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Local Plans CSRM

Cambridge and South Cambridgeshire Local Plans Transport Report

Cambridge City Council, Cambridgeshire County Council, South Cambridgeshire District Council

27 November 2015

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Table of contents

Tables

Figures

1. Executive summary

Introduction

1.1. This report outlines the work undertaken by Atkins to investigate the transport implications of a range of development options, as well as the preferred development strategy for Cambridge and South Cambridgeshire Local Plans to 2031. These strategies have been tested in the Cambridge Sub Regional Model (CSRM).

1.2. Local planning authorities are required to undertake an assessment of the transport implications in developing or reviewing their Local Plan so that a robust transport evidence base is developed to support the preparation and / or review of that Plan. The purpose of this transport evidence base is to demonstrate the soundness of the Local Plan and the associated development strategy.

1.3. This transport evidence base identifies the opportunities for encouraging a shift to more sustainable transport usage, where reasonable to do so, and highlights the infrastructure requirements to deliver growth. It provides an assessment of the transport impacts of both existing development as well as that proposed, and models the impact of transport measures that mitigate against the impact of growth. It must also comply with the National Planning Policy Framework (NPPF) and National Planning Policy Guidance (NPPG).

1.4. The outcome could include assessing where alternative allocations or mitigation measures would improve the sustainability, viability and deliverability of proposed land allocations (including individual sites) provided these are compliant with national policy as a whole.

1.5. This modelling work has been carried out in three phases as described below. Phases 1 to 3 were first undertaken in 2013 (with additional updates and sensitivity testing in early 2015 as a result of issues raised during the Local Plan Examination), Phases 2 and 3 have been re-run following the suspension of the Local Plan Examination in May 2015, to address points raised by the Inspectors (phase 2) and reflect changes proposed to the submission Local Plans (phase 3). This report describes the whole process from 2013, but when discussing the results of phases 2 and 3, refers to the re-runs in 2015.

1.6. In phases 2 and 3, model tests were carried out initially assuming only committed transport investment is undertaken (including upgrading the A14 and Cambridge North station). Further tests investigated the improvements which could be made by using a focused series of transport improvements. The measures tested included improvements to the A428 from Caxton Gibbet to the Black Cat roundabout, access controls on the Cambridge Ring Road, a major increase in cycle provision, bus priority measures and busways, additional Park & Ride sites, and improvements to rail services.

Forecast Traffic Growth

1.7. The most recent DfT traffic forecasts for the East of England predict 2010 to 2030 traffic growth in the range of 30-33% in a ‘central’ economic case, and 36-41% with high economic growth. The most comparable results from the CSRM modelling predict overall growth in Cambridge and South Cambridgeshire of around 35% from 2011 to 2031. These local forecasts are therefore in line with the DfT’s own predictions.

1.8. In the peak periods, both districts are forecast to have lower traffic growth, brought about at least partly by capacity constraints and increased congestion. Cambridge will have a 27% growth in the AM peak hour (8am-9am) rising to 42% in the inter-peak (2pm-3pm). South Cambridgeshire is likely to experience higher average traffic growth than Cambridge but still lower than the wider Cambridge sub region with figures of 31% in the AM peak and 42% in the inter-peak periods as people either move around within South Cambridgeshire for employment and services or use Cambridge as their main destination for these trips.

Phases of Modelling

1.9. **Phase 1**: Seven different scenarios were tested based on the sites identified in the Councils Local Plan Issues and Options reports**,** including the current committed level of development (planning permissions and sites allocated in current local plans). These scenarios sequentially increased the total development, allowing the impact of varying levels of future housing at different stage of the development sequence to be tested. The results showed that increasing traffic levels occur in the Cambridge area in all available strategies.

1.10. In the Phase 1 tests, it was found that focusing development in and around Cambridge would lead to lower growth in car trips per dwelling than development in rural areas or new settlements[1]. However, the majority of the total trips in the area are pre-determined by the distribution of existing and currently planned development. This means that the TOTAL car mode share varies much less: only by approximately 1% between options in Phase 1.

1.11. **Phase 2:** in 2013 detailed tests were carried out on short-listed strategic options:

1. Village focused development in South Cambridgeshire;
2. A new town north of Waterbeach; and
3. Development at Bourn Airfield.

1.12. These tests allowed the different development focuses to be compared, including the potential for mitigation of transport impacts. They also considered full housing numbers anticipated at new settlements, rather than the amount of development anticipated to be completed by 2031.

1.13. After the suspension of the Local Plan Examination in May 2015, it was decided that the Phase 2 tests should be re-run and expanded to cover additional options for development focusing on major developments in areas on the edge of Cambridge (currently in the Green Belt). Accordingly, Phase 2 was re-run with the original three options tested in 2013 (as noted above), and four additional options for green belt development. The four radial Green Belt options tested were:

4. A west radial comprising development on Barton Road;
5. A combined south and north-east radial for developments adjacent to Hauxton Road and Trumpington Road and Horningsea Road in the north east of the City;
6. A south east radial for development off Babraham Road; and
7. A combined radial scenario covering all of these together.

1.14. The Phase 2 tests allowed the different development focuses to be compared, including the potential for mitigation of transport impacts. As before, the results demonstrated that amongst the original options, the dispersed village development option is less preferable than new settlements in terms of car mode share of new trips generated. This reflects the improved access to public transport and greater internalisation that can be achieved in larger developments. The concentrated impacts of car trips on specific corridors can be more easily addressed through focused mitigation measures.

1.15. The edge of Cambridge options tested all have a high active mode share and lower car mode shares for trips from the sites themselves, as might be expected due to the proximity to the City and the provision of sustainable infrastructure. This confirms one of the expected advantages of development on the edge of the City.

1.16. However, when considering overall car mode share and traffic growth in Cambridge and South Cambridgeshire from the total level of development considered, the net benefit from these options is less apparent. All options tested indicate overall traffic growth of a similar order, and very significant growth in delay and congestion across the two districts. The transport measures proposed and tested in each case are successful in reducing traffic levels and congestion, but in

[1] The Phase 1 scenario with Cambridge fringe developments generated 6% fewer additional car trips per additional dwelling than the scenario assuming only village extensions, when considering the total change in car trips across both Districts in each case.

all options levels of delay will rise by over 80% in South Cambridgeshire, and will more than double in Cambridge.

1.17. **Phase 3:** In the final phase, the Proposed Submission Local Plan scenarios for South Cambridgeshire and Cambridge (the Preferred Strategy) were tested together with an enhanced package of transport mitigations. These transport mitigation measures were developed in cooperation with Cambridgeshire County Council.

1.18. As with phase 2, a re-run of phase 3 has been undertaken in 2015 following the suspension of the Local Plan Examination, to reflect modifications proposed to the Local Plans. The results are reported in this modelling report. The Transport Strategy measures proposed have a beneficial impact on travel behaviour in the two districts. These measures directly cause non-car trips into Cambridge to grow at double the rate they would otherwise be expected to (26% compared with 13%). The growth in car trips into Cambridge is reduced by 11% in the AM peak. The measures have the added impact of reducing the total trips into Cambridge making the City more accessible overall. This clearly shows that the Transport Strategy improves trips by public transport, cycling and walking.

Conclusions

- The Local Plan Strategies should pursue focused rather than dispersed development;
- Development locations should maximise sustainable travel alternatives to the car, particularly by providing high quality public transport;
- Such public transport routes need to be able to bypass queues and congestion to offer reliable and swift journey times both to the identified growth areas to improve options for residents in existing villages and settlements as well as for the new developments; and
- The Transport Strategy will help to make the City and key destinations more accessible and should reduce the amount of car growth to and from the City.

1.19. This work has therefore demonstrated that the proposed Local Plan and Transport Strategy should have a beneficial effect overall. The development strategy chosen by providing further housing will assist in minimising in-commuting, which is a major driver of future traffic growth. The focus on new settlements will provide opportunities to further minimise traffic growth through use of sustainable travel modes and internalisation of trips.

2. Background and context

Background

2.1. The Cambridge area is a success story. It is one of the best performing economic areas in the country, with globally renowned research and high tech and biotech clusters. This makes Cambridge and South Cambridgeshire popular places to live and work. The area is expected to continue to experience high levels of jobs, housing and population growth.

2.2. However, with such success come challenges, not least on the transport network. Despite figures from the 2011 Census showing that the proportion of people using private cars or vans to travel to work has dropped in both Cambridge and South Cambridgeshire, congestion on some parts of the network has worsened. In peak periods, parts of the network frequently operate at or near capacity. In addition, many people, especially in rural South Cambridgeshire find it difficult to access the services they need, because of the lack of transport options available to them. The challenge ahead is to address current problems on our network whilst at the same time using the network more efficiently to accommodate new trips.

2.3. Cambridge City Council and South Cambridgeshire District Council submitted Local Plans for adoption in 2014 which set out the expected number of new jobs and homes for the area and this document should be read alongside them to appreciate the full context of the strategy. For the period between 2011 and 2031 around 33,000 new homes are proposed to be built in and around the city and in South Cambridgeshire to help accommodate the 44,000 new jobs projected for the area. Note that the proposed modifications increase this to 33,500 new homes.

2.4. The Local Plans have regard to national policies contained in the National Planning Policy Framework. In compliance with that policy, they take account of the evidenced need for development to cater for forecast demographic changes and economic activity.

2.5. The plans for Cambridge and South Cambridgeshire also take account of the ability of existing infrastructure, including transport, to cope with growth, and the ability to provide new infrastructure to serve the development.

2.6. Economic growth in Cambridge and South Cambridgeshire is projected to continue, and job growth in the area remains strong. The attractiveness of the area as a place to live combined with this growth has led, over the years, to high house prices and to many people who work in the area being unable to afford to live in the area. Housing allocations contained in the Local Plans will go some way to rebalancing local supply and demand.

2.7. Transport is one of the critical factors in deciding where growth should occur. Previous experience suggests that with economic growth continuing, failure to provide new homes in the area will lead to greater levels of travel in Cambridge and South Cambridgeshire as people from outside the area travel through to access new jobs. If growth is to occur in the area, the transport network must be capable of dealing with it sustainably.

2.8. In recent years Cambridge and South Cambridgeshire have been very successful in keeping traffic levels stable. Department for Transport data shows that between 2001 and 2008, traffic grew roughly in line with the growth in population, but decreased slightly between 2008 and 2011.

2.9. Modelling work to date has demonstrated that the Transport Strategy would have a beneficial effect, by helping to reduce some of the predicted car traffic growth. It would also mitigate some of the implications of this growth through increasing the modal shift and number of non-car trips within the area. However, despite these improvements there will be a growth in car traffic and further demand management and smarter travel measures will be necessary to help reduce car growth even further.

2.10. The Greater Cambridge City Deal provides additional funding for transport improvements to support growth. The Greater Cambridge City Deal aims to ensure that the success of the area

continues by investing in the transport infrastructure, housing and skills needed to see future economic growth. The first £100m of funding is being made available for transport improvements in the five years from April 2015, with a further two tranches of £200m apiece to be released in 2020 and in 2025 subject to growth targets being achieved.

2.11. The priorities for the first tranche of City Deal have been identified, and schemes are currently being developed in more detail and undergoing consultation.

2.12. In order to find the right transport solutions to support planned growth, a range of growth strategies have been tested with and without transport measures to determine which approach would deliver growth most sustainably.

Purpose of this report

2.13. This report provides transport evidence to underpin the Cambridge and South Cambridgeshire Local Plans. The report provides an overview of the detailed assessment of the seven growth strategies considered by the Plans, and is one element of the detailed evidence base which has been used to help make a recommendation for the preferred strategy.

2.14. The report assesses the transport impacts of both existing development as well as proposed development to 2031. It provides a high level review of the detailed modelling that has been undertaken since 2013 on the Local Plan development options. More detailed technical work can be found in the appendices, including the compliance with the NPPG.

2.15. Significant transport evidence was prepared during the Local Plan issues and options process as the Local Plans were developed. This included consideration of the transport impacts of development of different strategy options, as well as the preferred strategy that was eventually included in the Local Plans.

2.16. The Inspectors examining the Cambridge and South Cambridgeshire Local Plans issued a letter on 20 May 2015 outlining preliminary conclusions following the joint hearings, which included hearings related to transport.

2.17. The Local Plan Examination Inspectors' Preliminary Conclusions[2] (20 May 2015) sought to ensure that the sustainability implications of different development strategy options had been fully considered, including comparisons of strategy options which include development on the edge of Cambridge. It also stated that if development is to be directed to new settlements rather than the edge of the urban area, that the challenges of making such development as sustainable as possible have been addressed, in particular infrastructure requirements and sustainable transport options.

2.18. This Report provides information on the transport evidence prepared prior to submission of the Local Plans, but provides additional evidence to address the issues raised by the Inspectors. New modelling has been carried out to compare strategies focusing development on the edge of Cambridge with strategies focusing on new settlements. This includes consideration of the transport mitigation measures that would be required.

2.19. In addition, the Councils have considered a range of evidence and are proposing modifications to the development strategy included in the Local Plans. The transport impacts of these modifications have been tested.

[2] Inspectors' Preliminary Conclusions (letter of 20 May 2015)
https://www.scambs.gov.uk/sites/www.scambs.gov.uk/files/documents/Letter%20from%20Inspectors%20to%20Councils%20-%20Preliminary%20Conclusions%20200515.pdf

Report structure

2.20. This report is structured as follows:

- Chapter 2 – provides background and context to the Local Plan development process, confirms geographical coverage, and identifies policy compliance. This section explains the transport assessment process to date, how it was used, and what it showed.
- Chapter 3 – provides an overview of the policy context which both supports and is aligned with the Local Plans.
- Chapter 4 – reviews existing land use and transport provision in Cambridge and South Cambridgeshire.
- Chapter 5 – presents the updated modelling results from testing the performance of the various land use scenarios that were considered in the first and second incremental phases of analysis that has been undertaken since 2013.
- Chapter 6 – presents the updated results from the third phase of modelling that tested the preferred strategy scenario.
- Chapter 7 – provides a summary and conclusion.
- Appendices which add details to the chapters are provided at the end of the report. The appendices include an assessment of compliance with Planning Policy Guidance, details from previous modelling summary reports, details of the support measures includes in the land use scenario testing, and relevant transport policies and Local Plan policies.

Geographical coverage

2.21. Modelling was undertaken using the Cambridge Sub-Regional Model (CSRM) through to 2031. The CSRM's geographic coverage includes Cambridge; South Cambridgeshire; East Cambridgeshire; and Huntingdonshire.

2.22. While the focus of the modelling is on Cambridge and South Cambridgeshire, it also considers traffic movements from East Cambridgeshire and Huntingdonshire as well as patterns from the wider hinterland of the Cambridge sub-region and beyond.

Overview of the Local Plan Process

Brief history of local plan process

2.23. The Councils commenced the formal stages of plan review in 2012. Issues and Options consultations were undertaken in summer 2012, and spring 2013 (including a joint consultation on the development strategy and approach to the edge of Cambridge). Alongside the consultation process, the councils were preparing and refining the evidence base to support the plans, which includes the transport evidence detailed in this report.

2.24. On 28 March 2014, the Cambridge and South Cambridgeshire Local Plans and supporting documents were submitted for independent examination to the Secretary of State for Communities and Local Government via the Planning Inspectorate. A series of Examination hearings took place between November 2014 and April 2015.

2.25. The Inspectors examining the Cambridge and South Cambridgeshire Local Plans issued a letter on 20 May 2015 outlining preliminary conclusions following the joint hearings and further work required to support the Local Plans.

2.26. The councils responded to this letter on 30 June 2015 proposing suspending the examination process until February 2016 to allow further work to be undertaken.

Transport Strategy for Cambridge and South Cambridgeshire 2014 and Local Transport Plan 2015

2.27. The Transport Strategy for Cambridge and South Cambridgeshire 2014 and the Cambridgeshire Local Transport Plan 2015 were prepared in parallel with the local plans, and were informed by the modelling, design and testing of mitigation measures which supported local plan development.

2.28. This strategy has two main roles:

- It provides a detailed policy framework and programme of schemes for the area, addressing current problems, and is consistent with the Cambridgeshire Local Transport Plan 2011-31. It is part of how the Council manages and develops the local transport network of the County as a whole; and
- It supports the Cambridge and South Cambridgeshire Local Plans, and takes account of future levels of growth in the area. It details the transport infrastructure and services necessary to deliver this growth.

2.29. The strategy contains details of the major schemes proposed in the short, medium and longer term. The programme will be regularly reviewed given the extent of growth and development in the area.

2.30. The Transport Strategy considers all modes of transport used for local trips, including trips on the trunk road and motorway network managed by the Highways England, and the rail network managed by Network Rail. It takes account the jobs and housing growth planned in Cambridge, South Cambridgeshire and in surrounding Districts in the period to 2031 and identifies interventions to provide for the transport demands of that growth. The Transport Strategy also supports interventions that will minimise the need to travel.

2.31. The Local Transport Plan has been updated from the original LTP3 that was submitted to Government in 2011. There are a number of factors contributing to the decision to refresh the LTP, including, but not limited to

- To reflect the longer timescales for the Local Planning Authorities' emerging Local Plans to 2031 (2036 in Huntingdonshire), and to provide support for future planned development and the growth agenda more widely.
- To incorporate the new Transport Strategy for Cambridge and South Cambridgeshire. This strategy was adopted as a daughter document to LTP3 in March 2014.
- To incorporate the LTP3 Implementation Plan into the County Council's detailed Transport Delivery Plan from April 2015; and
- To reflect the current funding environment for transport schemes (that has changed considerably since 2011).

2.32. Further details about the Transport Strategy and the Local Transport Plan can be found in chapter 2.

Cambridge Sub-Regional Model (CSRM)

2.33. The CSRM[3] has been used to model the transport impacts of development strategy options and the preferred strategy for the two Local Plans. The use of such modelling is recommended in the Governments Planning Practice Guidance[4].

2.34. The CSRM allows stand-alone testing of road, public transport, cycle, walk schemes, standard economic benefit tests using the highway and demand model with fixed trip ends, as well as

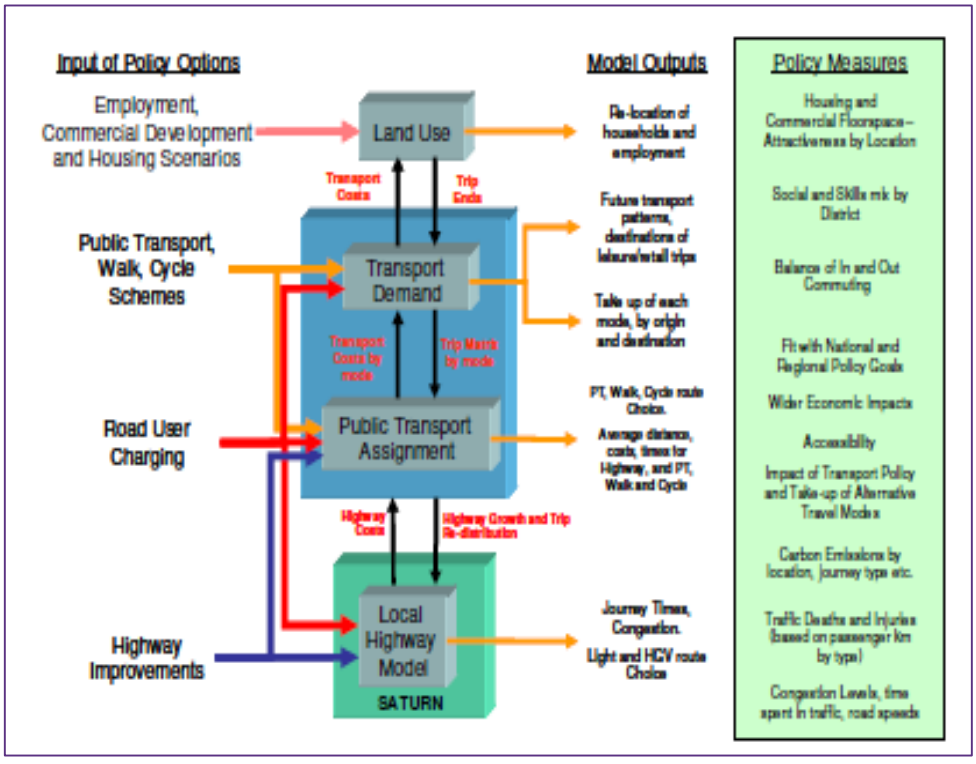
[3] https://www.scambs.gov.uk/local-plan-examination-statements-matter-7
[4] http://planningguidance.planningportal.gov.uk/blog/guidance/transport-evidence-bases-in-plan-making/transport-evidence-bases-in-plan-making-guidance/

complex tests of strategic policy options incorporating land use responses. The essential features of the CSRM are shown in Figure 2-1**.** Essential features of CSRM model structure are:

- A linked land use model to generate trip ends from forecast planning data and travel accessibilities.
- A detailed Transport Demand Model (TDM), as described in this report, using WSP's MEPLAN software. It includes traveller responses including choice of mode / sub-mode, change of (macro) time day of travel, and trip redistribution among destinations. Travellers are segmented by income, trip purpose and car ownership. This model is compliant with current Department for Transport guidance for variable demand modelling including the assessment of road pricing schemes.
- A public transport, walk and cycle assignment sub-model (PT-Walk-Cycle) also implemented in MEPLAN.
- A highway assignment sub-model (LHM) using Atkins' SATURN software for light and heavy good vehicle (HGV) assignment, described in detail in a separate report.

In addition to road-pricing, highway infrastructure and public transport schemes, the CSRM modelling tool is designed to address effectively a variety of policy options, as represented by Figure 2-1.

Figure 2-1 Input of policy options with CSRM



2.35. This report provides an overview of how CSRM has been used in Local Plan development to test strategic development options and to help arrive at the preferred option, and to help identify and refine transport mitigation measures.

Overview of current process

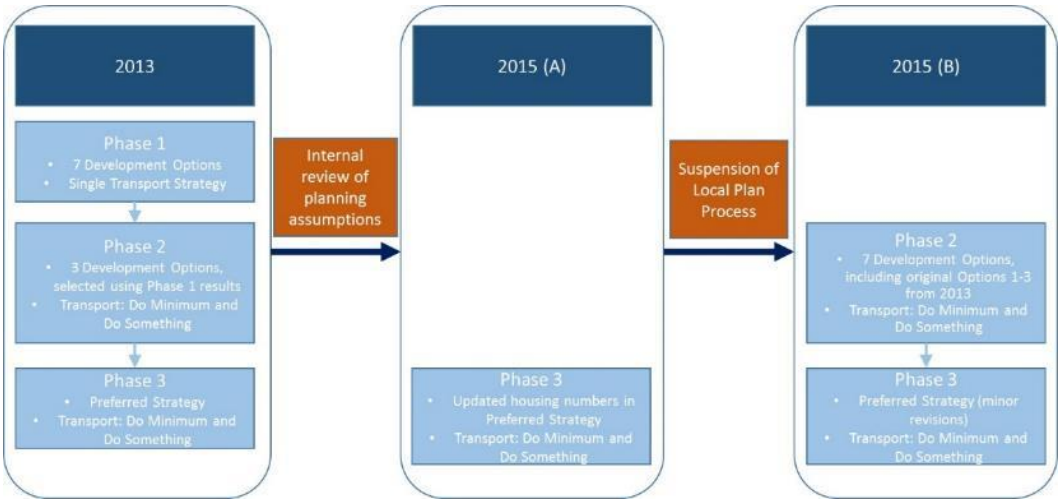
2.36. In 2012 transport modelling work was commissioned to inform the emerging Cambridge and South Cambridgeshire Local Plans, and the Transport Strategy for Cambridge and South Cambridgeshire. This modelling work was undertaken in three phases, reflecting the transition from broad options at the start of the plan making process, to the testing of preferred options.

2.37. This iterative approach, becoming more detailed though later stages of the plan making process reflects the National Planning Practice Guidance, which refers to carrying out transport

assessment work at each stage of plan making, but becoming more refined and detailed as the process draws to a conclusion[5].

2.38. Modelling runs were used to test and consider transport mitigation measures, to help inform measures eventually included in the draft local plans and the transport strategy, to maximise benefits and ensure a sustainable strategy. This was reported in the Modelling Report for Cambridge and South Cambridgeshire Local Plans[6].

Figure 2-2 Overview of modelling runs, phases, and assumptions



2.39. This modelling undertaken at each stage was as follows (see Figure 2-2).

2.40. The initial modelling was undertaken from Autumn 2012 to Summer 2013, as follows:

2013 Modelling:

- Phase 1 (Autumn 2012): Seven different scenarios were tested based on the sites in the Issues and Options consultation, including the current committed level of development (planning permissions and sites allocated in current local plans). These scenarios sequentially increased the total development, allowing the impact of varying levels of future housing at different stages of the development sequence to be tested.
- Phase 2 (Spring 2013): Detailed tests were carried out on short-listed strategic options: village focused development in South Cambridgeshire, development at Bourn Airfield and a new town at Waterbeach. These tests allowed the different development focuses to be compared, including the potential for mitigation of transport impacts. Each option was tested first without additional transport measures (the Do Minimum), and then with site specific transport measures and other strategic transport improvements in place (the Do Something). By this point the decision had been taken that major new development on the edge of Cambridge should be a rejected option, so further modelling of this option was not carried out.
- Phase 3 (Spring 2013): Preferred Local Plan Strategies: In the final phase, the Proposed Submission Local Plan scenarios for South Cambridgeshire and Cambridge were tested together with an enhanced package of transport mitigations (see Appendix B). Transport mitigation measures used in the transport modelling reflect those developed for the emerging TSCSC, designed by CCC to address significant known transport issues, and anticipate measures which would be needed to support future growth. As for Phase 2, this development option was tested first without additional transport measures, and then with the transport strategy and appropriate site-specific measures in place. This work was documented in the

[5] National Planning Practice Guidance Paragraph: 004 Reference ID: 54-004-20141010
[6] Modelling Report for Cambridge and South Cambridgeshire Local Plans. (RD/Strat/160)

CSRM Modelling Summary Report for Cambridge and South Cambridgeshire Local Plans (July 2013)[7].

2.41. During the Examination in Spring 2015 two further runs of the model were carried out to address issues arising during discussions (2015(A) in Figure 2-2):

- Two additional model runs of the Phase 3 stage were completed. The first tested the situation if Caxton to Black Cat improvements on the A428 were not included, and this resulted in minimal impacts on the major development proposals compared to the scenarios where improvements were included[8]. The second considered a variation to the housing numbers, particularly to take count of windfalls and minor changes to the development sites included in the Submitted Plans since the phase 3 model was run. This information was reported in a revised modelling report[9].

2.42. During the evidence presented during Main Matter 7 (transport) of the examination, the Inspector asked the Councils and the participants to meet and agree a Statement of Common Ground (SoCG)[10] about the transport modelling produced. A meeting occurred in April 2015 and the predominant outcome of it was a number of further requests for information on the modelling work undertaken. While much of this is now included in the main narrative of this report, a separate appendix will be produced providing further information specifically to address issues raised (see Reference document RD/MC/071 - CSRM Technical Modelling Summary Report for Cambridge and South Cambridgeshire Local Plans - Supplementary Technical Note November 2015 relating to Matter 7 Statement of Common Ground).

2.43. In response to the Inspector's Preliminary conclusions, the Councils commissioned additional transport evidence, including new model runs for both Phase 2 and 3 (2015(B) in Figure 2-2).

Summer 2015 Modelling - 2015(B):

- Review the Phase 2 model runs, which compared strategy options, to include options which incorporate major development options on the edge of Cambridge in the Green Belt in addition to the original 3 options tested in 2013. This work supersedes the previous Phase 2 tests and is reported in this document.
- In addition, a re-run of phase 3 has been completed, to review the transport implications of proposed modifications to the Local Plans, consideration of which was informed by the updated phase 2 runs.

[7] Modelling Report for Cambridge and South Cambridgeshire Local Plans. (RD/Strat/160)
[8] Cambridge Local Plan and South Cambridgeshire Local Plan Matter 7: Transport Update on Transport Modelling M7/CCC & SCDC – SUPPLEMENT 2
[9] CSRM Modelling Summary Report for Cambridge and South Cambridgeshire Local Plans – July 2013 UPDATE MARCH 2015 (RD/Strat/161)
[10] The Statement of Common Ground Report, which is a separate work-steam and will be added to the Core Documents Library subject to the agreement from the Inspectors.

3. Policy context

Introduction

3.1. This section provides a brief overview of the relevant national and local policy relating to this study, which has influenced the development of the transport evidence. This includes a review of policy at national, regional and local levels relating to walking, cycling, public transport, private car and planning issues. In particular, this section presents measures and policies which influence the development of future transport programmes and objectives in the Cambridge area.

National Policy

Government White Papers

3.2. In July 1998 the Government published the Integrated Transport White Paper: A New Deal for Transport: Better for Everyone. This White Paper marked an important strengthening of the transport aspects of the planning system. It contained proposals for new and revised planning policy guidance PPG13, which refers to land use and transport. It also promoted the increased use of sustainable transport to help deliver new developments.

3.3. More recently, Creating Growth, Cutting Carbon (2011) White Paper set a vision for a transport system that is an engine for economic growth, and one which is greener and safer. It stated that by improving transport links and targeting projects that promote green growth, a dynamic, low carbon economy could be created.

DfT Circular 02/2013 'The Strategic Road Network and the Delivery of Sustainable Development'

3.4. This document sets out the way in which Highways England, at that time Highways Agency, will engage with communities and the development industry to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the strategic road network.

3.5. The document stated that development proposals are likely to be acceptable if they can be accommodated within the existing capacity of a section (link or junction) of the strategic road network, or they do not increase demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed. However, development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

3.6. The document goes on to state that overall forecast demand should be compared to the ability of the existing network to accommodate traffic over a period up to ten years after the date of registration of a planning application or the end of the relevant Local Plan whichever is the greater (the review period).

3.7. Highways England expects the promoters of development to put forward initiatives that manage down the traffic impact of proposals to support the promotion of sustainable transport and the development of accessible sites. This is particularly necessary where the potential impact is on sections of the strategic road network that could experience capacity problems in the short or medium term.

National Planning Policy Framework

3.8. The National Planning Policy Framework (NPPF), replaces previous Planning Policy Statements (PPSs) and Planning Policy Guidance (PPGs), and sets out aims to make the planning system less complex and more accessible, and to promote sustainable growth.

3.9. It sets out the Government's economic, environmental and social planning policies for England which, taken together, articulate the Government's vision of sustainable development, which should be interpreted and applied locally to meet local aspirations.

3.10. The NPPF introduces 12 core planning principles, in summary these suggest that planning should:

- Be genuinely plan-led. This should include providing a practical framework within which decisions on planning applications can be made with a high degree of predictability and efficiency;
- Be a creative exercise in finding ways to improve the places where people live;
- Drive and support sustainable economic development;
- Seek to secure high quality design and a good standard of amenity;
- Take account of the different roles and character of different areas;
- Support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change;
- Contribute to conserving and enhancing the natural environment and reducing pollution;
- Encourage the effective use of land by reusing land that has been previously developed;
- Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas;
- Conserve heritage assets in a manner appropriate to their significance;
- Actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable; and
- Take account of and support local strategies to improve health, social and cultural wellbeing.

3.11. The NPPF states that transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas.

3.12. The NPPF has retained the use of Transport Statements and Transport Assessments, and states that all developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment.

3.13. Planning decisions should take account of whether:

- The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;
- Safe and suitable access to the site can be achieved for all people; and
- Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

3.14. This last point indicates that a refusal of planning permission on transport grounds will only be defendable if there are severe adverse impacts arising from the development.

3.15. The NPPF advises that developments should be located and designed where practical to:

- Accommodate the efficient delivery of goods and supplies;
- Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;
- Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;
- Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and
- Consider the needs of people with disabilities by all modes of transport.

3.16. Planning policies should aim for a balance of land uses within their area so that people can be encouraged to minimise journey lengths for employment, shopping, leisure, education and other activities.

3.17. NPPF states that for larger scale residential developments in particular, planning policies should promote a mix of uses in order to provide opportunities to undertake day-to-day activities including work on site. Where practical, particularly within large-scale developments, key facilities such as primary schools and local shops should be located within walking distance of most properties.

National Planning Practice Guidance (NPPG)

3.18. The NPPG provides practice guidance on how the NPPF should be implemented. The 'Transport evidence bases in plan making' section was added to the NPPG on 10 October 2014, after the original modelling report which accompanied the submitted plans was completed. Nevertheless, the process undertaken is considered to reflect that described in the NPPG. Appendix A of this report expands on this NPPG compliance further and builds on the Councils matter statement response during the examination, prior to its suspension[11].

3.19. The NPPG describes the need for Local Plans to be supported by an assessment of their transport implications, identifying opportunities to shift towards usage of sustainable transport modes. It includes consideration of alternative strategies and mitigation measures, developing more detailed proposals as plans move form options towards preferred strategies.

3.20. Further information on how this report addresses the practice recommended in the NPPG is included in Appendix A of this report.

Local Policy

Greater Cambridge and Greater Peterborough Local Enterprise Partnership (LEP)

3.21. The LEP has set five priority work streams one of which is "advocating and influencing improvements to our area's transport infrastructure" to help it meet its wider vision of driving forward sustainable economic growth in the area.

3.22. The LEP's Strategic Economic Plan prioritises the planned A14 improvement as essential to delivering continued growth in the areas, and it identifies the A428 as one of a number of key corridors that need improving to enhance growth opportunities and connectivity with Milton Keynes, Oxford, Luton & Bedford and the East Coast Ports.

Cambridge Local Plan 2014: Proposed Submission

3.23. The Cambridge Local Plan has a high-level vision developed from a range of existing strategies and through consultations and feedback from stakeholders. It is designed to help clarify the kind of city Cambridge wants to be in 2031. The vision takes account of the aspirations identified in the Cambridge Local Plan 2006 and through an iterative process has reviewed them against the experience of delivering that vision, and the issues relevant to Cambridge today.

3.24. The plan replaces the Cambridge Local Plan 2006 and sets out policies and proposals for future development and spatial planning requirements to 2031.

3.25. The vision for Cambridge is based on a number of important factors which can be abridged to:

"…a compact, dynamic city, located within the high quality landscape setting of the Cambridge Green Belt…..Cambridge's new development will be innovative and will promote the use of sustainable modes of transport, helping to support the transition to a more environmentally sustainable and successful low carbon economy…The Cambridge Local Plan 2014 seeks to

[11](MM7a iii - https://www.cambridge.gov.uk/sites/default/files/documents/M7%20-%20CCC%20-%20SCDC.pdf)

guide and facilitate growth and the infrastructure required to support development, so that the city grows in a sensitive and sustainable manner".

3.26. The plan sets 15 strategic objectives based around:

- An environmentally sustainable city;
- Highly water efficient;
- High quality in terms of design excellence and innovation;
- Positive management of change in the historic environment;
- Protect and enhance the quality of the city's skyline;
- Protect and enhance the landscape setting of the city;
- Protect and enhance the city's biodiversity;
- Meet the housing needs of the city and its sub-region;
- Create and maintain inclusive, environmentally sustainable communities;
- Promote and support economic growth in environmentally sustainable and accessible locations;
- Support vibrant and thriving centres;
- Promote social cohesion, sustainability and a high quality of life;
- Minimise the distance people need to travel;
- Ensure appropriate and timely provision of environmentally sustainable forms of infrastructure; and
- Promote a safe and healthy environment.

3.27. Further details of relevant policies can be found in Appendix F.

South Cambridgeshire Local Plan Proposed Submission (2011 – 2031)

3.28. The Proposed Submission Local Plan for South Cambridgeshire updates and replaces the South Cambridgeshire Local Development Framework which was adopted between January 2007 and January 2010 and covered the period up to 2016. The draft Local Plan's policies and proposals cover the period 2011 to 2031.

3.29. The Plan aims to strike the right balance between growth and conservation. It is about making sure that jobs are created, and new homes are built in the right areas, and that all transport needs are considered and people have a choice about where to live so they do not have to rely on cars for all of their journeys.

3.30. The vision for the Local Plan is:

'South Cambridgeshire will continue to be the best place to live, work and study in the country. Our district will demonstrate impressive and sustainable economic growth. Our residents will have a superb quality of life in an exceptionally beautiful, rural and green environment.'

3.31. The Local Plan sets the levels of employment and housing development that should be provided over the plan period to best meet the needs of the area and establish a clear strategy for meeting development needs in the most sustainable way that protects the quality of life of existing and future residents.

3.32. Its policies aim to ensure that development is of high quality and will meet the challenges we face with an ageing population and changing climate. It will ensure that new development comes with the necessary schools, health facilities, shops, leisure facilities and open spaces that residents need to provide a good quality of life.

3.33. The Local Plan sets a strong framework for new development to meet the needs of the area and provide a clear statement for local residents, businesses, service providers and the development industry of what they can expect to happen in terms of change in the built and natural environment over the next couple of decades.

3.34. Underpinning the Plan is the Government's commitment to sustainable development. The Local Plan's development and other proposals aim to meet the 3 overarching principles of sustainability:

- Economic – contributing to building a strong, responsive and competitive economy by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;
- Social – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural wellbeing; and
- Environmental – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, prudent use of natural resources, minimising waste and pollution, and mitigating and adapting to climate change including moving to a low carbon economy.

3.35. Further details of relevant policies can be found in Appendix F.

Local Transport Plan 3[12]

3.36. Cambridgeshire's Third Local Transport Plan (LTP3) covers the period 2011-2031.

3.37. The LTP demonstrates how the policies and plans for transport will contribute towards the County Council's vision: *Creating communities where people want to live and work: now and in the future.*

3.38. The LTP3 document addresses the County Councils priorities. These are:

- Supporting and protecting people when they need it most;
- Helping people to live independent and healthy lives in their communities; and
- Developing our local economy for the benefit of all.

3.39. The plan is an evolution of LTP2 and it takes forward that plans focussed strategic objectives:

1. Enabling people to thrive, achieve their potential and improve quality of life;
2. Supporting and protecting vulnerable people;
3. Managing and delivering the growth and development of sustainable communities;
4. Promoting improved skills levels and economic prosperity across the county, helping people into jobs and encouraging enterprise; and
5. Meeting the challenges of climate change and enhancing the natural environment.

3.40. The LTP3 recognises the challenges faced by the transport system in delivering planned growth to 2031 and sets eight strategies including, but not limited to improving journey times and maximising the capacity and efficiency of the transport network; reducing the length of the commute and the need to travel by private car; and making sustainable modes a viable alternative to the private car.

3.41. The plan establishes eight challenges which are derived from the problems and issues facing the county. Of these eight challenges, the following are particularly relevant to this work:

- Challenge 1: Improving the reliability of journey times by managing demand for road space, where appropriate and maximising the capacity and efficiency of the existing network.
- Challenge 2: Reducing the length of the commute and the need to travel by private car.
- Challenge 3: Making sustainable modes of transport a viable and attractive alternative to the private car.
- Challenge 7: Protecting and enhancing the natural environment by minimising the environmental impact of transport.

[12] http://www.cambridgeshire.gov.uk/info/20006/travel_roads_and_parking/66/transport_plans_and_policies

- Challenge 8: Influencing national and local decisions on land-use and transport planning that impact on routes through Cambridgeshire.

3.42. There are a range of major transport schemes that are needed to address current problems and provide for economic growth, informed by the policy basis in this document. From the portfolio of major schemes in the plan, of particular relevance to the local planning process are:

- A14 Cambridge to Huntingdon improvement scheme (Highways England);
- A428 Black Cat to Caxton Gibbet improvement (Highways England);
- Cambridge North Station (Network Rail);
- Cambridge Science Park Station busway access;
- A10 Foxton level crossing; and
- Chisholm Trail cycle route.

Long Term Transport Strategy[13]

3.43. The Long Term Transport Strategy (LTTS) for Cambridgeshire examines at a strategic level, the implications of the growth proposed for the whole of Cambridgeshire including that within and on the edge of Cambridge.

3.44. The LTTS established a vision whereby the people of Cambridgeshire will benefit from an integrated transport network which enables efficient and reliable travel between key destinations in support of a thriving local economy. This would be achieved by a high quality passenger transport network of rail, guided bus and bus services will enable efficient journeys between Cambridge, Peterborough, the Market towns and district centres in and around Cambridgeshire. This network will prioritise passenger transport on key corridors and link up with community transport connections to access more rural areas. This will be fed by a comprehensive system of long distance cycle / pedestrian routes connecting key destinations.

3.45. This strategy identifies the major infrastructure requirements that are needed to address existing problems and capacity constraints on Cambridgeshire's transport network, and the further infrastructure that is required to cater for the transport demand associated with planned growth.

3.46. Across the county, major growth is planned in the period to 2031, with over 72,000 new dwellings needed to simply meet the predicted demand for housing for current and new residents of the area. The economy of the south of the county, and in particular the area around Cambridge is dynamic and plays on an international stage. Major transport investment is needed to support growth, maintain the competitive advantage that the clusters of high-tech industries in around the city have over competing clusters around the world, and to maintain the quality of life that draws these industries and their employees to the Cambridge area.

3.47. The strategy also identifies the investment that is needed by government and its agencies on the nationally managed, trunk road, motorway and rail networks. Improvements on these networks are critical to the ongoing economic success of Cambridgeshire. Improvements to the A14 are now in the Highways Agencies programme, but further commitment is needed to vital improvements to the A47, A428 and A1. Rail growth in the county has been marked over the past decade, and opportunities to significantly improve north-south and east-west rail links are identified in this strategy. It is pleasing to note that the rail industry is proactively progressing major improvements, but there are numerous further opportunities that should be taken.

3.48. The objectives of the strategy are:

- To ensure that the transport network supports sustainable growth and continued economic prosperity;
- To improve accessibility to employment and key services;
- To encourage sustainable alternatives to the private car, including rail, bus, guided bus, walking and cycling, car sharing and low emission vehicles;
- To encourage healthy and active travel, supporting improved well-being;

[13] http://www.cambridgeshire.gov.uk/info/20006/travel_roads_and_parking/66/transport_plans_and_policies/5

- To make the most efficient use of the transport network;
- To reduce the need to travel;
- To minimise the impact of transport on the environment; and
- To prioritise investment where it can have the greatest impact.

3.49. Funding of major infrastructure is often challenging. Cambridgeshire has been very successful over the years in bringing in funding from government, developers and other sources to deliver improvements to our transport network. The current funding environment is challenging, but a variety of opportunities do exist, including the Cambridge City Deal which is worth up to £1bn.

