GREATER CAMBRIDGE PARTNERSHIP

Growing and sharing prosperity

Delivering our City Deal

8 January 2018

To: Members of the Greater Cambridge Partnership Joint Assembly:

Councillor Kevin Price	Cambridge City Council (Chairperson)
Councillor Tim Wotherspoon	Cambridgeshire County Council (Vice Chairperson)
Councillor David Baigent	Cambridge City Council
Councillor Tim Bick	Cambridge City Council
Councillor Noel Kavanagh	Cambridgeshire County Council
Councillor John Williams	Cambridgeshire County Council
Councillor Grenville Chamberlain	South Cambridgeshire District Council
Councillor Kevin Cuffley	South Cambridgeshire District Council
Councillor Bridget Smith	South Cambridgeshire District Council
Sir Michael Marshall	Marshall Group
Mark Robertson	Cambridge Regional College
Claire Ruskin	Cambridge Network
Helen Valentine	Anglia Ruskin University
Dr John Wells	Cancer Research UK Cambridge Institute
Andy Williams	AstraZeneca

Dear Sir / Madam

You are invited to attend the next meeting of the **GREATER CAMBRIDGE PARTNERSHIP JOINT ASSEMBLY**, which will be held in the **KREIS VIERSEN ROOM, SHIRE HALL, CAMBRIDGE** on **THURSDAY, 18 JANUARY 2018** at **2.00pm**

Requests for a large print agenda must be received at least 48 hours before the meeting.

AGENDA

		PAGES
1.	**Apologies for absence**	
2.	**Declarations of Interest**	
3.	**Minutes of Previous Meeting** To confirm as a correct record the minutes of the meeting held on 2 November 2017.	**1 - 14**
4.	**Questions from Members of the Public**	
5.	**Petitions**	
6.	**Rapid Mass Transit Options Appraisal**	

7.	**A10 Foxton level crossing bypass and travel hub** To consider the attached report.	**15 - 114**
8.	**Ely to Cambridge A10 Transport Study** To consider the attached report.	**115 - 200**
9.	**Our Big Conversation** To consider the attached report. Appendix A of the report will follow.	**201 - 282**
10.	**Rural Travel Hubs** To consider the attached report.	**283 - 376**
11.	**Date of Next Meeting** To note that the next meeting will take place on Wednesday 28 February 2018 at 2pm in the Council Chamber at South Cambridgeshire Hall, Cambourne Business Park, Cambourne.	

Growing and sharing prosperity

Delivering our City Deal

GREATER CAMBRIDGE PARTNERSHIP JOINT ASSEMBLY

Minutes of the Greater Cambridge Partnership Joint Assembly
held on Thursday 2 November 2017 at 2.00pm

PRESENT:

Members of the Greater Cambridge Partnership Joint Assembly:

Councillor Kevin Price (Chairman)	Cambridge City Council
Councillor Tim Wotherspoon (Vice Chairman)	Cambridgeshire County Council
Councillor Dave Baigent	Cambridge City Council
Councillor Tim Bick	Cambridge City Council
Councillor Noel Kavanagh	Cambridgeshire County Council
Councillor John Williams	Cambridgeshire County Council
Councillor Kevin Cuffley	South Cambridgeshire District Council
Sir Michael Marshall	Marshall Group
Claire Ruskin	Cambridge Network
Andy Williams	AstraZeneca
Helen Valentine	Anglia Ruskin University
Dr John Wells	Cancer Research UK Cambridge Institute

Members or substitutes of the Greater Cambridge Partnership Executive Board in attendance:

Councillor Ian Bates, Transport Portfolio Holder	Cambridgeshire County Council

Officers/advisors:

Rachel Stopard	Interim Chief Executive, Greater Cambridge Partnership
Niamh Matthews	Strategic Programme and Commissioning Manager, Greater Cambridge Partnership
Chris Tunstall	Interim Director of Transport, Greater Cambridge Partnership
Chris Malyon	Finance Director, Cambridgeshire County Council
Victoria Wallace	Democratic Services Officer, South Cambridgeshire District Council

1. APOLOGIES FOR ABSENCE

Apologies for absence were received from Councillor Bridget Smith, Councillor Grenville Chamberlain and Mark Robertson.

2. DECLARATIONS OF INTEREST

In relation to agenda item 6, Councillor Kevin Cuffley informed the Joint Assembly that he had been involved in all the Local Liaison Forum meetings and conversations.

3. MINUTES OF PREVIOUS MEETING

The minutes of the meeting held on 13th September 2017, were agreed as a correct record, subject to the following amendments:

- Councillor Smith had requested bullet point 4 at page 10 of the minutes be amended to:

  'Councillor Bridget Smith referred to the recommendation of some members of the LLF, that consideration be given to a rail focused park and ride at Foxton and recalled that support for some improvements had been agreed in principle some time ago'.
- Under point 9 on page 14 of the minutes, the word 'with' would be added to the wording of the recommendation.

7. QUESTIONS FROM MEMBERS OF THE PUBLIC

Three questions had been received from members of the public, one of which was not accepted for the meeting but would receive a written response and be kept informed by officers of when relevant reports would be presented to the Executive Board. The other two questions had been accepted and would be addressed at agenda item 10.

5. PETITIONS

No petitions were received.

6. A1307 THREE CAMPUSES TO CAMBRIDGE (A1307 HAVERHILL TO CAMBRIDGE) - 25 MINS (2.15PM - 2.40PM)

Councillor Tony Orgee, Chairman of the Local Liaison Forum (LLF), updated the Joint Assembly on the work of the LLF:

- Five workshops had taken place to develop options for the A1307 Haverhill to Cambridge corridor. 200 ideas had come forward which were grouped into 40 proposals. Three workshops took place to look at these proposals, focussing on a particular part of the route at each workshop.
- The three strategies set out in the officer report to the Joint Assembly, had been developed by the LLF and presented at its workshop in September 2017. Councillor Orgee explained that all three strategies were identical between Fourwentways and Haverhill. The LLF considered it appropriate that all three strategies be taken forward to consultation by the GCP Executive Board.
- Councillor Orgee urged that the work on the A1307 Haverhill to Cambridge corridor not be seen in isolation from the other work of the GCP and that the work of the GCP not be seen in isolation from the work of other organisations, such as the Combined Authority.

