City of York

LDF

Local Development Framework

ANNEX F

Transport implications of LDF growth assumptions and potential for mitigation

June 2011

Purpose

This paper presents the analysis of the implications for transport arising from the proposed growth assumptions within Local Development Framework (LDF) Core Strategy. This analysis has been undertaken to test The LDF core strategy, in transport terms, to:

- Ascertain the increases in traffic associated with the growth assumptions
- Establish whether the increases in traffic can be accommodated with acceptable levels of impact, at a city-wide level and spatially, without the need for investment in transport infrastructure and services.
- Identify the essential infrastructure and other transport measures that are required to mitigate the impacts of the growth assumptions to a more acceptable level, either city-wide or spatially, if the traffic increases can not otherwise be accommodated.
- Determine what growth assumptions and spatial distribution on these new growth assumptions can taken forward to result in traffic increases being more acceptable, if otherwise neither acceptable nor able to be adequately mitigated.

This paper follows-on from the LDF Preferred Options Topic Paper 3 – Transport prepared by Halrow in June 2009, which considered the transport implications associated with the potential areas of search detailed in the spatial strategy methodology, presented in Topic Paper 1. It also updates the report submitted to the Local Development Framework Working Group on 1 November 2010.

This paper gives an overview of the methodology used to undertake the analysis and the indicative results obtained. It also presents these results in terms of the likely impacts on motorists and wider considerations such as local air quality and the quality of the public spaces and attractiveness of the city.

Background

The need to assess the impacts

The Local Development Framework Core Strategy is intended to establish the principles and policy governing the amount and location of development in York over the next 20 years (to 2031). This includes establishing the growth in employment to ensure York's sustained economic prosperity and the number of households to be built in future years to provide homes for the anticipated population increase in the city, due to meeting the rising demand for jobs and demographic change.

Future growth in employment and housing in York will generate a substantial increase in the number of vehicular trips, placing additional demands on an already congested transport network. Because of this, and the limited space available for providing

additional road capacity, options that enable sustainable access to developments should be promoted.

Strategic transport modelling of various locations for areas of search for development that could not be accommodated within the existing city centre was undertaken by Halcrow in 2009 (as described in Topic Paper 3). It should be noted that the expansion of the main urban area would only be considered suitable should it not be possible to find sufficient land for future employment and housing needs within the existing built up areas. It is unlikely that this would be before the latter stages of the LDF.

This research concluded that given the existing constraints in York, any future areas of search for housing would be best suited to the eastern sector of the City rather then the western sector, whereas for employment, splitting the areas to the east and west of the city would offer the better solution.

Although this research provided a relative assessment of future growth and the impacts on the transport network, it did not provide an absolute assessment as to whether this growth could be accommodated.

Links with LTP3

The LDF and LTP3[1] are inextricably linked, as the future housing and employment rates form the crucial element in setting the long-term strategy for LTP3. Conversely, the deliverability of the strategy and actions within LTP3 will determine to a large extent how the LDF core strategy is realised.

Existing Traffic Levels in York and how York compares with other places

Congestion levels in key areas of the city are already high, with traffic on the Inner Ring Road, key radials and the northern outer ring road experiencing significant delays at peak travel times. Traffic levels recorded on the automatic traffic counters in the peak hour, as part of the indicator monitoring process for York's current Local Transport Plan , (LTP2) have, on the whole, remained close to 2005 levels with a slight downward trend over the longer term.

It is also stated in LTP2 that, according to 2001 Census data, York is a net 'importer' of approximately 5,000 commuter trips per day (22,455 in 17,199 out and 70,098 within), an increase of 65% from 1991. The majority of 'external' trips consist of movements to or from the neighbouring authority areas, particularly the East Riding of Yorkshire, Leeds and Selby.
The most useful indicator for benchmarking York's performance against 'comparable' towns and cities is National Indicator NI167 Congestion – average journey time per mile during the morning peak (also LTP2 indicator 6C). However, there are several

[1]City of York's Local Transport Plan 2011 - 2031 (LTP3)

variants to this, with authorities able to choose which one to use. 28 authorities, including York, are using Variant 2[2]. Table 1shows the delay time and ranking for York in relation to 'benchmarking' authorities within the 28 using Variant 2, Together with an approximate comparison to some other authorities using other variants. Taking into account the highly constrained nature of the highway network, it could be argued that congestion in York is not excessive at present, although this may be contrary to public opinion.

Table 1: NI167 Congestion – average journey time per mile during the morning peak benchmarking results

Authorities using Variant 2		
Authority	2008/09 delay time	Ranking (out of 28)
Warrington	3 mins. 12 secs.	8
York	3 mins. 19 secs.	9
Brighton and Hove	3 mins. 26 secs.	15
Kingston-upon-Hull	3 mins. 55 secs.	19
Cambridgeshire	4 mins. 12 secs.	25
Oxfordshire	4 mins. 14 secs.	28
Authorities using other Variants		
Chester and West Cheshire (Variant 3)	2 mins. 3secs	n/a
Leeds (Variant 1)	3 mins. 55 secs.	n/a

Cost of congestion

Nationally, In 1995, it was reported that congestion cost the British economy £15 billion per year[3] and could reach £30 billion per year by 2010[4] . A reasonable estimate of the current cost of congestion in the UK is somewhere in between these extremes and could be assumed to be approximately £20 billion per year. The 'Wider costs of Transport in English Urban Areas in 2009' report indicated that excess delays cost £10.9bn but there were also additional comparable costs due to environmental and safety impacts.

Assessment Methodology

[2]NI 167b: Variant 2 - Vehicle journey time per mile during the morning peak on major inbound routes in the larger urban centres, weighted by the relative traffic flow on those different routes.
[3]'Moving forward – a business strategy for transport' CBI 1995
[4]The economic costs of road traffic congestion, ESRC Transport Studies Unit, 2004

The city's SATURN transport model has been used to determine the impact of the development projections and national traffic growth assumptions on the highway network for three target years – 2016, 2021 and 2026.

The SATURN model is, currently, somewhat limited in its ability to model the effects on the wider area beyond York's boundary. Therefore, it can neither accurately predict the increase in longer distance commuting trips nor their affects. However, an updated version of the model, currently under construction, is expected to generate more accurate predictions

The employment and housing growth projections that have been assumed to form the basis of this assessment are 1000 jobs per annum and 800 dwellings per annum.

Future trip generation rates based on the above housing and employment projections supplied by the LDF team were compared to trip growth rates TEMPRO, which incorporates the National Trip End Model (NTEM). This comparison showed a close correlation between the supplied housing and employment growth factors and the TEMPRO V5.4 dataset. This proved the validity of the TEMPRO traffic growth factors to be used input into subsequent analysis using SATURN to derive modelled traffic flows.

Reference has been made to the Monks Cross Transport Masterplan (May 2011), prepared by Halcrow for the City of York Council, as a proxy, to ascertain the spatial impacts of the areas of search for Urban Extensions (housing) in the eastern sector of the city.

Results of the Assessment

The reference 'do minimum' case

The 'do minimum' case includes improvements that are committed or confirmed as part of development proposals that have Planning Permission. The 'do minimum' case assumes there is a good probability that the following schemes will be in place by 2016:

- **Access York Phase I -** Major Scheme Business Case 1 (MSB1), comprising one relocated/expanded and two new Park & Ride sites, plus improvements to the A59/A1237 junction and bus priority on A59. This was included in the (now revoked, by the new Coalition Government) Regional Allocation Funding Programme refresh (RFA2), and attained Department for Transport (DfT) 'Programme Entry' status. The scheme was included in the development pool following the Comprehensive Spending Review (CSR) and an Expression of Interest was submitted on 4 January. A full and final bid will be submitted in the summer of 2011 with a decision expected in December 2011.
- **James Street Link Road Phase II -** An evaluation of this was presented to a City Strategy EMAP on 20 October 2008, in response to a petition presented,

seeking its construction to be undertaken. The review confirmed that there would be significant journey time savings in the area if the final section of the link road was constructed. Delivery of the scheme is dependent on the development of a key site in the Foss Basin area.

The 'do minimum' case does not include Haxby Rail Station, as although this is a project included in LTP2 and was included in the RFA2 programme, it is delivery timescale is uncertain at present.
The results of the 'do-minimum' assessment are shown in Table 2.

Table 2: 'Do minimum' network predictions[a]

Indicator	2008 Base	2016	2021	2026
Flows (passenger car units per hour)	39,338	42,604	44,950	48,398
Modelled growth in flow	1.00	1.09	1.14	1.23
Total network delay (Hours)	2,711	4,065	5,776	7,658
Delay multiplier	1.00	1.50	2.13	2.83
% of Trip spent delayed	37%	47%	51%	58%
Time taken for what should be a 20 min. journey (mins.)[b,c]	32	37	41	47
Time taken for what should be a 30 min. journey (mins.)[b]	48	56	61	71

Notes

a. Employment and housing growth rates 1000 jobs and 800 dwellings per annum respectively.

b. The 20 minute and 30 minute journey times indicated in the first column do not include for waiting at junctions etc., hence the reason for the 2008 figures being higher. i e equivalent to a night time trip duration.

c. Average journey distance in York, derived from a range of average journey figures[5] is 12.5 kilometres. This would equate to a journey of approximately 20 minutes duration, assuming an average speed across the network of 20mph

[5] Data sources - The 2001 Census, the 2009 'Towards a New Transport Plan for York' consultation responses and the SATURN model

Implications of the 'do minimum' case

From Table 2 it can be seen that:

- The increase in delay is not directly proportional the increase in flow
- By 2021 the delay across the network could be almost double the current delay, rising to nearly three times the current delay by 2026.
- The multipliers for congestion cost could be similar to those for delay

The 1.50 delay multiplier, at 2016, arises from committed or confirmed development proposals expected to in place by then. So, the effective influence of future growth projections will be relative to delay in 2016 rather than at present. Therefore, the effective delay multiplier from 2016 to 2026 could be up to 1.89 (instead of 2.83)

In considering the more 'human' aspects of the 'do minimum' case, the cost of congestion, overall, could increase from £37 million per year, to £104 million per year (using a generalised cost associated with journey time delay in SATURN). At a 'personal' level, the cost of congestion (i.e. the cost of congestion per household in York), could increase from £441 per year (2008) to £1,030 per year (2026).