Transport Strategy for Cambridge and South Cambridgeshire[14]

3.50. The Transport Strategy for Cambridge and South Cambridgeshire (TSCSC), adopted by Cambridgeshire County Council in March 2014, ensures that local councils plan together for sustainable growth and continued economic prosperity in the area.

3.51. The strategy provides a plan to cope with the rising population and increase in demand on the transport network by shifting people from cars to other means of travel including cycling, walking and public transport. It will support and enable the forecast approximately 44,000 new jobs and 33,000 new homes that will be created in Cambridge and South Cambridgeshire by 2031.

3.52. This strategy has two main roles:

- It provides a detailed policy framework and programme of schemes for the area, addressing current problems, and is consistent with the Local Transport Plan 3.
- It supports the Cambridge and South Cambridgeshire Local Plans, and takes account of future levels of growth in the area. It details the transport infrastructure and services necessary to enable this growth.

3.53. The strategy contains details of the major schemes proposed in the short, medium and longer term, together with a delivery programme that will be reviewed regularly.

3.54. The strategy sets a short term policy objective that bus and guided bus priority measures will be introduced on radial routes and other key links in the bus network where congestion severely impacts on the timeliness and reliability of services.

3.55. In the medium to longer term, there will be comprehensive treatment of routes to give a consistent level of priority along the whole length and road space will be reallocated to buses, cyclists and pedestrians in many areas of the city.

3.56. The key components of the strategy are:

- It states the aim for more journeys to be made by bus, train, cycle and on foot so that traffic levels aren't increased;
- Extra capacity for traffic to travel round the outskirts of Cambridge, so that road space into and across the city can be prioritised for buses, cyclists and pedestrians;
- Additional Park and Ride options on the fringes of Cambridge, to reduce the amount of unnecessary traffic travelling through the city;
- Ensuring public transport, cycling and walking are the best ways of getting around and across the area, since they will be quicker and more convenient than by car;
- Reducing car traffic by using a variety of techniques, which may mean limiting the available road space for cars;
- Enabling people to use public transport for at least some of their journey into Cambridge or surrounding towns, by creating a frequent, quality service across major routes;
- Developing local transport solutions with communities, which link to public transport along key routes;

[14] http://www.cambridgeshire.gov.uk/info/20006/travel_roads_and_parking/66/transport_plans_and_policies/2

- Encourage more people to walk, cycle and use public transport for journeys into, out of and within the city;
- Promote bus routes that connect key economic hubs and link to the new train station at Cambridge North Station;
- Persuade more people to car share; and
- Maintain general traffic at current levels.

Greater Cambridge City Deal

3.57. The Greater Cambridge City Deal was signed by Central Government, Council leaders, businesses and the University of Cambridge and aims to secure hundreds of millions of pounds for the areas of Cambridge and South Cambridgeshire. The Greater Cambridge City Deal aims to ensure that the success of the area continues by investing in the transport infrastructure, housing and skills needed to see future economic growth, with a focus on radial and orbital movements in and around the city, and on key outer radial corridors where housing and jobs growth is planned, including the A10, A428 and A1307. The vision is for a connected city region with reliable journey times, which supports the next wave of the Cambridge phenomenon and increased economic activity in the area.

3.58. The City Deal transport programme is drawn from emerging Local Plans and the Transport Strategy for Cambridge and South Cambridgeshire. It contains transformative transport improvements which will unlock housing and jobs growth, deliver better and reliable journey times, and provide new connections between key employment clusters. Much of the programme focuses on major cycling improvements into and within the city, and the provision of comprehensive public transport corridors from leading employment sites and new developments, into Cambridge. When reaching the edge of the city, the reliability of public transport services, and the quality of cycling provision must continue on to the city centre and other key destinations. Cambridge is an historic city with unique features and a special character. With limited capacity and high levels of congestion on many routes; highly innovative and creative solutions are required to ensure that the city centre can accommodate additional public transport services and passengers, cyclists and pedestrians, while enhancing the unique character of the city and the wider city region. It is vital that the city centre and the city region network operates smartly and efficiently, making better use of new technologies to achieve the City Deal vision.

3.59. City Deal funding is split into three tranches over 15-20 years. The Greater Cambridge region will receive £100m for the first tranche for the period 2015-2019 (£20m per annum). The City Deal Board agreed the tranche 1 programme at the end of January 2015. The programme concentrates on maximising economic and network benefits that will transform the area's transport network.

3.60. The decision taken was based on an assessment of the potential economic benefits of the range of schemes the overall programme derived from an initial EAST[15] assessment and a more detailed appraisal by consultants Cambridge Econometrics and SQW. The Executive Board also took into account recommendations from the Assembly in coming to their decision. The programme on this basis is as follows:

- Milton Road bus priority – £23.04m.
- Madingley Road bus priority – £34.56m.
- Histon Road bus priority – £4.28m.
- A428 to M11 segregated bus route / A428 corridor Park & Ride – £24.48m
- City centre capacity improvements / cross-city cycle improvements – £22.66m.
- A1307 corridor to include bus priority / A1307 additional Park & Ride – £39.00m
- Chisholm Trail cycle links / Chisholm Trail bridge – £8.40m

[15] The Department for Transport's Early Assessment and Sifting Tool

4. Existing land use and transport provision

Introduction

4.1. This section outlines existing land use in the two districts and provides an overview of the current transport network in the area and how it performs[16]. It is necessary to understand the baseline before the impact of planned growth on transport provision in Cambridge and South Cambridgeshire can be assessed.

4.2. This section will consider demand in the area, levels of connectivity and accessibility, how people travel, and how the network performs given the demands placed on it.

Existing land use and economy

4.3. Cambridge and South Cambridgeshire are popular places to live and work with a strong economy and as a result are going through a period of significant change in terms of growth and development, not only these two districts, but more widely as the Cambridge effect has a wider impact across the sub region.

4.4. The Greater Cambridgeshire and Greater Peterborough LEP forecasts:

- 134,000 new jobs by 2024 across a range of sectors;
- 300,000 increase in population by 2031 on top of the 1.37 million resident population in 2011;
- 21% population increase, one of the highest levels of growth across the wider South East; and
- 158,000 new homes planned by local authorities over the next 20 years.

4.5. Cambridge and South Cambridge has a wide range of strengths[17] that attract people to live in the area. These include:

- Internationally renowned universities, combined with a high value R&D cluster;
- A significant hi-tech economy that provides around 19% of employment in the city;
- A substantial tourism industry that generated £351m of expenditure in 2007. Relatively high levels of resident satisfaction in Cambridge as a place to live;
- High levels of educational attainment locally;
- Strong business performance helping to create high jobs density; and
- A significant recent increase in retail floors pace, supporting a growing retail sector

4.6. However, there are also some weaknesses that need to be addressed including, but not limited to:

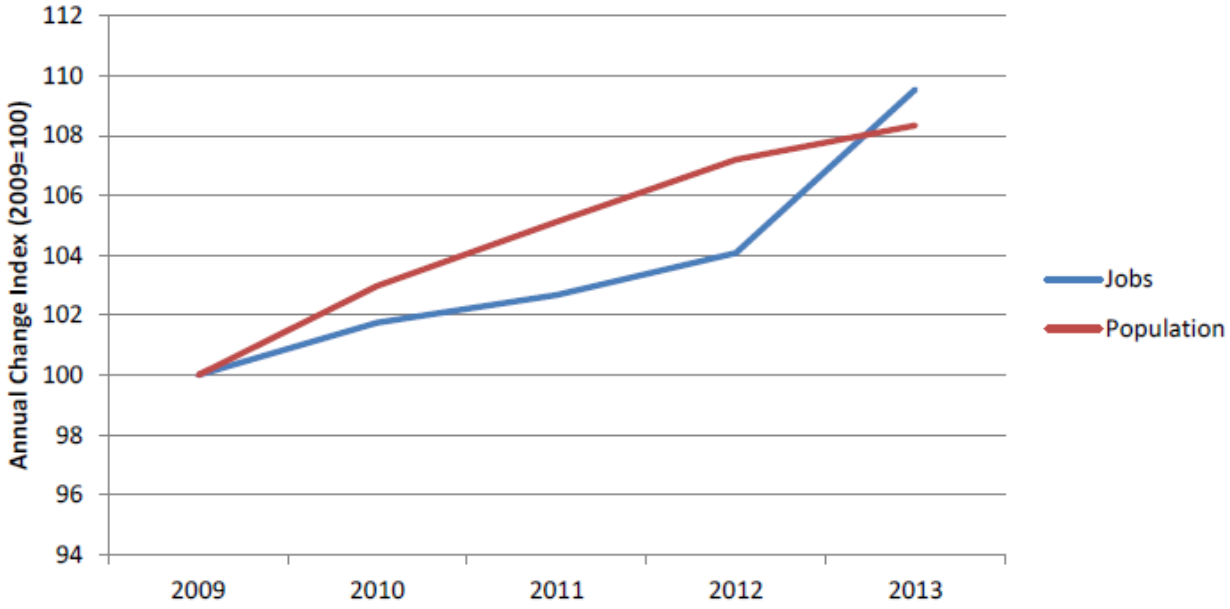
- A high level of in-commuting causes significant levels of congestion within the city; and
- Housing within the city is often unaffordable.

Existing demand / trip generation

4.7. Data shows that Cambridge has experienced significant growth in recent years, in terms of both employment and resident population.

[16] Source: Cambridge Access Study: Access Audit Report, July 2015, Mott MacDonald. http://www.gccitydeal.co.uk/citydeal/info/2/transport/1/transport/10
[17] Source: Cambridgeshire Insights Local Economic Assessment

Figure 4-1 Indexed growth in Cambridge population and employment, 2009 - 2013[18]



4.8. Figure 4-1 shows that growth in jobs has kept pace with the growth in resident population during the recovery from the recession. More recently employment growth has exceeded population growth which suggests that in order to fill these jobs, employers are having to widen the labour pool to outside the city boundary.

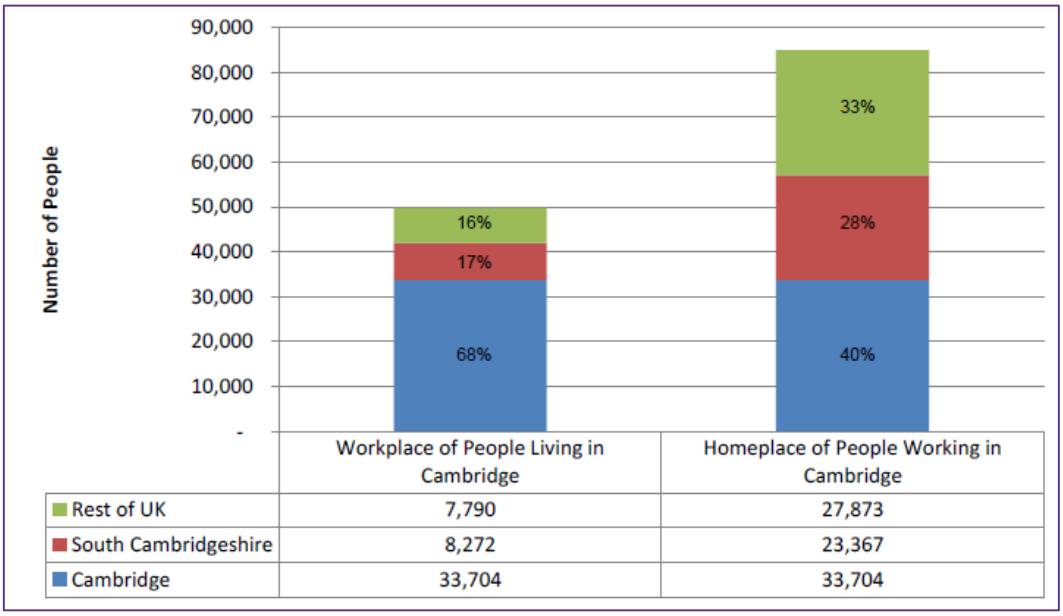
4.9. Figure 4-2 summarises and compares the level and distribution of commuting destinations for Cambridge residents and commuting origins of Cambridge employees.

4.10. It shows that:

- There are about 35% more jobs in Cambridge than there are economically active residents.
- Over two thirds of the city's economically active residents work in Cambridge.
- Just less than two thirds of the city's employees travel in from outside Cambridge, and one third from beyond South Cambridgeshire.
- There is significant in-commuting to Cambridge; over three times more people travel into Cambridge for work than travel out of the city for work.

[18] Source: Cambridge Access Study, Access Audit Report, July 2015, Mott MacDonald.

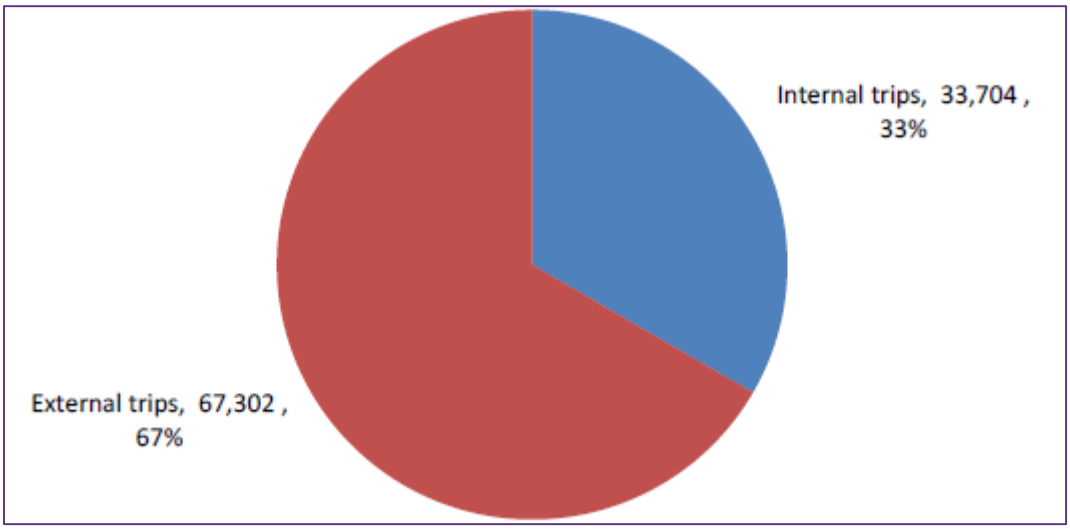
Figure 4-2 Workplace and home distribution of Cambridge residents and employees[19]



	Workplace of People Living in Cambridge	Homeplace of People Working in Cambridge
Rest of UK	7,790	27,873
South Cambridgeshire	8,272	23,367
Cambridge	33,704	33,704

4.11. The pie chart at Figure 4-3 shows that a significant proportion of commuter trips (67%) in the city either start or finish outside the city boundary.

Figure 4-3 Trip distribution in Cambridge by origin



4.12. The 2007/08 Cambridgeshire TIF study showed that over 60% of peak hour journeys into Cambridge are for work (40%) and education (19% university, 7% school).

4.13. The main commuting destinations for trips are:

- Central areas including the city centre, railway station, and retail parks along Newmarket Road;
- Main outlying clusters of the Cambridge Science Park, Biomedical Campus (including Addenbrooke's Hospital), and Vision Park.
- University destinations mainly to the west and south west of the city centre.

[19] Source: Cambridge Access Study, Access Audit Report, July 2015, Mott MacDonald. Using 2011 Census data.

Connectivity

4.14. While the previous section reviewed the distribution of demand for trips into Cambridge, this section provides an overview of the transport network that allows these trips to take place.

Bus network

4.15. Cambridge is served by a city wide network (Citibus), longer distance services including the Guided Busway, and national coach services.

4.16. The Citibus network connects to most areas of the city providing local and interurban services in and around Cambridge. Higher frequency services serve the main radial routes in the city and to some villages mainly just outside the city boundary. Service frequency is more limited away from radial routes, to the west of the city, on orbital routes, and to other urban centres or more rural locations.

4.17. The Guided Busway links Trumpington P&R with Huntingdon via Addenbrooke's Hospital, Cambridge Station, city centre, Histon, Longstanton, Swavesey, and St Ives. It also serves the location of the proposed new settlement of Northstowe. The section between Trumpington and Cambridge Station, and between Chesterton and St Ives is predominantly by guideway ensuring buses are separated from general traffic.

4.18. The city operates five Park & Ride locations sited at Babraham Road, Madingley Road, Milton, Newmarket Road, and Trumpington. The objective of these services is to pick up the high number of trips to the city that originate from outside the city boundary and encourage onward travel by bus. Service frequencies are high with 10 minute frequencies Monday to Saturday, and 15 minutes on Sunday.

4.19. The main bus interchanges in Cambridge are Emmanuel Street and Drummer Street bus station, alongside locations at the Grafton Centre and Cambridge rail station.

4.20. Stagecoach is the main bus operator in the city through its Citibus network. Other operators for longer distance services, including on The Busway. Each operator maintains its own pricing structure, but multi-operator fares are available with restrictions.

4.21. Bus fleets tend to meet current accessibility standards, and buses operating on The Busway have a higher level of specification with leather seats and Wi-Fi.

4.22. The majority of long distance coach services operate from Parkside, approximately 400m south or 5 minute walk from Drummer Street Station. There are also drop-off points on Trumpington Road and Chesterton Road in the city.

4.23. Recent work by Cambridgeshire County Council as part of developing schemes for City Deal shows that it is working to deliver other High Quality Public Transport (HQPT) corridors to the city with levels of service and quality similar to The Busway.

4.24. Bus patronage in Cambridgeshire increased by 61% between 2001 and 2008, with a 100% increase in Cambridge and between 2011/12 and 2012/13 an additional 209,113 passenger journeys were made across Busway and Park & Ride services. By 2014, 3.6 million passenger journeys per annum were being made on the Busway, which means that the busway has already reached its projected levels of use in advance of Northstowe being built out, . However, bus trips account for a relatively low share of travel throughout the county compared to that of private cars.

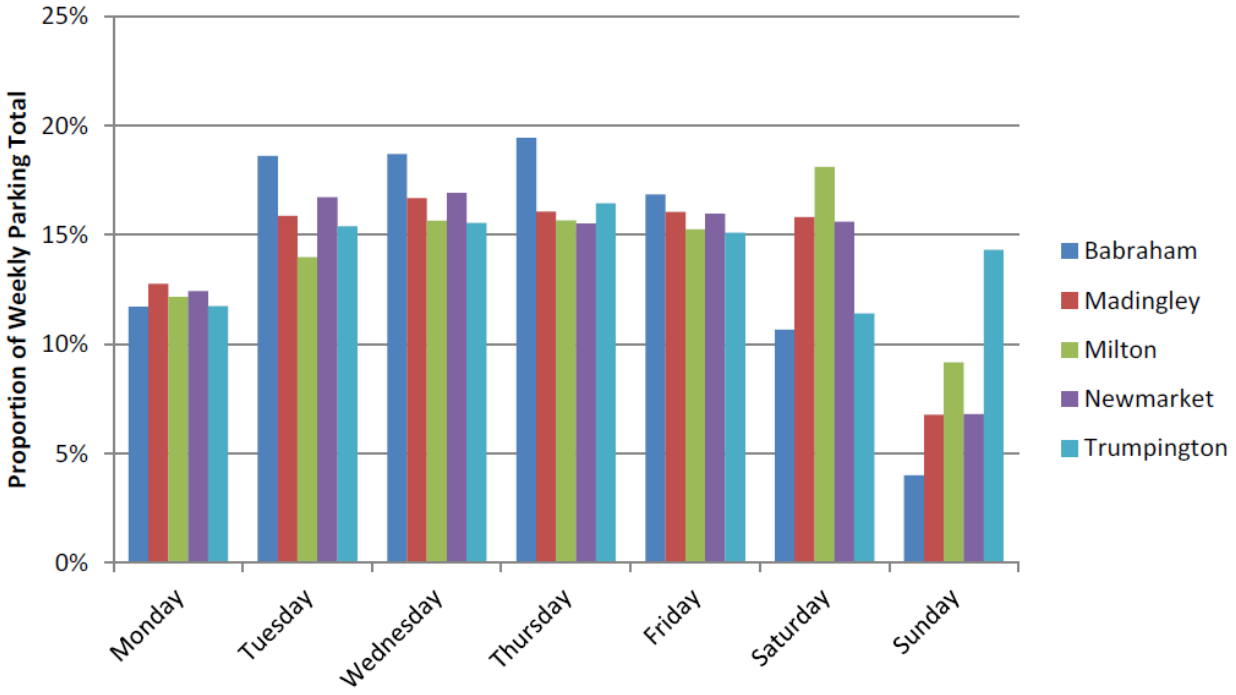
Park and Ride

4.25. There are seven Park & Ride sites which provide access to Cambridge city centre by bus; five in the city and two on The Busway. All the Park & Ride sites offer high quality cycle parking. For the five city based Park & Ride sites, the Cambridge Access Study found the following:

- Based on the number of vehicles parked in May 2015, the Trumpington site has the greatest demand, with Milton having the lowest;

- Weekday demand is lowest on Monday (see Figure 4-4);
- Saturday usage is high suggesting demand from shoppers;
- Parking duration is highest during weekdays suggesting demand is predominantly from commuters; and
- Data shows monthly two way passenger flows on two way Park & Ride us services dell between January 2014 and April 2015, which coincides with the introduction of a parking fee in addition to the bus fare.

Figure 4-4 Cambridge P&R weekly parking demand profile, May 2015[20]



4.26. The popularity of the scheme means some Park & Ride sites are now operating close to capacity; the Transport Strategy for Cambridge and South Cambridgeshire plans to expand or relocate some of the existing sites. Additionally, the County Council is developing proposals for new sites targeted at those using the key radial routes into Cambridge.

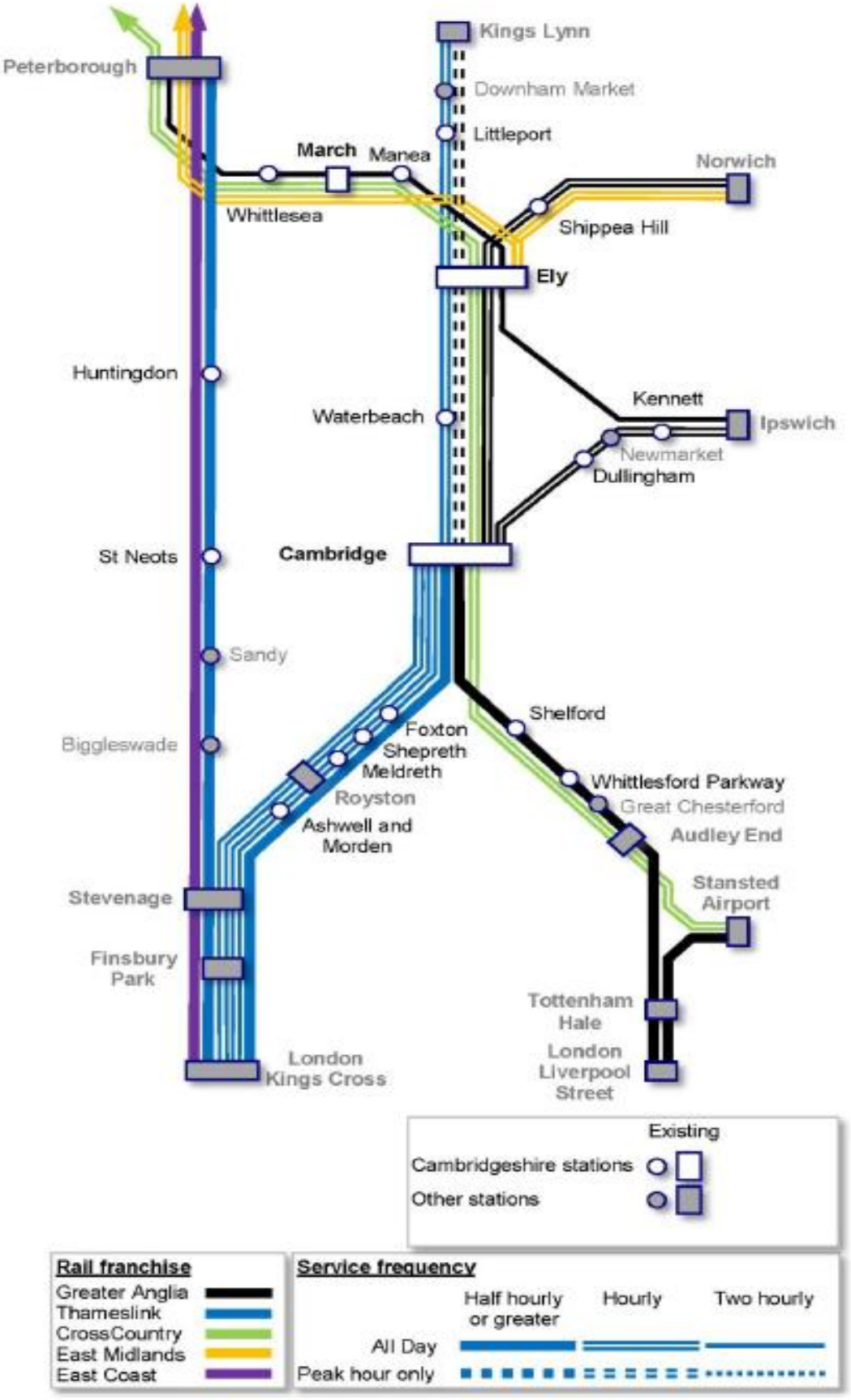
Rail network

4.27. Cambridge station is situated to the south of the city, and provides service to London Liverpool Street on the West Anglia Main Line and to London Kings Cross via the Cambridge Line and East Coast Main Line. The lines connect to a variety of locations including Kings Lynn and East Anglia, the Midlands and north via Peterborough, and Stansted Airport.

4.28. More locally, services connect Cambridge to Waterbeach to the north of the city, Foxton and Meldreth to the south west and Shelford and Whittlesford to the south. Figure 4-5 shows rail services in the county as of 2012.

[20] Source: Cambridge Access Study. Access Audit Report, July 2015.

Figure 4-5 Current rail services in Cambridgeshire (2012)



4.29. In September 2015 the County Council gave its approval for a new station to the north of Cambridge Station at Chesterton sidings which will link to The Busway and will provide links to Cambridge Science Park and other sites in the north of the city.

4.30. Cambridge Station is a key interchange in the city, approximately 1.7km from the main bus interchange at Drummer Street. It is served by The Busway, Citi services, and services to P&R sites at Babraham and Milton.

4.31. Data provided by the Office of Rail and Road, formerly the Office of the Rail Regulator, shows that the combined number of entries and exits at Cambridge station have increased from 5.2 million (2001/02) to 9.8 million (2013/14), which is clearly indicative of how popular commuting to Cambridge by rail has over time.

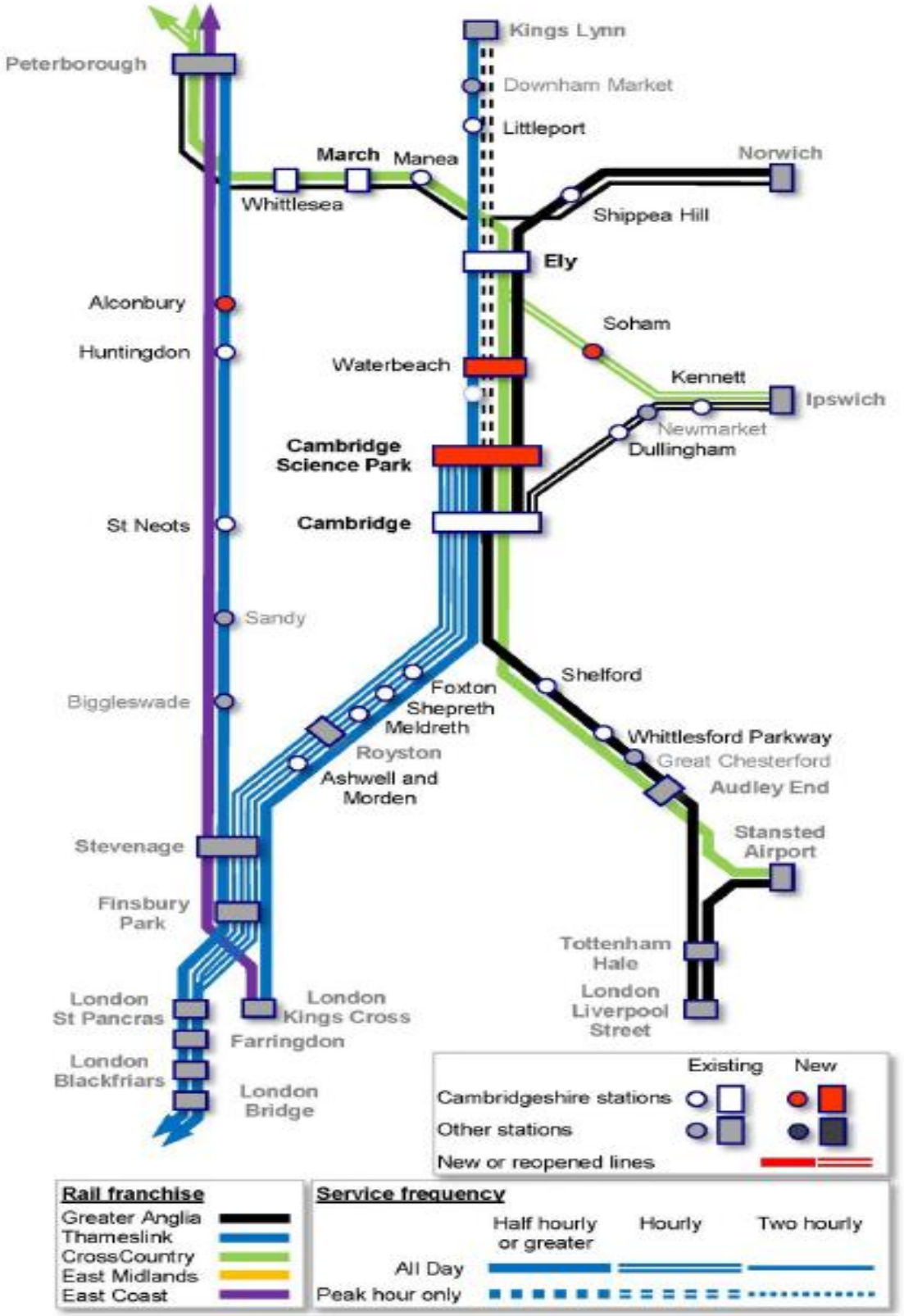
4.32. The TSCSC outlines a number of proposed measures targeted at providing increased capacity and more frequent rail services. These include the following infrastructure upgrades:

- Capacity improvements in the Ely area.
- Power supply upgrade to allow more electrically powered services to concurrently use the Cambridge to Ely and Kings Lynn route north of Milton.
- Platform lengthening at stations may be needed on the Hitchin to Cambridge and Kings Lynn route, including in Cambridgeshire:
  - Ashwell and Morden.
  - Meldreth.
  - Shepreth.
  - Foxton.
  - Waterbeach.
  - Ely (only if required for 10 car Inter City Express trains).
  - Littleport.
- Double tracking or passing loops on the route between Cambridge and Newmarket.
- Electrification of the Ely to Norwich and Cambridge to Newmarket routes.

4.33.

4.34. Figure 4-6 shows planned rail service improvements and new stations.

Figure 4-6 Planned rail service improvements and stations[21]



[21] Source: Transport Strategy for Cambridge and South Cambridgeshire

Sustainable modes

Cycling and Walking

4.35. Cycling is a very popular mode of transport in Cambridge which is relatively flat and encourages cycling. The city has an extensive cycle network (see Figure 4-8) with on-road and off-road, shared and segregated cycle routes, for example, along the main radial routes into the city, and more are being delivered. This mixture of infrastructure results in a very permeable city for cyclists which, during peak times, can be the quickest form of transport in the city. A good example of this is the cycle track alongside The Busway, which has seen the number of people cycling along the northern section of the Busway almost double since it has opened, as Table 4-1 shows:

Table 4-1 Total pedal cycles using the Busway (north section) between 7am and 7pm between 2011 (opening year) and 2014

Year	Total Cyclists (both directions)
2011	724
2012	766
2013	1,091
2014	1,426

4.36. The city provides a range of cycle parking locations, but the sheer number of cyclists in the city means demand for cycle parking exceeds supply.

4.37. Cambridge in particular has strong walking networks with new facilities having been implemented since 2001 to make walking easier for example, through wayfinding, and safer for example, by improving and implementing crossing facilities across the network.

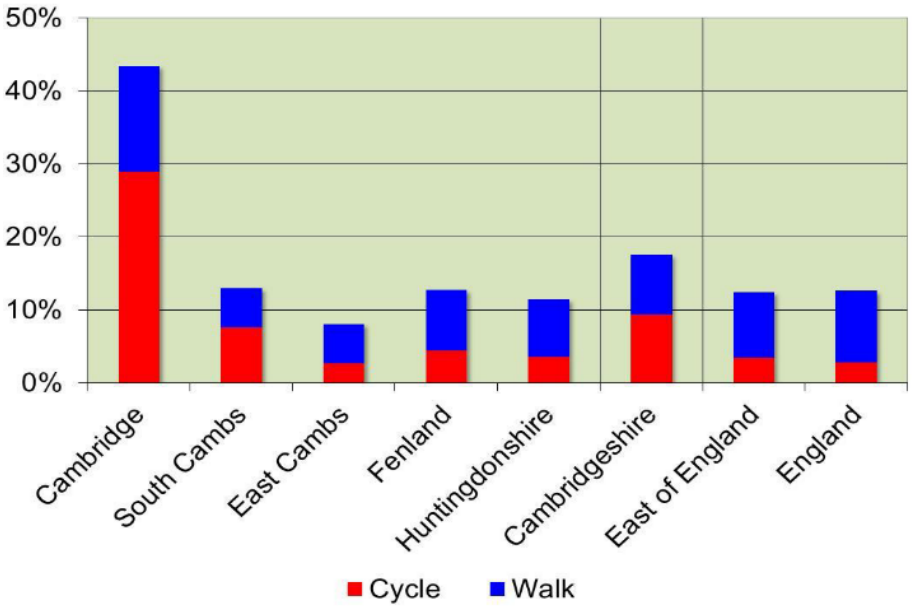
4.38. Cambridgeshire's Traffic Monitoring Report 2014 shows that there was a 17% increase in cycle trips in 2014 compared with 2013, and that there has been significant growth of 55.6% from the 2004-05 average baseline.

4.39. South Cambridgeshire is the 9th best performing district in terms of proportion of the population who regularly cycle[22], and indeed more journeys to work are undertaken by cycle that than in any other rural district in the country[23].

Figure 4-7 shows how this has helped to push Cambridgeshire to the top of the national walking and cycling statistics.

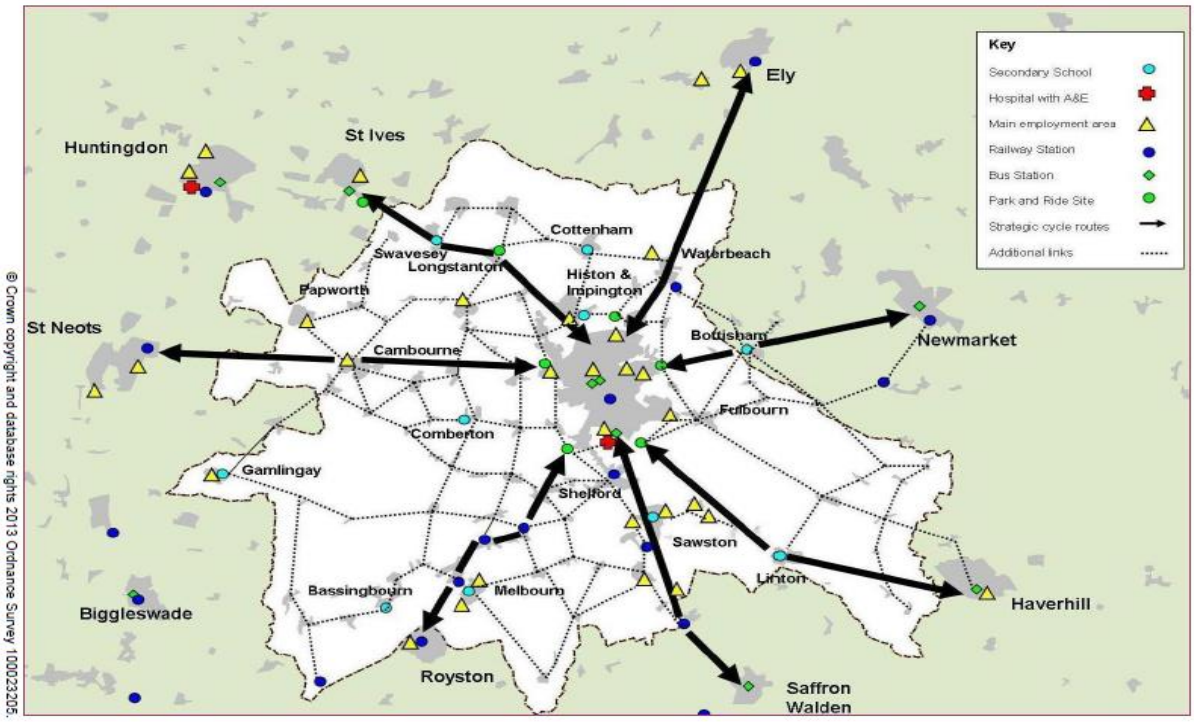
[22] See CTC Cycling Statistics http://www.ctc.org.uk/resources/ctc-cycling-statistics
[23] Cambridgeshire Local Transport Plan 2011-2031 (LTP3 Refresh) Adopted November 2014 (RD/T/093) Page 4-47

Figure 4-7 Levels of walking and cycling in Cambridgeshire[24]



4.40. Walking and cycling is not just about providing a journey benefit, but also has wider implications. These include fewer cars on the road leading to reduced congestion, reduced emissions from motor vehicles, and health and fitness benefits to cyclists if routes can be delivered at locations away from traffic. These modes also promote inclusivity, and can be appropriate for longer distance journeys if supported by the provision of good quality facilities such as the cycle track alongside The Busway.

Figure 4-8 Cycle network - indicative main network in South Cambridgeshire25

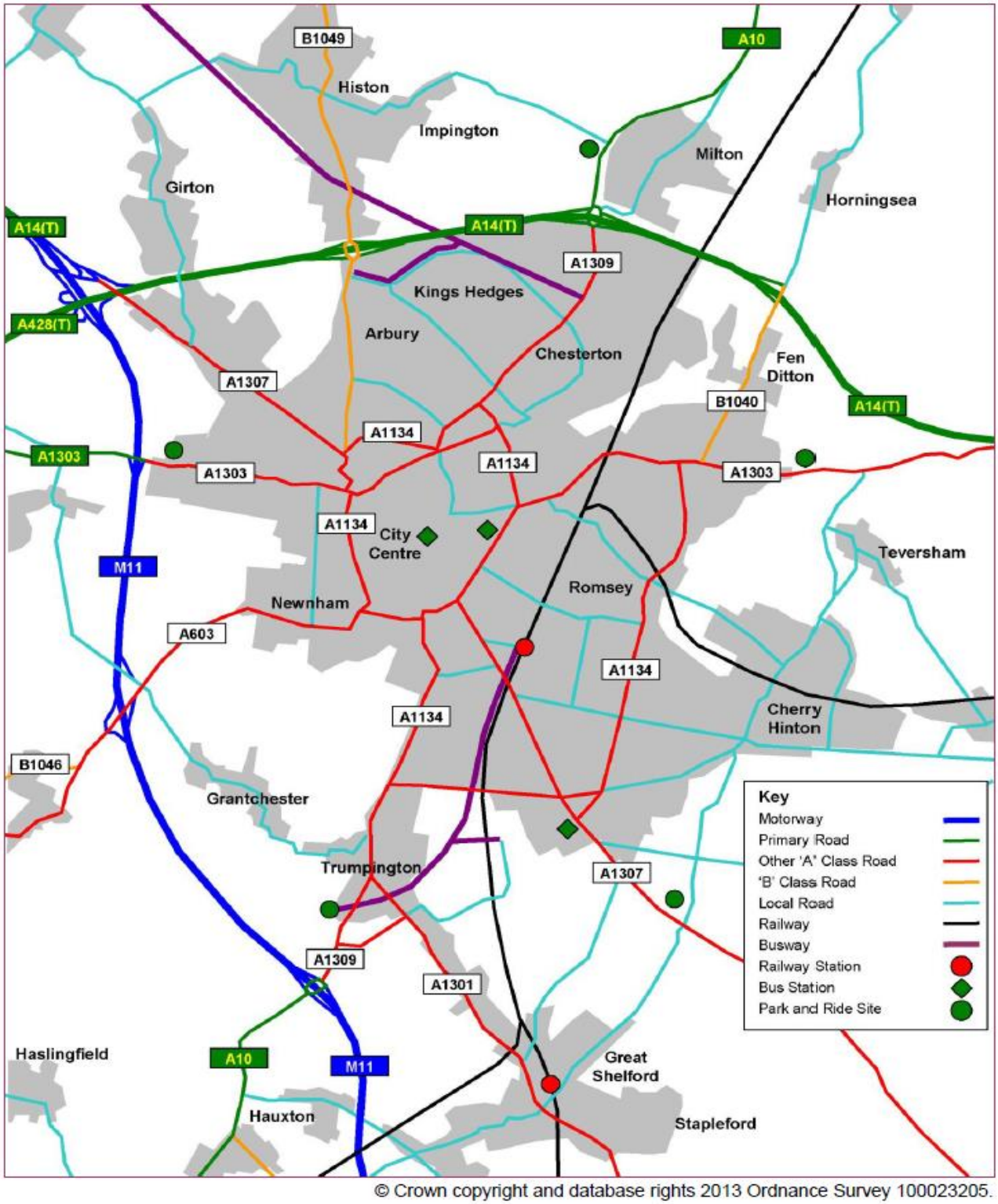


[24] The Local Transport Plan 3
[25] Source: Transport Strategy for Cambridge and South Cambridgeshire

Highway network

4.41. Cambridge has good connections to the Strategic Road Network through the M11, A11, A14 and A428. These are complemented by the local road network throughout Cambridgeshire, but which focuses on Cambridge though a variety of radial routes which connect centres of population with employment key destinations. Figure 4-9 is network map of road (rail and busway) in Cambridge.