The GCP Interim Director of Transport presented the report and the recommendations that would be made to the Executive Board, explaining that some park and ride sites were no longer suitable and more sites needed to be identified. Public consultation was therefore anticipated to start in February 2018.

Councillor Ian Bates was in attendance as the Transport Portfolio Holder for the GCP Executive Board. He thanked the LLF Chairman on behalf of the Executive Board for the LLF's work on the development of the three strategies, which reflected the direction of travel members of the public wanted to see.

The Joint Assembly was invited to comment on the report and proposals:

- Members commended the LLF for its work on developing the three strategies and supported the recommendation to the Executive Board that these be put forward for consultation.
- Councillor Williams requested that if no major concerns regarding the section between the A11 and Haverhill were raised during the consultation, this be progressed regardless of the outcomes of the consultation in relation to the strategies for the section between the A11 and Cambridge Biomedical Campus (CBC). Officers confirmed that subject to the consultation's outcome they would be recommending moving forward with this.
- Claire Ruskin supported the next steps and milestones, but advised that the project name 'Three Campuses to Cambridge' was meaningless and should not be used. She supported the use of the name 'Haverhill to Cambridge'. She further advised that the speed with which this work progressed needed to be proportionate to the immense speed of growth of employment on the Cambridge Biomedical Campus. Officers advised that they were hoping to progress rapidly.
- Councillor Bick welcomed the LLF's development of Option 1. He was keen to see existing populations benefit from improvements to transport infrastructure where possible and Option 1 appeared to provide this to the existing population of Sawston. The other options did not seem to provide the same level of benefit to existing populations.
- Councillor Cuffley queried the reasons for consultation being delayed until February 2018. Officers advised this was due to some park and ride sites now being unsuitable and new sites needing to be looked at. New sites would be put forward to the Executive Board in February 2018 when it was anticipated discussions with landowners would have taken place. Officers advised that all three strategies being put forward required park and ride provision.
- Cllr Kavanagh referred to the statistic relating to pedestrians and cyclists, which suggested a projected drop in cycling. The Interim Transport Director explained the figure did not reflect a reduction as it was based on a proportion of an expected 25% increase in traffic. He further explained that modelling did not deal well with cycling and was more suited to motorised vehicular traffic.
- Andy Williams reiterated that growth at CBC was rapid, with 17,250 jobs located there. This was 50% more than had been estimated and it was predicted that this would grow more rapidly. Officers reassured members that 28,000 jobs had been predicted at CBC and this was being factored into modelling along with all anticipated development along that corridor.
- Sir Michael Marshall indicated preference for option 1, with concern regarding the other options being the impact of single lane roads, particularly on emergency vehicles moving through traffic.

The Chairman summed up the discussions which had reflected general support for the way forward being recommended to the Executive Board, with all three strategies being put forward for consultation. The Joint Assembly recommended that the strategies should be consulted on early in the new year without the need to identify the park and ride sites but also acknowledged that park and ride sites should be consulted on in future once the preferred strategy had been identified. The Joint Assembly also requested that officers pursue the options common to all three strategies once the Board had received and agreed the result of the consultation.

The change of the project's name was discussed, with the Joint Assembly's views on the change to the project's name invited. Cllr Cuffley supported the use of the name 'Three Campuses to Cambridge. Other names suggested were 'The Haverhill Trail' and 'Granta Park to Cambridge'. The Vice-Chairman recommended the LLF be asked to consider a new name for the project. The Chairman of the LLF agreed with this, as did the other Joint Assembly members.

7. WESTERN ORBITAL - 20 MINS (2.40PM-3.00PM)

Helen Bradbury, Chairman of the Western Orbital Local Liaison Forum, was invited to address the Joint Assembly. She brought the following points to their attention:

1. **Process** – the LLF requested that more time be given between the publication of end stage reports and the timing of the subsequent Joint Assembly meeting so that it could better feed its recommendations, concerns and suggestions into the decision-making process. The timing structure made it difficult for the Joint Assembly to take account of the LLF's views and consequently the LLF did not believe that its views, recommendations and suggestions were given adequate consideration. The LLF Chairman explained the considerable amount of work that needed to be done by the LLF in the time between reports being published and Joint Assembly meetings taking place. This had been particularly difficult for the LLF in September 2017 with a large number of documents to consider in 12 days between publication of the Joint Assembly papers and the subsequent meeting. The LLF therefore recommended that an extra week be given between the publication of relevant end stage reports and the timing of the subsequent Joint Assembly meeting, to enable the LLF to carry out its relevant business within a reasonable timescale before the meeting.
2. **Connectivity at junction 13**- The LLF did not believe that it was sensible to decide the alignment of the Cambourne to Cambridge busway first. The LLF believed that connectivity of a Western Orbital service to Cambourne to Cambridge bus services was of key importance. End to end journey times and journey quality from west of Cambridge settlements to key employment sites such as the Cambridge Biomedical Campus, were a critical factor in judging the benefit of these schemes, to allow proper evaluation of benefit to cost ratio. The LLF requested that the Joint Assembly recommended to the Executive Board that end-to-end journey metrics be included in all documentation on this and related schemes moving forward, particularly in the forthcoming consultation literature.
3. **Park and Ride at junction 11** – the LLF needed more information and more options to be put forward in order to provide a considered response to this. The LLF wanted to know why other locations around M11 junction 11 had been rejected so early in the process. The LLF acknowledged the importance of adequate park and ride provision near M11 junction 11, but had serious reservations about both park and ride options presented in the end stage report. The LLF felt it had not received answers to the questions it had asked of the Joint Assembly in September 2017. Trumpington Residents Association had raised many questions about the visual impact on the local community particularly if the Trumpington park and ride was decked, the impact on the local network if it was extended, what would happen during construction and the value for money per new parking space. The Joint Assembly was informed that Hauxton and Haston parish councils had questions regarding the impact on their villages of a large park and ride west of the M11, such as traffic through the villages which were already congested, access to the new site and concerns about erosion of the green belt buffer between Cambridge and South Cambridgeshire villages. The LLF had passed a resolution at its 17 June 2017 meeting that the new park and ride should be sited before congestion began and as a general principal that new transport infrastructure should not be allowed to urbanise villages surrounding the city or unduly damage the city's greenbelt.

