum and With Transport Strategy Scenario is greater than the reduction in vehicle km, this is a reflection not only of the switch to sustainable modes but also reduced congestion on the A49 and the journey time saving for those travelling on the relief road and links back to the reduction in queued flow within the model.

Table 3.4 Modelled vehicle KMs to and from Hereford Central area

Vehicle KM	AM	Inter Peak	PM
Base	5439	4942	5514
2032 Do Minimum	8704	9471	10923
2032 Transport Strategy	7784	8099	9423

Table 3.5 Modelled vehicle minutes to and from Hereford Central area

Vehicle Minutes	AM	Inter Peak	PM
Base	20145	14464	21427
2032 Do Minimum	38399	42748	57906
2032 Transport Strategy	28880	32509	41062

3.13 The table below provides a comparison of CO_2 emissions using outputs from the SATURN highways assignment model. The analysis indicates a 52% increase in the AM and 58% increase in the PM in CO_2 emissions in the 2032 Do Minimum scenario. This increase is 51% in the AM and 54% in the PM in the 2032 With Transport Strategy scenario. The increase in CO_2 reflects the level of development proposed within Hereford, this is illustrated in the increase in person trips in Table 3.1 of this chapter. The reduction in the Transport Strategy scenario compared with the Do Minimum reflects the increased take up of sustainable modes but also incorporates additional mileage for those transferring from the A49 to the relief road. It is important to note that the analysis of CO_2 emissions assumes no reduction in emissions per vehicle.

Table 3.6: CO_2 emissions (SATURN output, Kg)

Peak Hour	2012 Base	2032 Do minimum	2032 Transport Strategy
AM	6488	9854	9798
PM	6270	9901	9629

3.14 Table 3.7 below illustrates the level of emissions at the river crossings within the study area. Measured levels increase in the Do Minimum for CO_2, CO and NOx at Greyfriars Bridge, while these figures fall below the 2012 base in the With Transport Strategy scenario.

Table 3.7: Emissions at bridge crossings (SATURN output, Kg)

		AM		PM	
		Greyfriars	WRR	Greyfriars	WRR
2012 Base	CO2	161.18	-	154.55	-
	CO	17.86	-	16.65	-
	NOx	4.06	-	3.95	-
2032 Do Minimum	CO2	178.88	-	156.48	-
	CO	19.76	-	16.72	-
	NOx	4.56	-	4.03	-
2032 Transport Strategy	CO2	149.82	110.97	134.99	133.54
	CO	16.3	6.52	14.16	8.48
	NOx	3.9	2.20	3.61	2.85

3.15 Analysis has been undertaken on the mode split within the model, Table 3.8 illustrates the mode split for movements to and from Hereford. This illustrates that car mode split reduces by 5% points during the AM and 7% points during the PM in the With Transport Strategy scenario compared with the Base. The With Transport Strategy scenario conversely experiences an increase in the proportion of people using sustainable modes including walking, cycling and public transport.

Table 3.8 Mode split for movements to and from Hereford

Mode Type	2012 Base		2032 Do Minimum		2032 Transport Strategy	
	AM	PM	AM	PM	AM	PM
Car (Person Trips)	20775	21479	25713	27533	24522	26179
	76%	80%	74%	77%	71%	73%
Public Transport	1943	1615	2427	2262	3494	3304
	7%	6%	7%	6%	10%	9%
Walk	4186	3377	5706	5078	5582	4943
	15%	13%	16%	14%	16%	14%
Cycle	496	454	807	793	1151	1311
	2%	2%	2%	2%	3%	4%

Summary

3.16 The Council wishes to refine its transport strategy to better reflect its key transport outcomes[8] to:

- Reduce congestion and delay and provide access to development;

[8] Taken from LDF Core Strategy Modelling, Non Technical Summary, June 2013

- Reduce emissions of carbon dioxide through behaviour change and provide facilities for sustainable transport including public transport; and
- Improve health outcomes by reducing accidents and noise and by encouraging physical activity.

3.17 This brief summary of modelling outputs indicates that the With Transport Strategy scenario delivers journey times broadly in line with the base year. There is a slight increase in journey times on the A49, however given the level of development taking place within Hereford a nil detriment scenario is unlikely to be possible.