In terms of 'personal' travel, the average journey distance in York, derived from a range of average journey figures from the 2001 Census, the 2009 'Towards a New Transport Plan for York' consultation responses and the SATURN model is 12.5 kilometres. This would equate to a journey of approximately 20 minutes duration, assuming an average speed across the network of 20mph. From the modelling carried out, the duration of this journey increases in future years, as shown in Table 2, due to increasing delays on the network. Table 2 also shows the increases in time for a typical 30 minute journey.

Car use has a high degree of elasticity, compared to other forms of transport. In other words, drivers would tend to accept this extra travel time as part of their day, unless a much more attractive offer (alternative mode) is made available. The five minute increase in the time (in 2016) taken for a journey should take 20 minutes is likely to be absorbed by drivers as part of their journey. However, the increase in journey peak-hour times by 2026 may be sufficient to stretch beyond an acceptable level, so the likelihood is that more trips will be made outside of the peak hour (08:00 –09:00), leading to more peak spreading. Alternatively, these could be undertaken using other modes, or (less likely) not done at all.

Mitigation options

Range of potential options

A table showing the range of other mitigation measures that could be introduced to reduce traffic delays, together with the cost estimates for implementing them is contained at Appendix A. This is summarised in Table 3, with a more detailed description in the following paragraphs and a further breakdown of the various elements in Appendix B.

The range of mitigation options available vary from low cost capital measures, with significant associated revenue supported measures, such as travel behaviour change programmes, through to high capital investment schemes, such as Access York Phase II (comprising Roundabout capacity improvements on the A1237 Outer Ring Road (ORR) and enhanced ORR improvements (including dualling and grade separation).

The mitigation options as described in the following paragraphs, including Table 3, are each considered separately.

Table 3: Impact of mitigation options on Traffic Delays

	2016	**2021**	**2026**
Intervention	**Increase in Delays Relative to 2008 Baseline**		
No mitigation over and above the 'do minimum' case (see also Table 2)	+50% (1.50 multiplier)	+113% (2.13 multiplier)	+183% (2.83 multiplier)
Smarter Choices (Behavioural Change, Sustainable Travel promotion, bus subsidy etc.)	-12%	-24%	-42%
Infrastructure (Sustainable Travel) Park & Ride, Cycle Network, Bus Priorities	-6%	-12%	-21%
More Off Peak Travel (peak spreading)	-18%	-24%	-35%
ORR Upgrade (Access York Phase 2 – Roundabout Capacity Improvements)	-5%	-19%	-31%
ORR Upgrade (Enhanced Improvements)	-5%	-45%	-73%

Behavioural change programme

The congestion relieving effects of transport behavioural change programmes (**'smarter choices'**) can be significant if investment in them is sufficient and sustained. The DfT's document "Smarter choices: changing the way we travel", showed that such programmes could reduce peak hour urban traffic by as much as 21 per cent.

The outcome of travel behaviour programmes in three medium sized (100,000 – 140,000 population), relatively free-standing towns designated 'Sustainable Travel Towns' (STTs) have been reported recently[6]. These towns implemented a programme of measures from 2004 – 2009, intended to reduce car use. The main results (largely contrary to national trends) from implementing a range of 'smarter choices' measures were:

- Car trips fell by 9% per person, with 7 - 8% observed reduction in traffic volumes in inner areas (greatest trip reduction in short trips up to 1km and work trips)
- Cycling increased 26% - 30% and walking increased by 10% - 13% per head
- Bus trips grew by 10% - 22%.

At a local level, it is unlikely that the 21% reduction in peak-hour urban traffic volume will be achieved in York, as many of the behavioural change measures, such as school travel plans, tele-working, public transport marketing, cycling facilities and car clubs, have already been introduced. However, there is yet more that can be done to influence travel behaviour and it is not unreasonable to expect further measures to effect a slightly higher reduction in traffic than was achieved in the STTs, due to York having a higher, but more compact population than the STTs.

A reasonable estimate for the reduction in future traffic flow due to a travel behaviour change programme(s) is in the range of 7% - 10%. The resultant reduction in the delay multiplier could be in the order of 26% - 46%.

The effectiveness of behavioural change programmes is influenced by the reluctance for motorists to consider other modes of travel unless there is an overwhelming perceived advantage in doing so. Consequently, improvements are required to the more sustainable forms of travel, such as walking, cycling and bus use to demonstrate this advantage. Research by DfT has shown the impact of behavioural change programmes could also be greatly enhanced by complementary demand management policies. It is likely that a full range of complementary capacity improvement and demand management measures, which could also have positive effects on York's 'quality of place' will need to be implemented to realise the maximum benefits of a behavioural change programme.

[6] The Effects of Smarter Choice Programmes in the Sustainable Travel Towns: Summary Report, DfT, Feb 2010

In order to make an assessment of how many people would travel in York by various forms of transport in the future, the 2001 Census modal split figures for the York population travelling to work were projected forward into future years using population estimates[7]. These were then used to calculate changes in modal split required to achieve reduction in car/van use to varying degrees. The results of this analysis are shown in Appendix C, Table C1 to Table C3.

It can be seen from Table C1 that 'Driving a car or van to work' trips could increase by up to 11,609 (+27.6%) from 2001 to 2026. This compares reasonably well (albeit slightly higher) with the modelled increase as shown in Table 1. This sets a sound basis for determining the changes in overall modal split required to achieve reduction in car/van use to varying degrees as shown in Table C2. In Table C2 it has been assumed that for every 5% reduction in new driving a car or van to work trips, there is a corresponding, potentially achievable, 2% transfer to 'bus' with the remaining 3% distributed to the other modes.

From Table C2 it can be seen that to achieve a significant reduction in future traffic growth (i.e. removing one in four new trips) at least a 1% increase in cycling, a half-percent increase in pedestrian and 0.16% increase in bus use modal share overall is needed to take-up the 2.6% reduction in car/van overall modal share (with a reduction in increase of new trips above the 2001 base from 27.6% to 20.7%). Whilst the percentage change in modal share for cycling and walking to take-up the transfer from driving may appear small, the actual numbers of people required to change to these modes are significantly higher, as are percentage changes for each mode as shown in Table C3 (for 25% reduction in 'Driving a car or van' to work trips.

The travel-to-work modal split targets, set in LTP2, are of a similar order to those for removing one in four new car/van trips. However, accurate data on how well measures introduced in LTP2 have performed in realising these targets will not be known until 2011 Census data becomes available in 2012.

Results from a city-wide consultation for LTP3[8] showed that Congestion is the most important transport challenge (81% of 12900 responses). LTP2 set a target of reducing traffic growth to 7% by 2011 (instead on the predicted 14% and a further doubling by 2021 in the absence of LTP2 measures etc.). In workshops held as part of the consultations for LTP3, some participants advocated zero traffic growth beyond 2011 (hence the 105% reduction in driving a car/van to work trips in Table C2).

To achieve an effective zero growth in traffic the proportion of 'Driving a car or van' trips needs to reduce by 11% (to 37% of all trips) by 2026 equivalent to approximately 1 in 4 current car trips being undertaken by another mode. Bus, cycling and walking trips would need to increase substantially by 0.8%, 4% and 3.5% of the

[7] Office for National Statistics (ONS) 2008-based Sub-national Population Projections
[8] 2010 Budget Consultation and Towards a new Local Transport Plan for York

total number of trips respectively. The number of trips undertaken by these modes (combined) would need to increase from 31,000 to 50,000 (Approximately, a 60% increase). It should also be noted that nearly 10% of the working population would need to be working from home as well (working from home = 7.87% in 2001).

Investment in transport infrastructure and services to support behavioural change

Public transport

In order to achieve the modal shift towards more public transport use, as shown in Table C3, significant investment will need to be made in services, infrastructure (including bus priority measures) and information.

Expanding the cycle network and the pedestrian environment

Other infrastructure improvements such as expanding the cycle network and the pedestrian environment into and within York have been and could continue to be implemented, increasing the quality of the alternative travel options to the private car. Many of these measures to influence driver behaviour are relatively low cost. York's status as a 'Cycling City' has resulted in more capital investment in cycling infrastructure over the last three years as well as revenue spending on marketing, training and events to boost cycling. Continued investment, not only capital, but more importantly revenue is needed to deliver a sustained behavioural change programme linked with infrastructure and service improvements to encourage long-term modal shift away from car use.