The LLF Chairman asked for the following in order to allow community feedback to be given:

1. A written response to the questions that the LLF had asked of the GCP at its September 2017 meeting.
2. A written response to the LLF's new concerns, voiced at its meeting on 31st October 2017, about each of the proposed sites.
3. Further possible sites to be brought forward, together with an explanation as to why other sites around junction 11 had been rejected.
4. As the evidence base on the number of parking spaces projected to be needed around the M11 in 2031 did not factor in the impact of the new Cambridge South rail station, or the potential effect of increased parking provision further south along the A10 (for example at Foxton station), the LLF requested officers provided data and modelling on these two points.
5. Where commuters were travelling to and not just where they were coming from, needed to be considered to enable informed community feedback to be given on the required size and location of park & ride provision at junction 11.

The Joint Assembly Chairman asked officers to provide written answers to the questions the LLF felt had not been answered. Councillor Ian Bates agreed to organise a meeting between himself and Ms Bradbury to discuss in details the LLF's concerns in detail.

The Interim Director of Transport responded to the points raised by the LLF Chairman while presenting the report:

- It was clarified that the western orbital was originally going to be a new road but was then looked at to run on the M11 between junctions 11, 12 and 13.
- The M11 was being dealt with as apart of the smart motorway upgrade with Highways England.
- The recommendation regarding junction 11 was to look at a new park and ride site to accommodate the parking capacity that was needed for the anticipated increase in traffic volume. This was rather than doing more with the existing park and ride site at Trumpington. An alternative site was being looked into and there were limitations on where this could be. A consultation group would be set up to work on this. Foxton was being looked at as part of the process.
- Park and cycle at junction 12 at Barton was looked at however, colleagues from the Cambridge cycling group advised there would be little use of this therefore the Executive Board would be advised not to consider this.
- M11 junction 13 was tied up with Cambourne to Cambridge and the recommendation was for this to be dealt with as part of the Cambourne to Cambridge proposals.
- As the Western Orbital LLF had two major schemes on it, it was considered beneficial to remove junction 11 from the work of this LLF and to create a consultation group to look at this.
- Cambridge South station would be considered, although it was pointed out that the only developments that could ultimately be factored in were those that were in the approved Local Plan.

The Joint Assembly considered the overall approach being recommended to the Executive Board to develop a full business case for a preferred option for a new park and ride site immediately to the north west of junction 11 of the M11, to include increased park and ride capacity and access/bus priority measures both into and out of the park and ride along Trumpington Road for city bound park and ride bus services. The business case would compare the costs and benefits of a new park and ride site against significant expansion of the existing site at Trumpington.

The Joint Assembly debated the proposals:

- Andy Williams informed members that AstraZeneca strongly supported new park and ride capacity at M11 junction 11 and at Fourwentways. This was based on evidence gathered by AstraZeneca which mapped where employees were coming from based on where they lived and where they were going to. AstraZeneca also had predictive software which could map what would happen if there was a train station. Mr Williams offered to work with officers to make information available where possible in order to help with mapping. Mr Williams understood the concerns of the local population but emphasized that more park and ride capacity was critical and needed to be in place by 2019. He questioned the lengthy timeline of the end of 2021 for a new park and ride to be built.

- Cllr Bick advised that the GCP should be planning on the basis of scenario three of the modelling of the number of parking spaces needed by 2031. Additional demand management measures in the city needed to be envisaged. These additional measures were critical and a sense of urgency needed to be renewed regarding this. There were significant constraints of the existing park and ride site at Trumpington due to the new community built around it, therefore the Harston side of the M11 needed to be considered for a new park and ride site rather than extending the Trumpington site.
- Some members felt that large expansion of the existing park and ride site would be disruptive and add to the already substantial congestion around the entry and exit to the park and ride. The use of the existing footprint at Trumpington did however need to be optimised.
- Cllr Bick referred to access to a potential new park and ride site at Harston via a new bridge, advising that there may be issues with this as this would be part of a country park that was envisaged. In response to this, the Transport Director informed members that access to a new park and ride site had been discussed with Highways England. The existing service bridge would take the weight to enable access to the site. Other possibilities for access to the site were being looked at.
- Cllr Bick asked whether the park and ride could be moved off the site at Trumpington, or whether commitments had been made to John Lewis, which tied the park and ride to this site.
- Cllr Bick asked for further opportunity for the Joint Assembly to discuss the smart motorway issue that was being discussed with Highways England, to ensure it would deliver what was needed.
- Councillor Kavanagh agreed that the existing park and ride site at Trumpington should not be expanded and that a new park and ride site with plenty of capacity should be built. He asked if a new park and ride site were built, whether the existing park and ride site could be taken out of service and turned over to use for housing.
- Claire Ruskin highlighted the need to manage growth well and that with more access to the hospital and jobs needed, more parking spaces would be needed. Ms Ruskin supported the idea of expanding the existing park and ride site at Trumpington as this would be the quickest and easiest thing to do, but advised that new park and ride sites were also needed. Hubs also needed to considered.
- Dr Wells advised that given the rate of growth of jobs on the Cambridge Biomedical Campus, there was urgency for a solution which needed to be consulted on.
- Some members expressed disappointment that park and cycle was not being taken forward. Councillors Baigent, Kavanagh and Dr Wells spoke in favour of park and cycle and suggested trial of small scale park and cycle which could be expanded if demand materialized suggested. It was proposed that this be considered on an existing park and ride site.

The Interim Director of Transport responded to the points raised:

- The Joint Assembly’s comments about a trial park and cycle would be taken onboard.
- The Joint Assembly was informed that it would take 18 months to build a new park and ride site, however the planning process and consultation took more time hence the timeline of 2021 for build of a new site.

- The GCP was talking to Highways England about the junctions to make them more accessible to park and ride buses.
- Travel hubs were being looked at. These were envisaged to be places with coffee shops, electric charging points, cycle provision and the potential for the provision of office space.