3.18 When the 2032 Do Minimum and the 2032 With Transport Strategy scenario are compared, the model outputs indicate a good fit with the key transport outcomes, this is summarised below:

- There is a significant reduction in journey times on A49 in the With Transport Strategy scenario than in the Do Minimum, a journey time reduction of 26% in the AM and 46% in the PM. While journey times on the relief road itself provide an attractive alternative to the A49 with the journey time on the relief road being 11 minutes faster in the AM and 13 minutes faster in the PM peak than journey times on the A49 with the relief road in place.
- A comparison of CO_2 emissions illustrates a 1% point reduction in CO_2 emissions in the AM and a 4% point reduction in the PM for the With Transport Strategy scenario compared with the Do Minimum in 2032.
- Car mode split reduces by 5% points during the AM and 7% points during the PM with the Transport Strategy compared with the Base. The With Transport Strategy scenario conversely experiences an increase in the proportion of people using sustainable modes including walking, cycling and public transport.

3.19 The model outputs therefore indicate the introduction of the Transport Strategy sets the transport outcomes moving in the right direction when comparing the 2032 Do Minimum.

3.20 A critical caveat here is that this analysis is at a strategic level and there are likely to be localised issues which require further analysis and refinement.

4 Conclusions

4.1 At this time the Hereford Transport Strategy is at an outline stage. Given the level of detail available this review has indicated that the broad coverage of the majority of the strategy elements is appropriate. However, further consideration is required in terms of the balance between the provision of behaviour change and physical infrastructure elements and in terms of how a number of the strategy elements interact. For example, refinements to junctions to maximise highway capacity alongside the provision of a safe and attractive environment for walkers and cyclists. Following a number of optioneering meetings with Herefordshire Council Officers and their contractors the following recommendations are made for updating the transport strategy:

- Bus priority measures should be removed from the strategy where they are undeliverable and where their implementation would lead to unacceptable increases in journey times on key routes.
- A Micro Park and Ride strategy should be pursued rather than the implementation of three strategic sites with dedicated services.
- Further work is required to establish the optimum parking charges for the different parking zones to be created in the longer term, parking charges should also take into consideration the relative cost of travel by public transport. This is key if the strategy is to be successful in encouraging people to use public transport as an alternative to private car.
- A significant level of ongoing behaviour change activity is required.
- Cycling initiatives need to focus on removal of perceived and actual barriers to cycling. Analysis of the demand matrix for the model has indicated a number of areas within Hereford with potential for transferring car trips to cycling or walking. Development of a comprehensive cycling strategy is needed to achieve the full potential of cycling within Hereford.
- The level and location of future development highlights the need for a recast of the public transport network.
- A key element of public transport strategy is the provision to the Enterprise Zone which is a key area of employment growth over the plan period and therefore provides one of the greatest areas potential patronage growth.
- The Council should introduce measures to remove parking from the historic core and remove the impact of parking within close proximity to the historic city core.[9]

4.2 The overall balance of how the individual transport strategy elements interact to produce the desired outcomes needs further consideration. For example, the major transport investment in the Western Relief Road is only likely to be delivered in conjunction with other strategy elements in support.

4.3 The review has also identified that there are significant practical issues and risks in terms of the deliverability and sustainability of a number of the strategy elements. These issues and risks on their own do not preclude these elements from the strategy. However it is appropriate at this stage to assess these against the outcomes and benefits these elements deliver.

[9] Herefordshire Council are currently reviewing the existing parking arrangements and on street charges in the historic core.

4.4 The summary of modelling outputs provided in Chapter three indicates that the 2032 With Transport Strategy scenario delivers journey times on the A49 broadly in line with the base year. There is a slight increase in journey times on the A49 by 2032. However, given the level of development taking place within Hereford a nil detriment scenario is unlikely to be possible. When the 2032 Do Minimum and 2032 With Transport Strategy scenario are compared the model outputs indicate a good fit with the outcomes of the transport strategy as:

- There is significant reduction in journey times on A49 with the Transport Strategy than the Do Minimum. While journey times on the relief road itself provide an attractive alternative to the A49.
- A comparison of CO_2 emissions indicates a minor reduction in CO_2 emissions in both the AM and PM peak in the with Transport Strategy scenario compared with the Do Minimum in 2032.
- Car mode split reduces by 5% points during the AM and 7% points during the PM with the Transport Strategy compared with the base. The With Transport Strategy scenario conversely experiences an increase in the proportion of people using sustainable modes including walking, cycling and public transport.

4.5 The model outputs therefore indicate the introduction of the Transport Strategy sets the transport outcomes moving in the right direction when comparing the 2032 Do Minimum scenario.