Until the outputs from the next Census are known, it is difficult to make an accurate assessment how much a travel behaviour programme(s) will effect modal shift in York. However, some evidence has already been presented in the light of initiatives elsewhere, such as the Sustainable Travel Towns.

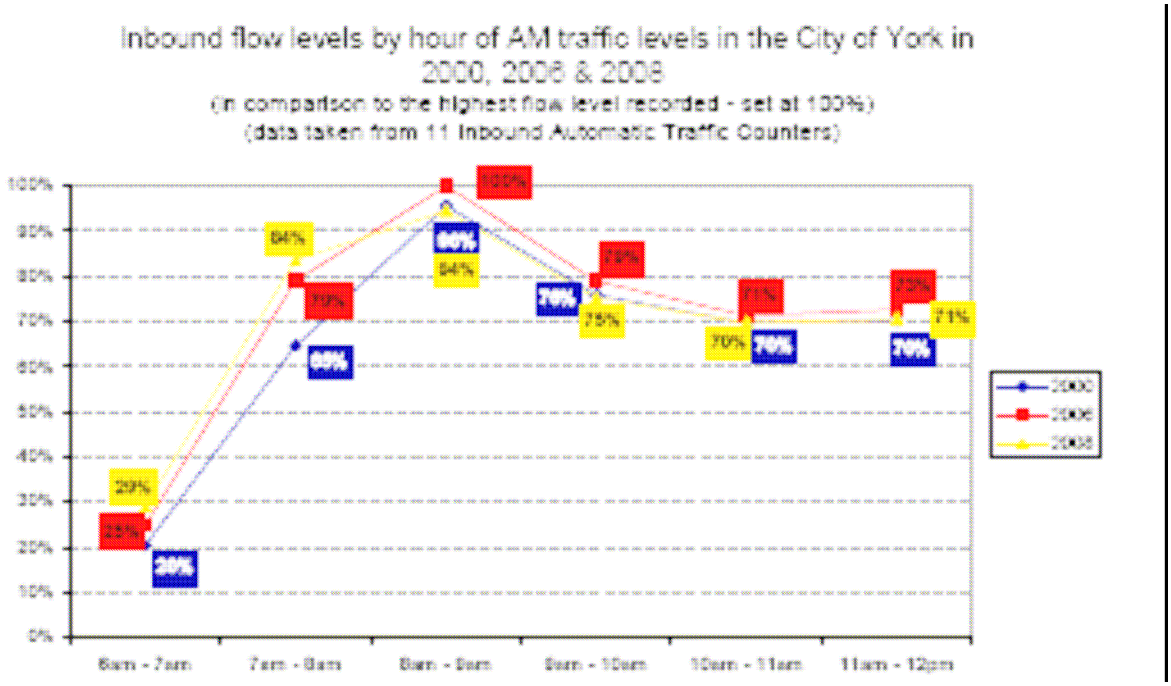
Increasing capacity through 'Peak Spreading'

Monitoring undertaken for the City of York's Local Transport Plan 2006-2011 (LTP2) shows that area-wide traffic mileage (as a proxy for traffic growth) has a downward trend in both the a.m. and p.m. peak periods. This could be due to:

- Development not proceeding at the anticipated rate
- The network approaching full-capacity in the peak hour (08:00 – 09:00)
- More people travelling outside the peak hour, as evidenced by the following statement in The Traffic and Congestion Ad-hoc Scrutiny Committee's report[9], *'There is also evidence of the peak period spreading as a result of drivers responding to congestion'* and Figure 1.

[9] Traffic Congestion Review – Final Report, 18 May 2010

Figure 1



As the network is (assumed to be) at capacity in the peak hour the likelihood is that more trips will be made outside of this. Analysis of traffic flows between 07:00 and 10:00 shows **there is approximately 24% and 21% spare capacity in the 1 hour pre and post peak hour** respectively, enabling the transfer of trips out of the peak hour to take place. Peak spreading might be encouraged though promotion of flexible working.

Traffic management efficiencies

Improving the efficiency of the traffic management systems in York, through, for example, upgrading controlled pedestrian crossings to 'puffin' crossings, further refinement of the Urban Traffic Management Control System and the wider implementation of 'Freeflow' [10] could produce delay savings of up to 5% by 2026.

Higher level investment options

Access York Phase II (MSB2) and 'enhanced' Access York Phase II

Access York Phase II (MSB2) consists of improvements to the A1237 Outer Ring Road (ORR) junctions not yet improved or due to be improved as part of Access York

[10] A system that is able to better detect, in real time, changes to the operation of the road network and provide operators with highly contextual advice and support for making traffic management decisions

Phase I. Enhancements to Access York Phase II consist of a series of selected link upgrades (to dual carriageway standard) on the busiest sections (Wetherby Road to Clifton Moor) of the ORR and grade separated junctions to 3 roundabouts (A59, Millfield Lane, A19) in addition to the junction improvements to the remainder of the route. The results for the Access York Phase II and 'enhanced' Access York cases are shown in Table 4.

By comparing the results in Table 4 with Table 1 it can be seen that:

- The increases in delay are not as high as for the 'do minimum' case, with more delay 'gains' being achieved in the later years. However, the delay with Access York Phase II in place is two-and-a-half times that of the 2008 baseline by 2026.
- The delay for the 'enhanced' Access York Phase II is much closer to twice the baseline delay in 2026.

The multipliers for congestion cost could be similar to those for delay. Access York Phase II would result in congestion cost savings of £12 million per year in 2026 compared to the 'do minimum' case (£104 million). Enhancing Access York Phase II would reduce this by another £15 million.

Table 4: 'MSB2' and network predictions growth trajectory in am peak with and without partial dualling 'enhancement' of the A1237[a]

Indicator	2021	2021 + Partial dualling	2026	2026 + Partial dualling
Flows (passenger car units per hour)	44,950	44,950	48,398	48,398
Modelled growth in flow (from 2008)	1.14	1.14	1.23	1.23
Total network delay (Hours)	5,264	4,558	6833	5,693
Delay multiplier	1.94	1.68	2.52	2.10
% of Trip spent delayed	49%	46%	55%	51%
Time taken for what should be a 20 min. journey (mins.)[b]	39	37	44	41
Time taken for what should be a 30 min. journey (mins.)[c]	58	55	67	61

Notes
a. Employment and housing growth rates aligned with RSS rates
b. 32 minutes for 2008 base year
c. 48 minutes for 2008 base year
d. Static trip numbers have been assumed – additional capacity may lead to the generation of new trips

The predictions for what should be a 20 minute journey time are reduced slightly, with the maximum delay 'gain' achieved in 2026 being three minutes over the 'do minimum' case with Access York Phase II in place, and six minutes with the

enhancements. For the 30 minute journey the equivalent delay gain is four minutes and 10 minutes, respectively, in 2026.

Access York Phase II, was presented to the Regional Transport Board in October 2008, for it to consider for inclusion in the Regional Funding Allocation Refresh Programme (RFA2). This bid was not successful, but Access York Phase II was included on a list of 'reserve' schemes. As the Access York Phase II scheme had not reached Programme Entry status before the Regional Funding Allocation system was revoked it is not included in the group of schemes being considered by the DfT for funding up to 2014/15. The mechanism for prioritising Major Scheme funding after the end of the current spending review period is currently unclear.

Access York Phase II is included in the Leeds City Region Connectivity study which is being used to prepare infrastructure priorities in the area (principally through Local Enterprise Partnerships).

Although the average citywide delays would reduce with the implementation of Access York Phase II, the principal benefits would be relatively close to the outer ring road with smaller reductions in the city centre and in the south and east of the city.

Tram-train technology

A report describing the potential for a Tram-Train system on the York-Harrogate-Leeds line and other routes in York was presented to EMAP on 14th July 2008.. This report stated:

- The Harrogate Line has been identified as being the most suitable line for the initial introduction of tram-train technology in operational and infrastructure terms.
- There are some operational constraints that affect the feasibility of routes into development sites and residential areas.

This report also stated that the estimated capital costs for the York-related elements of the potential tram-train strategy are in the range of £28 - £42 million (not including approximately £51-£80 million for laying the track for a city centre loop).

The DfT and Network Rail are currently undertaking a national trial to test the suitability of tram-train technology in the UK. Further progress on introducing tram-train systems, is therefore, subject to the outcome of this study, which is still several years away from being concluded. Consequently no detailed assessment of the impacts of introducing Tram-Train has been undertaken to date.

Freight transhipment centre

A freight transhipment centre could remove some freight traffic (particularly heavy goods vehicles) from the city centre. However, no detailed evaluation of this potential project in York has been undertaken to date. At a UK level, though, a study has

recently been completed for Tactran[11] on the feasibility for a freight consolidation centre serving Perth and Dundee.

Effects of environmental enhancements

In the modelling undertaken it has been assumed that traffic can redistribute across the entire network to find its 'optimum path'. In some cases, it would be beneficial to protect some parts of the network, such as residential areas, from suffering increases in through traffic in order to prevent a deterioration in safety or other aspects that affect local quality of life. It is likely that protection of this type will increase delays on other parts of the network, such as key corridors into the city.