Councillor Ian Bates added:

- Trumpington park and ride was owned by Cambridgeshire County Council and a bus from here went to the biomedical campus.
- The County Council did have an agreement with John Lewis regarding the long term provision of their retail collection point at the park and ride site.

Councillor Bick queried how the Joint Assembly's views would be represented to the Executive Board by not voting on recommendations. The GCP Interim Chief Executive assured members that their views would be captured and fed back to the Executive Board with the relevant Portfolio Holder present at the meeting to hear their views. Views expressed would be fed into the officer report to the Executive Board following the Joint Assembly meeting. The Joint Assembly Chairman would also be submitting a report on the Joint Assembly meeting to the Executive Board, which would reflect the views expressed by members.

Councillor Tim Bick proposed that a steer was given to the Executive Board that further park and ride development should only be on the Harston side of the M11. This was seconded by Councillor Williams and a vote was taken with five members voting in favour of the proposal, five against and two abstaining.

8. RAPID MASS TRANSIT STRATEGIC OPTIONS APPRAISAL - 30 MINS (3.00PM-3.30PM)

The Joint Assembly heard a presentation from Steer Davies Gleave, the consultants leading the rapid mass transit strategic options appraisal. Following the presentation, Joint Assembly members asked a number of questions and in response to these, were informed of the following:

- A long list of options regarding the type of transport for mass transit, was being considered. In response to a question regarding whether cable cars had been considered for use in certain areas for short distances, the Joint Assembly was informed that cable cars were not a mass transit option. Tram trains were not on the shortlist of options, with the Department of Transport having advised that this should not be pursued.
- Possible levels of growth post 2031 were being considered, with scenarios such as satellite developments on city fringes where major biomedical companies located back office functions and start-ups, may choose to locate.
- Fundability and affordability of transport options was being considered, with options needing to be financially sustainable and demonstrate value for money for users.
- Claire Ruskin invited the consultants to provide an update at an event looking at the future of transport, taking place on 30 November 2017.

9. HISTON ROAD - 15 MINS (3.30PM-3.45PM)

The Interim Director of Transport gave an overview of the officer responses to the resolutions of the Histon Road Local Liaison Forum, advising that officers agreed with most of the LLF's resolutions. The Interim Director of Transport advised that on street parking at the southern end of Histon Rd/Huntingdon Road needed to be looked at as it was causing issues due to the narrowness of the road. Bus priority at the far end at Kings Hedges to Gilbert Road needed to be looked. The Joint Assembly was informed that under the ‘do maximum’ approach, a bus lane from Kings Hedges to Gilbert Road had been suggested, which would have involved taking gardens away due to the narrowness of the road. Following further work between officers and the LLF, the Board would be advised that this bus lane option was not necessary, with a bus gate and bus priority to be considered instead. Officers would work closely with the Histon Road LLF to minimise any impact on trees. The Transport Director explained the scheme was being proposed up to the A14 junction. Subject to Board agreement, a revised concept scheme would come back to the Greater Cambridge Partnership by March 2018.

The Joint Assembly considered the report and commented on the progress and officer recommendations to the Executive Board. The following points were raised:

- Some Joint Assembly members questioned whether it was plausible to do something that would actually improve access along Histon Road. It was felt that a point of diminishing returns was being reached. There was support for the direction of travel outlined in the report, though it was felt that the result would not be transformative. In response to this, officers advised that consultants were looking into whether there was a good benefit to cost ratio. Whilst the Joint Assembly’s views were acknowledged and appreciated, the Interim Director of Transport felt strongly that Histon Road needed to be looked at.
- Sir Michael Marshall advised that much pressure on Histon Road could be reduced by having a proper feed off from the M11 at junction 13 southbound. The Interim Director of Transport advised that junction 13 would be tied in with discussions with Highways England regarding smart motorways.
- Councillor Kavanagh felt that the reference needed to be made to the safety of cyclists rather than the ‘comfort’ of cycling as referred to in the report. He stressed that the Huntingdon Road end of Histon Road was one of the most dangerous stretches for cyclists. Officers accepted this point, acknowledging that it was a well known incident spot for cyclists.
- Councillor Bick expressed his support for the direction of travel outlined in the report and congratulated the LLF on their work with officers.
- The Director of Transport emphasised that problems on roads were caused by junctions rather than links between junctions, with queuing occurring on the links due to congestion at the junctions.
- The Joint Assembly was informed that Histon Road and the A10 Trumpington Road had seen the most significant increase in traffic. Traffic on all other corridors had plateaued as the queues were already there.
- The LLF was congratulated for its work with officers. Councillor Bates advised that the Joint Assembly’s conversation needed to be fed back to the Histon Road LLF. The Vice Chairman of the LLF was present at the meeting.

The Joint Assembly broadly supported the direction of travel outlined in the report to move away from the ‘do maximum’ approach which had previously been proposed, and noted that subject to the outcome of the Executive Board meeting, a revised concept scheme for Histon Road would be presented to the Executive Board in March 2018.

10. QUARTERLY PROGRESS REPORT - 10 MINS (3.45PM-3.55PM)

The Chairman invited Mike Mason and Councillor Susan van de Ven to ask their questions relating to this item, which had been submitted in line with the provisions of Standing Orders. Details of the questions and a summary of the answers given are set out in Appendix A to the minutes. In response to comments made by Councillor van de Ven, the Chairman assured her that officers would update the report before it was presented to the

11. Executive Board, to reflect that the Cambridge to Royston cycle scheme was not complete and was missing a critical link.

The Strategic Programme and Commissioning Manager presented the quarterly progress report, which updated Joint Assembly members on progress across the Greater Cambridge Partnership programme. The GCP Interim Chief Executive drew Joint Assembly members' attention to the recommendations to the Executive Board regarding Cambridge South station, the Park and Ride subsidy, the Girton Interchange and Cambridgeshire rail study, as outlined in the appendices to the report.