Figure 4-9 Road, rail and busway networks in Cambridge



4.42. Cambridgeshire's Traffic Monitoring Report 2014 shows that The A14 remains the busiest road in the county, with an average annual daily flow of over 86,000 vehicles between Dry Drayton and Cambridge. The highest growth since 2002 on trunk roads within the County has occurred on the A428 (25%), related to the development of Cambourne. Traffic density on Cambridgeshire's rural trunk 'A' roads is almost twice the national average, and is 40% above average on other rural 'A' roads.

4.43. In Cambridge in 2014, there were just over 200,000 motor vehicles entering and leaving per 12-hour day (7am to 7pm). This represents an increase of 5% compared with 2013. However, prior to this the long-term trend over the past 17 or 18 years was relatively flat. Therefore it is unclear whether this is an annual fluctuation or a potential future trend.

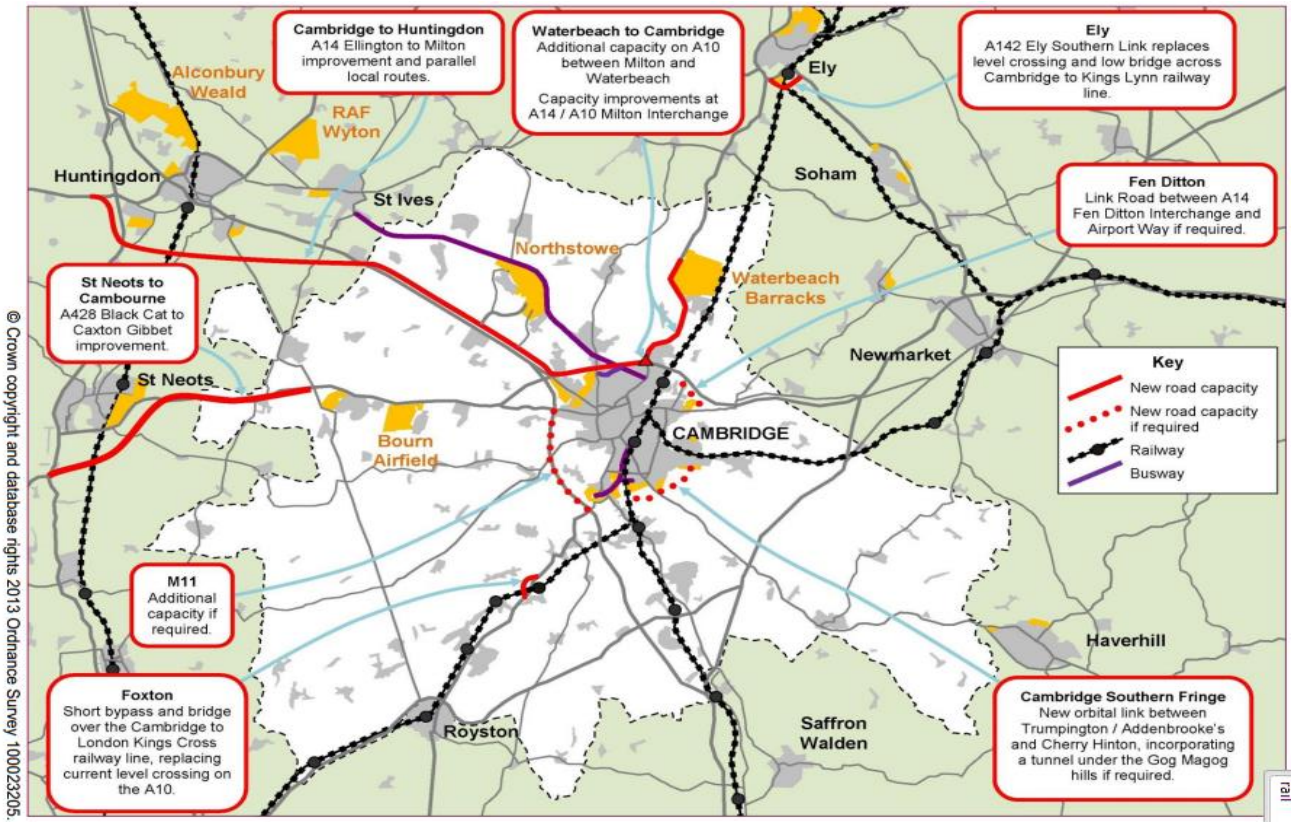
4.44. At just under 60,000, per 12-hour day, the number of motor vehicles crossing the River Cam bridges within Cambridge was 1% less than in 2013 and 15% less than 10 years ago.

4.45. Figure 4-10 details the proposed major interventions included in the TSCSC that are in development or under consideration in and around the strategy area. The measures aimed at providing new road capacity are:

- Additional orbital capacity:
  - A14 Cambridge Northern Bypass
  - M11 between Trumpington and Girton
  - Cambridge Southern Relief Road
  - Fen Ditton Link Road

- Major interventions to increase capacity along existing corridors:
  - A14(T) Cambridge to Huntingdon improvement
  - A428(T) Caxton Gibbet to Black Cat improvement
  - A10 Foxton
  - A10 Milton to Waterbeach and A10/A14 Milton Interchange

Figure 4-10 Major highway improvements



Secured Measures

4.46. The local highways authority, Cambridgeshire County Council, and its district partners have strived hard over time to deliver a transport network that works for the local population providing options for increased sustainable travel, as well as increasing capacity where it is most needed. This has led to considerable gains over time, including but not limited to the following schemes since 2001:

- Major schemes
  - A1198 Papworth Everard bypass
  - A142 Fordham bypass
  - Addenbrooke's Access Road
  - The Busway and parallel cycleway between Cambridge and St Ives
- Expansion of the five Cambridge Park & Ride sites
- Numerous road safety schemes
  - New pedestrian / cyclist crossing on the Sawston Bypass
  - Signalisation of the Mitchams Corner gyratory system in Cambridge
  - Pedestrian and Cycle infrastructure
- New cycle routes / infrastructure
  - Hills Road Bridge, Cambridge
  - A505 cycleway linking to Whittlesford Parkway Station to Granta Park
  - A1307 cycleway linking to Babraham Park & Ride to Wandlebury Country Park
- Expansion of the Cambridge Core Traffic Scheme
- Public transport improvements
  - A new bus station at Addenbrooke's hospital
  - Ongoing programme of bus stop improvements and rollout of real time passenger information countywide
- Improvements to the Rights of Way network
- Travel for Cambridgeshire

4.47. The outcomes of these improvements include:

- Increased bus use across the county;
- Nearly 4 million Park & Ride journeys per year;
- 9% of all journeys made in Cambridgeshire are made by cycle;
- 29% of journeys to work in Cambridge are made by cycle; and
- Reduction in road casualties.

Summary

4.48. The Cambridgeshire economy, which is focused on the opportunities offered by Cambridge and the surrounding area, is a key driver for not only the local economy, but also for the national economy attracting significant levels of investment.

4.49. Economic growth can only be delivered in combination with new jobs and new homes to house people who want to live, work, and be educated in the area. Both the current and new residents of the districts must have provision for sustainable forms of transport in order to access work and key services.

4.50. Delivery of transport measures in Cambridge has been successful in managing demand for car based travel, delivering opportunities for increased use of sustainable modes, and delivering strong growth.

4.51. It is vitally important to the future economic growth of the area that this considerable momentum in delivery is maintained, and that transport measures support the delivery of sustainable economic growth.

5. Planned growth – testing land use scenarios

Introduction

5.1. This section of the report summarises and discusses the modelling work undertaken to support the Local Plan making process. Modelling and testing was initially undertaken in three phases in 2012 and 2013, with further modelling undertaken in spring 2015 as a result of issues identified during the Local Plan Examination process.

5.2. The Local Plan Examination Inspectors' Preliminary Conclusions[26] (20 May 2015) sought to ensure that the sustainability implications of different development strategy options had been fully considered, including comparisons of strategy options including development on the edge of Cambridge. It also stated that if development is to be directed to new settlements rather than the edge of Cambridge, that the challenges of making such development as sustainable as possible have been addressed, in particular infrastructure requirements and sustainable transport options.

5.3. As a result, a further round of modelling was undertaken in summer 2015 to:

- Provide further comparison with development strategies which focus on the edge of Cambridge (re-run phase 2); and
- To consider the impact of any proposed modifications to the Submitted plans, informed by consideration of the new phase 2 runs (re-run phase 3).

5.4. This report details the whole process, but when discussing the results of phase 2 and 3 modelling, refers to the 2015 re-runs unless noted otherwise.

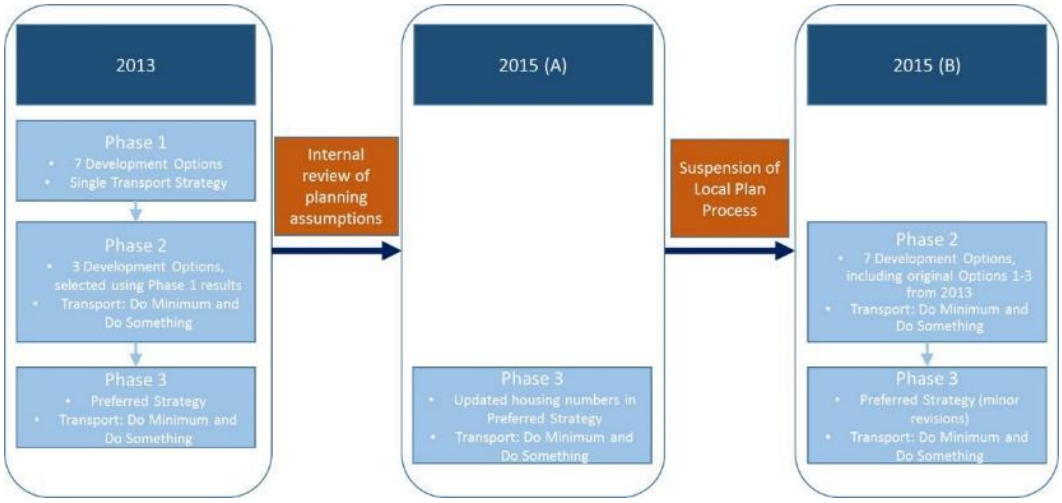
Overview of stages of the Transport Modelling Work

5.5. In 2012 transport modelling work was commissioned to inform the emerging Cambridge and South Cambridgeshire Local Plans, and the Transport Strategy for Cambridge and South Cambridgeshire. This modelling work was undertaken in three phases, reflecting the transition from broad options at the start of the plan making process, to the testing of preferred options. This iterative approach, becoming more detailed though later stages of the plan making process reflects the National Planning Practice Guidance, which refers to carrying out transport assessment work at each stage of plan making, but becoming more refined and detailed as the process draws to a conclusion[27].

5.6. Modelling runs were used to test and consider transport mitigation measures, to help inform measures eventually included in the draft local plans and the transport strategy, to maximise benefits and ensure a sustainable strategy. This was reported in the Modelling Report for Cambridge and South Cambridgeshire Local Plans[28].

[26] Inspectors' Preliminary Conclusions (letter of 20 May 2015)
https://www.scambs.gov.uk/sites/www.scambs.gov.uk/files/documents/Letter%20from%20Inspectors%20to%20Councils%20-%20Preliminary%20Conclusions%20200515.pdf
[27] National Planning Practice Guidance Paragraph: 004 Reference ID: 54-004-20141010
[28] Modelling Report for Cambridge and South Cambridgeshire Local Plans. (RD/Strat/160)

Figure 5-1 Overview of modelling runs, phases, and assumptions



5.7. The modelling undertaken at each stage is shown in Figure 5-1. The initial modelling was undertaken from Autumn 2012 to Summer 2013, as follows:

- **Phase 1 (Autumn 2012):** Seven different scenarios were tested based on the sites in the Issues and Options consultation, including the current committed level of development (planning permissions and sites allocated in current local plans). These scenarios sequentially increased the total development, allowing the impact of varying levels of future housing at different stages of the development sequence to be tested.
- **Phase 2 (Spring 2013):** Detailed tests were carried out on three short-listed strategic options: village focused development in South Cambridgeshire, a new town north of Waterbeach and development at Bourn Airfield. These tests allowed the different development focuses to be compared, including the potential for mitigation of transport impacts. Each option was tested first without additional transport measures (the Do Minimum), and then with site specific transport measures and other strategic transport improvements in place (the Do Something). By this point the decision had been taken that major new development on the edge of Cambridge should be a rejected option, so further modelling of this option was not carried out.
- **Phase 3 (Spring 2013):** Preferred Local Plan Strategies: In the final phase, the Proposed Submission Local Plan scenarios for South Cambridgeshire and Cambridge were tested together with an enhanced package of transport mitigations. Transport mitigation measures used in the transport modelling reflect those developed for the emerging TSCSC, designed by CCC to address significant known transport issues, and anticipate measures which would be needed to support future growth. As with Phase 2, this development option was tested first without additional transport measures, and then with the transport strategy and appropriate site-specific measures in place.

5.8. These three modelling phases were reported in the CSRM modelling summary report (RD/Strat/160), which accompanied the proposed submission Local Plans when they were issued for consultation.

5.9. During the Examination in spring 2015 further runs of the model were carried out to address issues arising during discussions (2015(A) in Figure 5-1). Two additional model runs of the Phase 3 stage were completed.

- The first tested the situation if Caxton Gibbet to Black Cat roundabout improvements on the A428 were not included; and this resulted in minimal impacts on the major development proposals compared to the scenarios where improvements were included[29].
- The second considered a variation to the housing numbers, particularly to take account of windfalls and minor changes to the development sites included in the Submitted Plans since the phase 3 model was run[30]. This information was reported in a revised modelling report[31].

5.10. In response to the Inspector's Preliminary conclusions, the Councils commissioned additional transport evidence, including new model runs for both Phase 2 and 3 (2015(B) in Figure 5-1):

- Review the Phase 2 model runs, which compared strategy options, to include options which incorporate major development options on the edge of Cambridge in the Green Belt in addition to the original 3 options tested in 2013. This work supersedes the previous Phase 2 tests and is reported in this document.
- In addition, a re-run of phase 3 has been completed, testing new preferred Local Plan Strategies which were informed by consideration of the re-run phase 2. This work supersedes the previous Phase 3 tests and is reported in this document.

5.11. This chapter provide a brief summary of the results and conclusions from the 2013, 2015(A), and 2015(B) Phase 2 tests. Fuller descriptions of the modelling tests and results are available in existing reports as referenced below.

5.12. For the most recent modelling tests - 2015(B) Phase 3 - a more detailed summary of the revised tests can be found in Chapter 6, including an explanation of the development options tested, underlying assumptions for housing, employment and transport, the modelling results, and the conclusions that can be drawn from the most recent testing.

Definition of Terms

5.13. For the sake of clarity, the following terms are used throughout the remainder of the section, with the following meanings:

- Development Options – are options for development, which vary according to the mix of additional Local Plan development sites, over and above committed and probable windfall developments.
- Site-specific transport measures – are transport measures beyond "minimal site access" considered necessary to provide adequate access from a site. They could include highway, public transport and active transport measures. They are designed to mitigate transport impacts. Those measures tested in Phase 2 (in 2013) informed by the TSCSC, which was developed alongside and in parallel with the Local Plans. There were also site-specific measures tested in the re-run Phase 2 (2015) for the Green Belt sites and the new site north of Cherry Hinton which does not form part of the TSCSC.
- Transport Strategy – are the measures identified and modelled, which are reflected in the Transport Strategy for Cambridge and South Cambridgeshire (TSCSC).

29 Cambridge Local Plan and South Cambridgeshire Local Plan Matter 7: Transport Update on Transport Modelling M7/CCC & SCDC – SUPPLEMENT 2

30 The altered dwellings assumptions are detailed in the Appendix to M7/CCC & SCDC – SUPPLEMENT 3.

31 CSRM Modelling Summary Report for Cambridge and South Cambridgeshire Local Plans – July 2013 UPDATE MARCH 2015 (RD/Strat/161)'.

Summary of 2013 Modelling

Phase 1 Autumn 2012 – Initial testing of spatial options

5.14. In Autumn 2012 seven different development options were tested based on the sites in the Issues and Options consultation, including the current committed level of development (planning permissions and sites allocated in current local plans), and 7 development options to test the effects of the site options which were consulted on between June and September 2012.

5.15. The additional development options separately tested locations as follows:

- Cambridge urban sites;
- New settlement development split between Bourn Airfield and Waterbeach;
- A single, larger, new settlement north of Waterbeach;
- Village extensions;
- The Cambridge Fringe, tested at two levels of development; and
- A combined option covering all of these together.

5.16. These scenarios allowed the impact of varying levels and locations of future housing to be tested. A single fixed transport scenario was assumed in each test (variations in transport were considered at phases 2 and 3).

Phase 2 (Transport Mitigation tests of selection options)

5.17. Detailed tests were carried out on short-listed strategic options with a focused set of potential transport mitigations also considered and the effects of the different options compared. These explored the strategic alternatives available for delivering the required development to 2031. Taking count of the existing development commitments, as well as opportunities for development within the urban area of Cambridge, which would meet the majority of planned growth requirements, the options for testing were guided by packages of site options identified through the Local Plan Issues and Options reports, which could potentially be allocated in the local plans to make up the remainder. At this point in 2013 it had been determined through the plan preparation process that strategy options focusing on the edge of Cambridge should not be considered further. Key strategy alternatives therefore related to a focus on new settlements, or a village focused strategy.

5.18. The options tested at this stage were focused around:

- Village development in South Cambridgeshire;
- A new town north of Waterbeach; and
- Development at Bourn Airfield.

5.19. For the purposes of modelling it was assumed that the whole of the new settlements (at Waterbeach and Bourn Airfield) would be built by 2031 in order to explore the impacts of the whole developments, even though this is not likely to be the case.

5.20. For the full development at these sites, the phasing and impacts of housing and employment development elsewhere beyond 2031 will also play a part in longer term travel patterns. However, these tests are helpful in giving a broad indication of the local travel characteristics, possible transport impacts and potential mitigations should development proceed.

Phase 3 (Preferred Strategy)

5.21. In the final phase of modelling undertaken in 2013, the packages of development included within the Proposed Submission Local Plans for South Cambridgeshire and Cambridge were tested together with an enhanced package of transport mitigations.

Results and Conclusions (2013)

5.22. This section briefly summarises the results and conclusions from the Modelling Report 2013. This report is available to view separately on the Councils' Websites, and is included as an appendix to this Report.

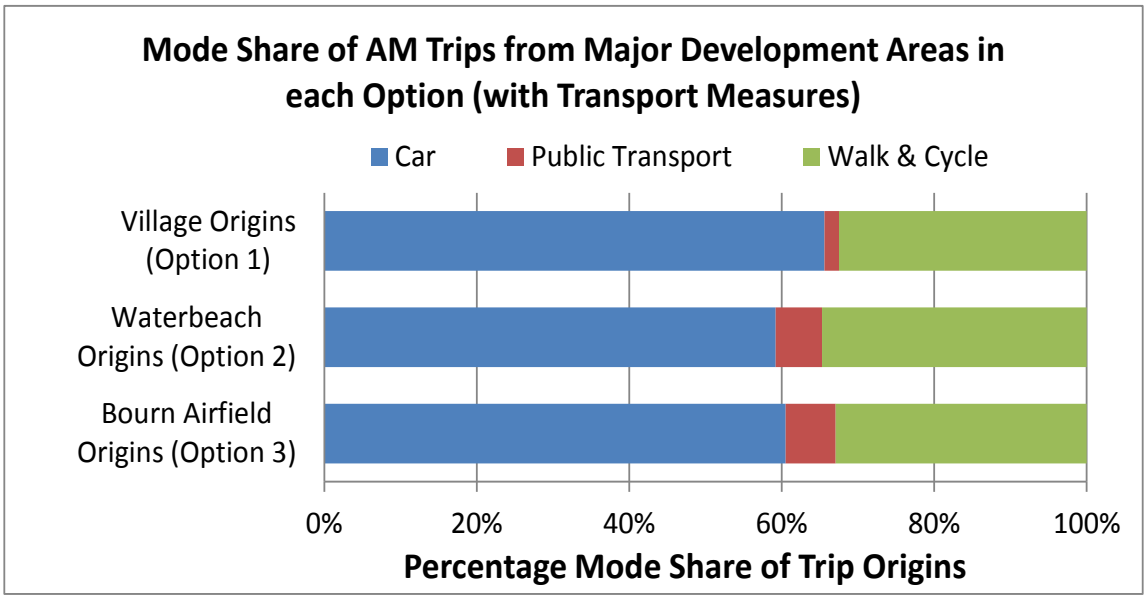
5.23. The results of the 2013 Phase 1 to 3 tests indicated that traffic growth in and around Cambridge would be broadly in line with the DfT's National Forecasts at the time for traffic growth in the East of England, which at the time were 37-39% (dependent on urban or rural definitions) for 2010 to 2030. CSRM forecasts indicated a general level of 40% traffic increase for Cambridgeshire, which given the typically higher GDP and population growth in Cambridgeshire is expected.

5.24. When testing different options, it was noted that the overall differences in mode share and traffic were often quite small. This is largely due to the fact that the new developments being relocated between options are a relatively small proportion of both the existing population, and of the committed development in the early years of the Local Plan (the locations of which are naturally fixed). This is demonstrated in more detail for the most recent tests later in this report.

5.25. As an illustration of the results, Figure 5-2 shows the difference in mode share for trips generated in the AM peak from the major developments in each of the Phase 2 options for all trips to all destinations. Note that trips that include part of the journey by car are recorded here as car trips, even if they include Park & Ride. This test indicated that:

- Village Origins – generate a higher proportion of car trips overall; 66% of additional trips are by car, and 2% by public transport;
- Waterbeach – 59% of additional trips are by car, and 6% by public transport; and
- Bourn Airfield – 61% of additional trips are by car, and 7% by public transport.

Figure 5-2 Mode share of AM trips from major developments areas to each scenario (Do-Something)



5.26. This result suggests there is some benefit to locating growth in new settlements over a dispersal of growth in villages because it would have the effect of generating a lower number of car borne trips.

5.27. The modelling consistently indicated that the transport measures tested in Phase 2 and Phase 3 would have the impact of decreasing car trips and congestion (particularly into Cambridge), whilst increasing significantly both the number and speed of public transport and walk/cycle trips.

However, the highway modelling indicated that large increases in traffic volumes and more significant rises in the level of congestion were inevitable. The development strategy and transport interventions could go some way to mitigate these, but would not avoid them.

5.28. The main conclusions of the 2013 tests were therefore that:

- Though the Phase 1 tests indicated some localised advantage in transport terms from development on the edge of Cambridge, it was not apparent that this advantage was realised strategically across the network.
- Local Plan strategies should pursue focussed rather than dispersed development: This has immediate advantages in terms of car mode share of trips, due to the increase in internal trip-making on the site. It also leads to trips into Cambridge being concentrated along particular corridors, making it simpler to implement sustainable transport measures to address the demand.
- The Cambridge and South Cambridgeshire Transport Strategy proposals would help make the city and key destinations more accessible – because they are focused on reducing the number of car based trips to the city through the provision of viable sustainable alternatives from the main residential areas.
- The preferred Local Plan strategies and transport measures should reduce the amount of car growth to and from the city – because the Transport Strategy offers a range of alternative sustainable modes to existing and new residents to the area. The consequential reduction in car based trips is exceeded by the increase in trips using sustainable modes.

Additional testing of Preferred Strategy (2015A)

5.29. As outlined in paragraph 5.8 above, some re-testing of the Phase 3 tests was undertaken in spring 2015, to address issues arising during the Local Plan Examination, in particular relating to the transport mitigation measures and housing development assumptions.

5.30. This first tested the situation if Caxton Gibbet to Black Cat improvements on the A428 were not included, and this resulted in minimal impacts on the major development proposals compared to the scenarios where improvements were included[32]. The results concluded that "there is no direct evidence that omitting the A428 Upgrade would undermine the viability of the development nor that the accommodation of the more major flow patterns being distributed from these sites being reliant, or seriously restricted, by the absence of the upgrade." The Government has announced funding for the A428 Black Cat to Caxton dualling scheme, and anticipates delivery late in the period 2015 to 2020[33].

5.31. The second considered a variation to the housing numbers, particularly to take count of windfalls and minor changes to the development sites included in the Submitted Plans since the phase 3 model was run. This information was reported in a revised modelling report[34]. This showed some small alterations, but none of significance or which affected the conclusions[35]. Therefore the overall conclusions and strategy remained in place as before.

[32] Appendix 11 of this document: Cambridge Local Plan and South Cambridgeshire Local Plan Matter 7 – Transport, January 2015

[33] Road Investment Strategy: Investment Plan - Department for Transport (December 2014) (RD/T/290) (Page 43) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382813/dft-ris-road-investment-strategy.pdf Road investment strategy plans: summary of assumptions - Department for Transport (December 2014) (RD/T/291) - (page 8) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/381496/roads-investment-strategy-summary-of-schemes.pdf

[34] CSRM Modelling Summary Report for Cambridge and South Cambridgeshire Local Plans – July 2013 UPDATE MARCH 2015 (RD/Strat/161)'.

[35] The overall transport demand growth 2011-2031 was revised from 23% to 24%, but general patterns of growth were otherwise maintained.

New Transport Modelling 2015(B) – Phase 2 re-runs

5.32. In response to the Inspector's Preliminary conclusions, the Councils commissioned additional transport evidence, including new model runs for Phase 2.

5.33. Phase 2 tests were re-run and expanded to cover additional development strategies, in order to compare those previously identified with strategies focusing development on the edge of Cambridge. Significant additional development on the edge of Cambridge had been tested with two scenarios in 2013 Phase 1, but not further tested in Phase 2 for reasons outlined above (see 5.17). The re-runs therefore allowed the previous three Phase 2 options to be retested alongside edge of Cambridge options, allowing for direct comparison of results. The re-runs of Phase 2 were considered by the councils before commissioning a revised Preferred Strategy (Phase 3) re-run.

Phase 2 2015(B) – Housing and Employment growth assumptions

5.34. The 2015(B) Phase 2 modelling has tested the impact on the transport network in Cambridge and South Cambridgeshire of seven development options, each with different development locations throughout the two districts. The total housing and employment growth assumptions are shown in Table 5-1 below.

5.35. The original three options, focusing on growth at villages, and at two new settlements were retained. In addition, four new options were identified. These focused development on different radial corridors around the edge of the city, to consider the impacts of growth in these different locations. Growth to the West, South East, South, and North East of Cambridge were all considered[36]. The scales of development at each location were guided by omission sites put forward to the Local Plan examination as alternative growth options. In addition, a combined edge of Cambridge (Green Belt) run was undertaken, to consider the impact of a higher scale of growth on the edge of Cambridge. The seven options tested were:

1. Village focused development in South Cambridgeshire;
2. A new town north of Waterbeach;
3. Development at Bourn Airfield;
4. A west radial comprising development on Barton Road;
5. A combined south and north-east radial for developments adjacent to Hauxton Road and Trumpington Road and Horningsea Road in the north east of the City;
6. A south east radial for development off Babraham Road; and
7. A combined radial scenario covering all of these together.

5.36. The total housing growth from 2011 to 2031 is in the range +36,000 to +38,000 dwellings in all scenarios except Waterbeach (Option 2) and the combined Edge of Cambridge (Greenbelt) option (Option 7) which are +42,000 and +44,000 dwellings respectively. These dwellings are added to the 110,000 existing dwellings in 2011, so represent growth in dwellings of between 33% and 40%.

5.37. In all options, the committed level of development from existing planning permissions and existing allocations in current plans remained constant and accounts for a significant proportion of the development required over the period to 2031. Figure 5-3 below shows the extent of this 'fixed' element of the growth in each option. The size of the variable element ranges from 14% of all 2011-2031 development in Option 1 to 29% in Option 7.

5.38. A significant element of the employment development is also common between options, given the level of existing commitments in the districts. There were variations related to the strategy

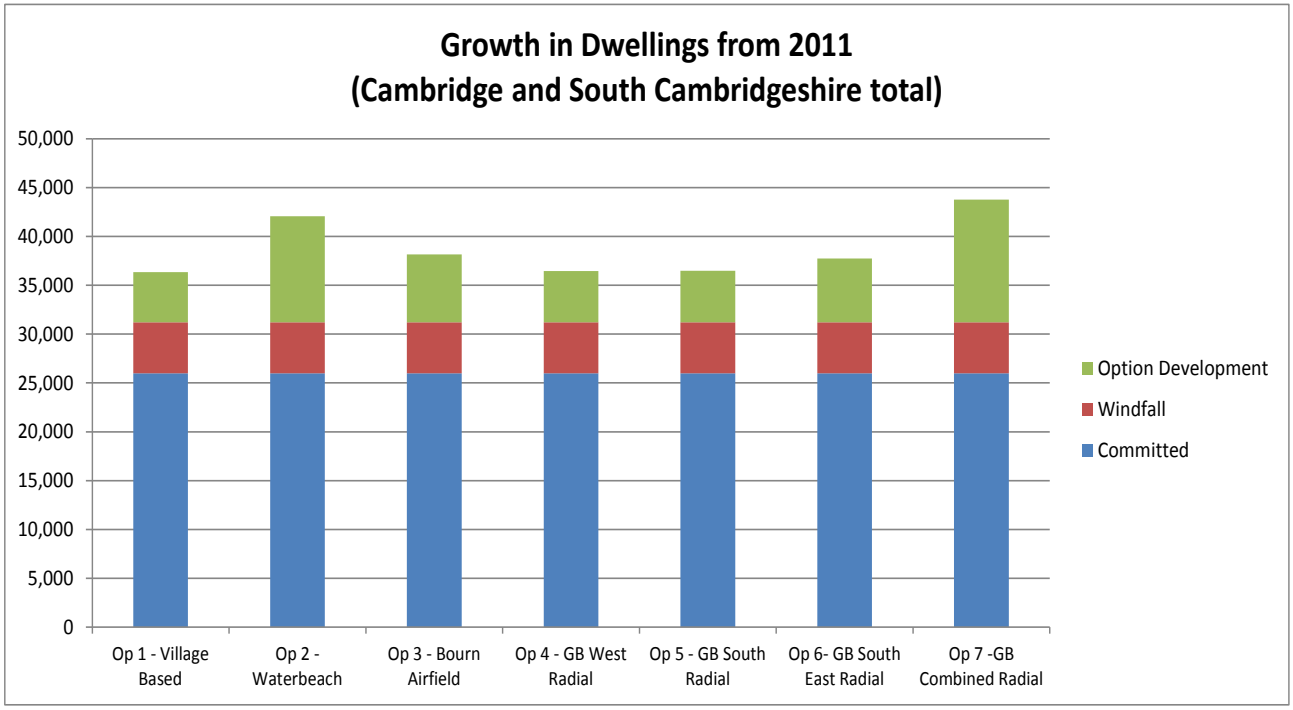
[36] For modelling purposes development south, and north east were considered in a single run, as they were sufficiently distinct and geographically remote that the impact of the south development would not influence the behaviour of the model in the area of the north east development and vice versa.

options, including consideration of a major employment development in the South edge of Cambridge (Green Belt) strategy option.

Table 5-1 Housing and employment growth assumptions for land use scenarios

	Development Option	Name	Growth in dwellings (2011 to 2031)		Growth in employment (2011 to 2031)	
			Cambridge	South Cambs	Cambridge	South Cambs
Phase 2	1	Village Based	14,191	22,144	22,100	22,000
	2	Waterbeach New Town	14,191	27,889	22,100	22,000
	3	Bourn Airfield New Settlement	14,191	23,979	22,100	22,000
	4	Green Belt West Radial (A603 Barton Road) - Broad Locations 1 and 2	15,461	20,989	22,100	22,000
	5	Green Belt South Radial (A1309 Hauxton Road / A1134 Trumpington Road) (Broad Location 3, 4 and 5) + North East (B1047) (Broad Location 9)	15,795	20,698	22,100	22,000
	6	Green belt South-East Radial (A1307 Babraham Road) (Broad Location 7)	19,104	18,629	22,100	22,000
	7	Green Belt Combined Radial	21,978	21,798	22,100	22,000

Figure 5-3 Growth in Dwellings by Development Option, showing extent of fixed growth element



5.39. Table 5-2 below shows the distribution of the housing development between sites.

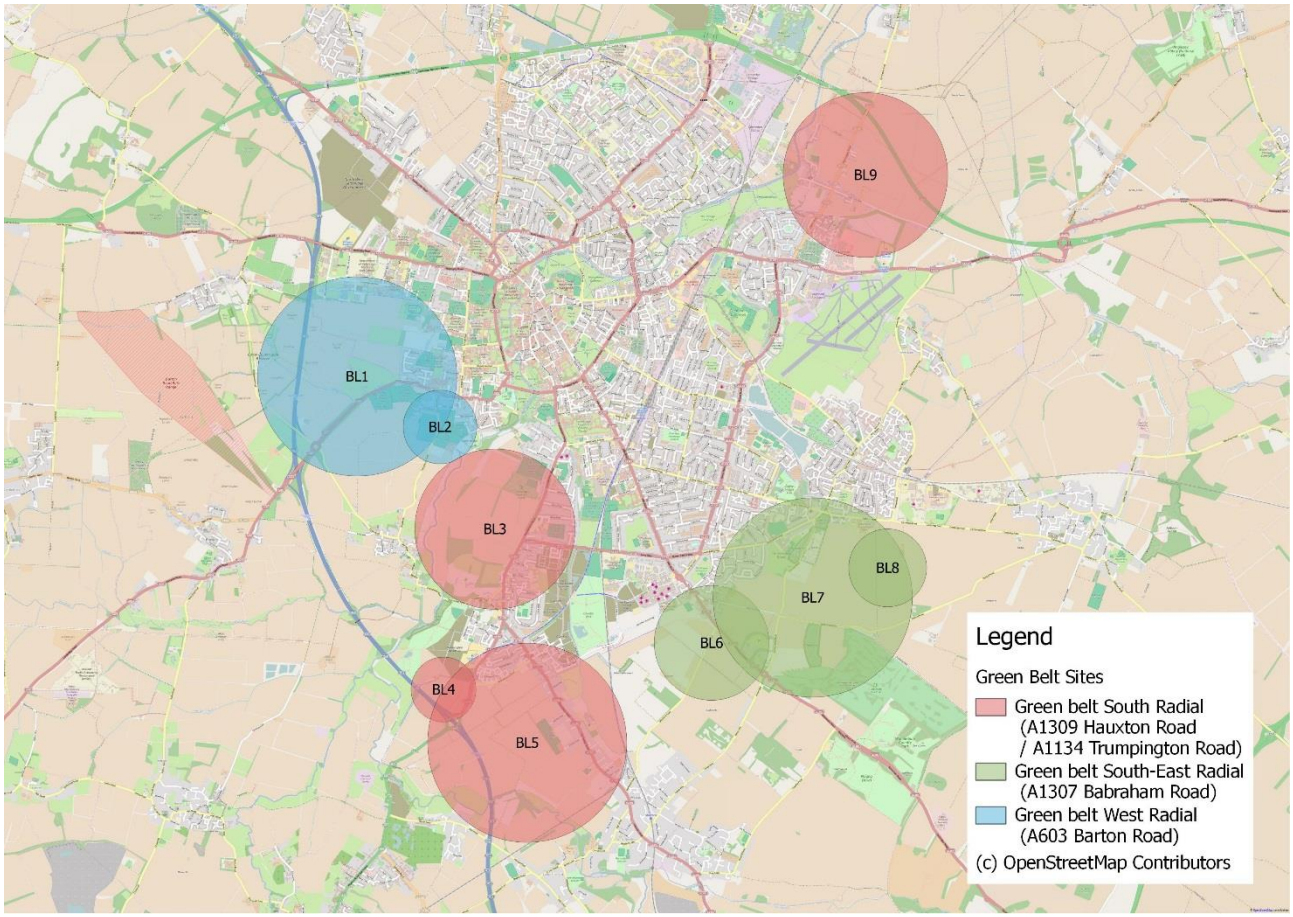
5.40. Figure 5-4 provides a reference to the locations of the Edge of Cambridge (greenbelt) developments tested. These locations have been termed 'Green Belt Broad Locations (GB BL)', and indicate the area within which this development would take place. These reflect the Broad Locations identified by the Councils at the early stages of the plan making process. It should be noted that the model zoning does not necessarily delineate between green belt and non-green belt areas.

Table 5-2 Distribution of Optional Housing Developments for Phase 2 tests up to 2031

	Op 1 - Village Based	Op 2 - Waterbeach	Op 3 - Bourn Airfield	Op 4 - GB West Radial	Op 5 - GB South Radial	Op 6- GB South East Radial	Op 7 -GB Combined Radial
S Cambs Villages[37]	2,800	860	860	860	-	-	-
Waterbeach[38]	1,115	10,000	-	-	-	-	-
Bourn Airfield / Cambourne[39]	1,200	-	6,090	1,200	1,200	1,200	-
GB BL1/2	-	-	-	3,170	-	-	3,170
GB BL3	-	-	-	-	1,529	-	1,529
GB BL4	-	-	-	-	500	-	500
GB BL5	-	-	-	-	1,250	-	1,250
GB BL6	-	-	-	-	-	1,343	1,343
GB BL7/8	-	-	-	-	-	3,970	3,970
GB BL9	-	-	-	-	794	-	794
Total	**5,115**	**10,860**	**6,950**	**5,230**	**5,273**	**6,513**	**12,556**

[37] Option 1 - sites focused on Rural Centres and Minor Rural Centres (guided by options identified through the Local Plan issues and options process, in addition to those identified in the Proposed Submission Local Plan.
Options 2-4 - reflects allocations proposed in the Submitted South Cambridgeshire Local Plan.
[38] Option 1 - includes built area of the barracks to the north of the village.
[39] Options 1,4,5,6 - reflects the Cambourne west site (1200 dwellings) included in the South Cambridgeshire Submission Local Plan.
Option 3 - in addition to Bourn Airfield new settlement (3500 dwellings), includes the larger Cambourne West planning application proposal (2350 dwellings), and dwellings on Cambourne Business Park (240 dwellings) to test the highest level of potential development in the corridor.

Figure 5-4 Broad Locations of Green Belt Development in Options 4-7



Changes from the original Phase 2

5.41. The phase 2 re-run was an opportunity to incorporate a number of changes to population and employment trends into the model.

5.42. During the 2013 Phase 3 tests, model assumptions regarding the number of workers in the sub region were reviewed, based on information in the Strategic Housing Market Assessment chapter on forecasts for all homes (May 2013). This identified objectively assessed needs for jobs and homes having looked at a range of available forecasts and the 2011 Census. This review showed that the higher employment levels in Cambridge would be associated with an increase in the number of employed residents in the City and South Cambridgeshire. This increase is in line with trends observed in the 2011 Census, that the number of workers per dwelling (especially in Cambridge) has been increasing, as has the proportion of dwellings with employed residents. For the 2015(B) study, these refinements have been applied to both the Phase 2 and Phase 3 tests for consistency.

5.43. The assumed growth in employment and population means that a similar proportion of the population is forecast to be in employment in 2031 as in 2011 (around 50%) with the remaining 50% being children, the retired as well as those of working age not in employment. The overall balance of jobs to workers is dependent on the number of new dwellings delivered, so varies between options. For Cambridge, the model is indicating that there will be an increasing proportion of the resident population in employment, resulting in a better balance between jobs and the resident workforce and the potential to reduce the amount of commuting into and out of the City.

5.44. Car ownership levels are rising through time and this is reflected in the assumptions input to the model for growth from 2011 to 2031. The percentage of households without a car will fall overall, though in the City the proportion of households without a car rises from 28% in 2011 to 31% by

2031. This is due to improved accessibility by non-car modes than in other parts of the sub region as well as the number of opportunities for work and leisure in the immediate vicinity.

Transport Measures

5.45. The Phase 2 modelling tests include consideration of the impact that transport mitigation measures could have on the results. For example, would the delivery of public transport or cycling improvements help to offset the transport impacts of a development site. In modelling terms, the 'do-nothing option' considers only basic access arrangements for a site. The 'do-something option' might include additional bus services or cycle links.

5.46. A set of 'Do Minimum (DM)' tests with identical transport measures were applied to all scenarios (including committed schemes such as the A14 upgrade and Cambridge North station), and a set of 'Do Something (DS)' tests with additional Transport Measures, including those relevant to specific development scenarios. Appendix B gives a complete description of the transport measures included in these tests.

5.47. These measures are largely identical to those applied in the 2013 and 2015(B) tests, with some modifications. The most significant changes, which are common to both Do Minimum and Do Something option tests in Phases 2 and 3, are as follows:

- Removal of the A14 toll charges which were a part of the A14 upgrade scheme when the original 2013 testing was undertaken;
- Updates to access coding for Northstowe, based on the most recent designs for this site; and
- The parking charge at Cambridge Park and Ride sites is now included in all future year runs.

5.48. Site-specific transport measures were introduced in each of the seven tested options, as relevant to the sites being developed in each case. For Options 1-3, the only change to the 2013 Phase 2 assumptions were refinements to the access arrangements. For the Edge of Cambridge (Green Belt) options, new access measures were developed as tabulated in Appendix B. In each case, the Do Minimum changes address site access only (minimum measures required to connect the site to the existing highway, PT and walk/cycle infrastructure). The Do Something tests add additional measures, representative of that which Cambridgeshire County Council, as the highway authority, consider are required (as a minimum) to bring the sites up to the standard of transport provision which might be expected for such developments. These requirements are not intended to be exhaustive or replicate the requirements recommended by a Transport Assessment, but do give an indication of what the minimum infrastructure requirements are for these sites at a strategic level in order to allow for suitable access by high quality public transport, walking, cycling and to the Strategic Road Network.