Appendix A - Modelled strategy elements

Hereford Transport Strategy Modelling Exercise

Behaviour Change

Scheme	Description
City-wide travel plans	Workplace, School and Personalised Travel Planning initiatives Travel Plans & TravelFund Grant
Support staff	City-wide travel plan co-ordination Personal, business and schools travel plan officers for Hereford Designated staff to drive travel plan adherence
Car clubs	Promotion and expansion of existing car clubs
Car share - Two share licence	Licence of car share matching database system and marketing activity
Bikeability	Continued programme of free adult and parent and child cycle training to build confidence and cycle skills.

Walking and Cycling

Scheme	Description
Rotherwas- Holme Lacy feasibility report (off street Rotherwas IE)	Feasibility of new off-street link between Greenway / Goodwin Way and Straight Mile, east of Gatehouse La extending to Holme Lacy
Grafton Depot (A49 Grafton Depot-Bullingham Lane) (P&C)	New off-street link between A49 and Bullingham La, parallel with railway
Roman Rd- Starting Gate Roundabout (off street A4103 W - A49 S)	Off-road shared use path between A49 and Old School Road
Broad Street cycle facilities and bus shelter (cannot be modelled)	Improvements to cycle parking and installation of a bus shelter
Commercial Road cycle lane & ASLs (on street Barrs Ct Rd - Blueschool St 4 signal junctions)	ASLs refurbished at multiple locations around the city
Riverside School-GWW to Belmont Avenue (off street)	New off-street links between GWW and Belmont Av / Hunderton Av
A49 Crossings-Barton Road (on street A49 - Barton Yd)	Coordinated with Highways Agency – ASL and carriageway repairs

City Core including High Town, St Owen's St, Offa St (on street plus Commercial St ped area)	20 mph zone and contraflow on St Owen's Street and Off a Street path,
Tillington Road South/Canon Pyon Rd	Signs and road markings to raise profile of cycle link
HATS - D5 Aylestone Hill N (on street Victoria Pk - Venns La) (P&C)	Mandatory uphill cycle lane
Destination Hereford - A438 Whitecross Rd / Kings Acre Rd	Kings Acre – Plough Lane
Destination Hereford - College Rd railway bridge	Road markings for cyclists
Destination Hereford - Old School La railway bridge	Road markings for cyclists
Promotional initiatives	Promotional programme to encourage walking Promotional programme to encourage cycling Programme of led short rides to build confidence and build connections Business partnership working e.g. supermarkets and cycle awareness for their freight partners and drivers Hereford cycle proofing project
Support Staff	Bikeit Officer funding Pump priming for cycle ambassadors
Cycle parking	Cycle parking in Hereford and associated security measures
Cycle Measures associated with Enterprise Zone	Cycle parking at Enterprise zone Cycle ways on Holme Lacy Road to/from Enterprise Zone Cycle way on Walnut Tree Avenue to from Enterprise Zone. This road is already traffic calmed – main issues are junction with A465 Belmont Road / GWW and linking in with Holme Lacy Road

Car Parking Regulation

Scheme	Description
Public off-street car park capacity	Close Merton Meadow (800 long stay) by 2017 and displace to existing car park zones: New 50 long stay spaces at St Martins zone: 60; New 200 long stay spaces at Rockfield Station App zone: 31; New 50 long stay spaces at Plough La zone: 97 these spaces at plough lane already exist although underused.
Parking charges	Double the parking charge in real terms over the plan period

Traffic Calming

Scheme	Description

Newmarket St / Blueschool St traffic restraint	20 mph speed restriction
A49 / A438 Inner Ring Rd AQMA 20mph zone	20mph speed limit

Public Transport Service Improvements

Scheme	Description
Public Transport Hub at rail station	N/E side of ESGLR at Station Approach.
Increased bus service frequency on existing routes	A modest increase in bus service frequency will be modelled. Which will increase the frequency of services within Hereford on key corridors. Generally urban buses have been upgraded to 4 buses per hour where base year coding is 3 buses per hour, i.e. the network has been made more consistent. A ongoing programme of route and service development is recommended by the Study to develop a detailed end of Core Strategy bus network but is outside the scope of this modelling exercise.
Bus fare increase	No real terms change in public transport fares (i.e. inflation increase only)
New subsidised bus route City - Rotherwas - Lower Bullingham	Assume 4 buses per hour each way from A49s/b to Holme Lacy Rd e/b to Straight Mile to Netherwood Rd to new bus link to Watery La to Lower Bulingham La to Hoarwithy Rd to City; Both directions
Multi operator ticketing	Reduced the interchange penalty between bus companies / modes