The Joint Assembly noted the recommendations to the Executive Board and discussed the proposals, raising the following points:

- While members supported the proposals which would enable the removal of the £1 parking charge at park and ride sites from 1st April 2018, they questioned what the long term sustainable source of funding was for this and whether parking charges would be reinstated once the GCP funding ended. Furthermore, members were of the opinion that the park and ride charge should never have been imposed and that the Cambridge City Deal funding had not been awarded to fund existing services in order to keep them going. Members felt this was questionable in relation to the purposes for which the original City Deal had been set up; to fund sustainable growth and infrastructure.
- Members asked whether there was a commitment from Cambridgeshire County Council that parking charges at park and ride sites, including at new sites to be developed by the GCP, would not be reinstated in future. It was felt that if the County Council reinstated park and ride parking charges in future, it would go against the GCP's work in trying to achieve a modal shift to public transport as the preferred form of transport. In response to this, the County Council's Finance Director informed members that for the next five years, income from the park and ride charge had been removed from County Council financial plans and Council resources were being managed without that income. A perpetual commitment could not however be made by officers and an ongoing revenue stream would have to be found.
- Councillor Williams asked whether Cambridge South station would be accessible to residents as well as those who worked at the Cambridge Biomedical Campus.
- Councillor Williams requested that the Executive Board be asked to look at a cost to benefit review of extended opening times of park and ride sites and extended operating times of buses. He advised that services would be better used if they were available from earlier and until later.
- Councillor Williams advised that the mass transit study should be linked with the rail study.
- In response to a question from Councillor Baigent regarding progress on negotiations regarding the Chisholm Trail in the Romsey area, members were informed that the GCP was in lengthy talks with Network Rail regarding this. Land agreements had almost been reached regarding the bridge over the River Cam, with heads of terms drafted. Ground investigation work had been conducted nearby. Agreements were in place for phase 1 of the Chisholm Trail. The focus had been on getting phase 1 of the project moving as some of the land to build the new bridge was time limited.

The Joint Assembly broadly supported the proposals that would be made to the GCP Executive Board, with their views to be incorporated in the reporting to the Executive Board.

11. DATE OF NEXT MEETING - 5 MINS (3.55PM-4.00PM)

The Joint Assembly noted that the date of the next meeting was Thursday 18th January 2018 at 2pm in the Kreis Viersen Room, Shire Hall, Cambridge.

12. APPENDIX A TO THE MINUTES (QUESTIONS AND ANSWERS TO PUBLIC QUESTIONS)

The Meeting ended at 4.40 p.m.

No	Questioner	Question	Response
10a	Mike Mason	I refer the joint assembly to Agenda Item 10 Appendices 1 and 3. The financial reporting arrangements for GCP are unsound in that there is no public confidence in the budgeting process, financial control or value for money spent. Table 2 leads one to suspect that the figures under columns "Actual to Date", "Forecast Outturn" and "Forecast Variance" are optimistic guesswork. I ask, are the "Actual to Date" figures verifiable by means of invoices from suppliers or cross authority documented charges (e.g. LA Admin. Costs, line 8)? Are these costs clearly and unambiguously defined in the County Council public payments data? If so will GCP publish a definitive list of cost centres for all of its expenditure headings to ensure that there is a clear audit trail and public accountability? If it is accepted that the County is the "Accounting Body" then what are the arrangements for recording all income including S106 money, housing and other grants or contributions, within the County Council's comprehensive income and expenditure statement (CIES) which forms part of its audited accounts? With regard to Appendix 3, I would question whether the recommendation to use GCP funds to support revenue budget income shortfall in one of its constituent authorities is either legal, or within the spirit of the grant award by HM Government? Furthermore are Assembly Members aware that the County Council is recording the City Deal/GCP Government Grant funding of £60M, to be received in future years 3,4,and 5, as "Useable Assets" in the third version of the 2016/17 Statement of Accounts?	I ask, are the "Actual to Date" figures verifiable by means of invoices from suppliers or cross authority documented charges (e.g. LA Admin. Costs, line 8)? Yes Are these costs clearly and unambiguously defined in the County Council public payments data? Yes – If above £500 they are detailed in the published payment data (which excluded salary costs and any data which is confidential). If so will GCP publish a definitive list of cost centres for all of its expenditure headings to ensure that there is a clear audit trail and public accountability? Yes (see appendix one in the third page of this document) If it is accepted that the County is the "Accounting Body" then what are the arrangements for recording all income including S106 money, housing and other grants or contributions, within the County Council's comprehensive income and expenditure statement (CIES) which forms part of its audited accounts? The County Council is the accountable body of the £100m City Deal grant. Regarding S106 income and capital grants/contributions with conditions attached, this is recorded within the Capital grants and contributions section of the Taxation and Non-Specific Grant Income section of the CIES at the point when income is applied to expenditure (as per the CIPFA Code of Practice). For capital grants/ contributions which have no conditions unmet, these are recognised in the CIES within the Capital grants and contributions section at the point at which the income is received. Revenue grants are credited to Taxation and Non-Specific Grant income or the relevant service directorate depending on the grant in question- please see page 70 of the published Statement of Accounts for example: https://www.cambridgeshire.gov.uk/council/finance-and-budget/statement-of-accounts/ With regard to Appendix 3, I would question whether the recommendation to use GCP funds to support revenue budget income shortfall in one of its constituent authorities is either legal, or within the spirit of the grant award by HM Government? The proposal to remove the charge at the County Council owned park and ride sites is not a proposal to cover the shortfall in income of the County Council. The County Council has no operational need to remove the charge and therefore the GCP is working with the County Council in order to support the strategic outcomes of the GCP by increasing patronage of public transport from these sites. GCP is funded by City Deal Grant (which can be used for capital or revenue activities), New Homes Bonus (revenue), S106 (capital), and interest on balances (revenue). Furthermore are Assembly Members aware that the County Council is recording the City Deal/GCP Government Grant funding of £60M, to be received in future years 3,4,and 5, as "Useable Assets" in the third version of the 2016/17 Statement of Accounts? A £60m debtor has been recognised in the County Council's Statement of Accounts for the £20m grant funding yet to be received in years 3, 4 and 5. The unused grant has been moved to the Capital Grants Unapplied Account as expenditure has not yet been incurred. The Capital Grants Unapplied Account forms part of the County Council's Useable Reserves as per the CIPFA Code of Practice and was an approach agreed by the Council's independent external auditors. The County Council will be spending the City Deal grant in future years as per the budgets agreed by the GCP. Page 36 of the published Statement of Accounts 2016-17 has more details on the 2016-17 accounting treatment: https://www.cambridgeshire.gov.uk/council/finance-and-budget/statement-of-accounts/