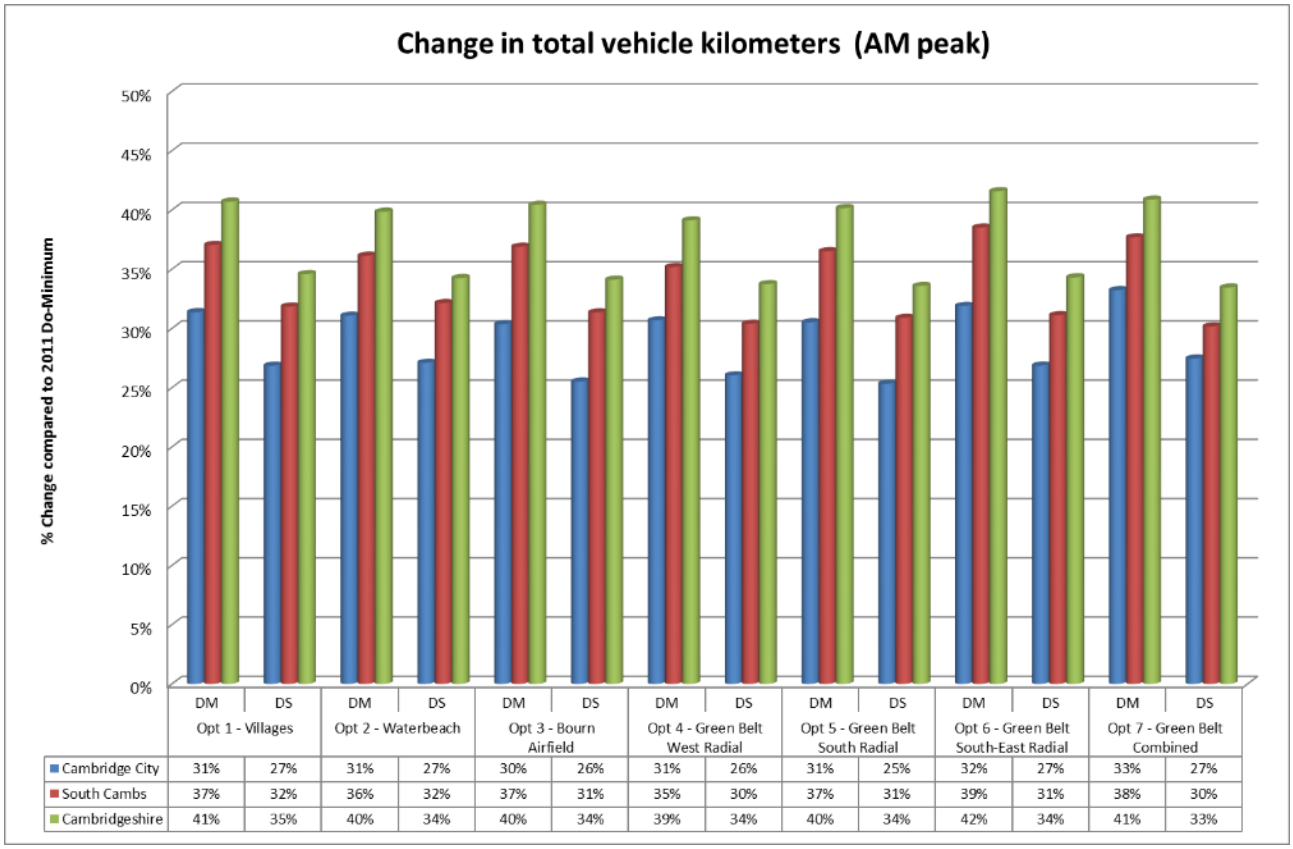
Phase 2 2015(B) Modelling Results – Impact of Scenarios on Traffic and Delay

5.49. This section summarises the increases in traffic levels and congestion from 2011 to 2031, comparing the performance of the seven options tested in the Phase 2 re-run, to demonstrate to what extent differences arise. In transport terms, these are some of the most critical measures of the performance of each option and hence are presented here ahead of other analysis. The charts show details of the traffic growth by option. The AM and PM peak figures are shown as these are the periods where traffic growth is expected to have highest impact. However, it should be noted that percentage growth is higher in the interpeak period, where there is less constraint on growth due to congestion.

5.50. Figure 5-5 and Figure 5-6 show the change in total vehicle kilometres in 2031 compared to 2011. Both figures show that in Cambridge for the AM peak there is an increase in the approximate range of 31-33%, and in the PM peak it is in the approximate range 35-39% in the Do Minimum. The results also clearly show that transport measures (Do Something) are effective in reducing the total traffic levels in all development options, and result in a more even traffic growth across the options. For example, under Do Something the AM peak range is approximately 25-27%.

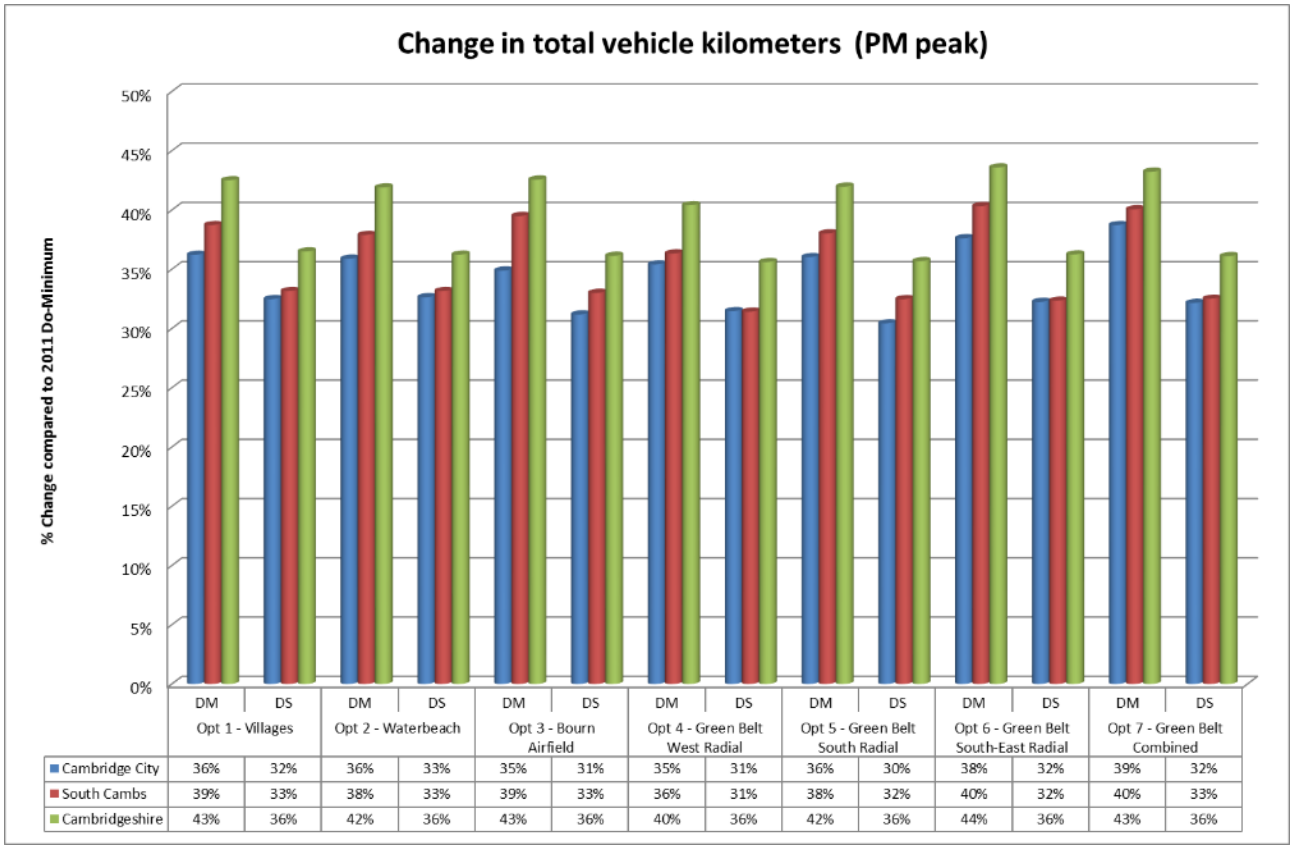
5.51. In these charts, and the following charts of vehicle hours and delay, the key message is that the different development options do not result in radically different levels of traffic growth, travel times or delay. Whilst there are variations, these are in the context of very high overall traffic growth where significant amounts of development are already committed. The differences between options when looked at as a whole are not thought to give indications of any one strategy having very large advantages or disadvantages. This is to some extent expected, given the amount of the demand which remains unchanged, as flagged in paragraph 5.37 above.

Figure 5-5 Change in total vehicle kilometres (AM peak) 2031



	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined	
Cambridge City	31%	27%	31%	27%	30%	26%	31%	26%	31%	25%	32%	27%	33%	27%
South Cambs	37%	32%	36%	32%	37%	31%	35%	30%	37%	31%	39%	31%	38%	30%
Cambridgeshire	41%	35%	40%	34%	40%	34%	39%	34%	40%	34%	42%	34%	41%	33%

Figure 5-6 Change in total vehicle kilometres (PM peak) 2031



	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined	
Cambridge City	36%	32%	36%	33%	35%	31%	35%	31%	36%	30%	38%	32%	39%	32%
South Cambs	39%	33%	38%	33%	39%	33%	36%	31%	38%	32%	40%	32%	40%	33%
Cambridgeshire	43%	36%	42%	36%	43%	36%	40%	36%	42%	36%	44%	36%	43%	36%

5.52. The following two figures show total vehicle hours in the AM and PM peaks. They show that an increase of c.40% in total vehicle kilometres in the PM peak (Figure 5-6) is, in some development options, leading to a c.92% increase in total journey time (Figure 5-8). In other words total vehicle hours is increasing at about twice the rate of total vehicle kilometres.

5.53. The fact that the vehicle hours increases more rapidly than the distance travelled means that overall journey speeds are falling and congestion levels are increasing considerably. This will not impact all journeys evenly, but it does show that total end-end journey times will rise significantly for cars in all development options.

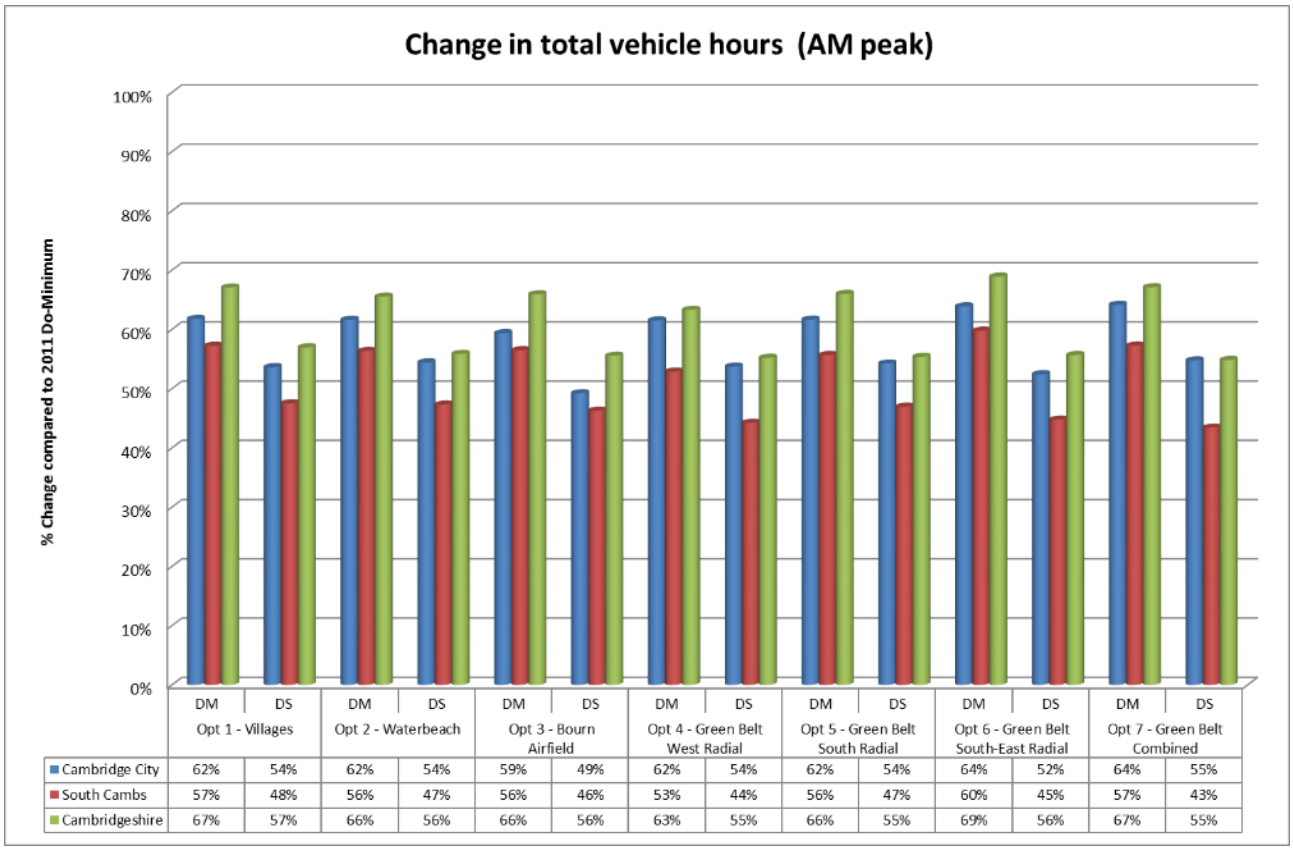
5.54. As with vehicle kilometre growth, the number of vehicle hours is reduced in each case in the DS, showing that the transport measures that have been included in the modelling are having a real impact on journey speeds as well as traffic. Figure 5-9 and Figure 5-10 show the change in delay on the network for each of the development options.

5.55. They show that network delay in the peak hours will also increase for all scenarios, by between 94% and 193% (more than doubling total delay). Journey delay here represents the difference between actual journey time and that which would occur in 'free flow' conditions. Levels of journey delay are reduced by the transport strategy as shown in the 'Do-Something' results. This is the result of the transport strategy highway improvements and a mode shift towards improved public transport services and active mode infrastructure. However, the delay minutes experienced within Cambridge will double in each scenario, even with these measures in place.

5.56. As with the previous figures it is worth noting the scale of change, on the y-axis, and the impact of this change. In general terms a 30% increase in vehicle kilometres (Figure 5-5 and Figure 5-6) can result in up to a doubling in total vehicle hours (Figure 5-7 and Figure 5-8), which is resulting in a tripling in total network delay in some development options in the PM peak (Opt 6, PM peak, c.193% increase in total delay in DM for Cambridge). For many journeys this will indicate only a small increase in absolute delay (a 1 minute delay increasing to 3 minutes), whilst for others it can be more significant.

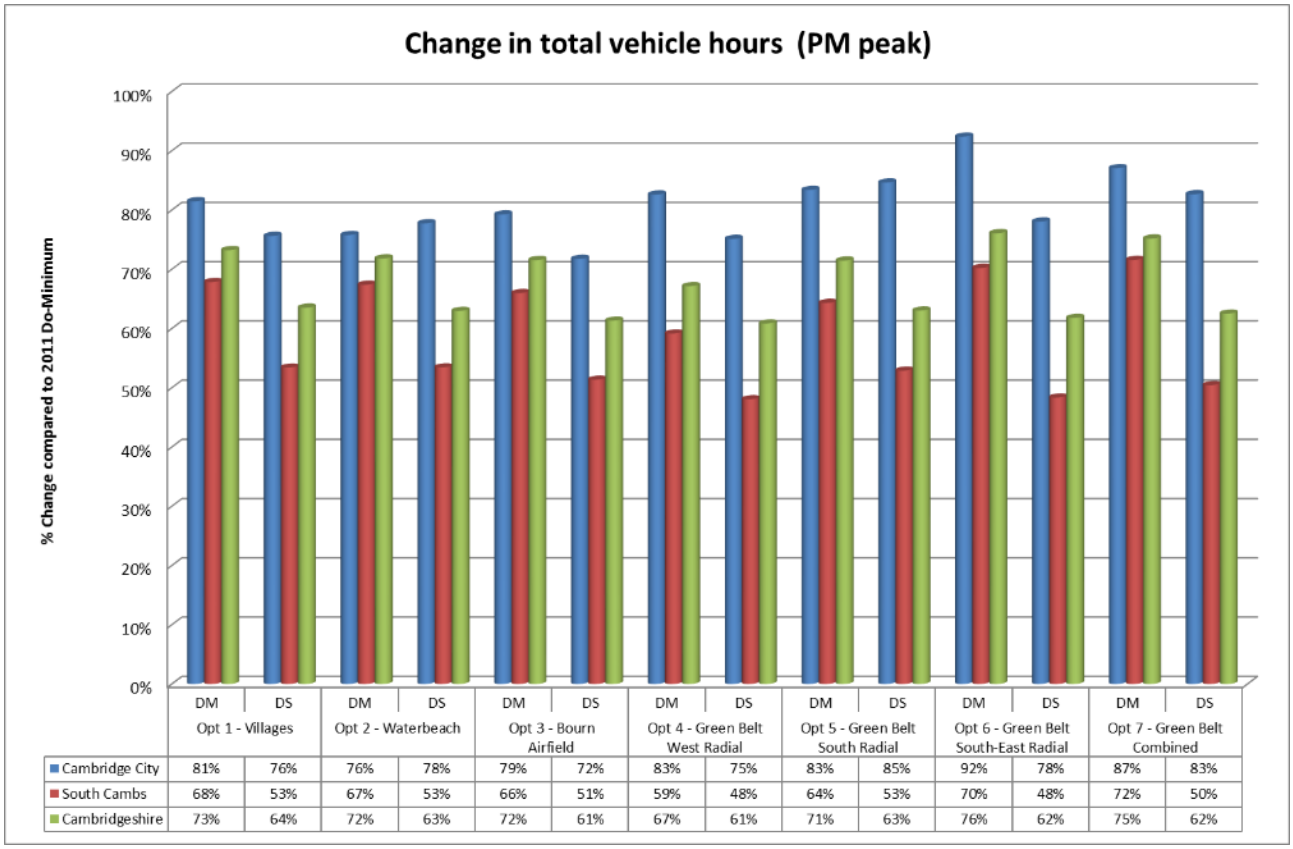
5.57. As with the previous figures, the transport measures included in the DS have a beneficial impact on total delay across all development options, although there is a lesser impact in terms of 'smoothing' the variability in network delay between the different options.

Figure 5-7 Change in total vehicle hours (AM peak) 2031



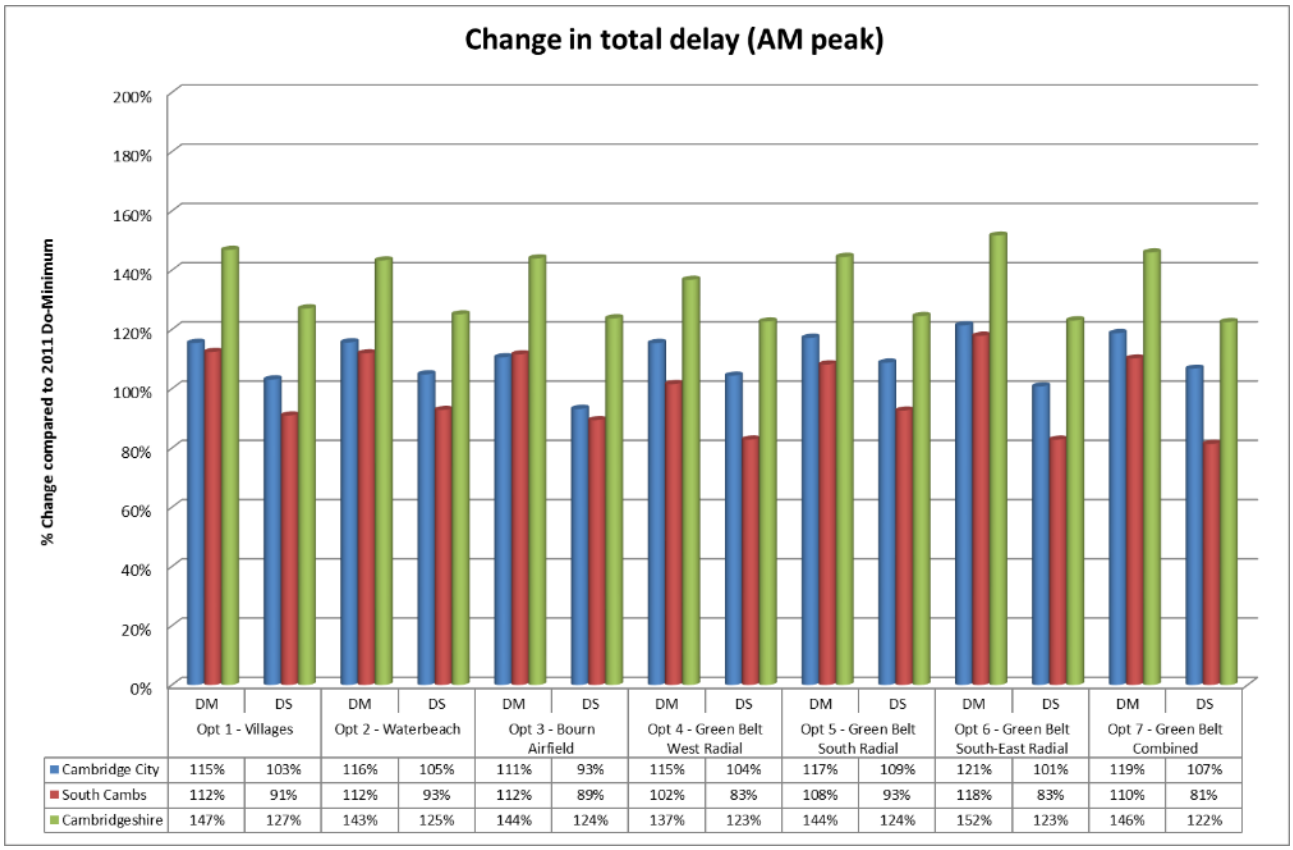
	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined	
Cambridge City	62%	54%	62%	54%	59%	49%	62%	54%	62%	54%	64%	52%	64%	55%
South Cambs	57%	48%	56%	47%	56%	46%	53%	44%	56%	47%	60%	45%	57%	43%
Cambridgeshire	67%	57%	66%	56%	66%	56%	63%	55%	66%	55%	69%	56%	67%	55%

Figure 5-8 Change in total vehicle hours (PM peak) 2031



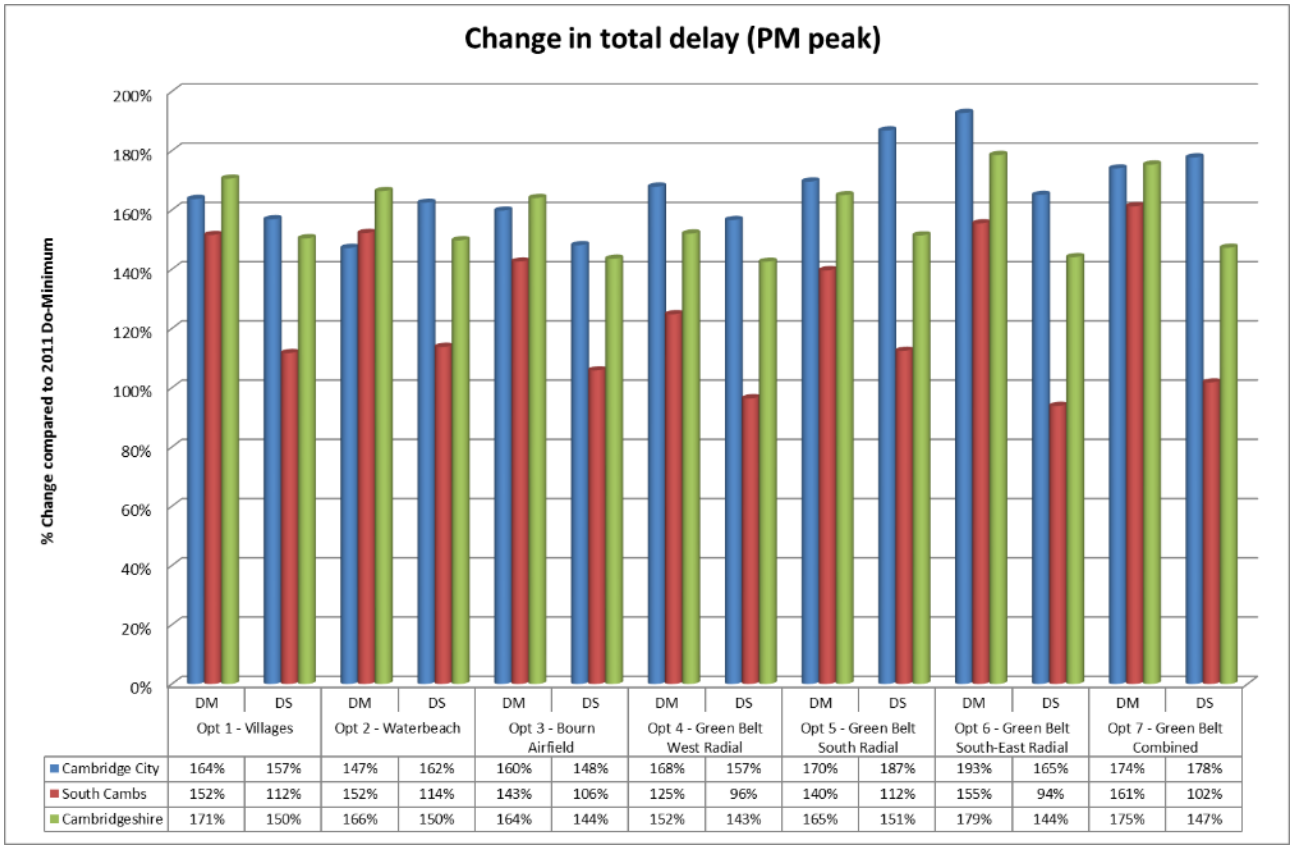
	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined	
Cambridge City	81%	76%	76%	78%	79%	72%	83%	75%	83%	85%	92%	78%	87%	83%
South Cambs	68%	53%	67%	53%	66%	51%	59%	48%	64%	53%	70%	48%	72%	50%
Cambridgeshire	73%	64%	72%	63%	72%	61%	67%	61%	71%	63%	76%	62%	75%	62%

Figure 5-9 Change in total delay (AM peak)



	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined	
Cambridge City	115%	103%	116%	105%	111%	93%	115%	104%	117%	109%	121%	101%	119%	107%
South Cambs	112%	91%	112%	93%	112%	89%	102%	83%	108%	93%	118%	83%	110%	81%
Cambridgeshire	147%	127%	143%	125%	144%	124%	137%	123%	144%	124%	152%	123%	146%	122%

Figure 5-10 Change in total vehicle delay (PM peak) 2031



Modal Share of Major Development Growth

5.58. This section considers the variation in mode share between development options, and confirms the effectiveness of the transport mitigation measures. To give an overview, Table 5-3 summarises the car mode share for AM peak trips to Cambridge and South Cambridgeshire across all options.

5.59. As can be seen, the overall mode share remains extremely stable in all options: representing a small decrease overall in the car mode share from 2011 to 2031, but very little variation between the options themselves. The lack of variation is not surprising, given that a significant proportion of the anticipated growth is as a result of existing commitments. However, the impact of the transport measures envisaged by the Do-Something scenarios is clear, particularly in the decrease in car mode share to Cambridge of approximately 2% in each option.

Table 5-3 Total Car Mode Share for 2031 AM Peak trips to Cambridge and South Cambridgeshire, with (DS) and without (DM) transport measures

	To Cambridge		To South Cambs	
	DM	DS	DM	DS
2011 Base	35.4%		62.1%	
Op 1(V)	34.8%	32.9%	61.8%	61.1%
Op 2(W)	35.0%	33.0%	61.3%	60.6%
Op 3(B)	34.9%	33.0%	61.9%	61.3%
Op 4(GB WR)	34.4%	32.7%	60.4%	60.0%
Op 5(GB SR)	34.8%	32.8%	61.8%	61.1%
Op 6(GB SER)	34.8%	32.9%	61.8%	61.4%
Op 7(GB CR)	34.1%	32.3%	61.3%	60.6%

5.60. To focus more on the growth element, Table 5-4 shows the car mode share of the additional transport demand above that in the 2011 Base. In this case, there is a clearer variation between options, with the edge of Cambridge (green belt) focused development strategy in Option 7 having, as might be expected, a slightly lower car mode share. The impact of the Transport measures on trips to Cambridge is much more obvious here, with a 7-8% swing in mode share away from car being achieved by the development focused transport interventions.

Table 5-4 Car Mode Share of 2011-2031 Growth in AM Peak trips to Cambridge and South Cambridgeshire, with (DS) and without (DM) transport measures

	To Cambridge		To South Cambs	
	DM	DS	DM	DS
Op 1(V)	32.9%	24.0%	60.6%	57.7%
Op 2(W)	33.5%	24.4%	58.6%	55.8%
Op 3(B)	33.3%	24.2%	61.5%	58.6%
Op 4(GB WR)	30.5%	22.7%	54.7%	53.0%
Op 5(GB SR)	32.7%	23.9%	60.8%	57.4%
Op 6(GB SER)	32.9%	24.8%	60.6%	58.8%
Op 7(GB CR)	30.1%	22.7%	58.4%	55.3%

5.61. The patterns of mode share are further investigated below, using charts which show the absolute mode share in 2031 for selected development areas in each option. The charts show the overall mode share in the areas of development focus in each option Table 5-2)

5.62. It should be noted that in Option 1 only 2,800 of the 5,115 dwellings are in the dispersed village locations, with the remainder being split between Waterbeach and Cambourne. The latter are both locations used in Options 2 and 3, but in Option 1 the developments represent expansions of existing Waterbeach (built area of the barracks) and Cambourne (Cambourne West) developments. If we consider the Option 1 major development focus as the developments **excluding** Waterbeach and Cambourne (therefore comprising the numerous site options identified at Rural Centres and Minor Rural Centres through the issues and options process needed to deliver the required quantity of development) the resulting mode shares are considerably higher (close to 80%). This indicates that the more dispersed developments have higher overall car mode share than is at first apparent when considering Option 1 as a whole.

5.63. The charts show that trips made from the green belt sites in Options 4 to 7 have lower car mode share than those originating at the development sites in Options 1 to 3. The car mode share for trips to Cambridge for these options ranges from 13% to 32%[40] , with in excess of 60% of trips being made by active modes. This is due to a combination of the location of growth on the periphery of the city, within walking and cycling range, with good access to public transport, so that car use is less attractive for the residents. However, these sites have comparatively high mode share for trips to South Cambridgeshire. Analysis of the trip distribution shows that the edge of Cambridge (green belt) sites do still generate car trips into South Cambridge (e.g. out-commuting to jobs to the South East of Cambridge, such as Granta Park), so this may be significant. Overall, this leads to an AM car mode share in Options 5-7 in the range 41-49% (see

[40] The Barton Road development in Option 4 has a particularly low car mode share and high walk/cycle share. It should be noted that given that the car mode share result is especially low, it could indicate an unacceptable level of car access to this site, even in the Do Something, due to loading directly onto very busy radial routes. This would cause the model to prevent trips being made by car, especially as there are no major highway interventions coded for this site. Therefore the car mode share result should be treated with some caution as it may not be indicative of the actual benefits of this site. The high cycle and walking mode shares are however likely to be as a result of the close proximity of the site to the centre of Cambridge, the West Cambridge site and the Southern Fringe / Addenbrooke's BMC.

Figure 5-13), which is higher than for Cambridge at present because of their location on the periphery of the city with good access to the strategic road network.

5.64. Though Options 1 to 3 (and the Preferred Strategy itself) have higher car mode share for trips to Cambridge, they have lower car mode share for trips within South Cambridgeshire. This is due to the fact that more short internal trips are possible, travelling to local work. Options 1 to 3 also achieve high public transport mode share for trips to Cambridge, of 27% in the case of Bourn, which includes 12% Park and Ride mode share. The Park and Ride mode share figure was not presented separately in the original 2013 Modelling Summary Report. Park and Ride is a key element of the Transport Strategy with additional capacity being proposed for both corridors with major new urban extensions (Bourn Airfield and Waterbeach). Figure 5-11 shows that Park and Ride mode share for trips from the major development options to Cambridge is particularly prominent for Options 1-3, highlighting the success of this aspect of the Transport Strategy.

Figure 5-11 Mode Share of AM trips from major development areas to Cambridge (DS)

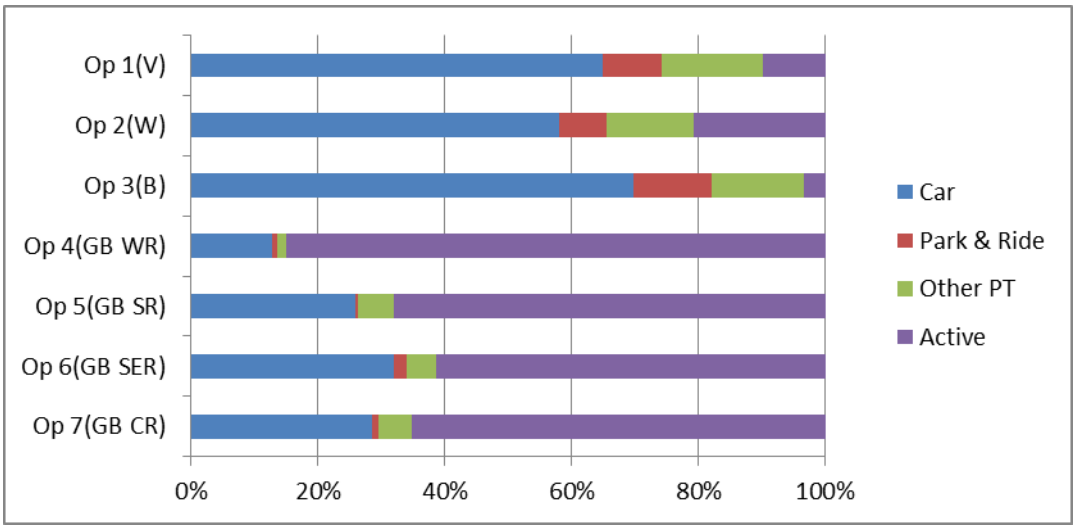


Figure 5-12 Mode Share of AM trips from major development areas to South Cambridgeshire (DS)

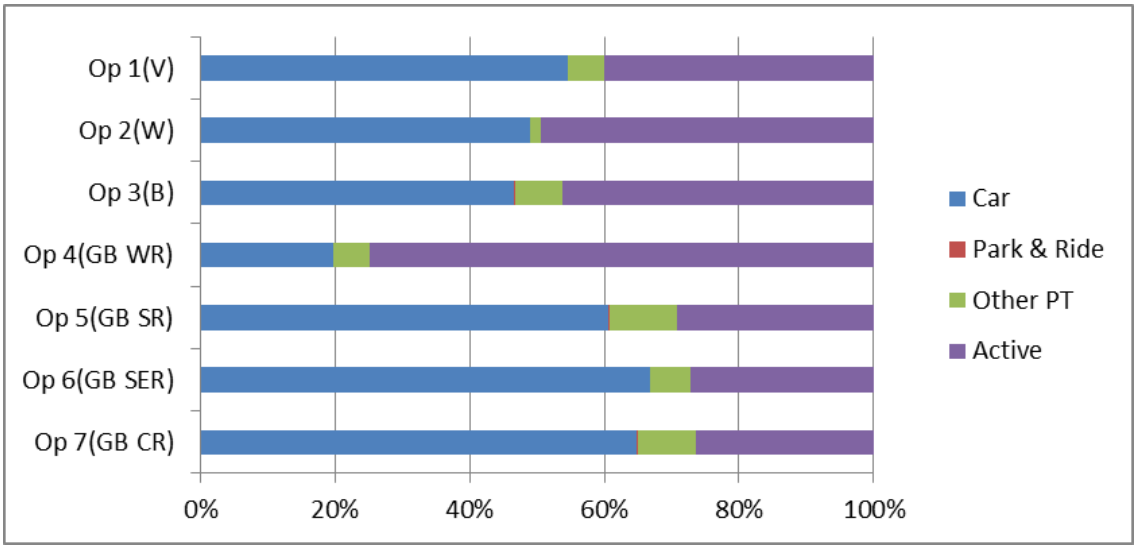
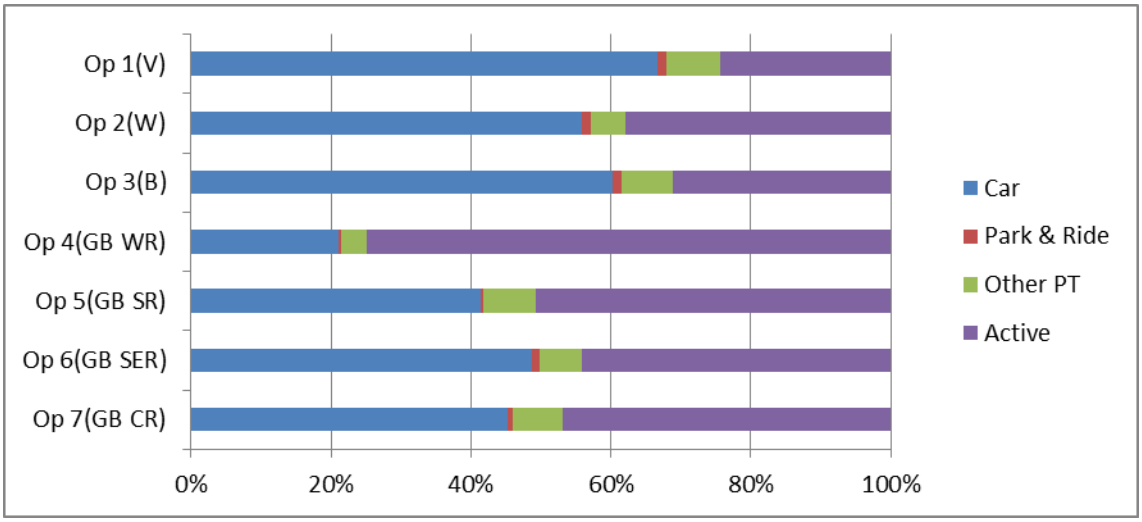


Figure 5-13 Mode Share of AM trips from major development areas to All Destinations (DS)



5.65. Figure 5-14 and Figure 5-15 demonstrate to what extent the transport measures introduced in the Do Something have influenced the above mode shares. As can be seen, the Option 1 to 3 car mode shares are particularly influenced, with mode shifts of between 6% and 13% away from car. The majority of the shift is to Park and Ride in Options 1 and 3, but Active options are slightly more dominant for Waterbeach (Option 2). The shift to Park and Ride again underlines the importance and the success of the proposed additional Park and Ride capacity proposed in the Transport Strategy. The impact of the Transport Measures on the Edge of Cambridge (greenbelt) options is smaller for trips to Cambridge, but does have an impact on trips to South Cambridgeshire, as might be expect given the extent of reverse commuting and that the measures are focused on access to/from Cambridge. It is also worth noting that in Option 6 the introduction of a new road, proposed by officers at CCC after assessing the strategic infrastructure that is likely to be required for this site, has encouraged an increase in car trips to South Cambridgeshire.

Figure 5-14 Change in Mode Share of AM due to Transport Measures (Cambridge)

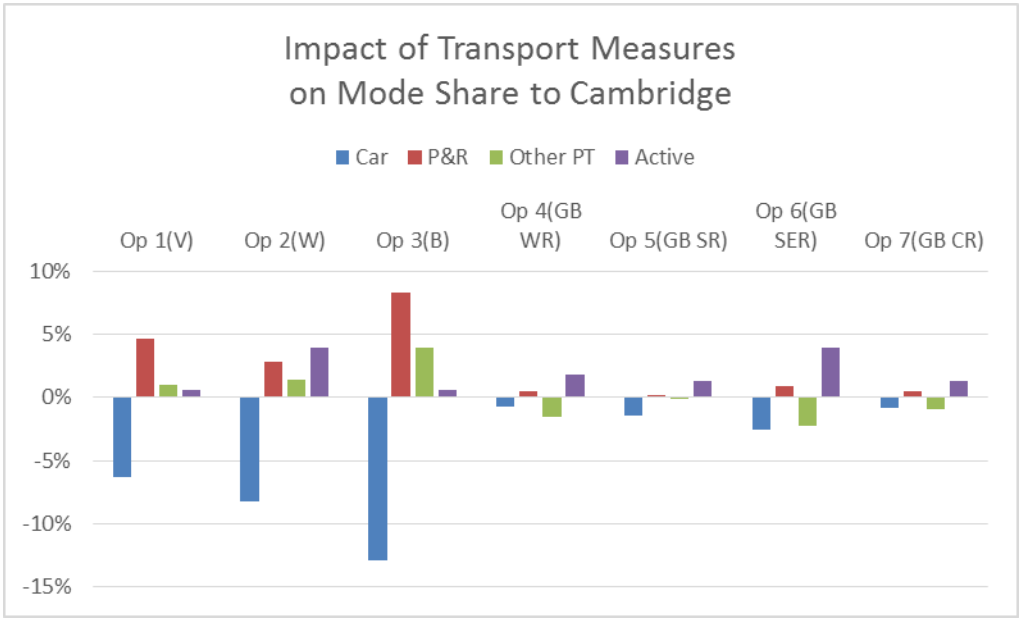
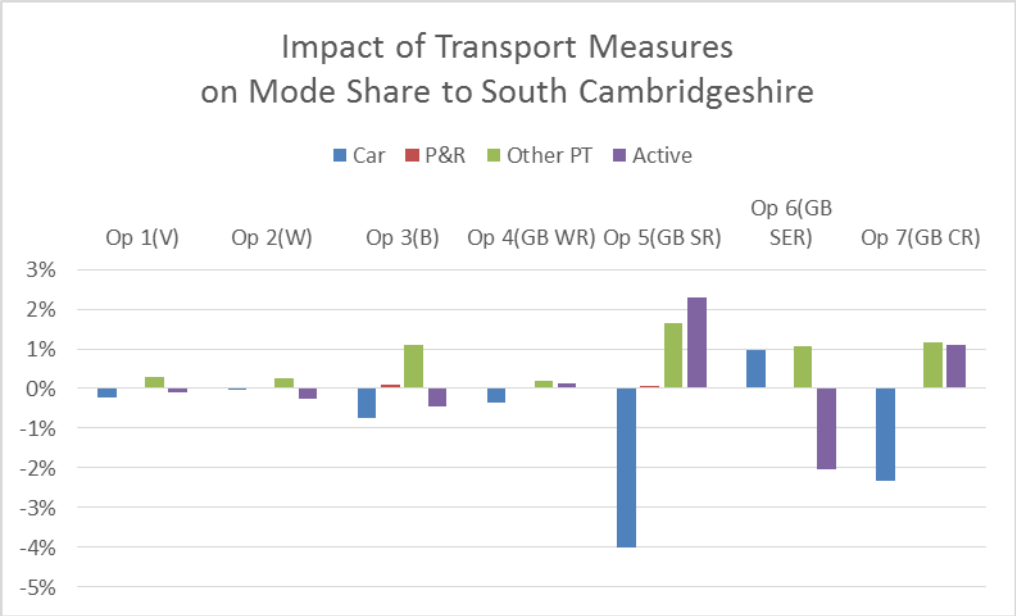


Figure 5-15 Change in Mode Share of AM due to Transport Measures (South Cambridgeshire)



Findings from Mode Share and Traffic Analysis

5.66. The tests showed that each of the development scenarios will result in a significant increase in traffic in rural areas and on routes into Cambridge and in Cambridge. The contributory factors for this traffic growth are:

- The overall increase in housing, population and employment – the expanding local economy and increasing demand for labour will result in a net inflow of residents to the districts creating an additional demand for travel to access work, education and other key services;
- Increasing availability of cars – over time it has become increasing cheaper to own a car compared to travelling by other forms of transport, consequently car ownership has grown and will continue to do so;
- Growth in traffic to fill available road capacity, particularly in off-peak and more rural areas (see paragraph 5.68 below);
- Increasing in-commuting, due to the attraction of Cambridge as an employment centre. Workers from outside the two districts will be attracted to the opportunities offered by working in Cambridge and living outside the immediate area. The districts' relatively high house prices also means longer distance commuting to work in the city is a more attractive, and affordable, proposition for some workers.