Traffic signals/Urban Traffic Control

Scheme	Description
A49 / Bullingham La	Move pedestrian crossing from A49N arm to A49S arm; ban left turn from Bullingham La; run pedestrian phase with Bullingham Lane right turn. Need to ensure this maintains a direct shared use link between Bullingham Lane and the Academy (via Marlbrook Road) and GWW via Mayberry Avenue. Transfer to south side will require upgrade of shared use path on south side of Bullingham Lane
A49 / Holme Lacy Rd	Two right turn lanes from Holme Lacy Rd; 1 - left/ahead/right; 1 – right Ensure cycle continuity is included between Holme Lacy Road and Walnut Tree Avenue. Current phasing arrangements allow right turners from Kings street and Barton road to run together.
A465 / Walnut Tree Av	Change from priority to signaised junction with inclusion in SCOOT system. Ensure cycle continuity is included between Holme Lacy Road and Walnut Tree Avenue (see above).

Highway Capacity

Scheme	Description

Hereford Western Relief Road (A49S - A4103E)	Inner alignment comprising south western, western and northern segments, between A49 / B4399 at southern end and A465 / A4103 at north eastern end; single 2-lane all-purpose carriageway 60mph (100kph) design standard; mix of roundabout junctions at: A49(S); A465(SW); A4103(W); A49(N); A465(NE); and signal junctions at: A438(W) and cycle infrastructure

Highways and signals improvements

Scheme	Description
A4103 Roman Rd pelican crossing west of A49 Starting Gate R/A	120 sec cycle; 1 stage; pedestrian demand alternate cycles; code as 240 sec cycle with 19 sec intergreen & cycle infrastructure related to Holmer West development
Holme Lacy Rd reduced green time	2x right turn lanes W/B at A49 Ross Rd Ensure cycle continuity is included between Holme Lacy Road and Walnut Tree Avenue
Barton Rd reduced green time and widening	3 lanes (2x right turn) E/B at A49 Victoria Rd Widening to allow feeder lane into Cycle ASL
A438 Eign St extension of 2-lane approach E/B at A49 Victoria St	Extend EB 2 lanes westwards back to Grimmer Rd
Grimmer Rd	Reduced green time on Grimmer Rd

Highway Access

Scheme	Description
Holmer West highway access	Holmer West highway access at A49 / Western Relief Road, North East of site This would be an extra arm on the Western Relief Road junction
Three Elms highway access	Three Elms highway access at A4103 / Western Relief Road North West of site maintaining Roman Road cycle route continuity. This would be an extra arm on the Western Relief Road junction
Lower Bullingham highway access	Lower Bullingham highway access at B4399, between Green Crize bridge and Watery Lane junction, South of site.

Walk and Cycle Access

Scheme	Description
New pedestrian and cyclist access at Holmer West development	Gate on North side of Roman Road between A49 and Bobblestock Access to A49 near church and crossing.
New pedestrian and cyclist access at Three Elms development	Gate on West side of Three Elms Road, between Huntington Lane and Bonington Drive. North access to Roman Road cycle infrastructure and South access to Kings Acre Road.
New pedestrian and cyclist access at Lower Bullingham development	Gate on East side of Hoarwithy Road, between The Pastures and Lower Bullingham Lane North East access to Rotherwas Enterprise Zone and Watery Lane

Walk / cycle access at HEZ	Improved cycle and Public transport access on Holme Lacy Road Access from Lower Bullingham development.

Bus Access

Scheme	Description
Divert existing bus route to serve Holmer West	Re-route No. 77 to/from Roman Road at signalised bus-only gate on North side, between A49 and Bobblestock. Increase No. 77 frequency to 4bph
Divert existing bus route to serve Three Elms	Re-route No. 71 to/from Kings Acre Road at signalised bus-only gate on West side of Three Elms Road, between Huntington Lane and Bonington Drive. Increase No. 71 frequency to 4bph. Re-route No. 72 to/from Grandstand Road at signalised bus-only gate on West side of Three Elms Road, between Huntington Lana and Bonington Drive. Increase No. 72 frequency to 4bph
Divert existing bus route to serve Lower Bullingham and Rotherwas	Re-route No. 78 to/from Hoarwithy Road at signalised bus-only gate on East side of Hoarwithy Road, between The Pastures and Lower Bullingham Lane. Increase No. 78 frequency to 4bph
Bus access at HEZ	Re-route No. 78 as above

Bus Park and Ride

Scheme	Description
A49 North P&R at Holmer West	Park and ride site included, no additional bus services coded into the model.
A438 North West P&R at Three Elms	Park and ride site included, no additional bus services coded into the model.
A49 South P&R at Lower Bullingham	Park and ride site included, no additional bus services coded into the model