A city centre that is viable and has vitality is crucial to the economic prosperity of York. The scale, nature and function for the future development of the city centre is currently being evaluated within the LDF City Centre Area Action Plan. One of the aspects being considered is how the city centre is to be accessed in the future and a 'City Centre Movement and Accessibility Framework' study investigating these issues is due to report shortly. Some work already undertaken leading up to this study considered several options for changing access arrangements in the city centre and their effects. This work revealed that reassigning road space for the easier movement of public transport in the city centre increased traffic flows on the inner ring road, which already experiences significant congestion.

Further consideration of affordability, deliverability and benefits

Further information regarding the funding of transport over the last ten years and the future for transport funding is contained at Appendix D

Other considerations

Induced traffic

Any measures to reduce congestion have the potential to enable traffic to move faster, and therefore can induce more traffic, thus reducing the benefits. Any measures that reduce traffic, or growth, will need other associated measures to 'lock-in' the benefits attained.

Other development opportunities

In addition to the planned growth rates in the LDF, other additional development may also take place either before or after the LDF is adopted. One such example is that of the proposed Community Stadium at Monks Cross and potentially a new swimming pool at Heslington East as part of the University of York's expansion. Both of these projects will have considerable impacts on the demand for travel, and hence traffic,

[11] Tactran Freight Consolidation Feasibility Study - Draft Feasibility Report, April 2010

over-and-above that of the LDF Core strategy, which may require mitigation measures and/or lead to a revision of the growth rates in the Core strategy.

It has not been possible to take account of the likely impacts of these developments in the assessment undertaken.

Greenhouse gas emissions and emissions harmful to health

The Climate Change Act imposed a legally binding target for the UK of an 80% reduction in greenhouse gas emissions by 2050. City of York Council has set an intermediate target of a 40% reduction by 2020. Transport is a significant contributor of Carbon Dioxide (CO2) and developments in engine/fuel technology have reduced, and will continue to reduce vehicles' emission levels. However, these improvements are likely to be offset by traffic growth.

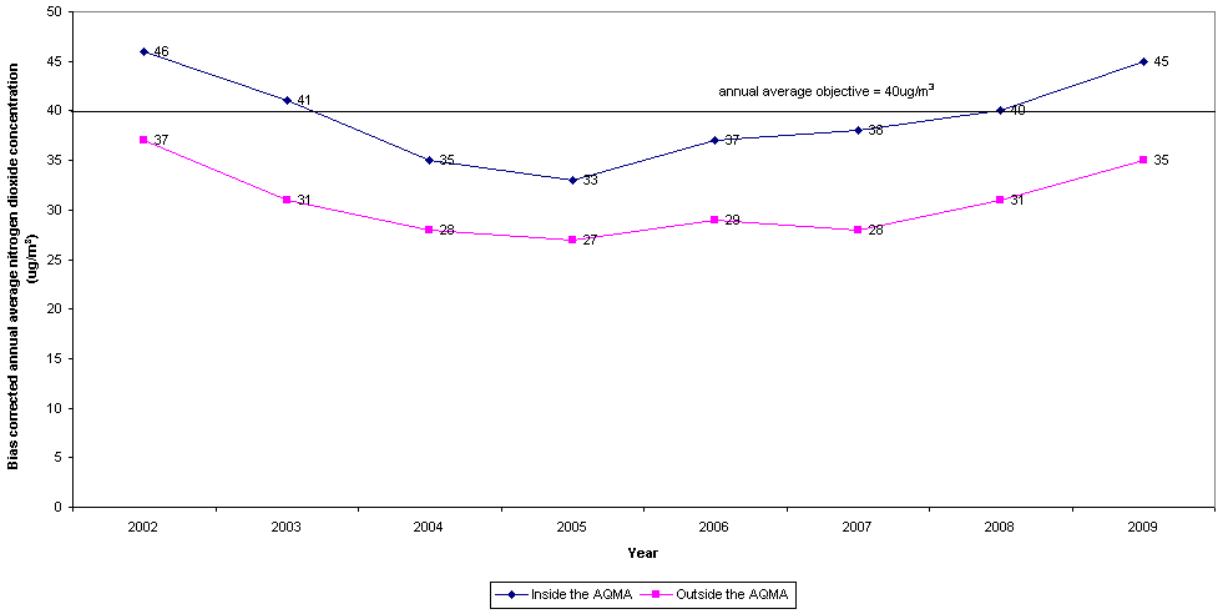
The update to the council's strategic transport model will enable it to model, more accurately than at present, the levels of CO2 attributable to increases in traffic associated with the growth assumptions.

Whilst CO2 emission reductions have been realised through engine/fuel technology improvements, these same Improvements have, perversely, been at the expense of increasing the level of pollutants, such as oxides of Nitrogen, that are harmful to health. In York this has resulted in deteriorating air quality, which despite achieving some improvements during the period of LTP1 and the early part of LTP2, has now breached health-based objective levels for Nitrogen Dioxide (NO2), as shown in Figure 2. In 2002 York's first Air Quality Management Area (AQMA) was declared and in 2010 a further AQMA, in Fulford, was declared.

Continued traffic growth in the future (and peak spreading) will, unless a major reduction in vehicle emissions is achieved, result in a further deterioration in air quality and is likely to see more AQMAs being declared. It can also lead to a further deterioration in the general 'quality of life' in the city.

The council also seeking to utilise funding to undertake some carbon modelling of the measures in LTP3 and also seeking to undertake some detailed air quality modelling for determining the need, scope and scale for a low emissions zone and the most effective measures to put in place if it is introduced. These two strands of work are likely to incorporate the impacts of the growth assumptions

Figure 2: Rising concentrations across the AQMA



Spatial Impacts

Assessment of Urban Extension sites

The projected growth in employment (1000 jobs/yr) is crucial for maintaining and improving York's economy well into the future. The housing growth requirements seek to house, as far as possible, within the identified constraints, the people filling the new jobs created. If the housing growth requirements are not kept in-line with the number of new jobs created, those filling them will tend to reside further away from the workplace, thereby commuting longer distances.

The research by Halcrow (Topic Paper 3), indicated that any future areas of search [for Urban Extensions (housing)] would be best suited to the eastern sector of the City rather then the western sector. Therefore, the Urban Extension areas of search have been confined to the eastern sector. However, this research provided only a relative assessment of future growth and the impacts on the transport network. It neither provided an absolute assessment to whether this growth could be accommodated nor gave an indication of the impacts on the local network (spatial assessment).

Initial inspection of the Potential Urban Extension sites showed sites A(I) and (II) to be more accessible than Site B, due to the more extensive road network and public transport network in the area of sites A (I) and (II).

Sites A (I) and (II) are situated to the south east and north of Monks Cross respectively. The Monks Cross Transport Masterplan assessed the impacts of constructing a new community stadium, incorporating a public library, offices and a 120 bed hotel, together with a range of other ancillary development, including food retail, non-food retail and restaurants. This masterplan has been used as a proxy for

evaluating the impacts of Urban Extension sites A (I) and (II). The key outcomes of the masterplan are:

- In the evening peak period, delays in excess of two minutes (above exiting) are predicted on the A64 southbound approach to the junction with the A1237 Outer Ring Road at Hopgrove and the southern end of Huntington Road
- At the weekend peak hour, similar delays in excess of two minutes are predicted on the southern end of Huntington Road.

It is anticipated that similar impacts, albeit of a different magnitude (yet to be more accurately determined), will be generated by the Urban Extension Sites A (I) and A (II) due to them being housing sites.

Urban Extension site B lies well to the south of Monks Cross adjacent to a site at Metcalfe Lane, which is currently being developed as a major housing site. Due to the location of Site B, no comparison can be made to the Monks Cross Transport outcomes, although high trip generation rates are likely.

Urban Extension site C (employment) – expansion at Northminster Business Park – is likely to generate significant number of cross-city trips along the A59, other nearby radial routes and the A1237, particularly between the A59 and Strensall Road. Traffic from the east side of the city is likely to favour accessing Northminster Business Park via the inner ring road and the A59.

Mitigation

General approach city-wide

The proposed approach for mitigating the impacts of traffic growth citywide can be summarised, as follows:

- Pursue the completion of Access York Phase I and James Street Link Road Phase II before 2016. Including the submission of a best and final funding bid to the DfT in 2011
- Promote the earliest possible introduction of non-carbon fuel based transport.
- Implement a sustained travel behaviour change programme commencing in the 2011/2012 financial year.
- Implement the low – cost transport infrastructure and service improvements to support the travel behaviour change programme
- Pursue the enhanced Access York Phase II project which includes upgrading the Northern Outer Ring Road for completion by 2026 at the latest (preferably by 2021).

The Council will deliver the phased infrastructure programme outlined below to ensure that the growth levels identified in the plan can be delivered in an appropriate way. Infrastructure improvements will be progressed in association with measures to

promote sustainable travel to minimise the generation of new trips taking up the additional road capacity. The list identifies the principal strategic schemes planned to be delivered – many smaller projects with more local impact will also be progressed.

Phase 1:2011 – 2015

Access York Phase I

- Provision of new Park & Ride sites at Poppleton Bar (A59) and at Clifton Moor (B1363).
- Relocation and enlargement of the existing Park & Ride site at Askham Bar (A1036).
- Enlargement to the A59/A1237 roundabout to increase capacity.
- Provision of an improved pedestrian/cycling crossing of the Outer Ring Road at the A59 junction.

Bus Network Improvements

- Bus priority measures on A59 and Wigginton Road corridors (either as part of Access York Phase 1 project, or separately).
- Targeted junction enhancements to improve reliability, as set out in the Local Transport Plan and subsequent investment programmes..