5.67. The tests have demonstrated that the transport measures introduced in the 'Do Something' tests have facilitate mode shift away from car and towards public transport (particularly Park & Ride), walk and cycle. The impacts on traffic levels and congestion are similar between development options. For the new settlements and village-based developments, the transport strategy leads to a very marked shift to Park & Ride, PT and active modes for trips to Cambridge. For the green belt developments, the transport measures encourage active mode trips to Cambridge, but have most influence on trips to South Cambridgeshire.

5.68. Model tests show that there is a broad level of consistency in the level of forecast traffic growth in each of the phase 2 development scenarios. The forecast levels of congestion into Cambridge suggest there will be suppressed demand for car travel by 2031. Given the very large amount of housing which is fixed between options (both existing houses and the committed growth), the amount of suppressed demand they account for is likely to be significant. The impact of this is that when road space is freed up, some of this benefit is eroded as the suppressed demand returns. There is some evidence in the model that this is taking place both in phase 2 modelling scenarios with lower housing numbers, and those with green belt development. This is evident in

the fact that the car mode shares for green belt sites are low, but the overall traffic growth and car mode share is less affected.

5.69. Increasing congestion, network delay and journey times means traffic in 2031 will be travelling more slowly than it did in 2011. This impact could take place as a result of all development options and as a result of returning suppressed demand returning. This has consequential impacts on air pollution and greenhouse gas emissions as traffic is stationary for longer.

6. Preferred Strategy (Phase 3) Tests

Introduction

6.1. Following consideration of a range of evidence prepared in response to the Inspectors Interim Conclusions including the re-run phase 2 options discussed in Chapter 5, the Councils identified draft proposed modifications to the Local Plans.

6.2. An additional model run, 2015(B) Phase 3 (Figure 5-1), was undertaken to test the transport impacts of the modifications, effectively a re-run of the phase 3 model run.

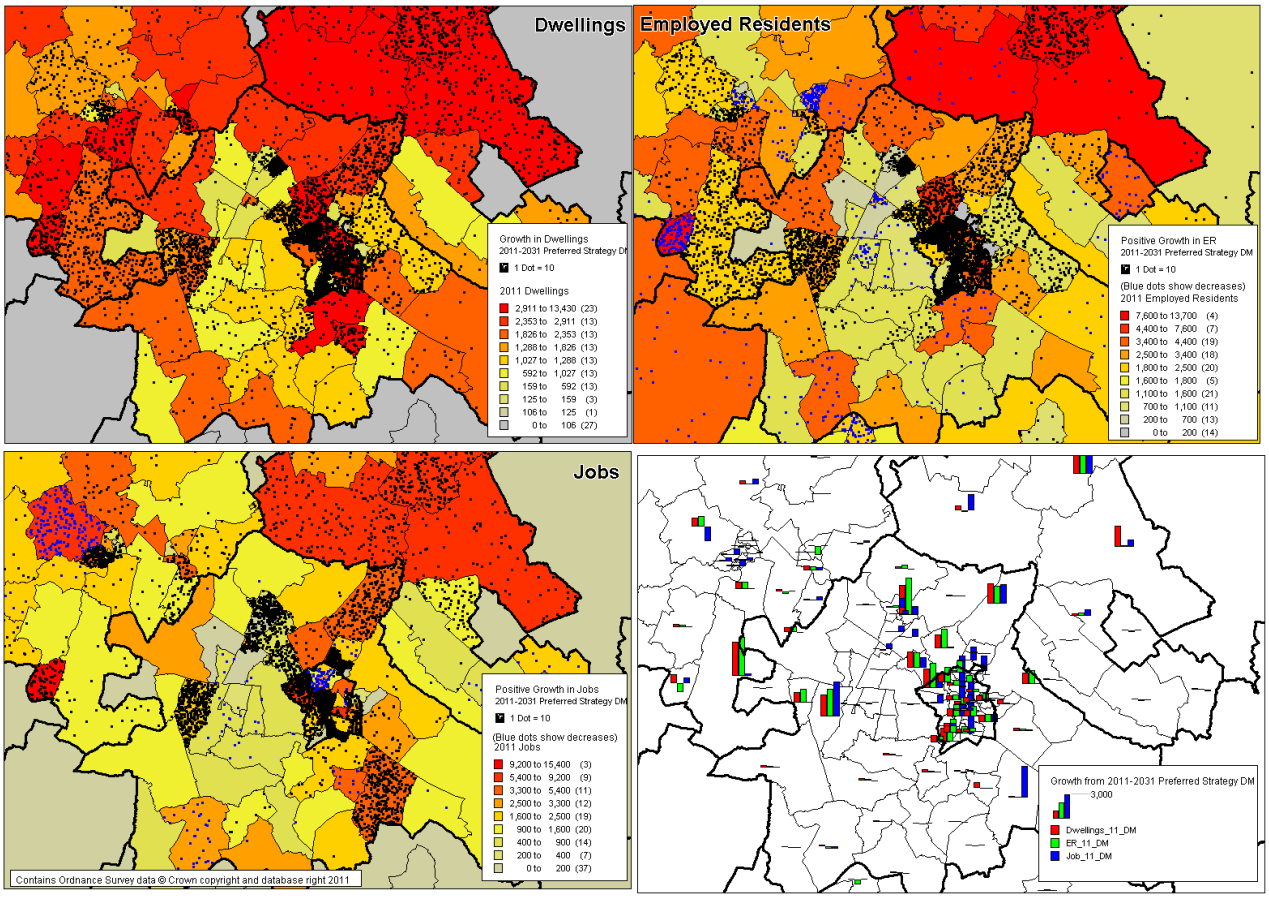
Inputs to the Phase 3 re-run.

6.3. For the Phase 3 re-run, the District and City Council provided revised development trajectories for the period to 2031. These were updated to reflect the latest monitoring information regarding completions and commitments, and the timing and phasing of individual developments. The most significant change reflected a Proposed Modification to the Local Plans to bring forward a larger area of development north of Cherry Hinton Road, a part of the safeguarded land within Cambridge East. The councils are only relying on 1,200 homes in this location in their housing trajectories; this is because any further development is reliant on constraints with the ongoing Airport use being overcome. However, in order to account for a potentially larger number of dwellings coming forward here, approximately 1,800 dwellings have been assumed to be developed here in the phase 3 re-run. The delivery trajectories were also amended for Waterbeach new town and Bourn Airfield, anticipating slightly more at Waterbeach and less at Bourn Airfield than previous phase 3 model runs.

6.4. Figure 6-1 below shows the change in the locations of dwellings, employed residents and jobs growth with these measures in place. The figures are taken from the outputs of the CSRM Land Use model, which has taken the development assumptions listed above as inputs. The Land Use model allocates dwellings to model zones precisely as specified by the District and City Councils, and also ensures job growth for each district matches the specified levels. However, locations of employed residents and jobs are to a certain extent determined by the model itself, based on availability of dwellings, commercial floorspace and the attractiveness of each area.

Figure 6-1 Change in Dwellings, Employed Residents and Jobs, 2011-2031

(see large scale version at Appendix D)



6.5. The transport mitigation measures previously used in phase 3 have been largely unchanged. The following lists all new mitigation measures that were included:

- Suitable access arrangements for the development north of Cherry Hinton;
- Improved access arrangements at the Bourn Airfield site; and
- Upgrading the A428 Caxton Gibbet junction to a fully grade separated junction.

6.6. Full details of the transport measures in the Preferred Strategy are given in Appendix B.

Impact of Preferred Strategy on Traffic and Delay

6.7. The following figures show the change in total vehicle kilometres, total vehicle hours and total delay for the Preferred Strategy.

6.8. These figures show that the Preferred Strategy performs in a very similar way overall to the seven development options tested in 2013 and 2015 in both the 'Do-Minimum' and 'Do-Something' situation (see Appendix E for comparison charts)

6.9. The change in total vehicle kilometres in the AM peak between DM and DS is a difference of 3-4 percentage points with the transport measures having a beneficial impact on total vehicle kilometres. The increase in total vehicle hours in Cambridge, is approximately double that the increase in total vehicle kilometres, indicating the journey speeds overall will decrease in the Preferred Strategy. This impact is forecast to occur because of the scale of planned growth and so would likely be the result of all development scenarios.

6.10. The increase in total vehicle kilometres across the whole of Cambridgeshire of 40% in the AM (42% in the PM) results in a 145% (165%) increase in total delay without transport measures in place; in other words more than doubling network delay by 2031. Note that the increase in delay is lower in both Cambridge and South Cambridgeshire, but still represents a doubling of total delay minutes in each case. The transport measures in the Do Something test reduce this growth of delay, typically by 10-20% but by 35% in Cambridgeshire in the PM peak. The exception is for Cambridge in the PM peak, which experiences slightly more delay with transport measures in place. This was observed in some Phase 2 options, and is likely to arise from reallocation of road space.

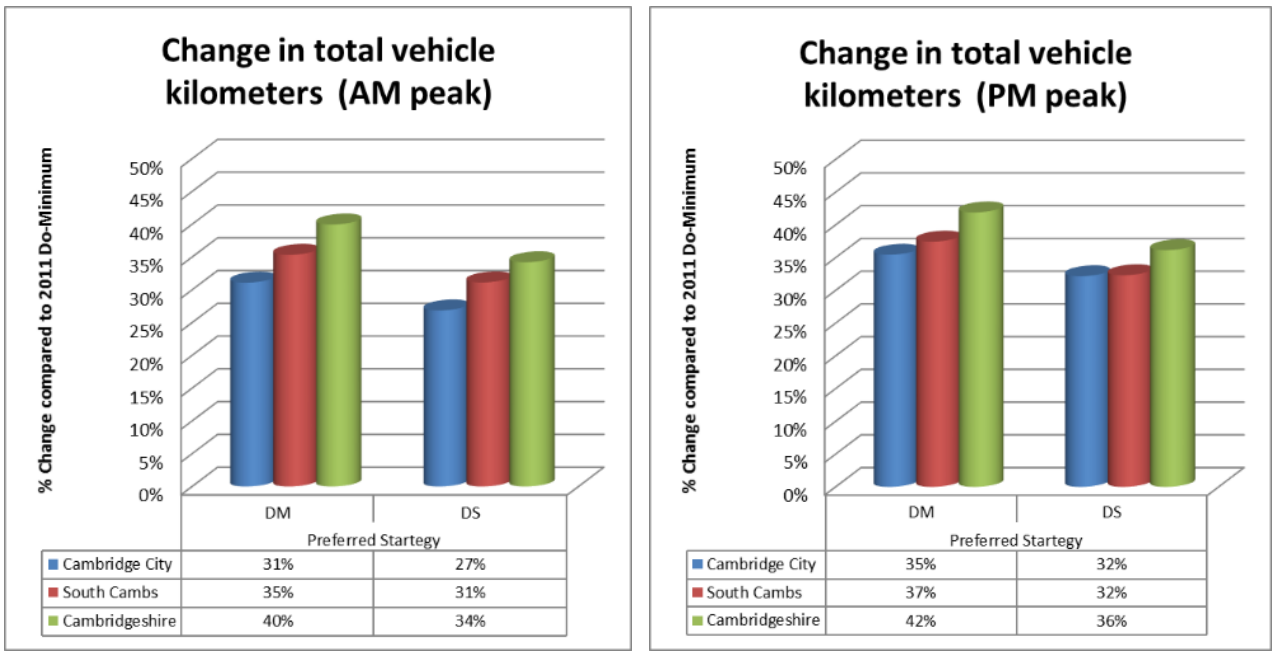
Comparison with National Traffic Growth

6.11. To confirm that the CSRM forecasts of traffic growth appear credible, they can be compared with the Department for Transport's national road traffic forecasts, which were updated in 2015. These forecasts are available at regional level, so have been obtained for the East of England[41]. The DfT's forecasts with 'central' economic growth assumptions project 2010 to 2031 growth of 30% in urban areas and 33% in rural areas, rising to 36% and 41% in a high economic growth scenario. The comparable figures for 2011-2031 all day traffic growth from CSRM are 35% for Cambridge and 36.5% for South Cambridgeshire[42].

6.12. This indicates that CSRM is predicting growth somewhere between that in the DfT central and high economic growth case for the East of England, which appears plausible as Cambridgeshire is itself a high growth area.

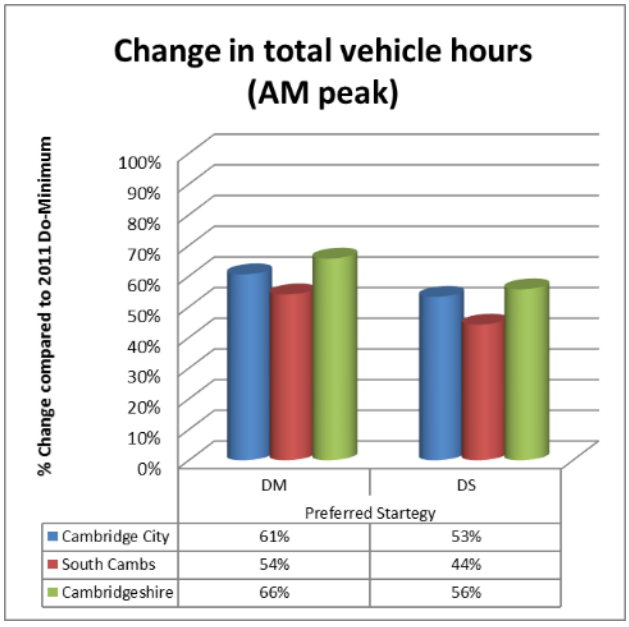
6.13. Furthermore, CSRM is able to give a more detailed breakdown of the growth by time of day: in the AM peak the growth levels are 27% and 31% respectively for Cambridge and South Cambridgeshire, whilst in the interpeak the traffic grows by 42% for each area. Overall, the traffic growth in the interpeak accounts for just over 50% of the growth. These differences indicate the impact of the existing congestion in the peak periods, which constrain the extent to which growth can occur there.

Figure 6-2 Change in total vehicle kilometres (AM and PM peaks)



[41] Available from: https://www.gov.uk/government/publications/road-traffic-forecasts-2015
[42] Based on Phase 3 Preferred Strategy Do Something test.

Figure 6-3 Change in total vehicle hours (AM and PM peaks)



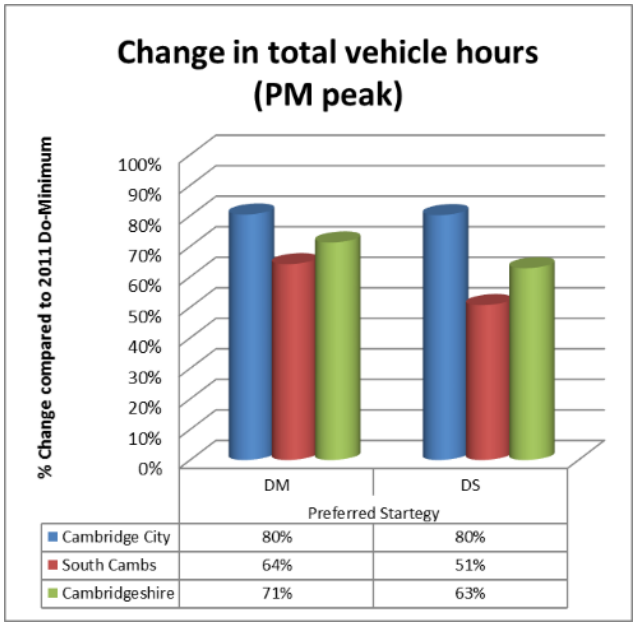
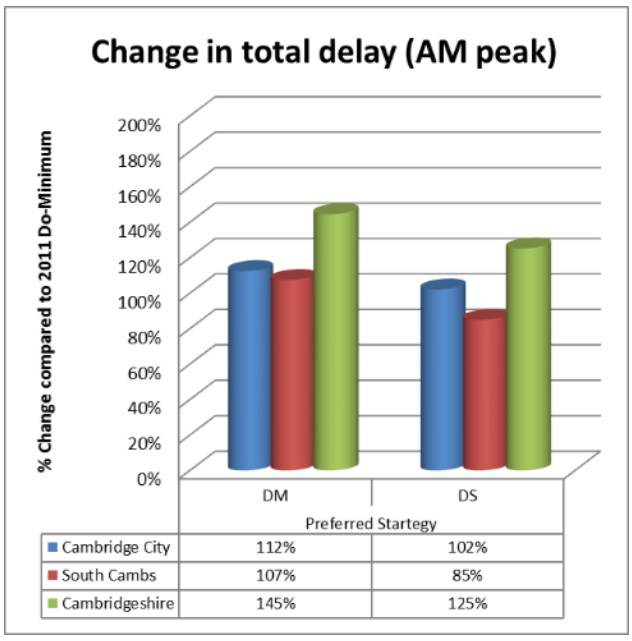
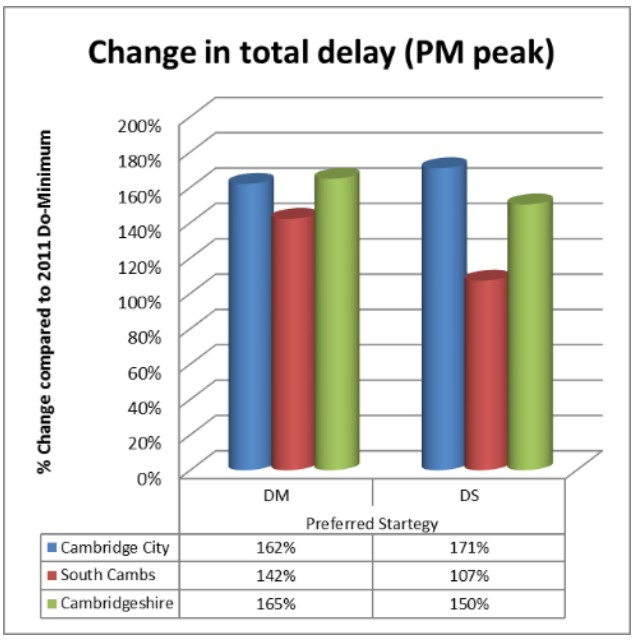


Figure 6-4 Change in total delay (AM and PM peaks)





Modal Share

6.14. The tests demonstrated that investment in high quality public transport corridors significantly increases patronage and helps improve the accessibility of Cambridge in particular. This is shown below in terms of the improvement of public transport journey times with the Transport Strategy in place as well as the upturn in Park and Ride usage.

Table 6-1 Total car mode share for 2031 AM peak trips to Cambridge and South Cambridgeshire, with (DS) and without (DM) transport measures

	To Cambridge		To South Cambs	
	DM	DS	DM	DS
2011 Base	35.4%		62.1%	
2031 Preferred Strategy (combined development sites)	34.8%	32.9%	62.1%	61.5%

6.15. Table 6-1 shows that, like the seven options tested in Phase 2, overall mode share remains stable with a small decrease in car mode share between 2011 and 2031. This is not surprising given that a significant proportion of the anticipated growth is as a result of existing commitments. The impact of transport measures is shown by the approximately 2% reduction in car mode share in the Preferred Strategy.

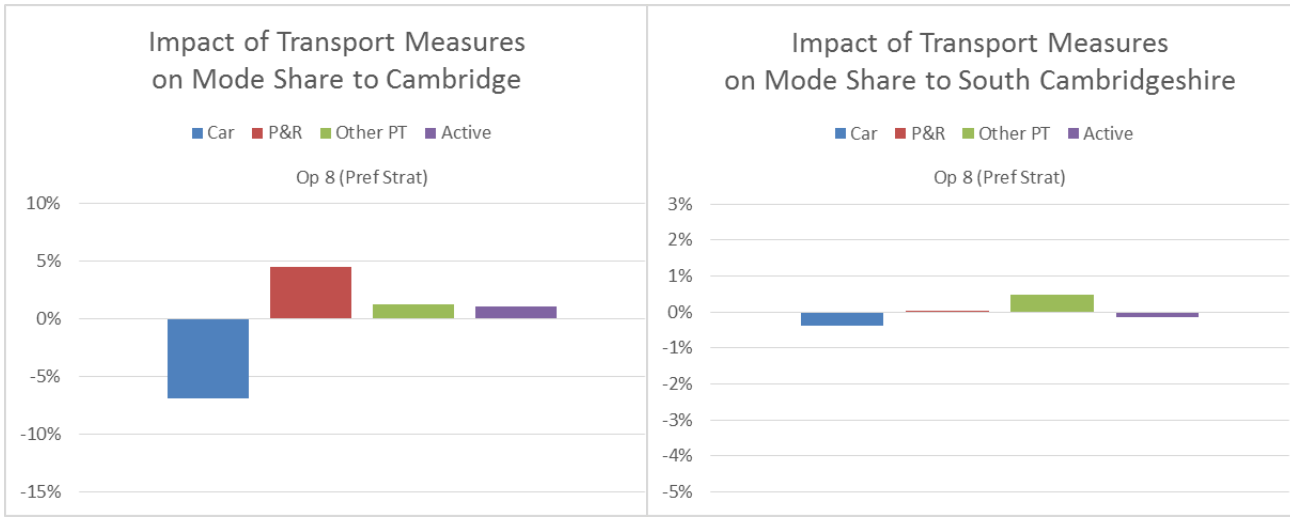
Table 6-2 Car mode share of 2011-2031 growth in AM peak trips to Cambridge and South Cambridgeshire, with (DS) and without (DM) transport measures

	To Cambridge		To South Cambs	
	DM	DS	DM	DS
2031 Preferred Strategy (combined development sites)	32.6%	24.2%	62.3%	59.4%

6.16. Table 6-2 shows that the growth in car mode share trips in the Preferred Strategy is similar to the seven options tested. It also shows that the impact of transport measures reduces the growth in car mode share by 8.4 percentage points.

6.17. The following figures demonstrate the extent of the impact of transport measures introduced in the DS on mode share for the Preferred Strategy, which achieve a mode shift away from car for trips into Cambridge of 7%. The majority of the shift is to Park and Ride, with smaller movements to active transport modes of walking and cycling. The transport measures have comparatively little impact on the mode share of trips to South Cambridgeshire. These results are very similar to those observed for Phase 2 Options 1 to 3.

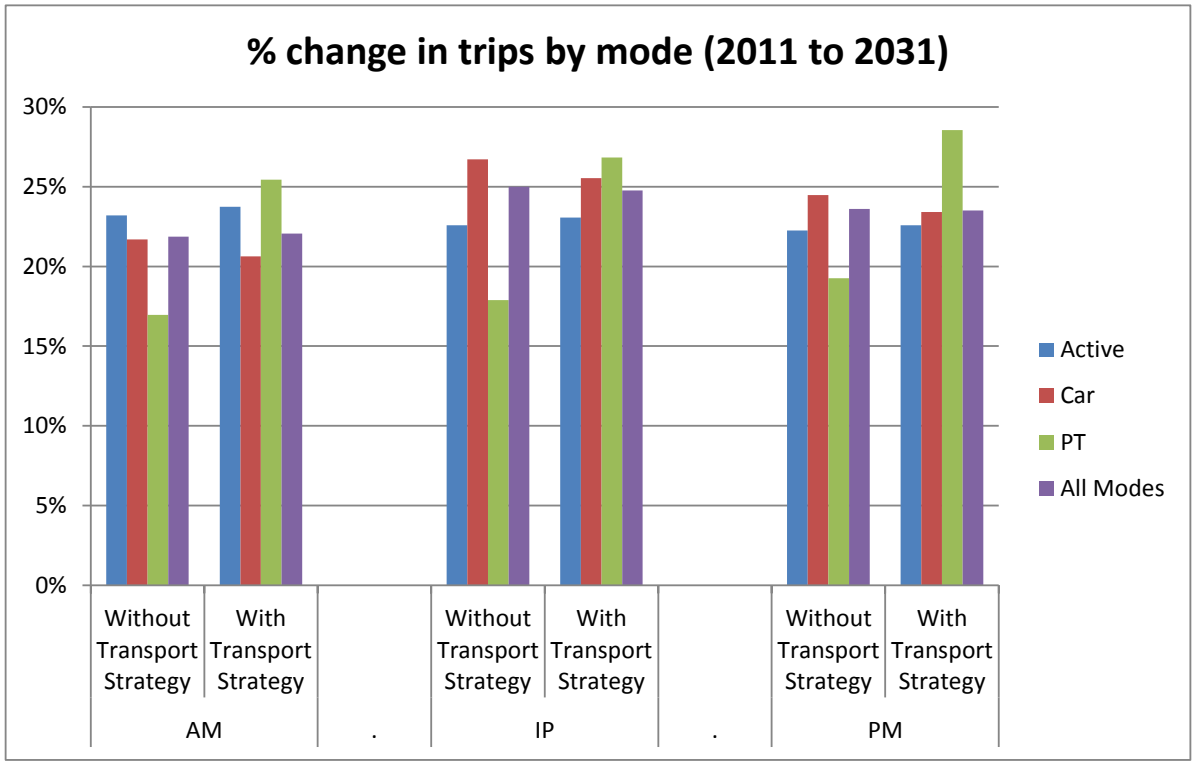
Figure 6-5 Change in mode share of AM due to transport measures in the Preferred Strategy (to Cambridge / South Cambridgeshire)



Change in Trips

6.18. The growth in population and employment (see Figure 6-1) will result in an increased demand for travel across the sub region.

Figure 6-6 Increase in travel demand (2011 to 2031) by mode across Sub Region



6.19. Figure 6-6 shows how the increase in demand varies by time of day and mode and that the total demand across all modes increases between 20% and 25% in all time periods. The growth in public transport trips improves significantly with the transport strategy, in particular public transport trips growing 25% in the AM with transport measures, compared with 17% without. However, public transport remains a minority mode for medium and particularly longer distance travel. It should be noted that Cambridge Park & Ride trips are included within the car mode share. Improvements to cycling facilities within and around Cambridge also have potential to reduce trips.

6.20. Table 6-3 below shows the growth in the total travel demand by origin and destination. This shows that travel to, from and within the City is expected to grow by around 30% while average growth in the sub region is 24%. It is significant however that the largest percentage growth is for trips within South Cambridgeshire and between Cambridge and South Cambridgeshire (in both directions). This illustrates that South Cambridgeshire is growing in importance as a destination for trips, relative to Cambridge. To some extent this relates to jobs growth on the edge of the City, but will also include increased movements in rural areas, where there is most spare capacity on the roads.

Table 6-3 Growth in total demand by Origin and Destination (2011-2031)

	To destinations in:			
From origins in:	**Cambridge**	**South Cambs**	**Elsewhere**	**All Areas**
Cambridge	30%	33%	22%	30%
South Cambridgeshire	33%	33%	26%	31%
Elsewhere	24%	28%	15%	17%
All areas	30%	32%	17%	24%

6.21. It can be seen below that with the transport strategy in place it helps significantly increase trips by non-car modes and improves overall accessibility to and from the City, with cycling and walking growing from 30% to 32% and public transport growing from 4% to 16% between the without strategy and with strategy situation.

Journey Speeds into Cambridge

6.22. Figure 6-7 shows the change in the speed of journeys into Cambridge as a whole, considering all origin locations outside Cambridge. It is clear that on average, travel conditions by car deteriorate over time while those for public transport improve. The Transport Strategy measures included as detailed in the TSCSC has a particularly large impact on the speed of public transport trips into Cambridge.

6.23. It should be noted that there will be spatial variations based on the availability of high quality public transport facilities between key locations. The transport strategy changes to travel times for selected corridors are shown in Figure 6-8. Car travel times are forecast to increase over the 20 year period in all cases, with the strategy alleviating congestion in some corridors. Note that journey times from the south and west into Cambridge increase slightly with the strategy in place, which reflects re-routing to cross the City once the expanded core scheme is in place. Travel times by public transport increase over time less than those by car and in some cases are forecast to reduce with the strategy amplifying this effect.

6.24. The chart also highlights congestion effects which remain on some corridors, and affect both car and bus journey times on the A428 (Bourn Airfield and Cambourne) and A10 south (Barrington and Royston).

6.25. In Figure 6-8, a single central point in Cambridge (the Grafton Centre) was selected to allow journey times to be clearly measured. However, as noted this can introduce some disparities due to the time taken to cross the centre of Cambridge. To complement this, the maps at the end of Appendix E (Figures E-4 and E-5) show the change in journey times to Cambridge from each origin location[43].

6.26. Figure E-4 compares 2031 **without Transport Measures** (the Do Minimum or 'DM' scenario) to 2011 (modelled times), and Figure E-5 compares the situation with and without Transport Measures in 2031 (Do Something or 'DS' minus DM). The maps show the percentage change in the average journey time to all City destinations from each model zone: Red represents an INCREASE in travel time, Blue a decrease (the change in time in minutes is shown in brackets on each zone).

[43] The maps are based on the average time taken to travel to destinations in Cambridge from each origin, weighted according to the number of trips made.

6.27. The maps illustrate the worsening of journey times for all modes between 2011 and 2031, other than some specific public transport corridors with improvements (e.g. Northstowe for CGB and Royston for rail services)[44].

6.28. Comparing times with/without the Transport Measures (DS-DM) shows that car journey times within and close to Cambridge stay the same or increase slightly. Journey times from more distant locations decrease, which is likely to be due to congestion relief on the edge of Cambridge. Figure 6-8 shows that Park and Ride journey times generally decrease, though the A1307 (Babraham Road) corridor worsens and may require some further investigation to determine whether this is associated with the bus or car leg. The 'Other PT' journey times (comprising bus, guided bus and rail) improve more significantly, particularly on the A1307 and A428 corridors showing the success of the HQPT.

Figure 6-7 Percentage change in speed of trips into Cambridge (from outside) with and without Transport Measures (2011 to 2031)

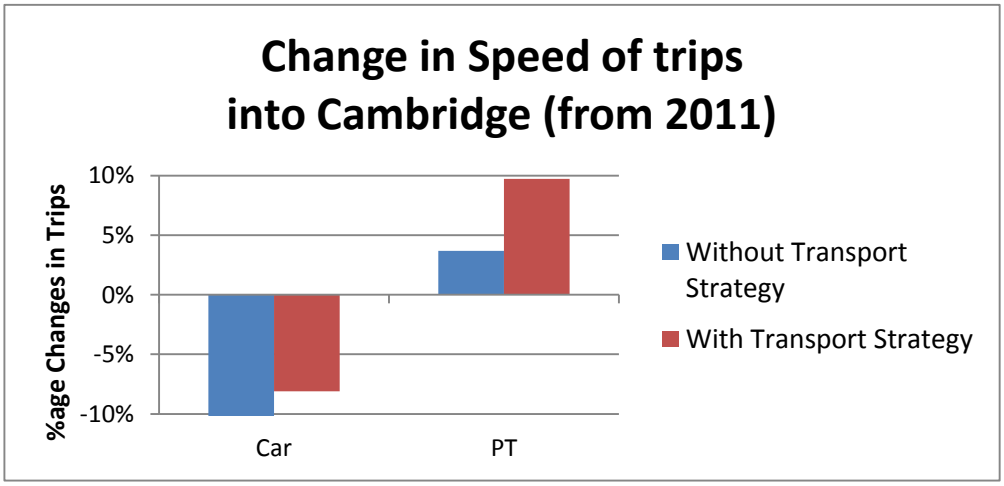
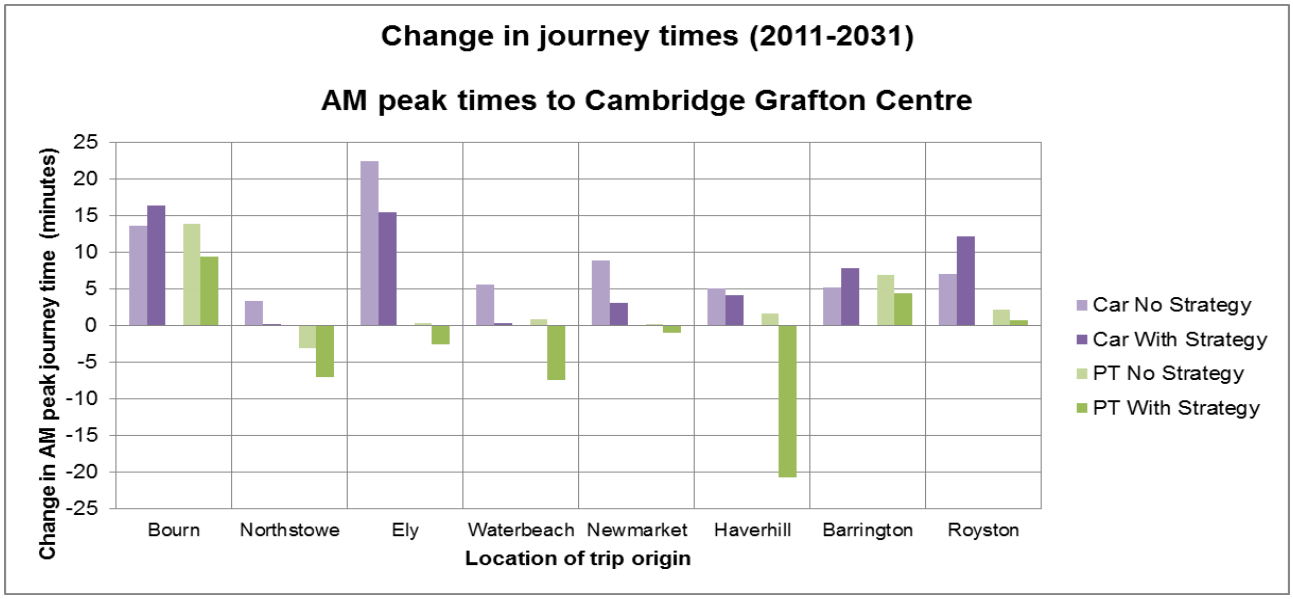


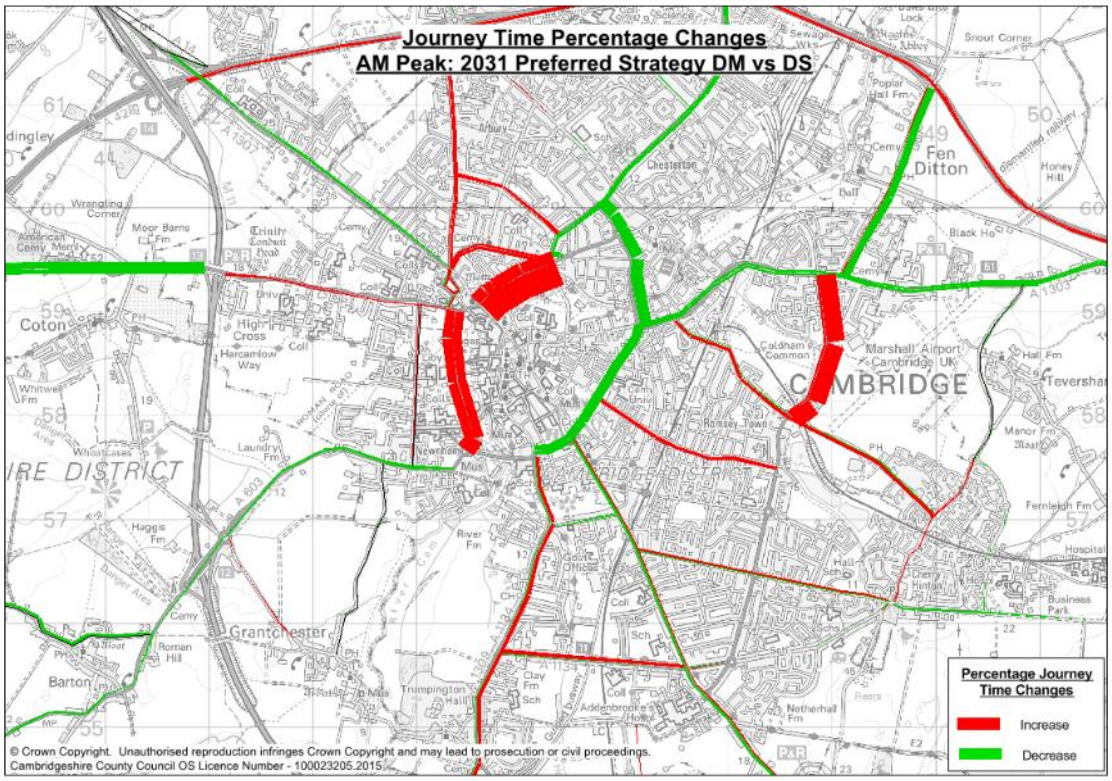
Figure 6-8 Change in AM peak journey time from selected locations to central Cambridge zone



[44] Note that because the maps represent average time to all of Cambridge, some changes may represent journeys lengthening by reaching further INTO the City. This is likely to be the case for 'Active' modes, where times would not otherwise increase. However, as cycling mode shares increase through time, cyclists are travelling further across the city and hence increasing journey time.

6.29. The diagram below shows the impact of further Core Scheme type interventions, potential road closures of Hills Road, East Road and Mill Road alongside comprehensive parking restrictions in residential areas, as an expansion to the existing core scheme, can reduce journey times for certain segments of movements within Cambridge but increase journey time pressures on other key routes. These measures will assist in improving travel by non-car modes, reducing journey times and increasing non-car modes shares.

Figure 6-9 Change in selected 2031 highway journey times as a result of Transport Strategy



High Quality Bus Services

6.30. Table 6-4 below shows the proposed High Quality Bus services on the A428, A1307 and A10 (South) corridors, along with the change in frequency, journey time, speed, and the peak ridership. For these bus services (excluding Park & Ride), it has been assumed that greater speed increases can be achieved outside Cambridge, on a par with those for the existing Cambridgeshire Guided Busway (CGB) services. Where specified by CCC, the services have been assumed to run segregated from other highway traffic, to eliminate delays caused by traffic queues. As with the CGB, these services also benefit from an additional 'attraction' factor which represents the improved quality of the bus service and stock, plus the improved frequency and reliability.

6.31. The results show that the total journey times (including decreases in waiting time due to frequency increase) improve by 24% on the Haverhill and North Bedfordshire routes. The St Neots / Cambourne route has a smaller improvement due to additional congestion delays on some remaining 'on road' sections. It is possible that further design work on the bus segregation measures or the highways in this corridor may eliminate this delay and provide journey times similar to CGB. For example, the minimum time from Cambourne and Northstowe to city centre are 40 mins (25 stops) and 22 mins (7 stops) respectively. The congested times are 57 mins and 24 mins respectively. The speed of the Cambourne service is 16 kph in the City and 37 kph in South Cambs, with CGB speed of 17 and 67 kph.

6.32. The improvements in bus ridership on each route are significant. The figures show the increase in maximum loading on each route section, which range from ~180 to ~1,100.

6.33. Note that journey times for a wider range of rural services have also been improved by this strategy, as the bus infrastructure introduced is expected to benefit all services using these routes.

Table 6-4 High Quality Bus Services in the AM Peak, impact of Transport Measures[45]

		Headway (min)			Difference (without / with Transport Measures)				
Origin	Destination	w/o Transport Measures	with Transport Measures	Route Section	Timetable Time (min)	Journey Time (min)	%age Time	avg speed (kph)	Max. Load
Haverhill	City Centre	15	10	City	-3	-3	-18%	3	232
				S Cambs	-2	-2	-25%	11	179
				Other	-10	-10	-26%	11	196
				All	-15	-15	-24%	8	187
St Neots	City Centre	60	10	City	0	0	2%	0	188
				S Cambs	-1	1	2%	-1	195
				Other	-4	-7	-41%	26	194
				All	-5	-5	-6%	2	195
North Beds.	City Centre	30	10	City	-3	-6	-31%	7	1,086
				S Cambs	-2	-7	-32%	14	454
				Other	-5	-7	-16%	9	472
				All	-10	-20	-24%	11	1,077

Summary of Findings on Preferred Strategy

6.34. This evidence taken together suggests the performance of the Preferred Strategy, in transport terms is broadly similar to other scenarios tested when considering overall levels of development.

6.35. In the Do Minimum, the Preferred Strategy shows that planned delivery of housing and employment growth results in an increase in traffic and congestion of a similar magnitude to all other development options tested. Under a 'Do-Something' situation there is an improvement in these data; the improvement is similar in magnitude to that seen in the original seven land use scenarios.

6.36. The 2015 tests show that the results are consistent with the outcomes reported in 2013, and that modest differences in the results do not alter the conclusions reached in 2013.

[45] Note: (1) Where bus services run unsegregated from other highway traffic, the Journey Time includes any extra delay caused by traffic congestion. This congestion is taken from the County's SATURN Highway model. (2) Timetable Times and speed includes any dwell time at stops on these services.

7. Summary and Conclusions

Summary of Findings from Modelling

7.1. Three separate sets of model runs were undertaken during 2013 and 2015 to test the impact of development options on the transport network in Cambridge and South Cambridgeshire.

7.2. The **2013 test** showed that the seven Phase 1 development options all led to broadly similar impacts on the key metrics of vehicle kilometres, total vehicle hours, and network delay, which would result in longer journey times, increased congestion, and increased delay for travellers.

7.3. The results also showed that for the three shortlisted scenarios of development in village, Bourn and Waterbeach, site specific transport measures would reduce the impact of growth, with dispersed growth in villages being less preferable to focused growth in Bourn Airfield and Waterbeach in transport terms.