10b	Cllr Susan van de Ven	With a relatively modest investment, the Cambridge-Royston cycle scheme could be quickly completed, within the Greater Cambridge Partnership Tranche 1 timeframe. I am not here to set out the detailed case for the scheme – that has already been done many times over, and the fact that it is near completion, thanks to GCP support, speaks for itself. The question now is how to tackle the remaining Melbourn - Royston two-mile stretch, given that this geography straddles a county border. The route consists of a pedestrian/cycle path in Cambridgeshire and a pedestrian/cycle bridge beginning in Cambridgeshire and landing in Hertfordshire. This is a shovel ready project that would deliver significant economic benefits, and make a substantial contribution to reducing reliance on the private car for travel to key areas of employment in Cambridge and along the A10 corridor. It will maximise the benefits of the investments in this route already made by GCP and others – indeed the whole will be greater than the sum of its parts. Because it has the potential to be delivered within the existing GCP funding period, it can demonstrate real progress on innovative, economically led schemes to Government. Ideally the Melbourn-Royston link should be delivered in one go. However, the overall Cambridge-Royston scheme has been delivered in segments as funding has become available, and this pragmatic approach has produced results. Nevertheless, any cross-border scheme demands a collaborative approach, as the Cambridgeshire and Peterborough LEP indicated last December when it pledged financial support for the project. Royston sits within the LEP's remit, unsurprisingly given Royston's Cambridge-facing business orientation. That collaborative approach is now taking shape: four global companies that jointly employ thousands of workers in Royton and Melbourn have pledged financial support or made indicative pledges, totalling £120K. Hertfordshire County Council funded and completed the bridge feasibility study and have formally committed lifetime maintenance costs for the bridge, estimated at £580K. Last month, Royston Town Council voted unanimously to commit £30K toward bridge costs, matching the commitment made by AstraZeneca. AstraZeneca has also provided a £10K grant for vegetation maintenance along the whole of the Cambridge-Royston cycle route. The A10 Corridor Cycling Campaign, with many of its members cycling to work, has raised £1.5K in small donations toward bridge costs. As the owner of Melbourn Science Park said to the City Deal Board last year, the A10 Cambridge- Royston cycle scheme will not only alleviate pressures on Science Park parking, which is at capacity, but it will allow the Science Park to create more jobs. This is precisely down to a significantly greater take-up of cycling, not driving, to work. Job creation and sustainable transport links are the key drivers for GPC investment, and partnership is the defining approach. Therefore, I would like to ask for the Assembly's support in proposing that the GPC commit necessary funds to complete the Cambridgeshire portion of this scheme, which amounts to approximately £2 million, and works with the LEP to ensure release of their pledged funds to deliver the whole scheme within the timescales I have noted here. This would be great win: win for residents, businesses, the GCP and the LEP.	We are really pleased to have been able to deliver this scheme as the first GCP scheme, and are really encouraged to hear all the positive feedback the scheme has generated. Given the opportunity the extension presents, I think it's something members should be thinking about adding to the Future Investment Strategy for consideration under the transport workstream.

Appendix One – Greater Cambridge Partnership Cost Centres

Cost centre	Cost centre description
UC20000	City Deal - NHB Funding
UC20010	CD - Programme Central Co-ordination
UC20020	CD - Strategic Communications
UC20030	CD – Skills
UC20040	CD - Economic Assessment
UC20050	CD - Smart Cambridge
UC20070	CD – Housing
UC20092	CD - Affordable Housing
UC20093	CD - Intelligent Mobility
UC20094	Cambridgeshire County Council costs
UC20096	South Cambridgeshire District Council costs
UC21000	City Access - Core Programme
UC21010	City Access - Bus Improvements
UC21020	City Access - Cycling Provision
UC21030	City Access - Demand Management
UC21040	City Access - Engagement & Comms
UC21050	City Access - Parking Management
UC21060	City Access - Public Space and Air Quality
UC21070	City Access - Travel Planning
UC22000	Developing 12 cycling greenways
UC23000	Electric Vehicle Charging
UC23010	Travel Audit - South Station and biomedical campus
UC23020	Travel Hubs
UC23050	Cambridge Promotions
UC23060	Towards 2050
UC23070	City Centre spaces & movement
UC24000	Residents Parking implementation

Project Group - Capital	
3520	Histon Rd
3521	Milton Rd
3522	Chisholm Trail
3523	A428 to M11
3524	Programme management and early scheme development
3525	City Centre capacity improvements
3526	A1307
3527	Cross City Cycle improvements
3528	Western Orbital
3529	A10 North Study
3530	A10 Frog End

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Report to: Greater Cambridge Partnership Joint Assembly 18 January 2018