Strategic Cycling and Pedestrian Network Improvements

- Cycle network improvements as set out in the Local Transport Plan and subsequent investment programmes.
- Extension of Footstreets area, to be progressed through the City Centre Area Action Plan.

Highway Network Capacity Improvements

- James Street Link Road Phase II road improvement scheme.

PHASE 2: 2016 – 2021:

A1237 Outer Ring Road Improvements

- Improvements to the highest priority congested A1237 outer ring road roundabouts to be identified in the Local Transport Plan.
- Further improvements to other A1237 outer ring road junctions.

Bus Network Improvements

- Improvements to the bus interchange at the railway station
- Further bus network improvements to be identified in the Local Transport Plan and subsequent investment programmes.

Strategic Cycling and Pedestrian Network Improvements

- Restrict access for private motorised vehicles across City Centre bridges, to be taken forward through the City Centre Area Action Plan.
- New cycling/pedestrian bridge near Scarborough Bridge.
- Continued implementation of the strategic cycling network as set out in the

Local Transport Plan and subsequent investment programmes

PHASE 3: 2022 – 2031:

A1237 Outer Ring Road Improvements

- Series of selected link upgrades to dual carriage way standard (including grade separation) on the busiest sections of the Outer Ring Road (Wetherby Road to Clifton Moor).

Bus Network Improvements

- Further bus network improvements to be identified through the Local Transport Plan and subsequent investment programmes.

Strategic Cycle Network Improvements

- Continued implementation of the strategic cycling network as set out in the Local Transport Plan and subsequent investment programmes.

Mitigation Measures for the urban extension sites

The spatial strategy in the LDF concentrates most of the growth in the urban part of the city, with the larger settlements taking-up most of the rest. The principal of providing urban extensions to accommodate growth where it can not be met by available housing land would enable commuting distances (to new jobs in York) to be kept short. This would maximise the opportunities for and uptake of more sustainable forms of travel, such as walking, cycling and using public transport.

The Monks Cross Transport Masterplan proposes a series of improvements to Junctions on the A1237 Outer Ring Road and several junctions adjacent to Monks Cross (see Appendix E). It is likely that similar mitigation measures will be required for Urban Extension Sites A (I) and (II)

Urban Extension Site B is, at present, inadequately served by the existing road network, with the only direct connection made via Bad Bargain Lane. This road serves approximately 1100 houses and is, at its narrowest point less than 2.5m wide. Therefore, new road links are likely to be required and masterplanning would provide the opportunity to determine appropriate access arrangements. There are various options that could be pursued for one or several new links (as shown indicatively in the diagram at Appendix F). These could include a new link road to the A64, which is likely to need a new slip road on/off the A64 to be constructed. It should be noted that the northbound lane of the section of the A64 where the link road could connect is termed 'stressed' by the Highways Agency.

Urban Extension Site B could also be designed as a series of discrete smaller-scale pockets of housing. Each zone could then be independently accessed using lightly trafficked links through adjacent areas.

The completion of the programmed improvements to the A1237 outer ring road (selected link upgrades to dual carriage way standard, including grade separated

junctions) is likely to provide the increase in capacity required to accommodate the traffic arising from Urban Extension C accessing the site via the A1237. Other improvements, as detailed in LTP3, are likely to improve access for all modes arriving via the A59.

Conclusion

The key outcomes from the analysis of the projected growth rates and spatial impacts are:

- If there is insufficient future investment in transport infrastructure and other transport measures, congestion delay time across the network could almost triple by 2026.
- Investment in transport infrastructure alone will not be sufficient to adequately mitigate the increased congestion delay by 2026. Consequently, other sustainable transport measures will also need to be put into place.
- Traffic growth to 2016, predominantly arising from committed development or development with planning permission, will result in congestion delay increasing by 50% compared to the present (2008 base year)
- Development at potential Urban Extension sites will generate significant volumes of traffic in the eastern sector of the city requiring a range of mitigation measures, which could include (for site B) a new link to the A64 (including slip roads).
- Even with all the reasonably practicable and deliverable transport investment in place, congestion delay across the network will double by 2026
- Full dualling of the A1237 (ORR) with grade separation of junctions is not considered to be deliverable within the timescale of the Local Development Framework.

Next Steps

The analysis undertaken to date has been based on the interrogation of modelling outputs for various projects already undertaken. This has been augmented by interpreting the outputs from the recently completed Monks Cross Transport Masterplan as a proxy for detailed assessment of the impacts of potential Urban Extension sites on the eastern side of the city. The following further work is required to confirm the outcomes of this evaluation:

- Detailed modelling of the traffic impacts arising from the potential Urban Extension sites A(I), A(II) B and C (once the upgrade to the city's strategic transport model is complete), commensurate with their anticipated timeframe for delivery
- Carbon/air quality modelling city-wide and spatially
- Feasibility studies for new links to Urban Extension Site B

Appendix A

Intervention	Equivalent change in flow (capacity increase/decrease or vehicle trip increase/decrease) Relative to 2008 Baseline			Impact of LDF Development and Intervention Measures (Cost of Congestion/Delays) Relative to 2008 Baseline			Cost of Intervention up to 2026 (2010 Baseline) Revenue Cost	Revenue Cost	Capital Cost	Total Cost (2011-2026)
	2016	2021	2026	2016	2021 (inc AYP1)	2026 (inc AYP1)	£m/Year	£m 15 Years	£m	£m
Vehicular Trips am Peak	42604	44950	48398	42604	44950	48398				
Increase in Number of Trips	9%	14%	23%	9%	14%	23%				
Do Nothing - Indicative Cost of Congestion Total £m (2008 Base =£37m)				56	78	104				
Do Nothing - Indicative Cost of Congestion % Increase				54%	113%	183%				
Protection Measures (Residential Areas)				0%	10%	25%	0.0	0.0	1.0	1.0
Access Restraint (City Centre)				0%	5%	10%	0.0	0.0	1.0	1.0
Infrastructure (Capacity Improvements) Basic ORR (Access York Phase 2), James St. Link etc.				-5%	-19%	-31%	0.0	0.0	35.0	35.0
Infrastructure (Capacity Improvements) Enhanced ORR, James St. Link etc.				-5%	-45%	-73%	0.0	0.0	100.0	100.0
Access York Phase 1				-4%	inc.	inc.	0.0	0.0	25.0	25.0
Infrastructure (Sustainable Travel) Park & Ride, Cycle Network, Bus Priorities	-1%	-2%	-3%	-6%	-12%	-21%	0.1	1.5	30.0	31.5
Use of Peak Shoulders (7:00-8:00, 9:00-10:00, 16:00-17:00, 18:00-19:00)	-3%	-4%	-5%	-18%	-24%	-35%	0.1	1.5	0.0	1.5
Smarter Choices (Behavioural Change, Sustainable Travel promotion, bus subsidy etc.)	-2%	-4%	-6%	-12%	-24%	-42%	0.7	10.5	0.0	10.5
After Mitigatation (No ORR Upgrade)				**14%**	**68%**	**120%**	**0.9**	**13.5**	**57.0**	**70.5**
After Mitigation (Basic ORR (Access York Phase 2))				**9%**	**49%**	**89%**	**0.9**	**13.5**	**92.0**	**105.5**
After Mitigation (Enhanced ORR)				**9%**	**23%**	**47%**	**0.9**	**13.5**	**157.0**	**170.5**

Modelled

Estimated

	Extent of Works	2016	2021	2026
Infrastructure (Capacity Improvements) Basic ORR (Access York Phase 2), James St. Link etc.	Upgraded roundabouts Wetherby Road to Strensall	A19 roundabout upgrdaded, A59 roundabout upgraded with Access York Phase 1,	All roundabouts upgraded (enlarged diameter and additional approach and exit lanes	As 2021
Infrastructure (Capacity Improvements) Enhanced ORR, James St. Link etc.	Upgraded roundabouts Wetherby Road to Strensall + Grade Separated Juncions at A59, Millfield Lane & A19 + Dual Carriageway Wetherby Road to Clifton Moor	A19 roundabout upgrdaded, A59 roundabout upgraded with Access York Phase 1,	+ Grade Separated junctions at A19, Millfield Lane & A59. Dual Carriageway from Wetherby Road to Clifton Moor	As 2021