7.4. The conclusion of the 2013 tests was that the councils should pursue focused rather than dispersed growth, with development supported by sustainable alternatives to the car, and that the Transport Strategy would help make the city and key destinations more accessible. The **2015(A) test**, based on updated housing numbers from the districts, showed no significant changes and therefore the councils regarded the **2013 conclusions as remaining sound.**

7.5. The **2015(B)** test firstly re-examined all seven Development Options using the latest up-to-date housing and employment data. This re-examination affirmed all previous results: all development options have very similar impacts on transport in terms of growth, congestion and delay. The Green Belt options perform best in terms of car mode share within their own development areas. However, these results hide the fact that these locations are in already congested areas of the city where there is little scope to create more capacity for more cars, forcing new trips to be undertaken by active modes.

7.6. The Preferred Strategy test shows that its transport performance is broadly the same as the seven development options tested. . Results also show that delivering the Preferred Strategy, supported by transport measures in the Transport Strategy, reduce some of the impact of growth and are forecast to result in a fall in car mode share of 7% accompanied by a 4% rise in P&R use.

Conclusions

7.7. The 2015(B) re-examination reaffirmed the earlier tests undertaken earlier in 2015 and in 2013. The conclusion of 2015(B) re-examination of all options, is that **the conclusions of 2013, subsequently supported by 2015(A), tests remain sound.**

7.8. Economic growth in the sub region brings opportunities and challenges in terms of increased population and a greater demand for travel. Increases in availability of cars are projected through time, particularly in the rural areas with greatest reliance on car travel. Without adapting the way people live and work, this will almost certainly lead to increased demand for travel resulting in more congestion and increased air pollution at peak times. Where spare road capacity is available, travel patterns and mode share will normally shift to take advantage of this and fill available road capacity. This may take the form of changes in the locations of development in the economic growth of the sub-region and requires increasing numbers of workers to fill jobs. Where housing for workers is not available locally, this tends to increase levels of in-commuting.

7.9. Whilst much of the trip patterns are generated by the historic distribution of development, the transport strategy will be critical to continuing the strategy of shifting from a reliance on car based travel to sustainable modes permitting viable and self-supporting public transport alternatives to be created to the new development areas delivered by the Local Plan Strategies.

7.10. The key findings of the detailed transport modelling undertaken to inform the two Councils' Local Plans and the Cambridge and South Cambridgeshire Transport Strategy are as follows:

- The Preferred Local Plan Strategies should focus development in key locations rather than dispersed in villages;
- These locations should maximise sustainable travel alternatives to the car, particularly by providing high quality public transport for those expanded and new settlements, and these locations are best suited to delivering the necessary infrastructure to encourage travel by non-car modes;
- Such public transport routes need to be able to bypass queues and congestion to offer reliable and swift journey times both to the identified growth areas to improve options for residents in existing villages and settlements as well as for the new developments.
- The Transport Strategy will help to make the City and key destinations such as employment centres more accessible;
- The Preferred Local Plan Strategies and transport measures should reduce the amount of car growth to and from the City; and
- With a growth in travel demand generally stricter controls on car access and parking in Cambridge will need to play an increasing role in managing car travel demand. Initial testing suggests that demand measures such as parking restraint appear to offer a realistic and cost effective mechanism of reducing car growth where strong alternative modes exist.

7.11. This work has therefore demonstrated that the proposed Local Plan and Transport Strategy should have a beneficial effect overall. The development strategy chosen by providing further housing will assist in minimising in-commuting, which is a major driver of future traffic growth. The focus on new settlements will provide opportunities to further minimise traffic growth through use of sustainable travel modes and internalisation of trips.

7.12. The Transport Strategy, and the inclusion of identified transport requirements in Local Plan policies for the major developments will help in mitigating some of the implications of future growth through providing high quality alternatives to the car that can bypass congestion and provide an attractive alternative that results in an increase in the modal shift and number of non-car trips within Cambridge and South Cambridgeshire. The Transport strategy should help to reduce congestion, help mitigate the impacts of growth, enhance travel by sustainable alternatives and help make the City and South Cambridgeshire more accessible overall, for existing and planned communities. It will ensure priority for sustainable modes can be promoted through appropriate planning allocations and tailoring high quality public transport services to provide reliable and attractive routes to areas of greatest demands.

Appendices

Appendix A. NPPG Compliance Checklist

NPPG criteria	Detail	Location in Report
Paragraph: 001 Reference ID: 54-001-20141010 **Why establish a transport evidence base for Local Plans?** It is important for local planning authorities to undertake an assessment of the transport implications in developing or reviewing their Local Plan so that a robust transport evidence base may be developed to support the preparation and/or review of that Plan. A robust transport evidence base can facilitate approval of the Local Plan and reduce costs and delays to the delivery of new development, thus reducing the burden on the public purse and private sector. The transport evidence base should identify the opportunities for encouraging a shift to more sustainable transport usage, where reasonable to do so; and highlight the infrastructure requirements for inclusion in infrastructure spending plans linked to the Community Infrastructure Levy, section 106 provisions and other funding sources. Local planning authorities should also refer to the Department for Transport's Circular 02/2013 'The Strategic Road Network and the Delivery of Sustainable Development'	To develop a robust transport evidence base to support the preparation and/or review of the Plan.	This document provides transport evidence to support plan making.
	To identify the opportunities for encouraging a shift to more sustainable transport usage.	Opportunities for encouraging mode shift are included in the LTP and TSCSC. This analysis takes the measures from these strategies and tests their impact on modal choice. See specifically Figures 5-14, 5-15, 6-5 and 6-6.
	To highlight the infrastructure requirements for inclusion in infrastructure spending plans linked to the Community Infrastructure Levy, section 106 provisions and other funding sources.	Infrastructure requirements are reported in Appendix B.
Paragraph: 002 Reference ID: 54-002-20141010 **What is the purpose of a transport evidence base to support the Local Plan?** A robust evidence base will enable an assessment of the transport impacts of both existing development as well as that proposed, and can inform sustainable approaches to transport at a plan-making level. This will include consideration of viability and deliverability. A robust assessment will establish evidence that may be useful in:	Improving the sustainability of transport provision.	The Transport Strategy (TSCSC) sets out the population, employment and housing growth information from the Local Plans and uses this to shape the transport strategy in terms of encouraging higher mode share of sustainable modes.
	Enhancing accessibility.	Options regarding accessibility are explored. The analysis of the preferred option shows that accessibility to Cambridge is increased. See para 1.18, 5.28, Table 5-3 and Figure 6-5. The Transport Strategy measures identified have a beneficial effect on non-car accessibility, see Figure 6-5 and Figure 6-6.
	Creating choice amongst different modes of transport.	Appendix B shows the transport choices available for each strategic option tested. Figures 5-14, 5-15, 6-5 and 6-7 demonstrate their impact in shifting trips to sustainable modes.

NPPG criteria	Detail	Location in Report
	Improving health and wellbeing.	Explores issues regarding modal shift from car to sustainable modes (see references above), including walking and cycling.
	Supporting economic vitality.	Considers accessibility and movement around the Cambridge area. Considers transport measures which can support housing and employment growth.
	Improving public understanding of the transport implications of development.	This evidence base, particularly Chapters 5 and 6, explains the transport impacts of the developments both locally and across the Districts as a whole. Appendix B discusses the specific measures related to individual sites, whilst Chapter 5 demonstrates that the choice of development locations cannot radically reduce the overall rise in traffic levels and congestion, due to (a) the fact that the development options vary only a small proportion of the demand and (b) the existence of suppressed demand. See para 5.37 and 5.69.
	Enabling other highway and transport authorities / service providers to support and deliver the transport infrastructure than conforms to the Local Plan.	The report highlights transport measures (Appendix B) required, some of which are delivered by national agencies such as Highways England and Network Rail. Others are delivered through LEP funding, and the Cambridge City Deal.
	Supporting local shops and the high street.	Though not specifically addressed, the report demonstrates how transport positively supports the economic development of the sub-region, as in response to point 8 above.
Paragraph: 003 Reference ID: 54-003-20141010 **What key issues should be considered in developing the transport evidence base to support the Local Plan?** The key issues, which should be considered in developing a transport evidence base, include the need to:	Assess the existing situation and likely generation of trips over time by all modes and the impact on the locality in economic, social and environmental terms.	The transport modelling estimates generation of trips and choice of modes, and projects the impact on road traffic and congestion (Figures 5-5 to 5-10). Economic, social and environmental impacts can be inferred but are not explicitly addressed in the current analysis.
	Assess the opportunities to support a pattern of development that, where reasonable to do so, facilitates the use of sustainable modes of transport.	Chapter 5, Table 5-3 & 5-4, and Figures 5-11 to 5-13 demonstrate how development options influence the use of sustainable transport both locally and across the districts as a whole. The report has informed the wider plan making process where decisions regarding the range of sustainability issues are weighed up in addition to transport.
	Highlight and promote opportunities to reduce the need for travel where appropriate.	This theme runs through the analysis in Chapters 5 and 6, where the modelling includes opportunities for more local trips. The analysis specifically highlights in para 5.62 the negative impacts of dispersed development in Option 1.

NPPG criteria	Detail	Location in Report
	Identify opportunities to prioritise the use of alternative modes in both existing and new development locations if appropriate.	The transport measures in Appendix B and development focused mode shares in Figures 5-11 to 5-13 highlight this, though further site specific work will be appropriate when considering each development locations.
	Consider the cumulative impacts of existing and proposed development on transport networks.	The modelling carried out naturally demonstrates these impacts arising from development, as drawn out in Chapter 5.
	Assess the quality and capacity of transport infrastructure and its ability to meet forecast demands.	The highway traffic and congestion charts (Figs 5-5 to 5-10 and 6-2 to 6-4) show network impacts with and without transport measures, whilst Figs 5-14 & 5-15, 6-5 and 6-6 demonstrate impacts of the proposed transport measures in encouraging use of sustainable modes.
	Identify the short, medium and long-term transport proposals across all modes.	See Appendix E.
Paragraph: 004 Reference ID: 54-004-20141010 **When should the transport assessment of the Local Plan be undertaken?** An assessment of the transport implications should be undertaken at a number of stages in the preparation of a Local Plan. The last of these stages should highlight the scale of and priorities for investment requirements and support infrastructure spending plans. Like a sustainability appraisal, it will be an iterative process and become more refined and detailed as the process draws to a conclusion.	As part of the initial evidence base in terms of issues and opportunities.	See Chapter 2 for details of the Local Plan process. Modelling evidence which forms part of this report was used to inform the issues and options process, along with other evidence including the Strategic Housing Land Availability Assessments and Sustainability Appraisals.
	As part of the options testing.	See paras 2.36 to 2.43
	As part of the preparation of the final submission.	The TSCSC was prepared in parallel with the Local Plans and went through an iterative process in order to be at an appropriate level of detail for each stage of the plan process, including for submission.
Paragraph: 005 Reference ID: 54-005-20141010 **What baseline information should inform a transport assessment of a Local Plan?** The following list indicates the key aspects that should be addressed in the transport assessment. This list is not exhaustive, and there may be additional issues that are important to consider locally. The transport assessment should be produced at a Local Plan level in partnership with all relevant transport and planning authorities, transport providers	All current transport issues as they affect all modes and freight covering, for example, accessibility, congestion, mobility, safety, pollution, affordability, carbon reduction across the whole Plan area and, within relevant areas of the Plan, including existing settlements and proposed land allocations.	An overview of the current transport situation is provided in Chapter 4. See also CSRM Technical Modelling Report for Cambridge and South Cambridgeshire Local Plans – Supplementary Technical Note, November 2015.
	The potential options to address the issues identified and any gaps in the networks in the short, medium and longer term covering, for	See Appendix B. The TSCSC, LTP and LTTS also set out the current situations in the area and have numerous proposals/options for dealing

NPPG criteria	Detail	Location in Report
and key stakeholders, for example, the Local Economic Partnership. It may be appropriate for the transport assessment to cover an area wider than the Local Plan at least initially given the size of some travel to work areas (this would be similar to the Strategic Housing Market Assessment). This process should help to identify any potential measures that may be required to mitigate negative impacts.	example, accessibility, congestion, mobility, safety, pollution, carbon reduction.	with these. These were developed in parallel with Local Plan strategies.
	The locations of proposed land allocations and areas/corridors of development and potential options for the provision of sustainable transport and transport networks to serve them.	Proposed growth locations are provided in Chapter 5 and the section Phase 2 2015(B) – Housing and Employment Growth Assumptions.
	Solutions to support a pattern of development that, where reasonable to do so, facilitates the use of sustainable modes of transport.	Figures 5-14 & 5-15, 6-5 and 6-6 demonstrate impacts of the proposed transport measures in encouraging use of sustainable modes.
	The scope and options for maximising travel planning and behavioural change.	The document explores a number of issues related to how strategy options impact on mode choice, particular chapters 5 and 6. The TSCSC and LTP contain a number of proposals for maximising travel planning and behavioural change. These were developed in parallel with Local Plan strategies. See also 7.10, final bullet.
	Accessibility of transport nodes such as rail / bus stations to facilitate integrated solutions.	Access to these nodes is integrated within CSRM and coded as part of the Transport Measures. However, more detailed assessment would be required for each site later in the planning process. Issues regarding accessibility of individual site options were addressed separately in the Councils in their Strategic Housing Land Availability Assessments and Sustainability Appraisals.
Paragraph: 006 Reference ID: 54-006-20141010 **What detailed information is required for the transport assessment of the Local Plan?** Much information required for the transport assessment will already be available, not least from the development needs and land availability assessments. Local planning authorities will need to consider the demographics of the area and also the desired or perceived changes likely to take place in the life of the Plan as they might affect the transport network.	Baseline existing conditions, which need to be established accurately to understand fully the context of the Local Plan policies and proposals.	An overview of the current transport situation is provided in Chapter 4. See also CSRM Technical Modelling Report for Cambridge and South Cambridgeshire Local Plans – Supplementary Technical Note, Nov 2015.
	The existing integrated transport networks and any gaps in these as well as service and quality.	See Chapter 4.
	Opportunities to change to other forms of transport	Modal shift, based on the transport measures in Appendix B, is described in Chapters 5 and 6.
	The current use and demand by all different types of transport including cumulative trips into and out of the area.	See chapter 4.

NPPG criteria	Detail	Location in Report
Other considerations that could be included are as shown. The list is not exhaustive, and other issues may need to be included as appropriate to give a complete baseline for the Plan area and how it will change. Early engagement between interested parties is important in agreeing the level and scope of assessment required.	The availability of information from travel plans, previous assessments, transport operators etc.	Some of this will be dealt with during later phases of the planning process. The TSCSC and LTP both contain policies related to travel planning and working with transport operators.
	Capacity data on rail and tram networks and constraints across the area.	See Chapter 4.
	Walking and cycling facilities and movements including future predicted trips.	See Chapter 4.
	Description and functional classification of the road network.	See Chapter 4.
	Current traffic flows including peak periods on roads, links and key junctions.	CSRM Technical Modelling Report for Cambridge and South Cambridgeshire Local Plans – Supplementary Technical Note, November 2015.
	Parking facilities, including any park and ride and existing under-provision of off-street parking spaces.	See para 4.24 for information on Park and Ride services. Relevant enhancements which are modelled in CSRM are listed in Appendix B and 7.10, final bullet point. The TSCSC considers a parking strategy for the area, including additional cycle parking facilities.
	Journey purpose of trips.	CSRM considers journeys split by trip purpose including commuting, education, leisure and shopping. These are in inherent part of the modelling undertaken.
	Identification and assessment of key links and junctions on the highway network to establish existing conditions.	The TSCSC, LTP and LTTS identify and discuss the existing key transport links in the area. These were developed in parallel with Local Plan strategies.
	Committed network improvements.	These are incorporated in all modelling, see Appendix B.
	Personal injury accident records, including cyclist safety.	LTP3 sets out the existing integrated transport networks across Cambridge and South Cambridgeshire. LTP3 indicators include road safety.
	Any programmed public transport improvements including type, timing and promoter information.	See Appendix B and the Cambridge and South Cambridgeshire Infrastructure Delivery Study Update (Final Report – Amended). 2013 update. The action plan of the TSCSC contains information on this. This detail will be worked up further as the planning process iterates.

NPPG criteria	Detail	Location in Report
	Pollution, including baseline carbon emissions broken down by type of travel.	The LTP has a number of chapters referring to environmental impacts and protection. It was also accompanied by an SEA, Environmental Report and HARA (link here) which discussed and assesses this.
	Existing transport-related environmental impacts.	The LTP was accompanied by an SEA, Environmental Report and HARA (link here) which discussed and assesses this. Local Plans Sustainability Appraisal scoping reports identified baseline issues related to transport.
	Established best practice in transport provision and the share of each type.	The LTP, which helps to support the Local Plans, has its policy basis derived from best practice as set out by Government. See chapter 3 of this report.
	At a broad level, journey purpose and origin and destination currently and how it is likely to change or desired to change – for all types of transport.	Chapter 4 provides a summary of existing transport demand. The modelling described in Chapters 5, 6 and 7 addresses trends in transport demand.
Paragraph: 007 Reference ID: 54-007-20141010 **How can a transport assessment of the Local Plan be undertaken?** A transport assessment is likely to be scenario based and in terms of projections look at a range of potential outcomes given a number of assumptions, for example, a movement in the proportion of people using different forms of transport consistent with best practice. Transport data should be included that reflects the typical (neutral) flow conditions on the network (for example, non-school holiday periods, typical weather conditions etc.) in the area of the Plan, and should be valid for the intended purposes. It should also take account of holiday periods in tourist areas, where peaks could occur in periods that might normally be considered non--neutral. The recommended periods for data collection are spring and autumn, which	Recent counts for peak period turning movements at critical strategic junctions, for example, in certain instances where there is known to be a significant level of heavy goods vehicles traffic, a classified count (identifying all vehicles separately) should be provided.	Cambridge Local Plan and South Cambridgeshire Local Plan. Matter 7 Transport. Update on Transport Modelling. Ref: M7/CCC & SCDC – Supplement 2) As the Planning Application process proceeds, further information on more focussed and up-to-date data may be sought.
	12 hour / 24 hour automatic traffic counts.	Cambridge Local Plan and South Cambridgeshire Local Plan. Matter 7 Transport. Update on Transport Modelling. Ref: M7/CCC & SCDC – Supplement 2) As the Planning Application process proceeds, further information on more focussed and up-to-date data may be sought.
	Manual turning counts (which should be conducted at 15 minute intervals) to identify all strategically relevant highway network peak periods.	Cambridge Local Plan and South Cambridgeshire Local Plan. Matter 7 Transport. Update on Transport Modelling. Ref: M7/CCC & SCDC – Supplement 2) As the Planning Application process proceeds, further information on more focussed and up-to-date data may be sought.

NPPG criteria	Detail	Location in Report
include the neutral months of April, May, June, September and October. Further advice is available from the Highways Agency, as described for traffic in the Design Manual for Roads and Bridges (Volume 13, Part 4). In terms of road traffic, but not other types of traffic, where there is a need to project existing or historical traffic data for future year assessments, the preferred option is the use of appropriate local traffic forecasts (such as the Trip End Model Presentation Program used for transport planning purposes), provided they offer a robust assessment. In some cases, National Road Traffic Forecast growth rates would be appropriate. However, it is important to ensure that this does not just perpetuate existing travel patterns but, where reasonable to do so, facilitates the use of sustainable modes of transport. The use of any area-wide traffic models or background growth rates should be agreed with the relevant transport or highway authority at the evidence gathering stage of the Local Plan. Care needs to be taken when considering using any model that it takes account of the need to address historic travel patterns not necessarily reinforce them.	Queue length surveys at key strategic signal junctions to establish demand and actual traffic flows.	Cambridge Local Plan and South Cambridgeshire Local Plan. Matter 7 Transport. Update on Transport Modelling. Ref: M7/CCC & SCDC – Supplement 2) As the Planning Application process proceeds, further information on more focussed and up-to-date data may be sought.
	Journey time surveys.	Cambridge Local Plan and South Cambridgeshire Local Plan. Matter 7 Transport. Update on Transport Modelling. Ref: M7/CCC & SCDC – Supplement 2) As the Planning Application process proceeds, further information on more focussed and up-to-date data may be sought.
	Freight counts.	Cambridge Local Plan and South Cambridgeshire Local Plan. Matter 7 Transport. Update on Transport Modelling. Ref: M7/CCC & SCDC – Supplement 2) As the Planning Application process proceeds, further information on more focussed and up-to-date data may be sought.
	Abnormal load counts.	N/A
	Pedestrian and cyclists counts.	See Figure 4-7, paras 4-34 to 4.39.
Paragraph: 008 Reference ID: 54-008-20141010 **How should the impact of land allocations be considered in assessing the transport implications of Local Plans?** The first step in quantifying the impact of proposed land allocations in the Local Plan on the transport system is to provide an estimate of the person trips (for all types of transport) that are likely to be generated by it. In all cases, an analysis of development-related trips using an appropriate database or an alternative methodology should be agreed with the relevant	Location plans of each site.	No detailed site plans included, though see Figure 5-4.
	Description of all the proposed land uses.	N/A – broad locations for growth are identified for this transport evidence base. See Tables 5-1 and 5-2.
	Scale of development – such as the number of residential units or gross floor area of development – subdivided by land use where appropriate / possible.	See Chapter 5, Phase 2 2015(B) – Housing and Employment Growth Assumptions
	Site area in hectares.	Information is available in the Councils Strategic Housing Land availability Assessments.
	Likely proposed access to existing transport infrastructure for all types of travel.	See Appendix B, table of Option Specific Measures.

NPPG criteria	Detail	Location in Report
highway authorities, as this will form the major element of the assessment. An assessment of the impacts of the proposed additional land allocations can be initiated once initial potential allocations have been determined. There needs to be a description of the type of development at each of the locations proposed in as much detail as possible at the time. Where this is not possible, a "likely" scenario will need to be employed to set out the potential transport impact. Information that could be required includes those shown. These requirements are not exhaustive and will require adaptation to reflect the knowledge about the potential site allocations and developments as well as the type and scale of the proposed developments.	Where known, the likely proposed parking strategy.	The TSCSC, which was prepared in parallel with the Local Plans, proposed a parking strategy for the area.
	Development phasing, where applicable.	Phasing of development can be found in CSRM Technical Modelling Report for Cambridge and South Cambridgeshire Local Plans – Supplementary Technical Note, November 2015.
	Potential for securing travel planning benefits and enhanced sustainable transport provision.	The modelling process has informed the development of transport mitigation measures, designed to enhance and support travel by non-car modes (Chapters 5 and 6, appendix B). These informed development of the preferred strategy, Phase3 modelling was then used to refine those measures.
Paragraph: 009 Reference ID: 54-009-20141010 **How should safety considerations be addressed and accident analysis used effectively in the transport assessment of the Local Plan?** All types of transport should be covered by safety considerations and accident analysis, taking into account the objective of facilitating, where reasonable to do so, the use of sustainable modes of transport. The level of detail required will be dependent on the stage of the Local Plan. The transport assessment should identify any significant highway safety issues and provide an analysis of the recent accident history of the affected/impacted areas. The extent of the safety issue considerations and accident analysis will depend on the scale and type of developments in the context of the character of the affected Strategic Road Network. The need to minimise conflicts between vehicles and other road user groups should be adequately addressed. Critical locations on the road network with poor accident records should be identified. This is to determine if the proposed land allocations will	Identify any significant highway safety issues and provide an analysis of the recent accident history of the affected/impacted areas.	LTP3 sets out the existing integrated transport networks across Cambridge and South Cambridgeshire. LTP3 indicators include road safety. CCC collects yearly accident data which feeds into the LTP. Issues regarding access to individual site options were addressed separately in the Councils Strategic Housing Land Availability Assessments and Sustainability Appraisals. This included consultation with the Local Highway Authority and Highways England. Appropriate policy requirements are included in the local plans.
	Identify critical locations on the road network with poor accident records.	LTP3 sets out the existing integrated transport networks across Cambridge and South Cambridgeshire. LTP3 indicators include road safety. CCC collects yearly accident data which feeds into the LTP. Issues regarding access to individual site options were addressed separately in the Councils Strategic Housing Land Availability Assessments and Sustainability Appraisals. This included consultation with the Local Highway Authority and Highways England. Appropriate policy requirements are included in the local plans.
	Determine if the proposed land allocations will exacerbate existing problems and whether	LTP3 sets out the existing integrated transport networks across Cambridge and South Cambridgeshire. LTP3

NPPG criteria	Detail	Location in Report
exacerbate existing problems and whether highway mitigation works or traffic management measures will be required to alleviate such problems. The accident records should be compared with accident rates on similar local roads. Where the Strategic Road Network is involved, we recommend that appropriate national statistics are also used as a comparison.	highway mitigation works or traffic management measures will be required to alleviate such problems.	indicators include road safety. CCC collects yearly accident data which feeds into the LTP, This data is used to identify and address accident cluster sites and is used in determining planning applications. Issues regarding access to individual site options were addressed separately in the Councils Strategic Housing Land Availability Assessments and Sustainability Appraisals. This included consultation with the Local Highway Authority and Highways England. Appropriate policy requirements are included in the local plans.
Paragraph: 010 Reference ID: 54-010-20141010 How is the WebTAG approach useful in the transport assessment of the Local Plan? An assessment should adopt the principles of WebTAG by assessing the potential impacts of development within the framework of WebTAG objectives. For most Local Plan assessments the full methodology recommended will not be appropriate. The Highways Agency's Project Appraisal Report System may provide some useful guidance on methods more appropriate in these cases. Assessments involving major new transport infrastructure should, however, employ the methods set out in WebTAG. Although this approach is typically applied when planning for local transport infrastructure, adopting this approach for Local Plan transport assessments will ensure that any proposed land allocation impact is considered in the context of two alternative scenarios – 'with development' and 'without development' – and will enable a comparative analysis of the transport effects of the proposed allocation.	The approach taken is WebTAG compliant.	CSRM is a WebTAG complaint model. See para 2.33 – 2.35.
Paragraph: 011 Reference ID: 54-011-20141010 **Over how long a period should the assessment of the transport impact of the Local Plan cover?**	The assessment covers the period of the Local Plan.	Yes, CSRM analysis covers the period 2011 – 2031.

NPPG criteria	Detail	Location in Report
The assessment should ideally cover the period of the Local Plan, taking into account all the changes and improvements in, for example, technology and behaviour that is likely to happen in that time. Circular 02/2013 sets out provisions for the Strategic Road Network and assessment years at paragraphs 25 to 27.		
Paragraph: 012 Reference ID: 54-012-20150313 **What should be considered in regard to the development of airport and airfield facilities and their role in serving business, leisure, training and emergency service needs? (National Planning Policy Framework paragraph 33)** Aviation makes a significant contribution to economic growth across the country, including in relation to small and medium sized airports and airfields (aerodromes). An aerodrome will form part of a larger network. Local planning authorities should have regard to the extent to which an aerodrome contributes to connectivity outside the authority's own boundaries, working together with other authorities and Local Enterprise Partnerships as required by the National Planning Policy Framework. As well as the National Planning Policy Framework, local planning authorities should have regard to the Aviation Policy Framework, which sets out Government policy to allow aviation to continue making a significant contribution (National Planning Policy Framework paragraph 160). A working or former aerodrome could be put forward for consideration as a site for mixed use development (National Planning Policy Framework paragraph 17) that includes continuing, adapting or restoring aviation services in addition to other uses.		N/A

Examination into the Soundness of the Cambridge City Local Plan and the South Cambridgeshire Local Plan. Matter 7: Transport. Statement by Cambridge City Council and South Cambridgeshire District Council, January 2015 (extract)[46]

Matter 7a iii. Does the Transport evidence base, including, comply with paragraphs 54-001-20141010 to 54-011-20141010 of Planning Practice Guidance?

35. This section of the National Planning Practice Guidance (RD/NP/020) was published in October 2014. It was published after the Local Plans were submitted, but nevertheless the Councils consider that the plans were prepared following a process which reflects this recently published guidance. The Councils have prepared an appendix to this statement (Appendix 6), examining each paragraph of the NPPG, and identifying how the Local Plans, supported by the TSCSC, the modelling report and other evidence, reflect the new guidance.

36. In summary, the Councils have taken a robust, thorough and proportionate approach to transport and the Local Plans. The Councils have worked closely with a range of stakeholders and particularly the Local Transport Authority (Cambridgeshire County Council) to develop a strategy that deliver sustainable transport infrastructure. Existing baseline situation, existing infrastructure and transport problems were fully considered when preparing the TSCSC and the Local Plans.

37. Local plans and the TSCSC are supported by transport modelling using the Cambridge Sub Regional Model (CSRM) as described above.

38. From the early stages of plan making, site based transport and accessibility evidence was gathered through the Councils' respective Strategic Housing Land Availability Assessments (SHLAA)[47] and Technical Documents[48]. This included consideration of safe access, impacts on the road network, opportunities for travel by sustainable modes, and potential infrastructure requirements and opportunities, in consultation with the County Council and the Highways Agency. Sustainability Appraisals drew on the SHLAA and technical document information, and also compared the relative transport merits of sites, including distance to centres, public transport, and cycling. The process helped to inform the identification of site options, and rejected options. These documents were published at each stage of the plan making process, including the issues and options consultations[49].

[46] https://www.scambs.gov.uk/sites/default/files/documents/M7%20-%20CCC%20-%20SCDC.pdf
[47] South Cambridgeshire Strategic Housing Land Availability Assessment (SHLAA) (RD/Strat/120); Cambridge City Council - Strategic Housing Land Availability Assessment (SHLAA) - Update 2013 (RD/Strat/140)
[48] Cambridge Local Plan Towards 2031, South Cambridgeshire Local Plan – Issues and Options 2: Part 1 – Joint Consultation on Development Strategy & Site Options on the Edge of Cambridge – Technical Background Document Part 1 (RD/LP/170); Cambridge Local Plan – Towards 2031 Technical Background Document – Part 2 (RD/LP/260); and Cambridge Local Plan – Towards 2031 Technical Background Document – Part 2 Supplement 2013, Cambridge City Council (RD/LP/310).
[49] SHLAA information: South Cambridgeshire Strategic Housing Land Availability Assessment (SHLAA) (RD/Strat/120); Cambridge City Council - Strategic Housing Land Availability Assessment (SHLAA) – 2012 (RD/Strat/130) and Update 2013 (RD/Strat/140); Sustainability Appraisals: South Cambridgeshire District Council Initial Sustainability Appraisal Report to accompany Local Plan Issues & Options Report July 2012 (RD/LP/040); South Cambridgeshire District Council Supplementary Initial Sustainability Appraisal to accompany Local Plan Issues & Options 2 Report (Part 2) Jan 2013 (RD/LP/060); Cambridge Local Plan Towards 2031, South Cambridgeshire Local Plan – Issues and Options 2: Part 1 – Joint Consultation on Development Strategy & Site Options on the Edge of Cambridge – Technical Background Document Part 1 Jan 2013); South Cambridgeshire Draft Final Sustainability Appraisal Report and HRA Screening Report March 2014 (RD/Sub/SC/60); Cambridge City Council Sustain ability Appraisal of the Cambridge Local Plan - SA Report - Appraisal of the Cambridge Local Plan 2014 - Proposed Submission (RD/LP/290)

39. The TSCSC and LTTS take account of the wider travel to work area of Cambridge and South Cambridgeshire, looking at travel to/from the surrounding market towns in the area including Ely (in East Cambridgeshire), Newmarket and Haverhill (in Suffolk) Royston (in Hertfordshire) and St Neots, Godmanchester and Huntingdon (in Huntingdonshire). The existing baseline situation, existing infrastructure and transport problems were fully considered when preparing the TSCSC and the Local Plans.

40. As the guidance suggests, an iterative process was taken to the Local Plans and the evidence base, considering a range of development scenarios and allocations prior to publication of the Proposed Submission Plans. Evidence available was proportionate at each stage of the process. The transport infrastructure to support the development strategy was refined and became more detailed though later stages of the plan making process (reflecting NPPG para 004). It would be disproportionate to prepare fully worked up and costed mitigation packages for rejected options as some representors suggest.

41. A number of representors consider that the Local Plans do not reflect the NPPF, particularly paragraph 17 which seeks to make the fullest possible use of sustainable modes. This does not take account of NPPF paragraph 6, which identifies that the full range of NPPF policies taken as a whole should identify what constitutes sustainable development. The Councils have considered a range of factors when preparing the development strategy. Transport is an important factor, but must be weighed against other issues, in particular Green Belt, as addressed at Matter 2: Strategy and Matter 6: Green Belt. The Local Plans supported by the TSCSC do, however, identify considerable opportunities for a shift towards sustainable transport usage where reasonable to do so (see below). The strategy will provide significant benefits to travel by sustainable modes, but not at all costs.

Appendix B. Transport Measures

B.1. Introduction

Part of the role of the modelling process was to help identify transport mitigation measures, which would provide suitable mitigation to address transport impacts and promote use of non-car modes.

Transport measures were developed by Cambridgeshire County Council (CCC) to indicate a likely package of improvements which could be brought forward in phases to 2031 as part of the development of the Transport Strategy for Cambridge and South Cambridgeshire (TSCSC). The measures were designed by CCC to address significant known transport issues, and anticipate measures which would be needed to support future growth. The TSCSC and its associated transport measures were developed in parallel with the Cambridge and South Cambridgeshire Local Plans.

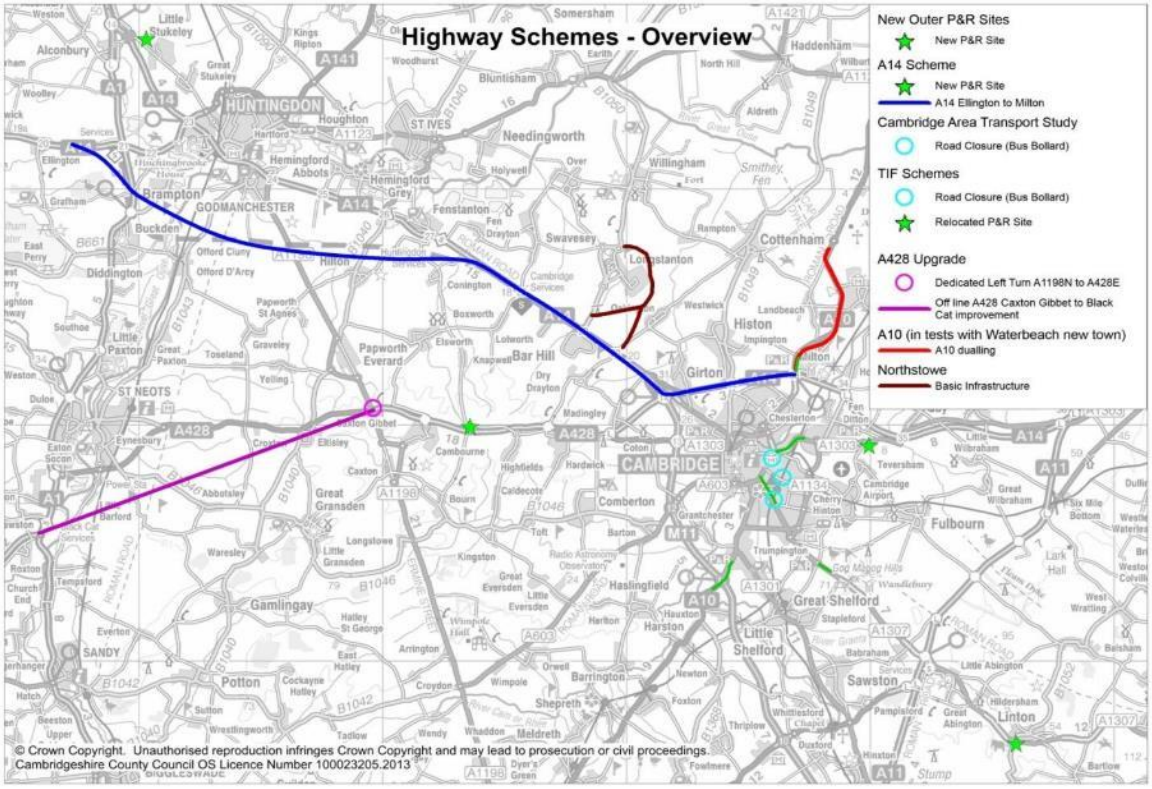
There are also schemes being developed and proposed by national bodies such as Highways England, the Department for Transport and Network Rail which are included in the TSCSC but are not being led on by CCC. The assumptions in the modelling reflected the best information available on these schemes at the time of the model runs.

B.2. Common Transport Elements

A number of measures were present in all modelling runs tested. These main common transport measures tested are were as follows:

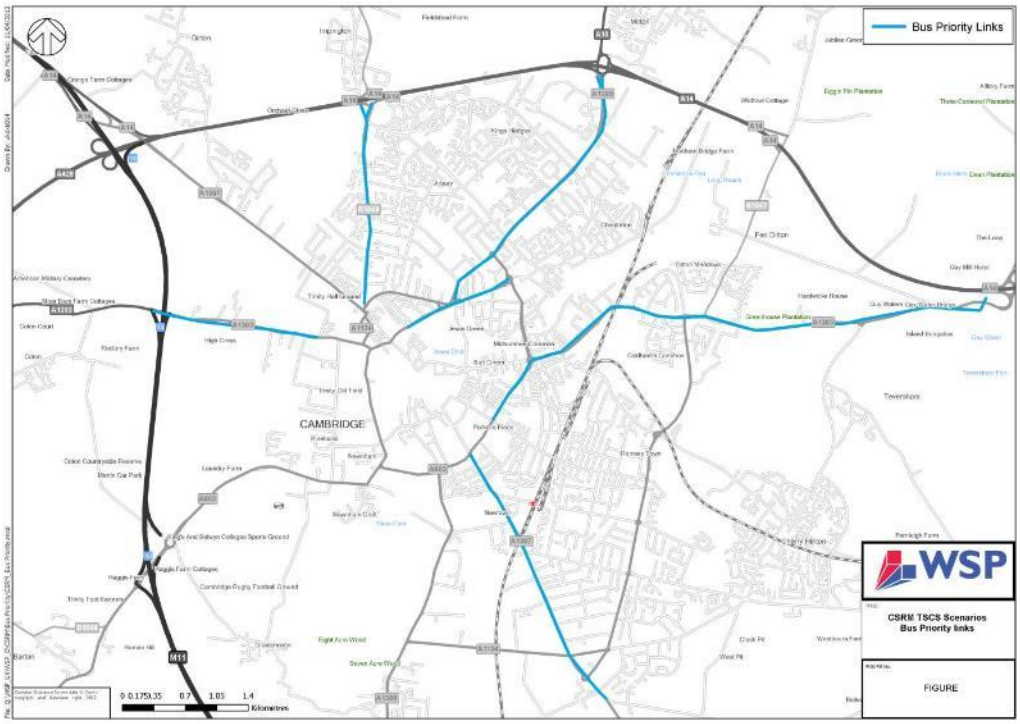
B.2.1. Highway

- Strategic corridor improvements:
  - A428 Black Cat - Caxton Gibbet dualling. In 2016, a dedicated left turn from A1198 north to A428 east with full length slip road onto A428 (rather than single lane for each flow). From 2021 onwards, A428 Caxton Gibbet to Black Cat improvement (single carriageway on an off line route between the two junctions with no intermediate junctions; grade separated junction at Black Cat; a grade separated junction at Caxton Gibbet; old A428 diverted to a separate roundabout just to the north on A1198). (note: this is a scheme led by Highways England (HE)).
  - In 2021, the A14 Cambridge to Huntingdon Improvement scheme Development Consent Order. The modelling reflected the scheme as of design freeze 3 (option 7 with D3AP main carriageway). The scheme does **NOT** include the A14 toll as it is no longer a HE proposal (the toll was included in previous modelling work as the assumption at the time was that the toll would go ahead). The most recent version of Northstowe coding as agreed with Cambridgeshire County Council officers. (note: this is a scheme led by Highways England).
- Core Scheme Extension demand management package - closure of East Road and Mill Road to through traffic (additionally Hills Road closure for bus priority).



B.2.2. Bus and Guided Bus

- Access controls close to Cambridge Ring Road to enhance public transport operations and discourage cross city movements by car in the built up area.
- Segregated bus lanes for major routes into Cambridge as shown in Figure below. These were modelled as increasing bus speeds and removing congestion impacts for buses on these routes.
- High Quality Public Transport services on the St Neots (A428), Haverhill (A1307) and Royston (A10) corridors with high frequencies and guideway quality segregated routes.
- Additional Park and Ride sites on the A428, the A1307 and at Hauxton on the A10, and the re-location of Newmarket Road P&R to Airport Way.
- An orbital bus service from Cambridge Science Park Station to Addenbrooke's, via North West Cambridge.
- Inner Park and Ride site expansion of capacity - Segregated access at Babraham Rd P&R, Milton P&R bus priority at Milton Interchange (TIF 28) and Hauxton M11 P&R access improvements (TIF 36) coded for 2016 onwards. Relocation of Newmarket Rd P&R site to east of Airport Way (as TIF) coded for 2021 onwards.
- The recently introduced parking charge at P&R and CGB sites was not included in the earlier model runs. All scenarios now include the parking charge at the city P&R and CGB sites from 2016 onwards.
- A busway from Waterbeach to Cambridge, implemented ahead of development of Waterbeach New Town.
- New / enhanced bus priority through junctions and pinch points on key radial routes into Cambridge. Newmarket Road segregated busway crossings between football stadium and Elizabeth Way (TIF 25) and Hills Road closure and bus priority between Station Road and Lensfield Road (TIF 33) coded for 2021 onwards.