Lead officer: Chris Tunstall – GCP Director of Transport

A10 Foxton level crossing bypass and travel hub

1. Purpose

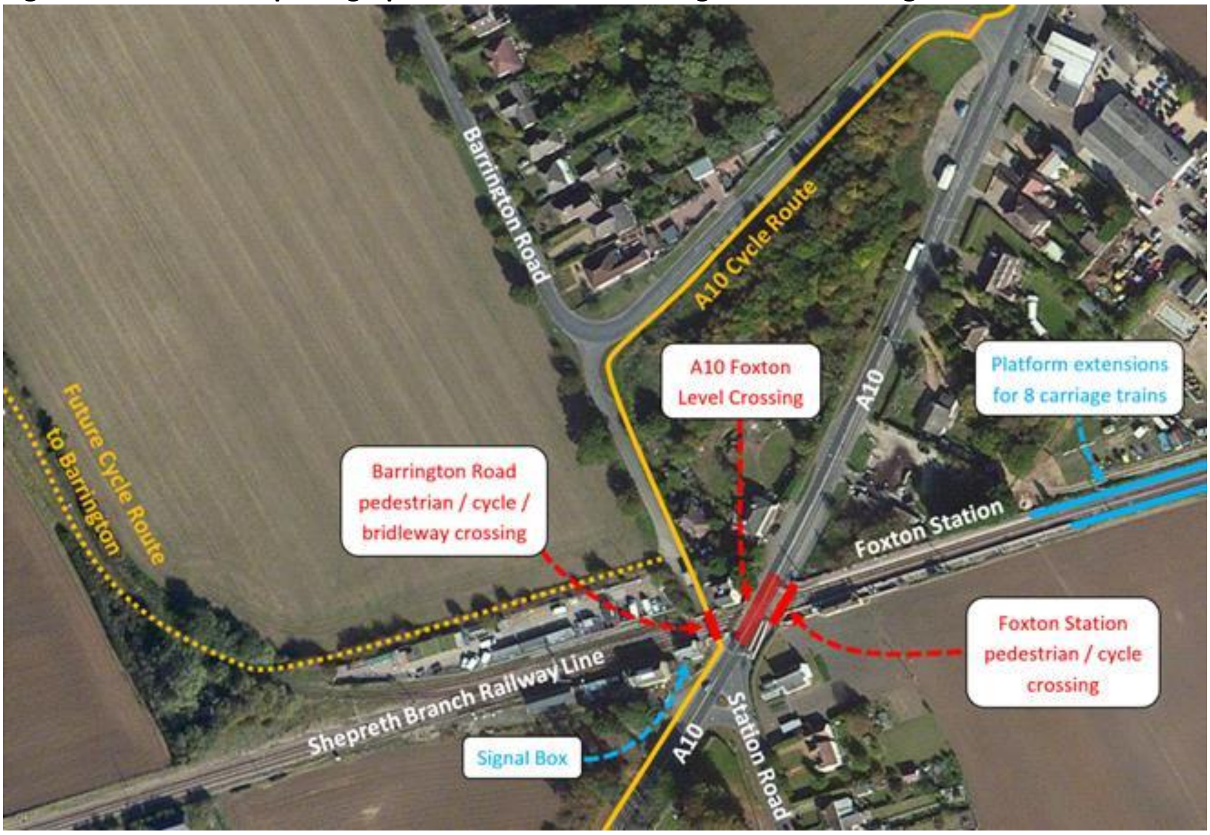
1.1 The list of priority schemes for support from the Greater Cambridge Partnership (GCP) was agreed at the Executive Board meeting of 28th January 2015. The A10 Foxton level crossing bypass whilst not within the list of prioritised schemes, was included as a relatively high priority for future consideration within later funding streams. It is now being recommended for further development as part of the Future Investment Strategy.

1.2 Whilst the original scheme initially only considered a level crossing bypass the revised proposals will also be consider a more extensive 'travel hub' with the provision of additional parking facilities to complement both our existing Park and Ride and Rural Travel Hub proposals.

2. Background

2.1 At the point where the Cambridge to Royston railway line crosses the A10, there are three at-grade crossings of the track: one for the road, and two pedestrian / cycle / bridleway crossings. The road crossing causes significant congestion on the A10, particularly in peak periods. The A10 Foxton level crossing bypass scheme involves provision of infrastructure to enable the closure of the level crossing on the A10 to the immediate south of Foxton Station. The closure would be facilitated by providing a bridge or underpass for the A10 on a bypass alignment to the north west of the existing road. A pedestrian bridge or underpass at Foxton Station could also be provided as part of the scheme. Figure 1 below shows a plan of the current layout of the level crossing, some annotated constrains and future considerations.

Figure 1 Aerial photograph of Foxton level crossing and surrounding area



2.2 This report summarises technical work carried by Cambridgeshire County Council, on behalf of Network Rail in 2013 (Appendix A). It also considers the present strategic objectives of the GCP and reflects more recent considerations of the, 'Cambridge to Royston cycle route', Cambridge North Station, East West Rail, Cambridge South Station proposals and Hauxton Travel Hub (Park and Ride).

2.3 There is a clear policy background supporting a strategic improvement to the transport network in the A10 Foxton area, particularly in the context of local growth, safety and reductions in journey times and congestion on the A10. The Third Cambridgeshire Local Transport Plan (LTP) 2011-2031: Policies and Strategy A10 Foxton Level Crossing states that 'a bridge or underpass across the railway, removing the conflict between trains and vehicular traffic, cyclists and pedestrians' is expected to be delivered. The 'scheme may also provide a new station footbridge or underpass, and improved interchange facilities'.

2.4 The Foxton level crossing bypass scheme supports many of the Greater Cambridge Partnership's aims and objectives including:

- Easing congestion and making it easier for people to travel by rail, cycle or on foot to improving average journey times
- Keeping the Greater Cambridge area well connected to the regional and national transport network, opening up opportunities by working closely with strategic partners
- Reallocating limited road space in the city centre and invest public transport
- Connect Cambridge with strategically important towns and cities by improving our rail stations and financing new rail links

2.5 The scheme has an interface with other GCP schemes including the Western Orbital Park and Ride interventions and the A10 Royston to Cambridge foot and cycleway. The connection to these schemes can be seen to further the additional GCP aims and objectives including:

- Invest in public transport (including Park & Ride) to make bus travel quicker and more reliable
- Build an extensive network of new cycle-ways, directly connecting people to homes, jobs, study and opportunity.
- Complementary to existing and proposed Park and Ride and Rural Travel Hubs.

2.6 It is intended to seek authority from the GCP Executive Board to review the existing work that has been undertaken and evaluate the options based on the GCP strategic objectives. It is programmed for such a review to be completed by June 2018. Work can then progress and an Options Appraisal Report (OAR) and an Outline Business Case (OBC) can be completed by end of 2018. Following a public consultation in the spring of 2019, approval for a Full Business Case (FBC) for the scheme will be sought.

3 Key issues and considerations

3.1 The A10 currently takes around 16,000 vehicles per day in the Foxton area, the level of traffic that a road of this type could be expected to cater for. However, the presence of a full barrier level crossing significantly limits the capacity of the route. Currently, the Shepreth Branch line typically takes four Great Northern passenger train an hour in each direction, one or two of which stop at Foxton Station. The spacing of the trains and volume of traffic mean that queues on the A10 do not always have the opportunity to clear between level crossing closures, particularly at peak periods.

3.2 From 2018, the number of passenger trains using the route will increase to six trains an hour in each direction, with at least two stops per hour at Foxton. This will increase the closure time at the level crossing. In addition Freight trains also impact the crossing down time using a siding at Foxton that provides access to Barrington Quarry.