Appendix B

Local Development Framework Transport Measures up to 2026

Intervention	Revenue /Year	Revenue to 2021	Revenue 2021-2026	Capital to 2021	Capital 2021-2026	Total to 2021	Total to 2026	Comments
	£m		£m		£m		£m	
Road Capacity Improvements								
James Street Link Road Phase 2				0.5	0.0	0.5	0.5	LTP contribution to Foss Basin Master Plan
Junction Enhancements (exc. ORR)				2.5	0.5	2.5	3.0	Improve junction capacity& Safety eg. Crichton Avenue/Wigginton Road
Technology improvements				1.0	0.5	1.0	1.5	Traffic Signal/ Variable Message Signs etc.
Public Transport								
Bus Priorities				2.0	1.0	2.0	3.0	Corridor upgrades (e.g.Clarence Street, A19N, Acomb Rd)
Bus Stop enhancements in City Centre				0.5	0.5	0.5	1.0	Upgrade 20 stops at £50k each
Technology improvements				0.5	0.0	0.5	0.5	BLISS/ Real Time Equipment
Orbital Bus Service	0.5	5.0	2.5	1.5	2.0	6.5	11.0	£0.5m/yr revenue support for 10 buses
Haxby Station				0.5	0.0	0.5	0.5	£7.2m Total cost (Originally assumed to be fully funded by DfT/Network Rail)
Cycling/Walking								
New Cycling/Walking bridge over river Ouse in City Centre				5.0	0.0	5.0	5.0	Scarborough Bridge Replacement (Guildhall Bridge Estimate £3.3m in 2003)
Core Cycle Network Improvements				3.0	1.0	3.0	4.0	10km at £400/m Strensall Road to Clifton Moor, Routes through City Centre, Cycle Parking etc.
Cycle Network - Links to villages				2.0	2.0	2.0	4.0	20km off road at £200/m (Strensall to Huntington, Rufforth to Acomb, Wheldrake to University etc.)
Safety & Accessibility								
Safe Routes to School				1.0	0.5	1.0	1.5	Completion of Programme (£100k/year)
Citywide Safety Improvements.				1.0	0.5	1.0	1.5	Continuation of programme -£100k/Year
Accessibility to services				1.0	0.5	1.0	1.5	Cycle Parking, Bus Routes improvements etc.
Economic Vision						0.0	0.0	
Car Free City Centre Measures				1.0	0.5	1.0	1.5	Route Closures/Public Realm Enhancements
Low Emission Strategy (Transport)				0.5	0.5	0.5	1.0	Electric Vehicles Plug in Points, Removal of traffic from sensitive areas, etc.
Smarter Choices Programme	0.4	4.0	2.0			4.0	6.0	£5/Household per Year. Travel Planning, Marketing, Promotions etc.
Minimising Development Impact								
Residential Protection Measures				0.5	0.5	0.5	1.0	Provision of rising bollards, traffic calming etc.
Total	**0.9**	**9.0**	**4.5**	**24.0**	**10.5**	**33.0**	**48.0**	
Major Schemes								
Access York Phase 1 (Park & Ride)	0.0	0.0	0.0	25.0	0	25.0	25.0	3 No. Park & Ride sites + A59/A1237 R/B + Bus Priorities
Access York Phase 2 (Outer Ring Road)	0.0	0.0	0.0	35.0	0	35.0	35.0	At grade roundabout improvements

Appendix C

Table C1 Projected future trips by mode for people usually travelling to work

	People aged 16-74 in York in employment who usually travel to work by:											
	WFH	Lt. rail	Train	'bus'	PTW	Drive car/van	Pass. Car/van	'taxi'	bicycle	On foot	Other[a]	Total
2001number	6,871	57	1,343	6,313	1,531	42,065	4,799	440	10,508	13,049	329	87,305
2016 increase.	1,388		271	1,275	309	8,495	969	89	2,122	2,635	78	17,632
2016 number	8,259		1,614	7,588	1,840	50,560	5,768	529	12,630	15,684	464	104,937
2016 % increase	20.20		20.20	20.20	20.20	20.20	20.20	20.20	20.20	20.20	41.02	20.20
2021 increase.	1,651		323	1,517	368	10,109	1,153	106	2,525	3,136	93	20,980
2021 number	8,522		1,666	7,830	1,899	52,174	5,952	546	13,033	16,185	479	108,285
2021 % increase	24.03		24.03	24.03	24.03	24.03	24.03	24.03	24.03	24.03	45.52	24.03
2026 increase.	1,896		371	1,742	423	11,609	1,324	121	2,900	3,601	107	24,095
2026 number	8,767		1,714	8,055	1,954	53,674	6,123	561	13,408	16,650	493	111,400
2026 % increase	27.60		27.60	27.60	27.60	27.60	27.60	27.60	27.60	27.60	49.71	27.60
Overall Modal Split (i.e. new plus existing)												
All Target Years	7.87%		1.54%	7.23%	1.75%	48.18%	5.50%	0.50%	12.04%	14.95%	0.38%	100.00

Notes

a Lt. rail incorporated into 'other' in years following 2001

b WFH = Work from Home, 'bus' includes coach, PTW = powered two wheelers (motorcycle/scooter/moped) and 'taxi' includes private hire

Table C2 Changes in modal split to effect 'capping' of future 'Driving a car or van to work' trips'

	Modal split (%) for total trips at various levels of capping 'Driving a car or van to work trips' for People aged 16-74 in employment who usually travel to work by:											
	WFH	Lt. rail	Train	'bus'	PTW	Drive car/van	Pass. Car/van	'taxi'	bicycle	On foot	Other[a]	Total
2001number	7.87	0.07	1.54	7.23	1.75	48.18	5.50	0.50	12.04	14.95	0.38	100
For 5% reduction in 'Driving a car or van' to work trips												
2001 - 2016	7.58		1.39	7.26	1.83	47.78	5.36	0.54	12.75	15.04	0.49	100
2001 - 2021	7.59		1.40	7.26	1.85	47.71	5.36	0.54	12.74	15.06	0.49	100
2001 - 2026	7.59		1.41	7.26	1.83	47.66	5.38	0.54	12.76	15.10	0.49	100
For 10% reduction in 'Driving a car or van' to work trips												
2001 - 2016	7.62		1.43	7.28	1.88	47.37	5.41	0.56	12.75	15.20	0.50	100
2001 - 2021	7.63		1.43	7.29	1.89	47.25	5.45	0.56	12.78	15.23	0.50	100
2001 - 2026	7.64		1.43	7.29	1.90	47.14	5.46	0.57	12.81	15.27	0.49	100
For 25% reduction in 'Driving a car or van' to work trips (i.e. remove 1 in 4 new trips)												
2001 - 2016	7.77		1.54	7.35	1.99	46.16	5.67	0.59	13.07	15.35	0.50	100
2001 - 2021	7.87		1.59	7.37	2.03	45.85	5.74	0.59	13.08	15.38	0.50	100
2001 - 2026	7.97		1.64	7.39	2.07	45.58	5.79	0.59	13.09	15.38	0.50	100
For 105% reduction in 'Driving a car or van' to work trips (i.e. small reduction in overall traffic)												
2001 - 2016	8.20		1.72	7.74	2.19	39.68	6.19	0.67	15.51	17.59	0.50	100
2001 - 2021	8.50		1.75	7.82	2.20	38.38	6.19	0.69	15.74	18.23	0.50	100
2001 - 2026	8.80		1.80	7.89	2.20	37.24	6.24	0.72	16.05	18.58	0.50	100

Table C3 Projected increase in other modes for 25% reduction in 'Driving a car or van' to work trips for people usually travelling to work

	People aged 16-74 in York in employment who usually travel to work by:											
	WFH	Lt. rail	Train	'bus'	PTW	Drive car/van	Pass. Car/van	'taxi'	bicycle	On foot	Other[1]	Total
2001number	6,871	57	1,343	6,313	1,531	42,065	4,799	440	10,508	13,049	329	87,305
2016 number.	8,150		1,620	8,386	2,090	51,485	5,950	620	13,720	16,112	525	108,658
2016 increase	1,279		277	2,073	559	9,420	1,151	180	3,212	3,063	139	21,353
2016 % increase	18.61		20.63	32.84	36.51	22.39	23.98	40.91	30.57	23.47	59.71	24.46
2021 number.	8,520		1,720	8,696	2,200	52,891	6,220	640	14,168	16,651	542	112,249
2021 increase	1,649		377	2,383	669	10,826	1,421	200	3,660	3,602	156	24,944
2021 % increase	24.00		28.07	37.75	43.70	25.74	29.61	45.45	34.83	27.60	64.80	28.57
2026 number.	8,880		1,830	9,080	2,310	54,637	6,450	660	14,580	17,137	558	116,123
2026 increase	2,009		487	2,767	779	12,572	1,651	220	4,072	4,088	172	28,818
2026 % increase	29.24		36.26	43.84	50.88	29.89	34.40	50.00	38.75	31.33	69.54	33.01%

Appendix D

Further consideration of affordability, deliverability and benefits of Transport investment 2001-2011

1. Over the last 10 years (2001-2011) approximately £50m of capital funding (excluding maintenance) has been spent by the city council on improving transport provision in the city. The majority of the funding has come from Government grants through the Local Transport Plan process and other grants for specific projects such as the Urban Traffic Management Control system. A further £5.5m of funding from developer contributions has been used for transport improvements. The most significant part-development funded scheme during the period was the construction of the first phase of James St. Link Road. Transport masterplans for the Monks Cross and Foss Basin areas were developed to determine improvements to mitigate against the effect of developments in these areas of the city and to apportion costs on a trip generation basis.

2. Funding has been used for a variety of improvements to meet the council's transport vision to develop a sustainable and integrated transport system for the city. Over 70% of the funding over the last 10 years has been used to deliver the necessary infrastructure to encourage sustainable travel. The remainder of the funding was used to progress schemes to increase road capacity by the use of technology and to upgrade junctions on the northern outer ring road.

3. The city has one of the most successful Park & Ride services in the country, providing over 3,700 parking spaces with frequent services to the city centre. The opportunities presented for cycling and walking by the flat terrain and relatively compact urban area have been maximised by investing in a citywide cycle network. It is anticipated that the infrastructure and softer measures implemented using the Cycling City grant since 2008 will further increase the high cycling levels in the City.