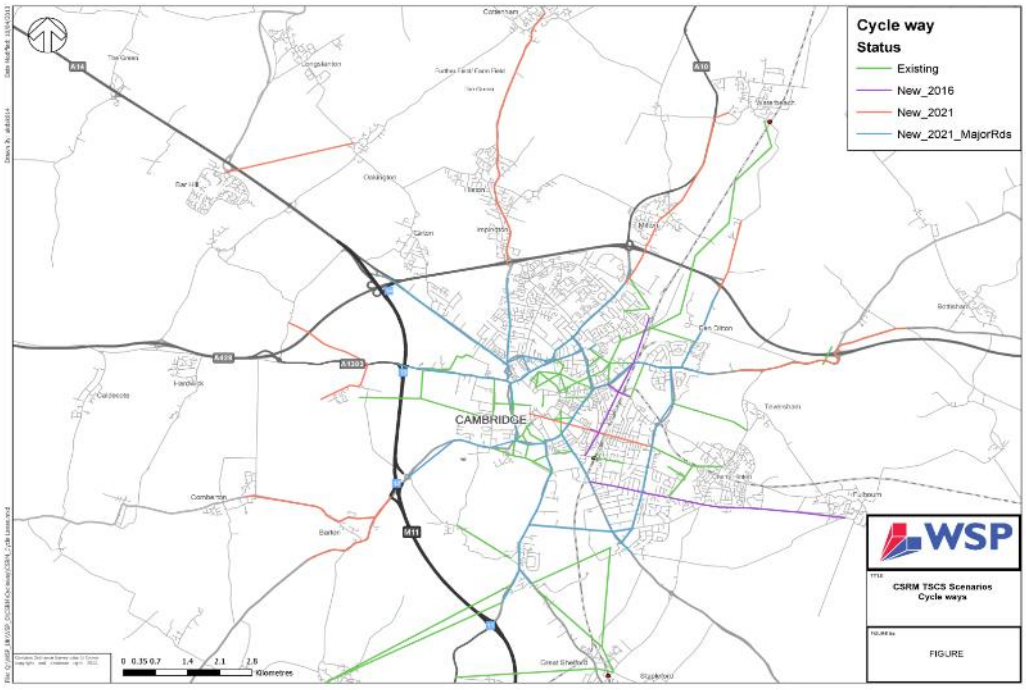
Segregated Bus Routes introduced within Cambridge as part of Transport Measures

B.2.3. Rail

- Improvements in rail services, speed and capacity, including the Thameslink upgrade and improved rolling stock to provide improved capacity to London, and onward accessibility to south London.

B.2.4. Cycle

- A major network of cycling improvements in and around Cambridge, including segregated routes along major roads and elimination of gaps in the network, see Figure below.



B.2.5. Other

- The Do Minimum models do NOT include any CCC led schemes associated with the TSCSC/City Deal. The CCC led TSCSC/City Deal measures are included in the Do Something models only.
- The changes made to CSRM forecast inputs for other studies post the Local Plan work, including the changes in Huntingdonshire for their Local Plan assessment work have NOT been incorporated in the new model runs.

B.3. Option Specific Measures

The table below lists the measures which were specifically applied to each development option, over and above the common transport elements listed above.

Option	Measure	Do Minimum	Do Something Mitigation (additional to Do Minimum)
1 – Village Based	Access	No new access provision.	No mitigation beyond common elements.
	Highway	No new highway infrastructure.	No mitigation beyond common elements.
	Public Transport	No new PT infrastructure or services.	Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	No mitigation beyond common elements.
2 – Waterbeach New Town	Access	New roundabout connecting development site to A10.	No mitigation beyond common elements.
	Highway	No new highway infrastructure.	2021 onwards: A10 dualled between Cambridge Research Park and A14 Milton Interchange, with dedicated access from Waterbeach new town. Assumed existing priority junctions on A10 remain as priority junctions with at-grade facilities to cross dual carriageway. No expansion of Milton Interchange incorporated at this stage.
	Public Transport	No new PT infrastructure or services.	Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	No mitigation beyond common elements.
3 – Bourn Airfield	Access	No new access provision.	No mitigation beyond common elements.
	Highway	No new highway infrastructure.	Improved Bourn Airfield site access – a new junction with The Broadway giving priority to development traffic, and a second access point connecting to the

Option	Measure	Do Minimum	Do Something Mitigation (additional to Do Minimum)
			existing roundabout of Highfields Road and St Neots Road.
	Public Transport	No new PT infrastructure or services.	Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	No mitigation beyond common elements.
4 – GB West Radial	Access	BL1 Two four-arm priority junctions providing access on the north and south sides of Barton Road. Locations of the junctions to be as proposed by land promoters (identified in South Cambridgeshire Proposed Submission Local Plan representation 59582). BL2 Connect to Grantchester Road.	Access per the DM with both junctions upgraded to signal control.
	Highway	No new highway infrastructure.	Include a non-strategic link road through the site between Barton Road and Grange Road. No capacity improvements to M11 Junction 12.
	Public Transport	No new PT infrastructure or services.	Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	• Permeability into and around the site. • Improved provision on Barton Road. • Dedicated (off road) links to Newnham, West Cambridge and Coton path.
5 – GB South Radial	Access	BL3 Two three-arm priority junctions on west side of Trumpington Road at north and south of development site. Northern most access to use existing Cambridge Lakes Golf Course access. BL4 Access from existing road serving the Trumpington Meadows	Access per the DM with junctions upgraded to signal control.

Option	Measure	Do Minimum	Do Something Mitigation (additional to Do Minimum)
		development – off Hauxton Road). Addenbrooke's Road junction 4th arm. BL5 Two three-arm priority junctions – one on Addenbrooke's Road and a second on Shelford Road (two of the access points suggested by promoters). BL9 A three-arm priority junction with Ditton Lane.	
	Highway	No new highway infrastructure.	No improvements to nearby trunk road network/junctions. Spine Road as proposed by promoters to be assumed Provide a link through the site between Yarrow Road and Addenbrooke's Road providing a better connection from the site to the M11.
	Public Transport	No new PT infrastructure or services.	Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	Provide links from development site to Trumpington Road and Long Road. High permeability and link to existing networks for Trumpington Meadows.
6 – GB South East Radial	Access	BL6 Two three-arm priority junctions providing access at 2 points on Babraham Road. BL7 Two three-arm priority junctions providing access at 2 points as proposed by promoter in Cambridge Proposed Submission Local Plan representation 28084 (one on Cambridge Road and the other onto Babraham Road).	Access per the DM with junctions upgraded to signal control. Bus gates at Worts' Causeway and Peterhouse Technology Park.
	Highway	No new highway infrastructure.	No improvements to nearby trunk road network/junctions. Spine Road as proposed by promoters to be assumed Provide a link through the site between Yarrow Road and Addenbrooke's Road. This is the requirement as judged by CCC in terms of what strategic infrastructure is

Option	Measure	Do Minimum	Do Something Mitigation (additional to Do Minimum)
			likely to be required in order to make this site viable. Specifically, it is adjudged that this is required to provide a link with the Strategic Link Road.
	Public Transport	No new PT infrastructure or services.	Link to existing services such as Babraham P&R. Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	Improvements on radial route. Improved provision on both Hills Road and Cherry Hinton Road to solve journeys to city centre/Addenbrooke's etc.
7 – Combined Radial	Access	A combination of all measures assumed for scenarios 4, 5 and 6.	
	Highway		
	Public Transport		
	Walking and Cycling		
8 – Preferred Strategy	Access	Waterbeach - New roundabout connecting development site to A10	No mitigation beyond common elements.
	Highway	No new highway infrastructure.	Dualling of the A10 between Cambridge Research Park and Milton Interchange. Improved Bourn Airfield site access. Improved Cherry Hinton site access.
	Public Transport	No new PT infrastructure or services.	Bespoke, high quality public transport provision with a headway of 10 minutes serving the following key destinations: • City centre • Rail station • Addenbrooke's • Northern Fringe and new Chesterton Station
	Walking and Cycling	No new provision for walking and cycling.	No mitigation beyond common elements.

Appendix C. CSRM Modelling Summary Report July 2013

The July 2013 CSRM Modelling Summary Report and subsequent March 2015 update have been published through the Local Plan reference library with the following references.

Modelling Report for Cambridge and South Cambridgeshire Local Plans. (RD/Strat/160)

CSRM Modelling Summary Report for Cambridge and South Cambridgeshire Local Plans – July 2013 UPDATE MARCH 2015 (RD/Strat/161)

Appendix D. Distribution of Dwellings, Workers and Jobs in Preferred Strategy

Figure D.1 is an enlarged version of Figure 6-1of the main report, showing the distribution of dwellings, employed residents (or workers) and jobs as produced by the model based on proposed development patterns.

In each case, the dwellings totals are directly entered into the model based on planning policy. Floor space for commercial developments is similarly entered as a model input. The location of the employed residents and jobs is determined by the model within the dwelling and employment space made available.

The shading shows the 2011 locations, coloured from grey through to red as the absolute numbers increase. The change from 2011 to 2031 is shown by dots, with each black dot representing 10 additional dwellings, workers or jobs. The blue dots show decreases. Decreases occur particularly for employed residents where there are few additional dwellings. This is because falling household size and the increase in the retired population will lead to fewer employed residents per household. Hence without increases in dwellings the number of workers in the area will fall.

The maps shows that the changes in employed residents correspond well with the dwellings, as would be expected. The jobs patterns match reasonably well, though there are increases to the south-east of Cambridge which do not have matching rises in employed residents. This means that the average distance between workers and jobs is increased in this area, leading to longer commuting trips.

Figure D-1 Distribution of dwellings, employed residents, and jobs in the Preferred Option (DM)

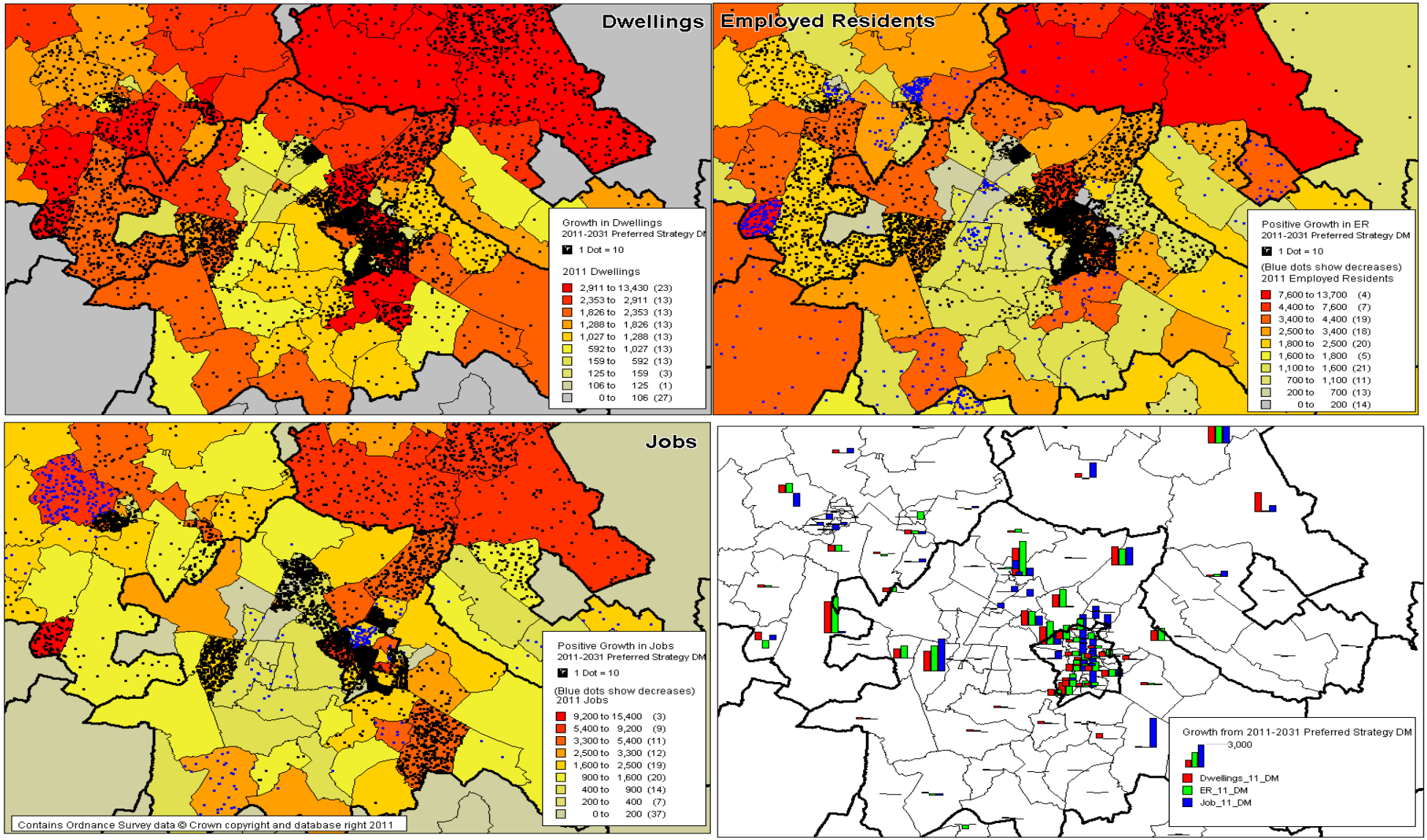
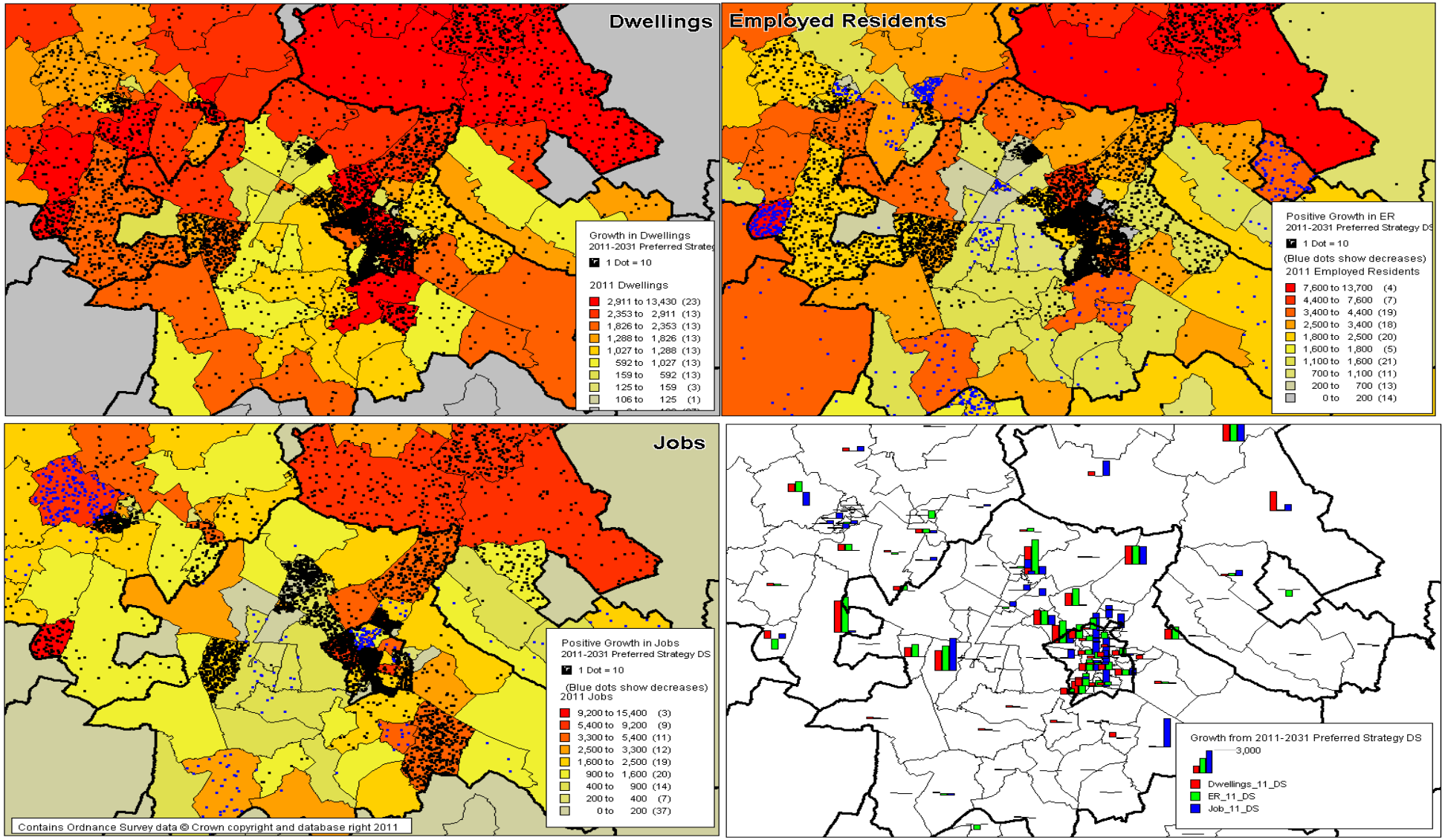
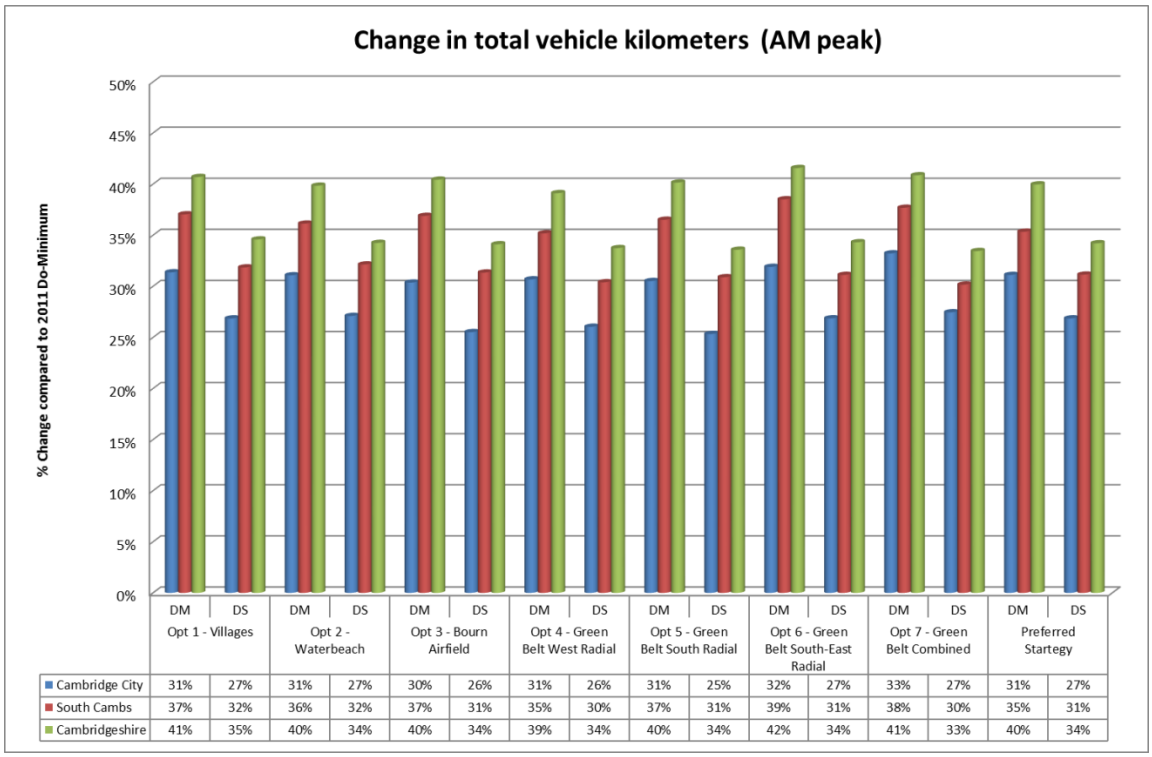


Figure D-2 Distribution of dwellings, employed residents, and jobs in the Preferred Option (DS)



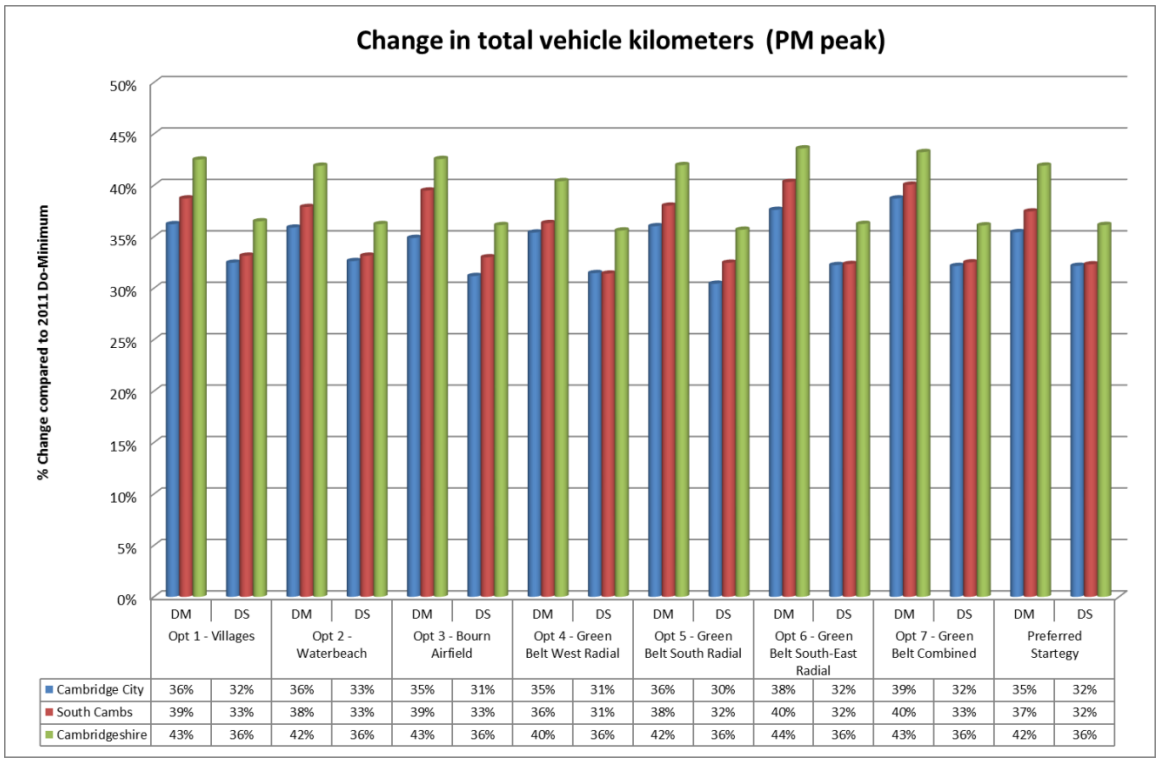
Appendix E. Analysis of Preferred Strategy Transport Impacts

Figure E-1 Change in vehicle kilometres – AM Peak



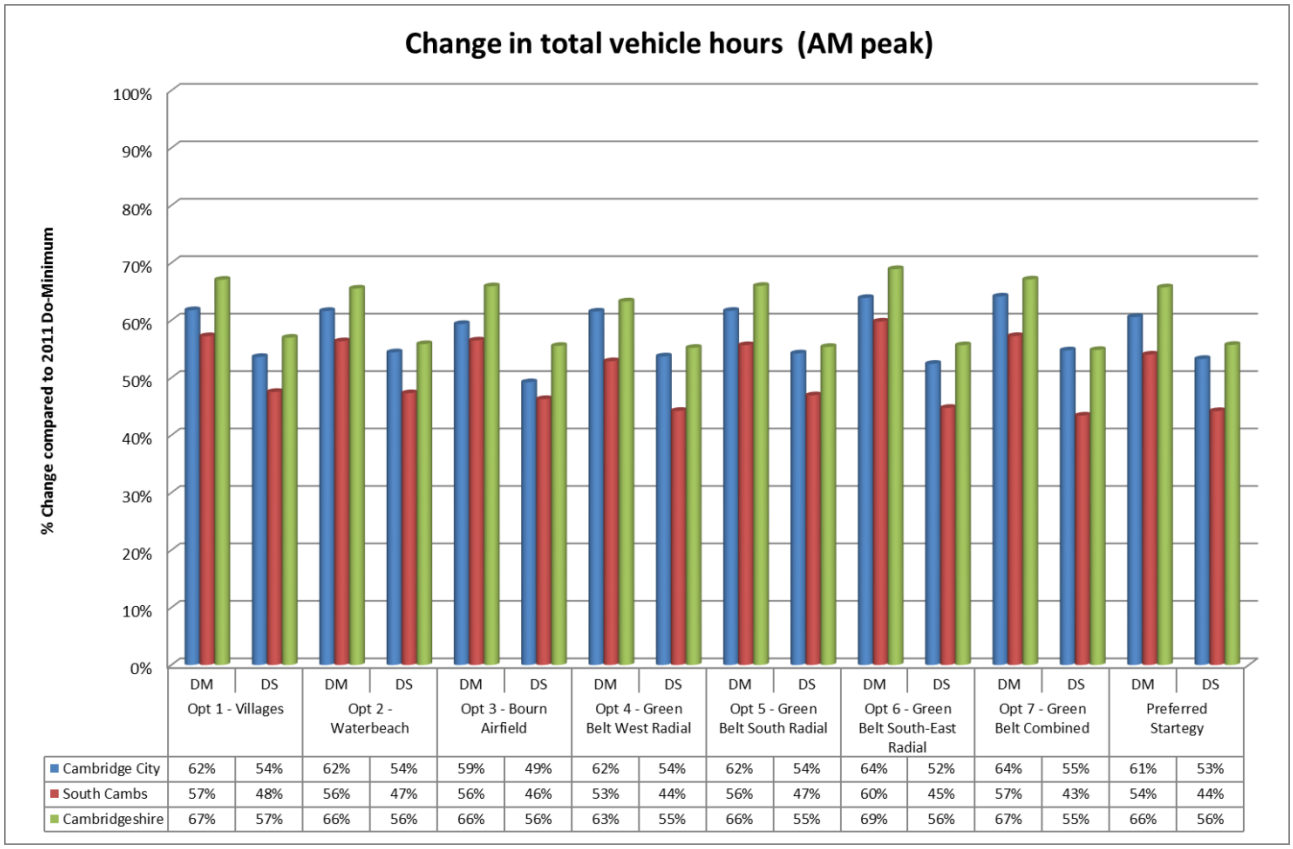
	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined		Preferred Startegy	
Cambridge City	31%	27%	31%	27%	30%	26%	31%	26%	31%	25%	32%	27%	33%	27%	31%	27%
South Cambs	37%	32%	36%	32%	37%	31%	35%	30%	37%	31%	39%	31%	38%	30%	35%	31%
Cambridgeshire	41%	35%	40%	34%	40%	34%	39%	34%	40%	34%	42%	34%	41%	33%	40%	34%

Figure E-2 Change in vehicle kilometres – PM Peak



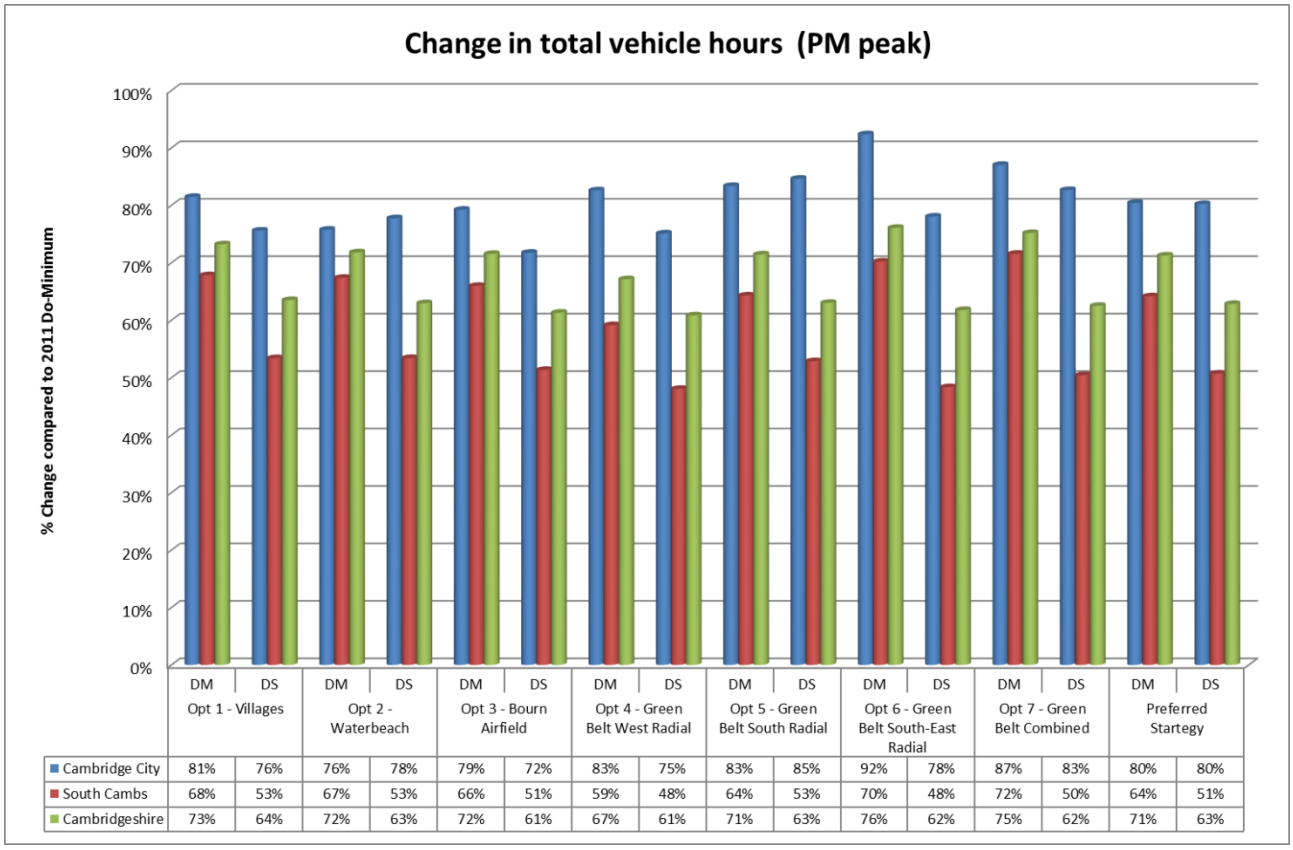
	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined		Preferred Startegy	
Cambridge City	36%	32%	36%	33%	35%	31%	35%	31%	36%	30%	38%	32%	39%	32%	35%	32%
South Cambs	39%	33%	38%	33%	39%	33%	36%	31%	38%	32%	40%	32%	40%	33%	37%	32%
Cambridgeshire	43%	36%	42%	36%	43%	36%	40%	36%	42%	36%	44%	36%	43%	36%	42%	36%

Figure E-3 Change in vehicle hours – AM Peak



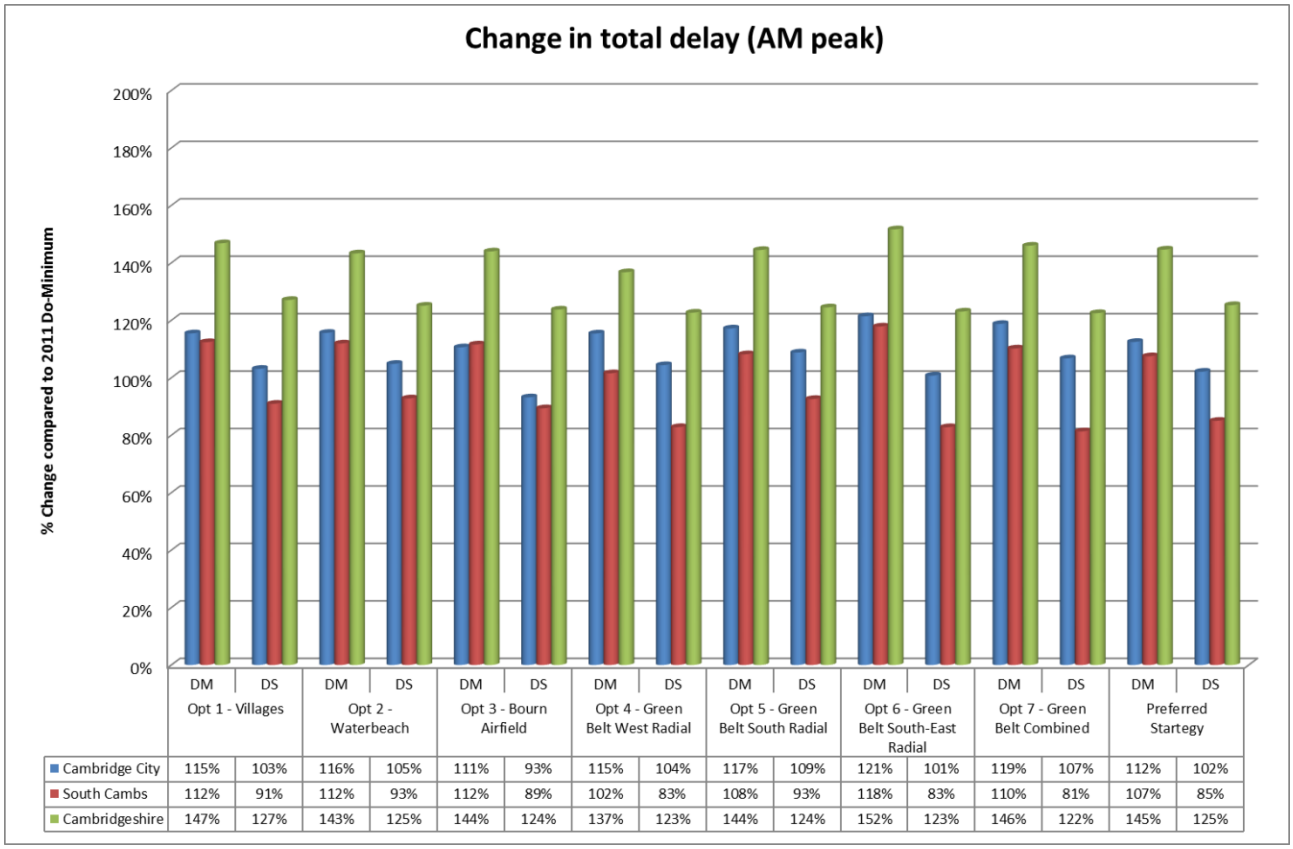
	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined		Preferred Startegy	
Cambridge City	62%	54%	62%	54%	59%	49%	62%	54%	62%	54%	64%	52%	64%	55%	61%	53%
South Cambs	57%	48%	56%	47%	56%	46%	53%	44%	56%	47%	60%	45%	57%	43%	54%	44%
Cambridgeshire	67%	57%	66%	56%	66%	56%	63%	55%	66%	55%	69%	56%	67%	55%	66%	56%

Figure E-4 Change in vehicle hours – PM Peak



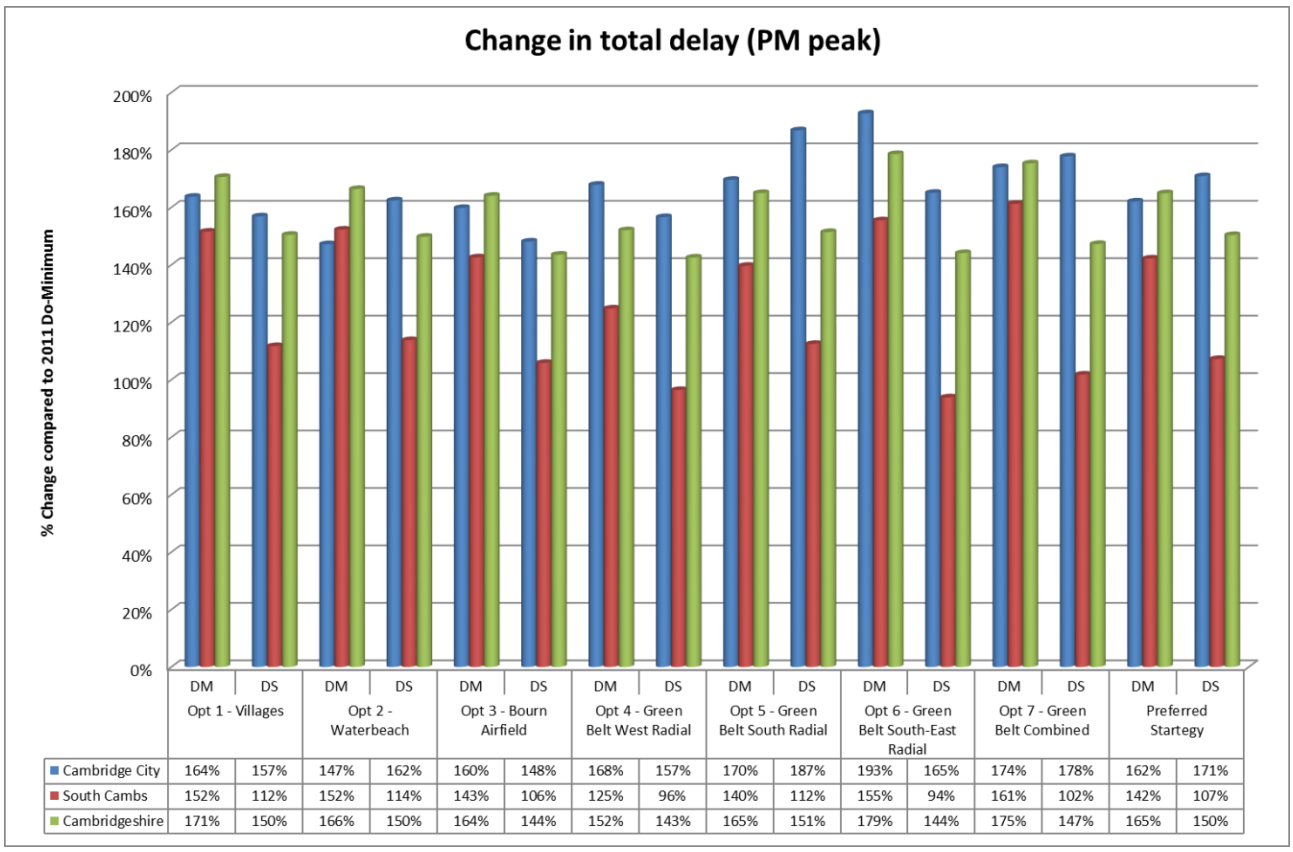
	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined		Preferred Startegy	
Cambridge City	81%	76%	76%	78%	79%	72%	83%	75%	83%	85%	92%	78%	87%	83%	80%	80%
South Cambs	68%	53%	67%	53%	66%	51%	59%	48%	64%	53%	70%	48%	72%	50%	64%	51%
Cambridgeshire	73%	64%	72%	63%	72%	61%	67%	61%	71%	63%	76%	62%	75%	62%	71%	63%

Figure E-5 Change in total delay – AM Peak



	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined		Preferred Startegy	
Cambridge City	115%	103%	116%	105%	111%	93%	115%	104%	117%	109%	121%	101%	119%	107%	112%	102%
South Cambs	112%	91%	112%	93%	112%	89%	102%	83%	108%	93%	118%	83%	110%	81%	107%	85%
Cambridgeshire	147%	127%	143%	125%	144%	124%	137%	123%	144%	124%	152%	123%	146%	122%	145%	125%

Figure E-6 Change in total delay – PM Peak



	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS	DM	DS
	Opt 1 - Villages		Opt 2 - Waterbeach		Opt 3 - Bourn Airfield		Opt 4 - Green Belt West Radial		Opt 5 - Green Belt South Radial		Opt 6 - Green Belt South-East Radial		Opt 7 - Green Belt Combined		Preferred Startegy	
Cambridge City	164%	157%	147%	162%	160%	148%	168%	157%	170%	187%	193%	165%	174%	178%	162%	171%
South Cambs	152%	112%	152%	114%	143%	106%	125%	96%	140%	112%	155%	94%	161%	102%	142%	107%
Cambridgeshire	171%	150%	166%	150%	164%	144%	152%	143%	165%	151%	179%	144%	175%	147%	165%	150%

Figure E-7 Mode Share of AM trips from major development areas to Cambridge (DS)

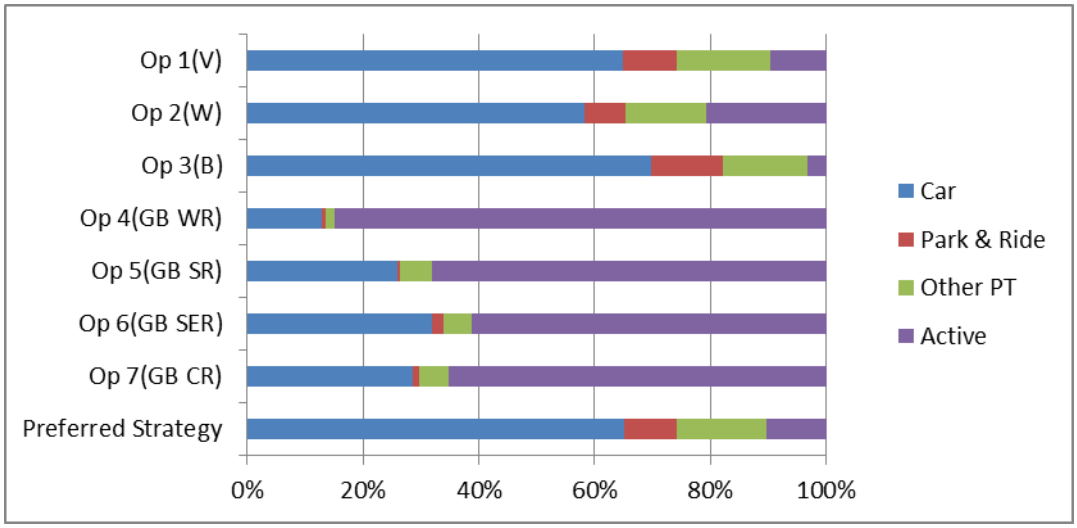


Figure E-8 Mode Share of AM trips from major development areas to South Cambridgeshire (DS)

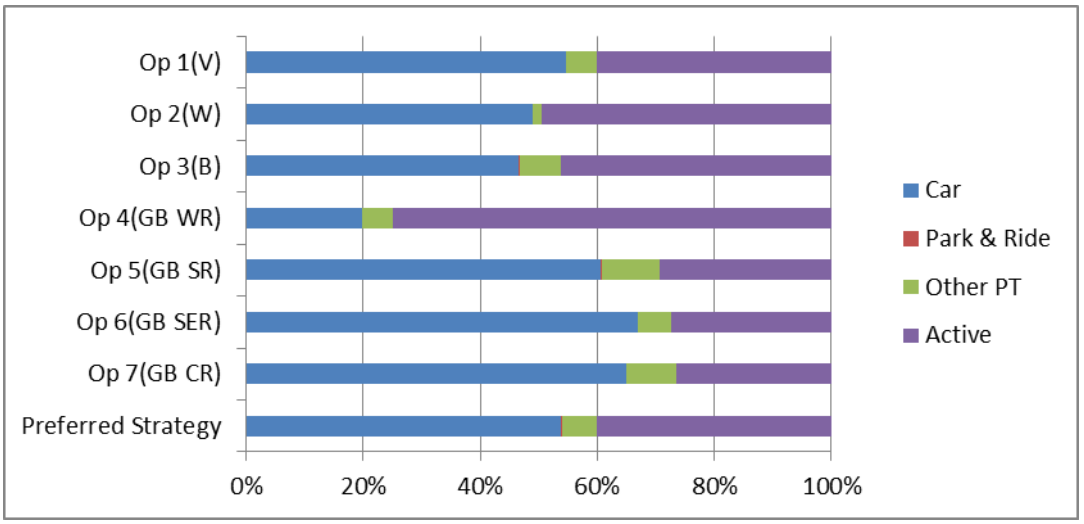


Figure E-9 Mode Share of AM trips from major development areas to all destinations (DS)

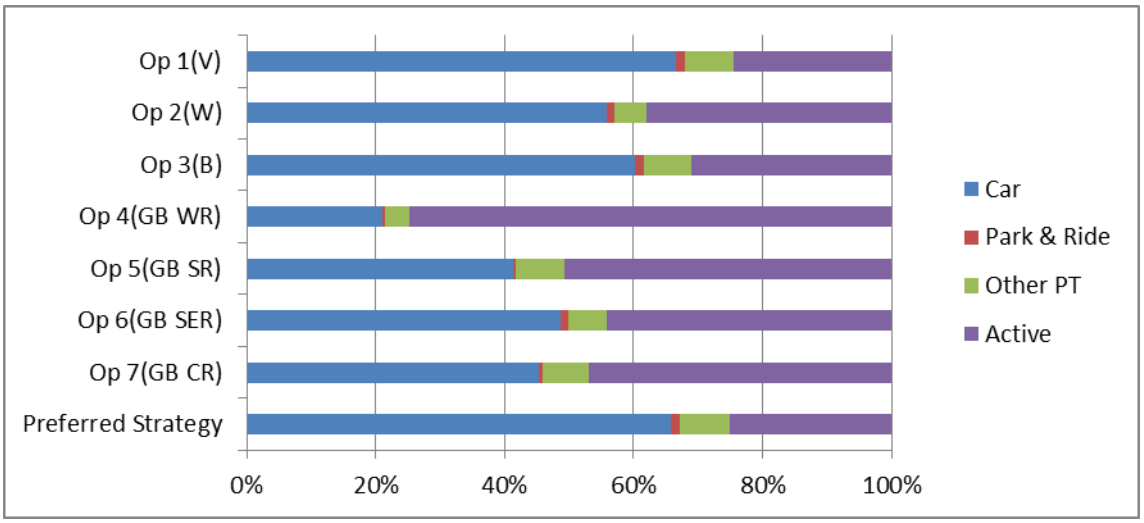


Figure E-10 Change in Mode Share of AM due to Transport Measures (Cambridge)

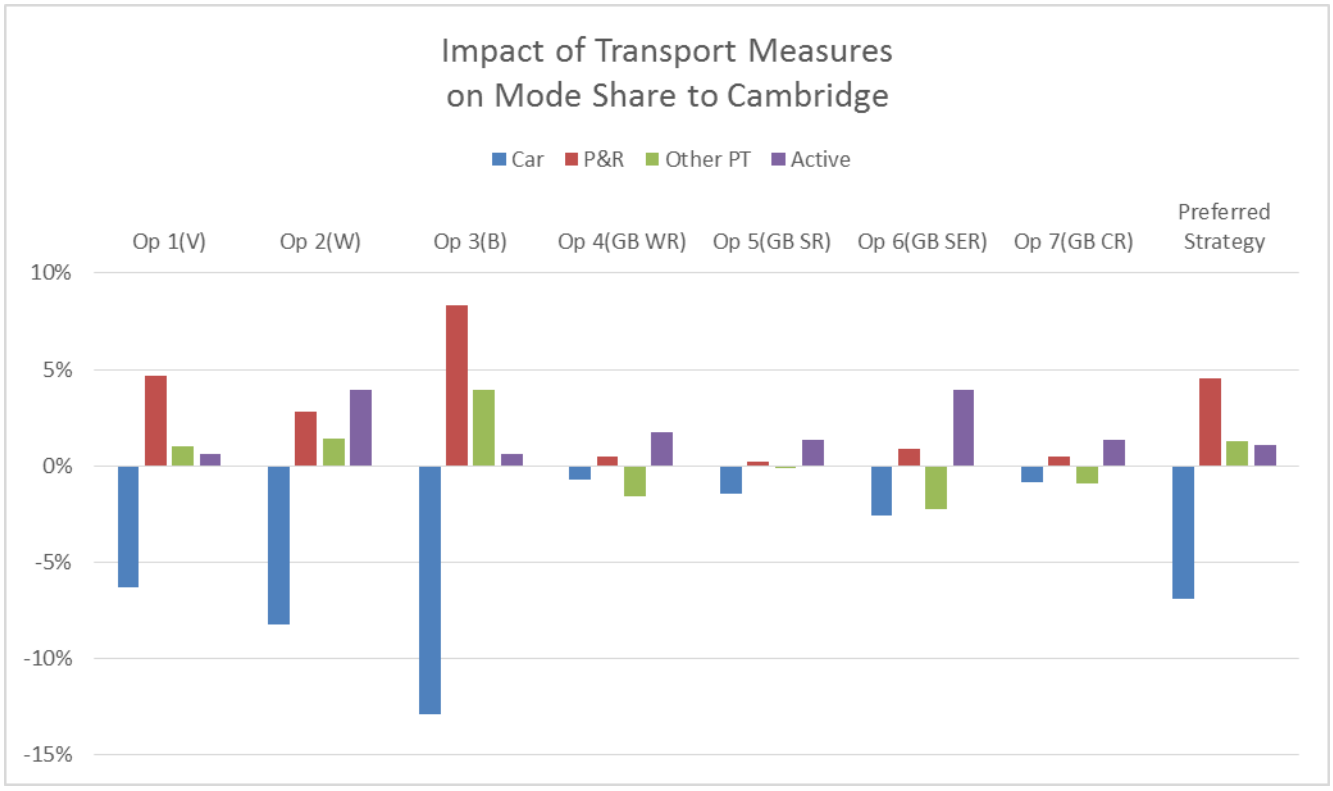


Figure E-11 Change in Mode Share of AM due to Transport Measures (South Cambridgeshire)

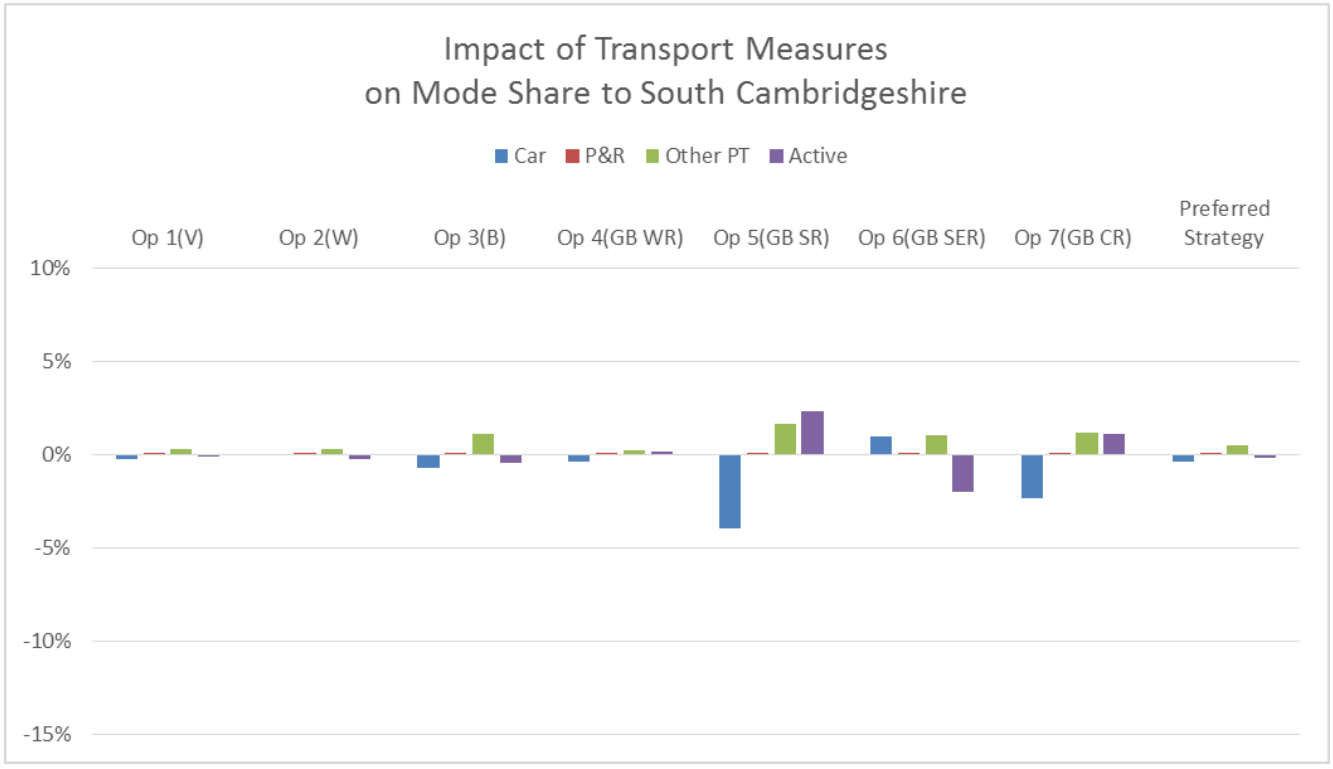


Figure E-11 Travel time differences, Preferred Strategy (DM)

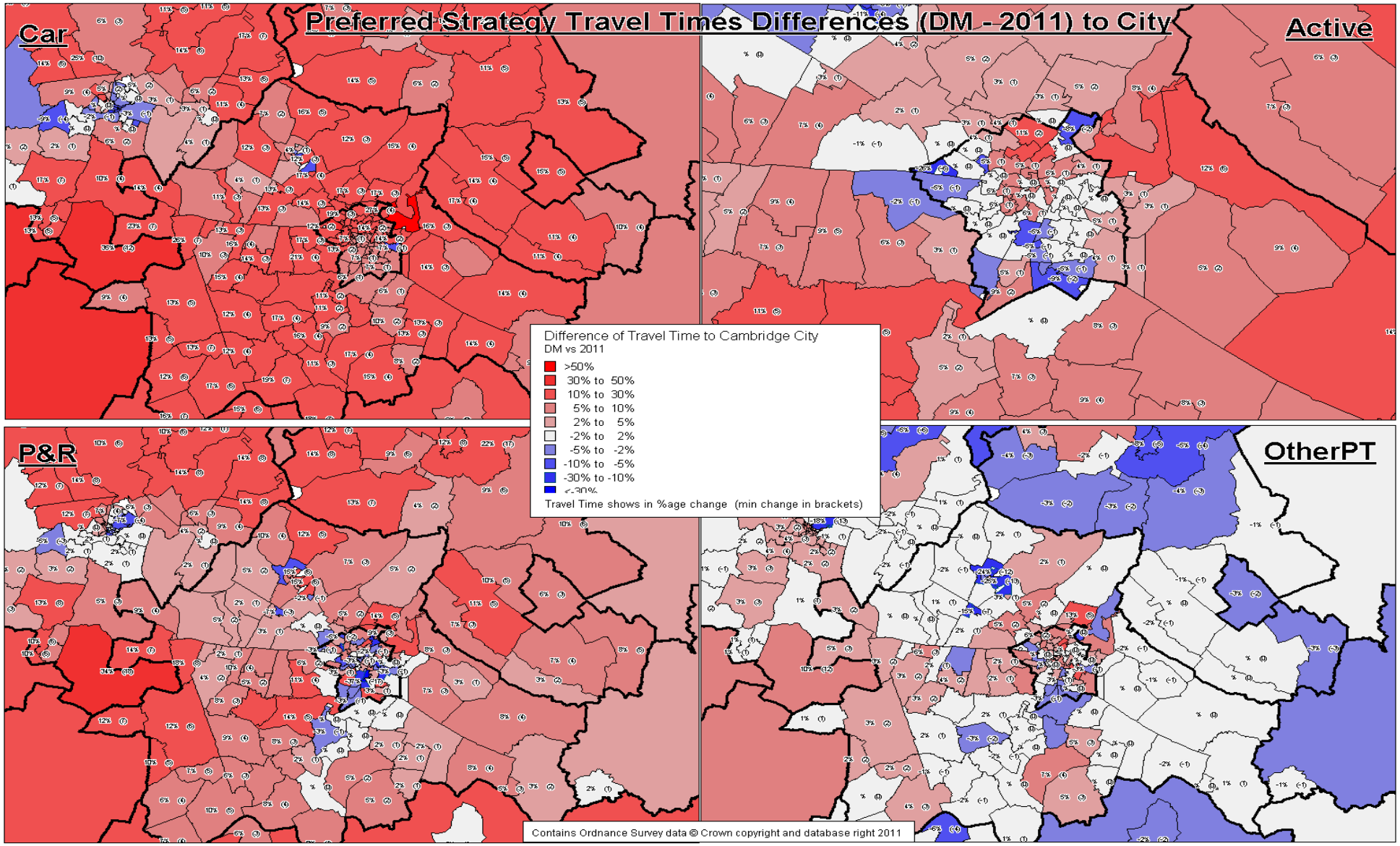
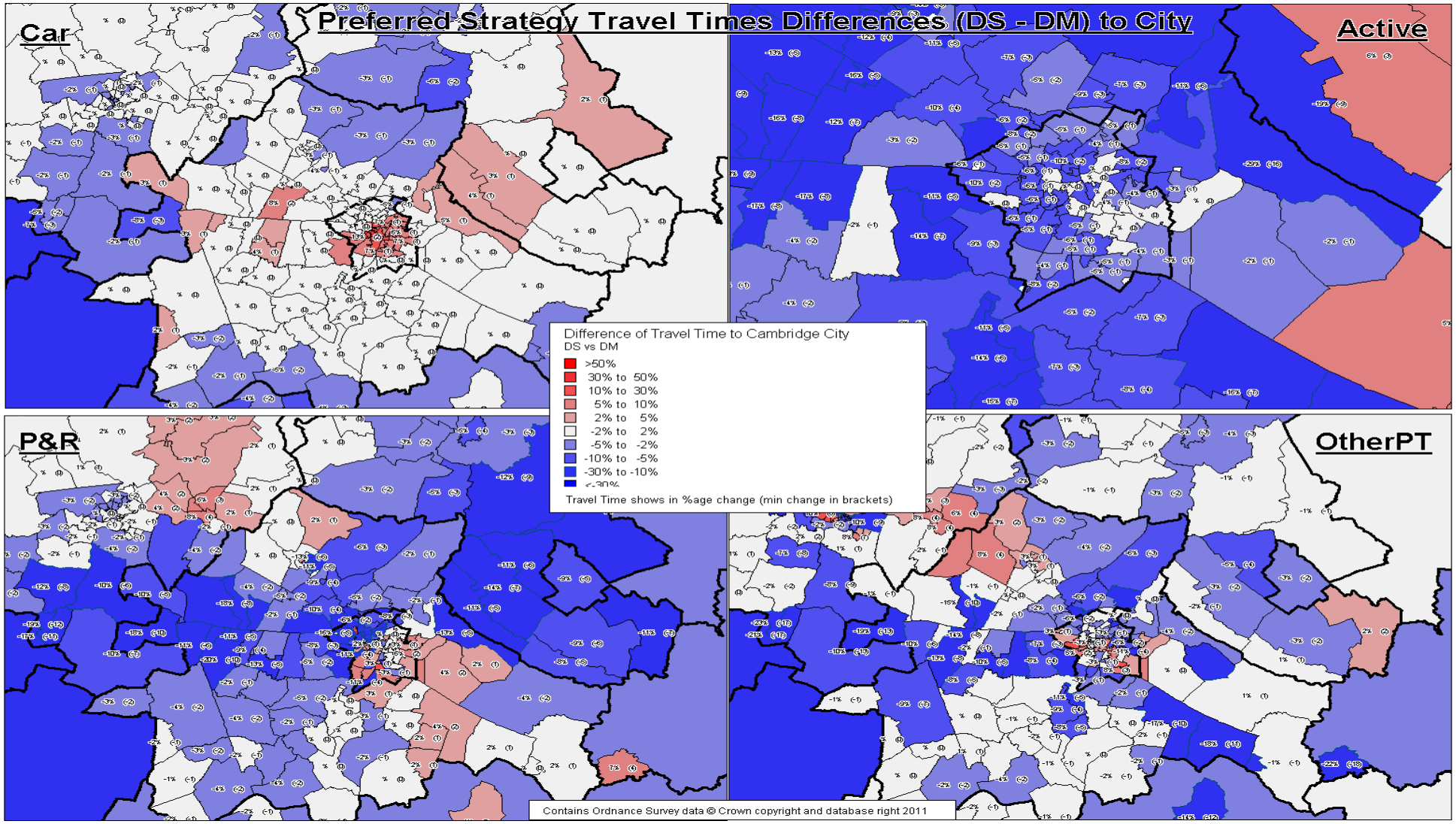


Figure E-12 Travel time differences, Preferred Strategy (DS-DM)



Appendix F. Planning Objectives

Introduction

This section provides an outline of the planning objectives in both districts local plans. It details the key policies from the local plans linked to sustainable economic growth, and the provision of transport measures to support that growth.

This is not a comprehensive review of the local plans rather a high level illustration of the planning objectives for Cambridge City and South Cambridgeshire to 2031.

Cambridge Local Plan 2014: Proposed Submission, July 2013

The draft Local Plan sets 15 strategic objectives, of which the following (numbered as per the Plan) are most relevant to this report:

1. Contribute to the vision of Cambridge as an environmentally sustainable city, where it is easy for people to make a transition to a low carbon lifestyle. This means making best use of energy (including community energy projects), water and other natural resources, securing radical reductions in carbon emissions, minimising environmental impact and being capable of adapting to the impacts of climate change;
6. Protect and enhance the landscape setting of the city, which comprises the Cambridge Green Belt, the green corridors penetrating the urban area, the established network of multi-functional green spaces, and tree canopy cover in the city;
8. Meet the housing needs of the city within its sub-region, delivering an appropriate mix of housing types, sizes and tenures to meet existing and future needs, including affordable housing;
9. Assist the creation and maintenance of inclusive, environmentally sustainable communities;
10. Promote and support economic growth in environmentally sustainable and accessible locations, facilitating innovation and supporting Cambridge's role as a world leader in higher education, research, and knowledge-based industries, while maintaining the quality of life and place that contribute to economic success;
13. Be located to help minimise the distance people need to travel, and be designed to make it easy for everyone to move around the city and access jobs and services by sustainable modes of transport;
14. Ensure appropriate and timely provision of environmentally sustainable forms of infrastructure to support the demands of the city, including digital and cultural infrastructure.

Table F-1 Summary of transport policies and transport infrastructure required by policies in the Cambridge Submission Local Plan

Policy name/number	Transport Issues / Requirements
Policy 5 – Sustainable Transport Infrastructure	• Strategic transport infrastructure required • Links to LTP, TSCSC, LTTS and other County Council transport strategy documents • Overall transport principles of the development
Policy 9: The City Centre	• Promotes sustainable modes of transport and public realm improvements • Improves connectivity for pedestrians and cyclists
Policy 11: Fitzroy/Burleigh Street/Grafton Area of Major Change	• Improve the bus interchange, including an increase in capacity and better waiting facilities for passengers • Provides access by sustainable modes of transport including improvements for pedestrians and cyclists such as a managed cycle parking facility, and with no increase in car parking above current levels • Improve the public realm along Fitzroy Street and Burleigh Street
Policy 13: Areas of major change and opportunity areas – general principles	• Allow development when the necessary infrastructure and associated arrangements to support that development have been secured, either by delivery as part of the development or through other stakeholders including relevant local authorities • Ensure public rights of way are protected, and enhanced where possible
Policy 14: Northern Fringe East and land surrounding the proposed Cambridge Science Park Station Area of Major Change	• Ensure that appropriate access and linkages, including for pedestrians and cyclists, are planned for in a high quality and comprehensive manner
Policy 15: South of Coldham's Lane Area of Major Change	• Includes the upgrading of existing public routes to support increased pedestrian and cycle access from the wider area;
Policy 16: Cambridge Biomedical Campus (including Addenbrooke's Hospital) Area of Major Change	• Maximise opportunities to improve the 'legibility' of the Cambridge Biomedical Campus by providing a network of cycle and pedestrian routes, high quality new public realm and open space • Include measures to enhance access to the Cambridge Biomedical Campus including for cyclists, pedestrians, wheelchair users and people with other disabilities, and mitigate the impact on the existing road network and parking in the surrounding area • Include provision for the extension of existing conventional bus services, the Cambridgeshire Busway and Park and Ride services to meet the needs of the resident and working populations, including people with disabilities

Policy name/number	Transport Issues / Requirements
Policy 17: Southern Fringe Areas of Major Change	• Be fully permeated by pedestrian and cycle routes (incorporating access for all), both within and between the development areas, improving links to the Cambridge Biomedical Campus (including Addenbrooke's Hospital) • Include provision for the extension of existing conventional bus services and Park and Ride services to meet the needs of all residents • Provide vehicular access for the Bell School site off Babraham Road only
Policy 18: West Cambridge Area of Major Change	• Includes a comprehensive transport strategy for the site, incorporating a sustainable transport plan to minimise reliance on private cars. This should include assessing the level, form and type of car parking on the site • Walking, cycling and public transport links (including access for all) to the city centre, railway station(s), other principal educational and employment sites, and other key locations within the city are enhanced to support sustainable development
Policy 19: NIAB 1 Area of Major Change	• Include a comprehensive transport strategy for the site, incorporating a sustainable transport plan to minimise reliance on private cars • Only be directly accessed by motor vehicles from Huntingdon Road and Histon Road (through South Cambridgeshire) • Provide a direct route for public transport, including access for all, through the development, and a circuitous route for private motor vehicles • Where possible retain and enhance existing definitive footpaths that cross the site, or provide suitable and safe equivalent links as part of the development • Provide for walking, cycling, and wheelchair-user improvements (accessible for all) on- and off-site to offer more sustainable travel choices for residents, including an orbital cycle link from Huntingdon to Histon Road along the western boundary and enhancing the footpath to Thornton Way
Policy 20: Station Areas West and Clifton Road Area of Major Change	• Allow the potential for future improvements to the access for pedestrians and cyclists between Station Areas West and Clifton Road Area
Policy 21: Mitcham's Corner Opportunity Area	• Create a low-speed environment to help restore the balance between people and vehicles. Reducing the physical and visual width of the carriageway, in addition to reducing or removing road markings, will help change the perception of the street and contribute to lower speeds; • Emphasise 'place making' over vehicle movement, in particular at junctions, through the use of tighter geometry – by removing or revising the existing gyratory system; • Reinforce or re-establish historic routes and create opportunities for new public spaces;

Policy name/number	Transport Issues / Requirements
	• Create a more comfortable and simplified pedestrian environment by providing wider pavements and more street trees, removing pedestrian guardrails and unnecessary signage, and introducing more direct crossings that respond to key desire lines
Policy 22: Eastern Gate Opportunity Area	• Take an approach to street design consistent with Manual for Streets 1 and 2 and their successor documents, creating a low-speed traffic environment to restore the balance between people and vehicles; • Emphasise 'place making' over vehicle movement, in particular at junctions, through the use of tighter geometry and radii, to reduce speeds and to reclaim public space; • Re-establish historic routes and create clear gateways/entry points into existing residential neighbourhoods; • Create a more comfortable and simplified pedestrian environment through provision of more generous pavements and street trees, removal of pedestrian guardrails and unnecessary signage, and introduction of more direct crossings that respond to key desire lines; • Elizabeth Way roundabout – removal of the pedestrian underpass; creating pedestrian/cycle movements at grade; remodelling to provide a more land efficient design to reclaim an area for a new public urban space and to allow built form to define this important gateway into the city • Newmarket Road and East Road – revision of the approach to traffic management and highway engineering to create a high quality street environment, including continuous cycle lanes; • East Road/St Matthew's Street junction – remodelling to include new direct pedestrian/cycle crossings; • Newmarket Road/Coldham's Lane junction – remodelling to include new direct pedestrian/cycle crossings; and • New Street and Harvest Way – two-way traffic flows and design of on-street parking as an integral component of the streetscape.
Policy 23: Mill Road Opportunity Area	• Take an approach to street design consistent with Manual for Streets 1 and 2 and their successor documents, creating a low-speed traffic environment to restore the balance between people and vehicles • Emphasise 'place making' over vehicle movement, in particular at • junctions, through the use of tighter geometry and radii, to reduce speeds and to reclaim public realm • Create a series of 'events' in the road network, which respond to key spaces and buildings • Create clear gateways/entry points into existing and new residential neighbourhoods • Create a more comfortable and simplified pedestrian environment by providing more generous pavements and more direct crossings that respond to key desire lines
Policy 24: Cambridge	• Take an approach to street design consistent with Manual for

Policy name/number	Transport Issues / Requirements
Railway Station, Hills Road Corridor to the City Centre Opportunity Area	Streets 1 and 2 and their successor documents that creates a low speed traffic environment to restore the balance between people and vehicles • Emphasise 'place making' over vehicle movement, in particular at junctions, through the use of tighter geometry and radii, to reduce approach speeds and to reclaim areas for additional public space • Re-establish historic routes and create clear gateways/entry points into existing residential neighbourhoods • Create a more comfortable and simplified pedestrian environment through provision of more generous pavements and street trees, removal of pedestrian guardrails and unnecessary signage, and introduction of more direct crossings that respond to key desire lines • Regent Street – reallocation of space for wider pavements to better cope with pedestrian flows, reduce street clutter and provide improved cycle parking facilities; • Hyde Park Corner – improvement of the setting of the Our Lady of the English Martyrs Church and increase pavement widths in front of the terrace opposite. Simplify the pedestrian and cyclist user experiences through more direct crossings and investigate the potential for single stage crossings; • Hills Road local centre – reconnection of both sides of the street and improvement of the pedestrian user experience through removing barriers and obstacles. Traffic management and the reallocation of space will help to reduce vehicle speeds and highlight the revitalised 'hub' of Hills Road; • Station Approach – linkage of the proposed CB1 Station Square from Tenison Road through to Hills Road, creating a high quality public realm; • Cambridge Leisure Park – creation of a high quality connection into the site, by upgrading the existing link south of the station across Hills Road Bridge; • Cherry Hinton Road junction – revision of the approach to traffic management and highway engineering in order to create a quality connection between the new developments on all sides of the junction through to Hills Road and Cambridge Leisure Park; • Lensfield Road junction – simplification and rationalisation of the layouts of the two junctions remove the bottleneck that causes traffic to back along Gonville Place. Improve the quality of the public realm and connectivity for pedestrians and cyclists.
Policy 25: Old Press/Mill Lane Opportunity Area	• Improve permeability through the site and create safer streets with priority for pedestrians and cyclists • Minimise non-essential car parking and improve servicing • Provide high quality, well-designed areas of cycle parking
Policy 26: Site specific	GB1 and GB2:

Policy name/number	Transport Issues / Requirements
development opportunities	• The establishment of appropriate public footpaths linking the development with the surrounding chalk farmland • The retention of Worts' Causeway's use for buses only during peak periods, with limited car access to provide a green link into the Cambridge Green Belt with space for pedestrians, horse riders and cyclists • The provision of a single point of crossover between GB1 and GB2 and a single access on to Babraham Road
Policy 43: University faculty development	• Take reasonable opportunities to improve circulation for pedestrians and cyclists, together with public realm improvements, reductions in car parking provision and the introduction of active frontages at ground floor level
Policy 46: Development of student housing	• The location being well served by sustainable transport modes • Having appropriate management arrangements in place to ensure students do not keep cars in Cambridge
Policy 47: Specialist housing	• Accessible to local shops and services, public transport and other sustainable modes of transport,
Policy 48: Housing in multiple occupation	• Accessible to sustainable modes of transport, shops and other local services.
Policy 49: Provision for Gypsies and Travellers	• The site is accessible to local shops, services and community facilities by public transport, on foot or by cycle; • The site has safe and convenient vehicular, pedestrian and cycle access for the type of vehicles that could reasonably be expected to use or access the site;
Policy 52: Protecting garden land and the subdivision of existing dwelling plots	• Provision is made for adequate amenity space, vehicular access • arrangements and parking spaces for the proposed and existing • properties
Policy 53: Flat conversions	• The proposal, in terms of the number of units and scale of associated extensions, would not have a negative impact on the amenity or character of the area or on highway safety in streets already experiencing parking stress;
Policy 54: Residential moorings	• Is served by adequate pedestrian and vehicular access. • Does not impede navigation and/or the use of the footpath.
Policy 56: Creating successful places	• Create streets that respond to their levels of uses while not allowing vehicular traffic to dominate
Policy 57: Designing new buildings	• Are convenient, safe and accessible for all users • Successfully integrate functional needs such as refuse and recycling, bicycles and car parking
Policy 58: Altering and extending existing buildings	• Retain sufficient amenity space, bin storage, vehicle access and cycle and car parking.
Policy 65: Visual pollution	• Proposals do not impede pedestrian and vehicular movements or impact on public safety;
Policy 75: Healthcare	• Planning permission will be granted for new primary healthcare

Policy name/number	Transport Issues / Requirements
facilities	facilities in locations accessible by road, by walking, by cycling and by public transport, where this will meet an existing deficiency, or support regeneration or new development.
Policy 79: Visitor attractions	• The locations of any new attractions should have good public transport • Accessibility.
Policy 80 – Supporting Sustainable Access to Development	• What is required to support the development • How the development can achieve high levels of sustainable modes of travel • Links to the existing and new networks of walking, cycling and public transport • Accessibility for all, including mobility impaired • The requirement and high standard for new road provided • Links to LTP, TSCSC, LTTS and other County Council transport strategy documents
Policy 81 – Mitigating the Transport Impact of Development Policy 82 – Parking management	• Transport Assessments of sites • E.g. junction capacity/safety • Travel Plans for development • Car and cycle parking strategies and provision for development (inc. car clubs, management of service vehicles etc.) • The requirement for financial contributions • Low emission vehicle infrastructure
Appendix B: Proposals Schedule	• Specific transport and access issues are referred to in the Proposals Schedule for the following sites: GB1; GB2; R1; R2; R3; R4; R5; R7; R8; R9; R10; R12; R14; R16; R17; M4; R40; R41; R42c; M1; M2; M3; M5; R6; R21; E4; E5;GB3; GB; U1; U2; U3; RM1.
Appendix L: Car and Cycle Parking Standards	• Sets out car and cycle parking standards for residential and non-residential development • Includes parking for disabled people and people with mobility difficulties • Includes garage dimensions

South Cambridgeshire Local Plan: Proposed Submission, July 2013

The draft South Cambridgeshire Local Plan (Policy S2) sets a high level vision which is supported by six planning objectives:

1. To support economic growth by supporting South Cambridgeshire's position as a world leader in research and technology based industries, research, and education; and supporting the rural economy.
2. To protect the character of South Cambridgeshire, including its built and natural heritage, as well as protecting the Cambridge Green Belt.
3. New development should enhance the area, and protect and enhance biodiversity.
4. To provide land for housing in sustainable locations that meets local needs and aspirations, and gives choice about type, size, tenure and cost.
5. To deliver new developments that are high quality and well-designed with distinctive character that reflects their location, and which responds robustly to the challenges of climate change.

6. To ensure that all new development provides or has access to a range of services and facilities that support healthy lifestyles and wellbeing for everyone, including shops, schools, doctors, community buildings, cultural facilities, local open space, and green infrastructure.
7. To maximise potential for journeys to be undertaken by sustainable modes of transport including walking, cycling, bus and train.

Table F-2 Summary of transport policies and transport infrastructure required by policies in the South Cambridgeshire Submission Local Plan

Policy name/number	Transport Issues / Requirements
Policy TI/2: Planning for Sustainable Travel	• Development must be located and designed to reduce the need to travel, particularly by car and promote sustainable travel appropriate to its location; • Requires sites to achieve sufficient integration and accessibility by walking, cycling or public and community transport; • Requires developers to demonstrate they will make adequate provision to mitigate the likely transport impacts, including direct improvements, or contributions towards wider infrastructure; • Requires Transport Assessments and Travel Plans for larger

Policy name/number	Transport Issues / Requirements
	developments
Policy TI/3: Parking Provision	Sets indicative car parking standards, and minimum cycle parking standards for new developments.
Policy TI/8: Infrastructure and New Developments	Planning permission will only be granted for proposals that have made suitable arrangements for the improvement or provision of infrastructure necessary to make the scheme acceptable in planning terms.
Policy TI/1: Chesterton Rail Station and Interchange	Safeguards land for new railway station and interchange facility.
Policy SS/1: Orchard Park	• Requires creation of strong internal cycle and footpath links • Requires a transport assessment of the remaining land parcels.
Policy SS/2: Land between Huntingdon Road and Histon Road	• Maximise the use of sustainable transport modes • Adequate highway capacity on A14 • Vehicular access from Cambridge Road, through the development, and then via Darwin Green 1 to Huntingdon Road. • HQPT to serve the development, including segregated bus priority • internal and external cycle and footpath links to neighbouring parts of the urban and rural areas.
Policy SS/3: Cambridge East	Addressed by Cambridge East AAP (see Cambridge East Area Action Plan Jointly Adopted 2008 section below)
Policy SS/4: Cambridge Northern Fringe East and land surrounding the proposed Cambridge Science Park Station	• Ensure that appropriate access and linkages, including for pedestrians and cyclists, are planned for in a high quality and comprehensive manner. • Will be subject to an Area Action Plan
Policy SS/5: Waterbeach New Town	4. It will deliver high quality public transport links to Cambridge, including a new railway station, to enable a high modal share of travel by means other than the car. 6. An AAP will be prepared for the area shown on the Policies Map. The AAP will establish a policy framework for the site, and will address issues and requirements including: Significant Improvements in Public Transport: • x. A relocated Waterbeach station to serve the village and the new • town; • y. A Park and Ride site on the A10 to intercept traffic from the north of Waterbeach, served by a new segregated Busway link to Cambridge; Measures to Promote Cycling and Walking: • z. A network of attractive, direct, safe and convenient walking and cycling routes linking homes to public transport and the main areas of activity such as the town centre, schools and employment areas; • aa. Direct, segregated high quality pedestrian and cycle links to north Cambridge, surrounding villages and nearby existing facilities such as the Cambridge Research Park;

Policy name/number	Transport Issues / Requirements
	• bb. A Smarter Choices package including residential, school and workplace travel planning. Highway Improvements: • cc. Primary road access to the A10; • dd. Additional capacity to meet the forecast road traffic generation of the new town, particularly on the A10 and at the junction with the A14; • ee. Measures to mitigate the traffic impact of the new town on surrounding villages including Waterbeach, Landbeach, Horningseas, Fen Ditton and Milton; • ff. Review the access arrangements to Denny Abbey.
Policy SS/6: New Village at Bourn Airfield	6. The AAP will establish a policy framework for the site, and will address issues and requirements including: Significant Improvements in Public Transport, including: • r. A segregated bus link from Cambourne to Bourn Airfield new village across the Broadway, and on through the development to the junction of the St Neots Road with Highfields Road; • s. Any measures necessary to ensure that a bus journey between Caldecote / Highfields and the junction of the A428 and the A1303 is direct and unaffected by any congestion suffered by general traffic. • t. High quality segregated bus priority measures on the A1303 between its junction with the A428 and Queens Road, Cambridge; • u. Potentially incorporate a Park and Ride facility for the A428 corridor. Measures to Promote Cycling and Walking, including: • v. A network of attractive, direct, safe and convenient walking and cycling routes linking homes to public transport and the main areas of activity such as the village centre, schools and employment areas; • w. Direct, segregated high quality pedestrian and cycle links to west Cambridge, Cambourne, Caldecote / Highfields, Hardwick and Bourn; • x. A Smarter Choices package including residential, school and workplace travel planning. Highway Improvements: • y. Measures to mitigate the traffic impact of the new village on surrounding villages and roads; • z. Convenient vehicular access, with at least two separate access points to the north west and north east of the site; • aa. There will be no direct vehicular access to the Broadway (except buses and bicycles).
Policy SS/7: Northstowe Extension	Addressed in Northstowe AAP (see South Cambridgeshire Northstowe Area Action Plan Adopted 2007 section below)
Policy SS/8: Cambourne West	Access • 11. Development will provide for the additional travel demands

Policy name/number	Transport Issues / Requirements
	generated. Coordination will be required with other developments on the A428 corridor to deliver the necessary improvements. The development will need to address, but is not limited to, the following (subject to detailed strategy development and to the transport assessment of development proposals): • a. Any measures necessary to ensure that a bus journey between Cambourne West and the junction of the A428 and the A1303 is direct and unaffected by any congestion suffered by general traffic; • b. High quality segregated bus priority measures on the A1303 between its junction with the A428 and Queens Road, Cambridge; • c. Direct, segregated high quality pedestrian and cycle links to west Cambridge, Papworth Everard, Caxton and Bourn; • d. The impact of the proposals on the junctions of the A428 with the A1303 and the A1198 will be assessed in detail and contributions towards or direct funding of improvements to the junctions may be required; • e. Delivery or funding of any measures required to mitigate the traffic impact on Bourn, Caldecote, Toft, Comberton and Barton; • f. A Smarter Choices package including residential, school and workplace travel planning; • g. Vehicular access to be provided through an enhanced route through the Business Park, one or more access points from the Caxton Bypass, and via Sheepfold Lane; • h. Bus prioritisation measures, including a bus link from one of the roundabouts on the Caxton bypass through the Cambourne West site, linking through to Great Cambourne by the Cambourne Business Park; • i. Creation of high quality segregated cycle and pedestrian routes within the new settlement.
POLICY H/1: Allocations for Residential Development at Villages	• H1a to c - Contribution to any highway works required to mitigate the impact of development as a whole on the eastern flank of Sawston;
POLICY H/2: Bayer CropScience Site, Hauxton	• b. Establishing pedestrian and cycle links to the Trumpington Meadows development, and to the Trumpington Park and Ride; • c. Establishing pedestrian and cycle links to the village of Hauxton; • d. Contributions to improved public transport provision along the A10 corridor;
POLICY S/2: Objectives of the Local Plan	• f. to maximise potential for journeys to be undertaken by sustainable modes of transport.
POLICY HQ/1: Design Principles	• f. Achieve a permeable development with ease of movement and access for all users and abilities, with user friendly and conveniently accessible streets both within the development and linking with its surroundings and existing and proposed facilities and services, focussing on delivering attractive and safe opportunities for

Policy name/number	Transport Issues / Requirements
	walking, cycling and public transport. • H. Ensure that car parking is integrated into the development in a convenient, accessible manner and does not dominate the development and its surroundings or cause safety issues. • i. Provide safe, secure, convenient and accessible provision for cycle parking and storage…in a manner that is appropriately integrated within the overall development.

Table F-3 Cambridge East Area Action Plan

Policy name/number	Transport Issues / Requirements
POLICY CE/2: Development Principles	The Urban Quarter of Cambridge East will develop: • 12. As a compact and sustainable urban quarter with a low car dependency, which is highly accessible and permeable to all its residents by foot, cycle and High Quality Public Transport, and which has good links to the city centre and to existing major employment centres;
POLICY CE/10: Road Infrastructure	• Requires adequate highway capacity to serve all stages of development, including on and to the A14. • Requires access by all purpose junctions. • Requires mitigation of impacts, submission of a Transport Assessment and traffic management measures. • Possible requirement for a contribution towards improving capacity on orbital routes. • Requires the relocation of the Park and Ride site.
POLICY CE/11: Alternative Modes	• Requires adequate provision for alternative transport modes and parking to serve all stages of development. • Requires High Quality Public Transport provision with associated infrastructure, with all development sited within 400m easy walk of a bus stop and provision of 12 month subsidy for new residents. • Requires high quality cycling infrastructure, both within Camb East and connecting with Cambridge, surrounding villages and the wider rights of way network. • Car and cycle parking provision in accordance with standards in Appendices 1 and 2, and encouraging shared car parking.
POLICY CE/12: Transport for North of Newmarket Road	• Requires one road access and one public transport only access onto Newmarket Road. • Requires all development to be sited within 400m easy walk of a bus stop and improved bus priority measures along Newmarket Road. • Requires cycle and footpath links into the Fison Estate, to the Jubilee Cycleway, and internal design to prioritise movements by foot or cycle rather than the car.

POLICY CE/33 Infrastructure Provision	• Requires suitable arrangements for the improvement or provision of infrastructure necessary to make the scheme acceptable, including improvements (including Infrastructure) for pedestrians, cyclists, equestrians, highways and public and community transport.

Table F-4 South Cambridgeshire Northstowe Area Action Plan Adopted 2007

Policy name/number	Transport Issues / Requirements
POLICY NS/10: Road Infrastructure	• Requires adequate highway capacity will be required to serve all stages of development, including on the A14. • Primary road access may include an improved Hattons Road, access from the Longstanton West bypass and/or a new road in the vicinity of the A14 Dry Drayton junction. • Requires an emergency access from the Cottenham direction. • Requires mitigation and traffic management measures. • Possible requirement for a contribution towards a Willingham Bypass, if it is required.
POLICY NS/11: Alternative Modes	• Requires adequate provision for alternative transport modes and parking to serve all stages of development. • Requires High Quality Public Transport, a dedicated local busway linked to the Guided Busway, all development within 600m easy walk of the local busway or 400m of a bus stop, provision of 12 month subsidy for new residents and a contribution towards the Guided Busway. • Requires access to the Park and Ride by foot and cycle but not by car. • Requires high quality cycling infrastructure, both within Northstowe and connecting with surrounding villages and the wider rights of way network. • Requires car and cycle parking provision in accordance with the district-wide standards, but encouraging shared use parking and car pooling.
POLICY NS/28: Timing / Order of Service Provision	• Requires the master outline planning permission and legal agreement to include a schedule of services, facilities and infrastructure to be funded by the developer(s), together with a timetable for their provision. These should be provided at stages in the development process according to a set of trigger points.

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