4. The capital investment has helped to keep peak hour traffic levels in the city centre fairly constant, despite pressures from increasing car ownership, changing work patterns and development. Future investment option costs and benefits

5. The levels of existing congestion and limited space available for providing additional road capacity means that options which enable sustainable access to developments must be promoted. To free up road capacity to accommodate growth the way the existing population move around the city will also need to change. Modal shift programmes can be cost effective in reducing vehicular trip numbers but require revenue funding to sustain them over the long term.

6. Both local and citywide transport improvements will be needed to enable the level of proposed development to be accommodated. Localised transport improvements will be required to mitigate the direct impact of additional traffic on the immediate local network. In addition the cumulative effect of traffic increases across the city will also need to be addressed.

7. A significant proportion of the funding required to deliver the mitigation measures for both of these impacts will need to be sourced from the developers of proposed sites. With the expected reduction in grant funding over the next 5-10 years it is anticipated that funds from the council for transport improvements will be substantially lower than has been available in recent years and the availability of funding for transport major schemes is expected to be significantly reduced.

8. Developer contribution has been successful in achieving local mitigation through the highways development control system (S106 payments). Where it is less successful is in achieving area-wide contribution towards the cumulative impact of development. There is perhaps an opportunity to introduce a formula based approach for contributions which would result in a higher overall level of contribution from developers to area wide schemes.

9. It is estimated that the cost of the basic Access York Phase II (at grade enhancements to all of the roundabouts along the route) would be approximately £35m. This lower level intervention has a high indicative benefit to cost ratio of over 2.5 indicating that a future funding bid to the Department for Transport is more likely to be successful. More significant upgrades involving dualling of sections or all of the ring road with grade separated junctions at some or all of the roundabouts would cost between £100m and £200m with benefit to cost ratios below 1.0. Schemes at the highest level of expenditure and low value for money (e.g. full dualling with full grade separation) are unlikely to be funded from government sources.

10. Furthermore, with the high level interventions there is a significant risk that additional trips will be generated by the improved route which would have considerable air quality and greenhouse gas implications.

11. Members may wish to consider how much reliance on mitigating traffic impacts should be placed on ORR infrastructure improvements and whether greater emphasis should be placed on sustainable travel and smarter measures.

12. Initial set-up costs for a freight transhipment centre could be in the order of £5 million. A recent survey of businesses undertaken as part of the ‘dialogue’ for LTP3 showed 46% of the 75 businesses responding in favour of a transhipment centre, with 24% against.

13. An estimate of the level of investment necessary for expanding the cycle network (as advised to the Traffic and Congestion Ad-hoc Scrutiny Committee) is in the order of £6.5 - 23 million over 10 years, depending on the extent of the expansion. A mid-range estimate of approximately £13 million has been assumed for the purposes of this assessment.

14. An estimate of the level of investment necessary for improving public transport services, infrastructure and information (as advised to the Traffic and Congestion Ad-hoc Scrutiny Committee) is in the order of £30 - 41 million over

10 years. For the purposes of this analysis, a slightly less expansive, but more deliverable, £16 million investment package has been assumed.

15. The estimated overall costs for implementing the Sustainable Travel Towns measures were £10 per person, per year, with a direct benefit to cost ratio (BCR) in the order of 4.5. The report authors concluded that this evidence was sufficient to justify a substantial expansion of 'smarter choices'. An estimate of the level of investment necessary (as advised to the Traffic and Congestion Ad-hoc Scrutiny Committee) is in the order of £2.5 million over 10 years If the level of expenditure in the sustainable travel towns is applied in York this would equate to approximately 1.95m per year (19.5m overall). As York has a relatively high 'sustainable travel' base a lower but sustained level of investment of £400,000 per year (approximately equivalent to £5 per household) has been assumed

16. The full implementation costs of a Tram-Train system could be in the order of £120 million

Appendix E

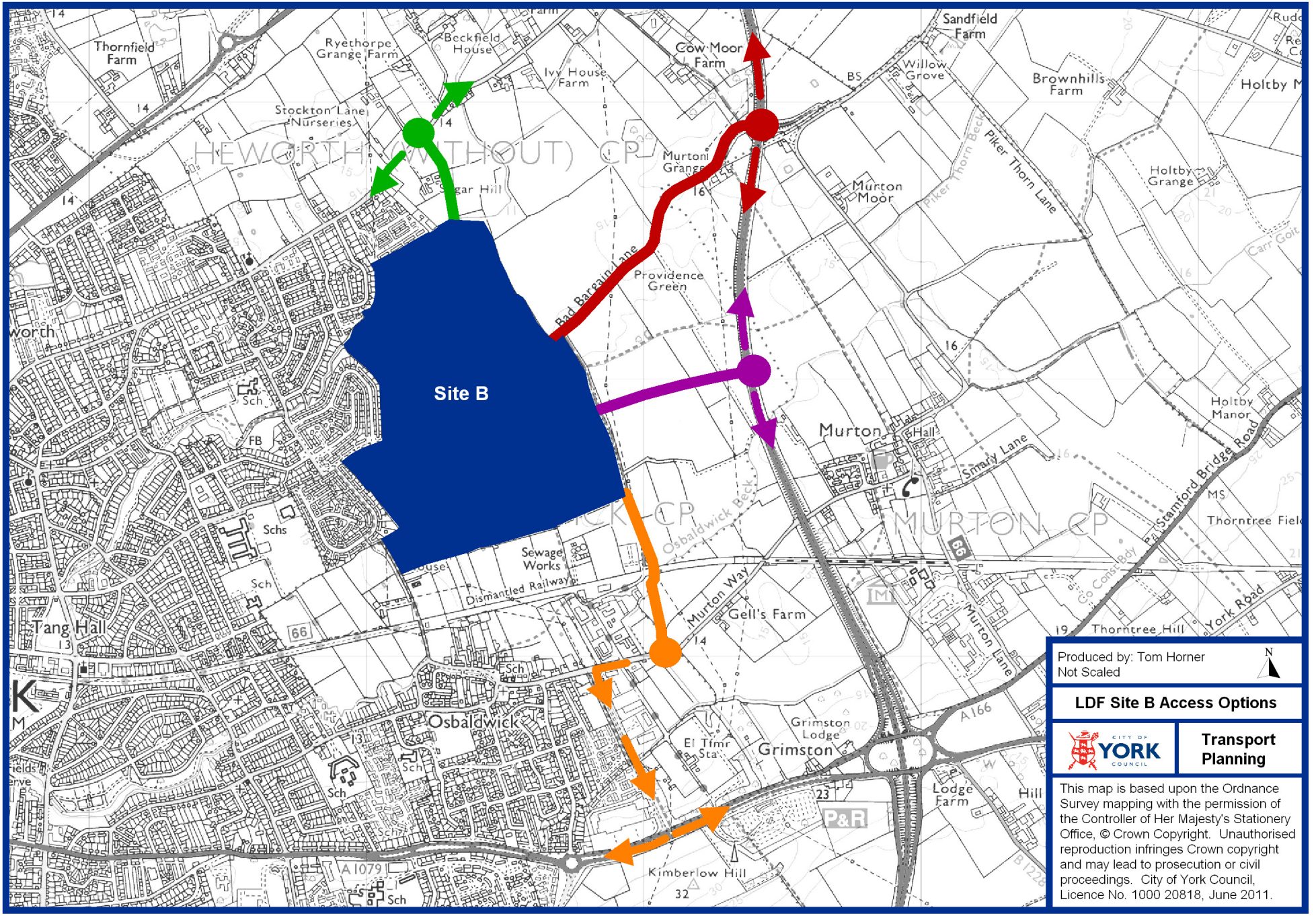
Table 7.3 Vehicular Access Strategy

Cat.	Pol.	Minimum Requirements to Support Ancillary/Enabling Uses			Additional Requirements for Capacity Stadium Events			Risks to Delivery
		Description	Benefits/ Rationale	Estimated Cost	Description	Benefits/ Rationale	Estimated Cost	
Marketing	VA1	Development of area-wide Travel Plan containing robust mechanisms to allow for the continuous assessment of travel patterns (such as ATCs, travel surveys, parking surveys, etc) over future years. Commitment required from all parties owning, managing, operating or leasing land/property within the study area to secure Travel Plan objectives and targets.	• Increased emphasis on sustainable travel reduces vehicular demand • Area-wide approach likely to result in greater impact	Not costed	Specific travel recommendations during stadium events to be identified and to be applicable to stadium staff and officials.	• Encourage reduced travel demand from staff during periods of peak stadium trips	Not costed	• Area-wide approach harder to deliver due reluctance of site occupiers to relinquish direct control
Site Access & Masterplanning	VA2	Exemplary standards of reduced car parking provision to be applied in the context of findings presented in section 5.3. Full parking accumulation assessment necessary to determine appropriate levels based on target mode splits and predicted linked trips between sites.	• Availability below threshold where provision found to impact mode choice • Deter linked trips driving between different retail sites • Allows land to be used for other purposes (e.g. public realm/landscaping)	Not costed	Direct management of retail car parking necessary to avoid use by stadium users. Supply and parallel management of additional stadium car parking required (see section 7.5).	• Retention of direct control over stadium parking supply and use to encourage access by sustainable modes where possible	Not costed	• Reluctance of retailers to commit to exemplary low parking standards • Retail parking supply infringement by stadium users
	VA3	Reductions in current car parking availability at existing Sainsbury's store following its proposed re-use for non-food retail purposes.	• Avoidance of excess supply enables mode splits to be more readily achieved	Not costed	Potential to retain excess car parking for stadium use on match days only, closed to the public at all other times.	• Efficient use of existing availability • Deters vehicular access at other times	Not costed	• Existent permission hard to control via planning condition • Aesthetic appearance of unused supply
	VA4	Provision of access onto Martello Way to serve the development site.	• Tie in necessary with policy VA11 and PT13	Included in scheme design	Active management of local network through variable message signage and officials (see section 7.5).	• Ensure stadium traffic separated from retail flows	Not costed	• Required land take and tie-in with adjacent P&R
	VA5	Provision of secondary access at new junction onto Jockey Lane (format to be determined through micro-modelling of potential junction layout).	• Reduce pressure on primary access • Integrate site with surrounding network	Included in scheme design	Active management of local network through variable message signage and officials (see section 7.5).	• Ensure stadium traffic separated from retail flows	Not costed	• Impact to flows on Jockey Lane
	VA6	Provision of additional capacity at **Strensall Road/A1237** junction, involving extension of left turn lanes on approach (assumed 100m length on each arm) to increase stacking capacity and reduce delay to other movements.	• Cater for up to **15%** increase in clockwise and anticlockwise flows on A1237	**£235k**	Major upgrade to junction in line with Access York (Phase 2) strategy, increasing diameter of roundabout to three circulatory lanes, three lanes at both A1237 stop lines and two lane egresses on A1237.	• Greater investment justified in long-term due to more frequent capacity events at stadium/LDF growth	**£7.5m**	• Limited additional capacity to be gained from initial proposals • Other funding sources for Access York upgrade uncertain

Network Enhancements	**VA7**	Provision of additional capacity at **Haxby Road/A1237** junction identified as necessary, although locational constraints prevent scope for delivery of minor improvements (further restricted through requirement to protect land for LSTF scheme over railway). Delivery of major upgrade (as per Access York Phase 2) thus prioritised here over other junctions.	• Cater for **10-20%** increase in flows on A1237	Contribution to major upgrade necessary due to lack of alternative 'low cost' scheme	Major upgrade to junction in line with Access York (Phase 2) strategy, increasing diameter of roundabout to three circulatory lanes, three lanes at both A1237 stop lines and two lane egresses on A1237	• Greater investment justified in long-term due to more frequent capacity events at stadium/LDF growth	**£5.0m**	• Existent capacity issues renders identification of measures specifically to mitigate masterplan traffic problematic
	VA8	Provision of additional capacity at **Monks Cross Link/A1237** junction, involving extension of two lane approaches on Monks Cross Link (assumed 50m length) and both A1237 arms (assumed 100m length on each arm), to increase stacking capacity and reduce delay to other movements.	• Cater for up to **50%** increase in flows from A1237 north to Monks Cross Link and up to **150%** in reverse direction	**£300k**	Major upgrade to junction in line with Access York (Phase 2) strategy, increasing diameter of roundabout to three circulatory lanes, three lanes at both A1237 stop lines and two lane egresses on A1237	• Greater investment justified in long-term due to more frequent capacity events at stadium/LDF growth • Further delay from approx 120 additional away fan car trips when playing teams from the North East	**£3.1m**	• Limited additional capacity to be gained from initial proposals • Other funding sources for Access York upgrade uncertain
	VA9	Provision of additional capacity at **Monks Cross Link/Monks Cross Drive** junction, involving widening both Monks Cross Link approach arms (assumed 50m length) to enable two lane entry, exit and circulatory.	• Cater for up to **130%** increase in flows along Monks Cross Drive	**£235k**	Active management of local network through variable message signage and officials (see section 7.5).	• Ensure stadium traffic directed to appropriate access points	Not costed	• Accommodation of increased northbound flows likely to impact on ability of PT to exit Monks Cross Drive
	VA10	Introduction of banned right turn for traffic egressing Monks Cross Link at **Monks Cross Link/Jockey Lane** junction, to improve safety following increase in turning movements. Availability of alternative and more direct routes to destinations currently accessed through right turn reduces potential for local access issues to result.	• Improved safety for increased volume of right turning traffic between Jockey Lane (south) and Monks Cross Link through elimination of central reserve conflicts	**£25k**	Full signalisation of **Monks Cross Link/Jockey Lane** junction, with localised widening within highway boundary on Monks Cross Link arm to enable two lane approach	• Reduced delay on Monks Cross Link approach/increased stacking capacity • Potential to reinstate right turn for traffic egressing Monks Cross Link if demand requirements dictate	**£90k**	• Potential impacts to adjacent PT access into masterplan site and Jockey Lane/ Monks Cross Drive roundabout
	VA11	Provision of additional capacity at **Jockey Lane/Malton Road** junction, involving dualling Martello Way and reconfiguring Malton Road citybound approach to enable two lane access into Monks Cross (requires tie in with policy PT13 involving parallel provision of bus priority to access P&R).	• Cater for up to **700** additional vehicles entering site via Martello Way from Malton Road (north)	**£500k** (excl. bus priority) **£800k** (incl. bus priority & assuming merge-in prior to junction)	Active management of local network through variable message signage and officials (see section 7.5).	• Ensure stadium traffic separated from retail flows	Not costed	• Required land take for dualling Martello Way and tie-in with development access roundabout • Assumes costly increase in roundabout diameter avoided
	VA12	Consider potential for provision of additional capacity at **New Lane/Malton Road** junction through introduction of two outbound straight ahead lanes on approach, subject to tie-in with policies WC16 and PT11. Required review of road space reallocation to be undertaken as part of study into parkway link	• Increased Malton Rd outbound capacity • Reduced resulting outbound green time requirement enables increased green time to New Lane arm	Costed as combined Malton Road **'parkway scheme'** (see section 7.3)	Adjustment to signal timings prior to stadium events to increase green time for outbound traffic along Malton Road. Variable message signage beyond outer ring road on main routes approaching city to encourage stadium access via the A64.	• Increased outbound capacity through junction to accommodate stadium flows • Deter use of corridor for stadium access	Not costed	• Requirements for reallocation of road space and adjustment to recently implemented infrastructure likely to be controversial

	VA13	Signalisation of **Monks Cross Drive/Jockey Lane** roundabout, including incorporation of pedestrian and cycle phases and inclusion of vehicle detection to enable bus priority. Assumes requirement for access and egress signals on all approach arms (except Julia Avenue due to low traffic flows) and introduction of signals on circulatory.	• Reduced delay on eastbound approach • Enhanced ped/cycle crossing facilities over Jockey Lane • Potential competitive advantage for buses through junction	**£230k**	Adjustment to signal timings prior to stadium events to increase green time for eastbound traffic along Jockey Lane. Active management of local network through variable message signage and officials (see section 7.5).	• Increased capacity to accommodate stadium flows • Ensure stadium traffic separated from retail flows	Not costed	• Requirement to avoid 'over engineered' solution that further increases vehicle dominance to deterrent of pedestrians/cyclists
	VA14	Investigate required scope for improvements at **Malton Road/Heworth Green** roundabout to maximise throughput through junction. Signalisation of Heworth Green, Malton Road and Heworth Road approaches likely to constitute possible option, although constrained widths/sensitive location requires micro-model testing to clarify suitability.	• Reduce forecast outbound delay on Heworth Green approach and prioritise PT movements through junction	**£54k** (assuming signalisation of three approaches)	Variable message signage beyond outer ring road on main routes approaching city to encourage stadium access via the A64 or A1237	• Deter use of Malton Road corridor for vehicular access to stadium	Not costed	• Constrained widths and sensitive residential location restricts scope for significant capacity improvements
	VA15	Provision of additional capacity at **Hopgrove Interchange** to cater for significant increased demand between Malton Road and A64 north and south. Given Highways Agency requirements to mitigate all forecast flows, scoping of suitable measures necessitates active engagement with the Agency to determine acceptable intervention.	• Cater for significant increased demand between Malton Road and the A64 north and south, avoiding detriment to A1237 approach	To be confirmed through discussions with the Highways Agency	Adjustment to signal timings prior to stadium events to increase green time for inbound traffic from A64 approaches. Variable message signage on both A64 approaches to encourage stadium access via Malton Road, with potential to divert traffic via A1237/Monks Cross Link in response to changing car park occupancy.	• Cater for further significant increases in demand, including accommodation of 120 additional away fan car trips (when playing teams from the south, west or east coast)	To be confirmed through discussions with the Highways Agency	• Acceptability of proposals to Highways Agency • Significant adjustment to recently installed layout likely to be contentious
	VA16	Introduction of UTMC/CCTV cameras at key junctions across the local road network for purposes of traffic control and public safety. Locations (four in total) to include Monks Cross Link/A1237 roundabout, Monks Cross Drive/Jockey Lane roundabout, Jockey Lane/Malton Road roundabout and Heworth Green/Malton Road roundabout.	• Enables optimisation of traffic management at key junctions • Assists in crime prevention and public safety	**£100k** (excludes required commuted payment towards future maintenance)	Appropriate access to camera resources by the police necessary during stadium events.	• Assists in crowd control and public safety during stadium events	Not costed	• Required coordination of resources between CYC and the police • Conflicting demands on cameras (traffic control and crime prevention) during stadium events

Appendix F


Site B
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