3.3 The East West Rail proposals would provide a new railway from the Bedford area to Cambridge, as part of a longer route from East Anglia to Oxford and potentially onwards to the west of England on existing lines. The route for the central section of East West Rail has yet to be determined, but it is possible that it could travel along the route of the Shepreth Branch through the Foxton area. The design of such a route would dictate no level crossings, meaning that an alignment through Foxton would have to provide a bridge or underpass across the A10. If the bypass scheme was progressed in advance of this process it would inform any option selection as opposed to be constrained by it.

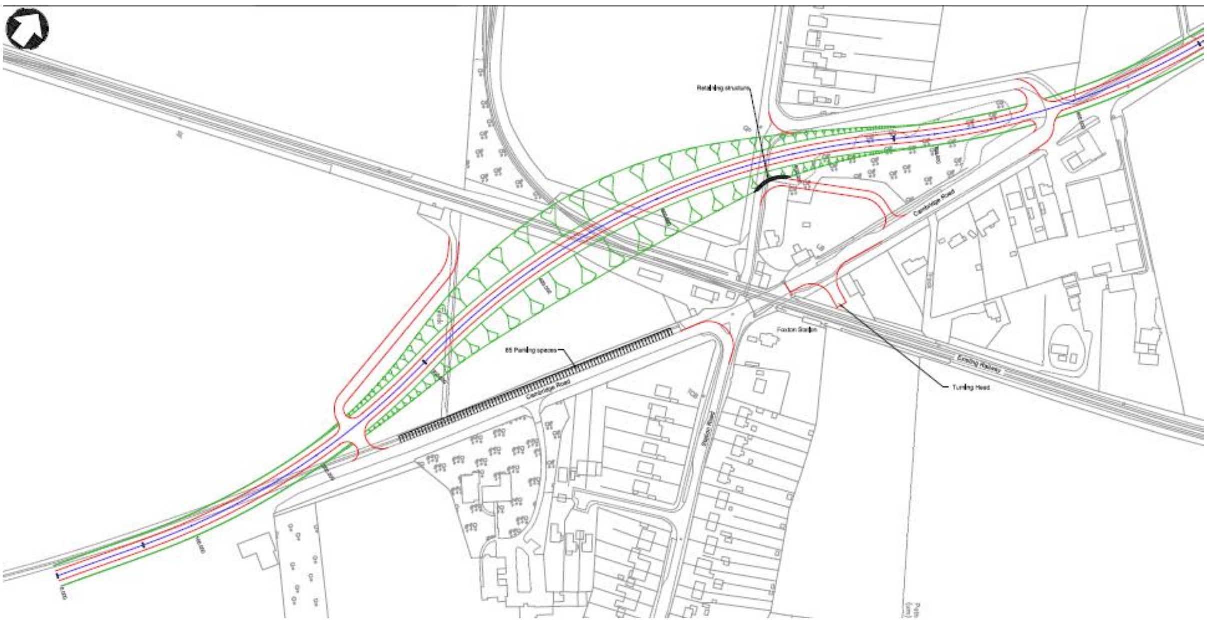
3.4 As part of the national programme to close level crossings Network Rail have committed to a risk reduction programme. The objective of the programme is to close and upgrade crossings across the network, which will improve safety for everyone and reduce the risk that level crossings present to the national rail network. Network Rail has identified the level crossings on the A10 at Foxton as a suitable site for evaluation.

3.5 The Foxton level crossing bypass scheme has currently progressed through the GRIP 1 and 2 (Governance for Railway Investment Projects) stages. GRIP1 established the scope of scheme and the investment needed and potentially asset renewal and GRIP2 defines the investment goals and identifies constraints to ensure that they can be achieved both economically and strategically. GRIP2 identifies the route Options and narrows the assessment to preferred options based on the requirements of the statutory undertakers, physical and environmental constrains and makes recommendations for further work.

3.6 In the 2013 GRIP2 work confirmed that the most feasible options were for a bridge or underpass taking the A10 across the railway on an alignment to the north of the current road. It also noted that while a bridge would be cheaper, an underpass would be likely to be less intrusive. Figures 2 and 3 below show an indicative bridge and underpass route option considered on the north side of the A10 from the GRIP2 report.

Figure 2: Indicative overbridge option layout from GRIP2 report

Figure 3: Indicative underpass option layout from GRIP2 report



Travel Hub - Park and Ride

3.7 The 2013 GRIP2 report shows that an additional 85 car parking spaces could be provided as an option to be delivered within the scheme. However, in light of the current forecast growth and the possible investments in the rail service and potential for station improvements consideration should be given for Foxton Station to act as a Travel Hub (Park and Ride / Rail facility) with sufficient car parking provision to accommodate demand for onward rail trips into Cambridge.

4. Options and emerging recommendations

4.1 The assessment work undertaken in 2013 did not conclude a Benefit to Cost Ratio (BCR) as the scheme was not fully costed. However, the assessment of similar schemes and the forecast growth of train and traffic travel patterns in Foxton indicates that the likely BCR value would be 'high' or 'very high' (The Department for Transport uses the following categories in relation to Benefit Cost Ratios: Low Value for Money if BCR = 1.0 to 1.5; Medium Value for Money (VfM) if BCR = 1.5 to 2.0; High Value for Money if BCR = 2.0 to 4.0; very high VfM if the BCR is greater than 4.0). The LTP estimates costs for the scheme within the range of £14-24M and the GRIP2 report estimated costs between £11-19M, but these costs are now considerably out of date.

4.2 It is recommended that the costs for Foxton would need to be assessed in more detail, further work on proposals should seek to develop and assess options that:

- Provide a bridge or underpass for the A10 across the Shepreth Branch to the north of the current A10 alignment, allowing for the closure of all three level crossings in the Foxton Station area.
- Provide pedestrian and cycle facilities that allow grade separated crossing of both the railway and the A10:
  - for journeys between Foxton and the A10 cycle route;
  - for journeys between Barrington and Foxton / Foxton Station; and
  - across the railway at a footbridge at Foxton Station.
- Consider the junction strategy for the terminal points of the A10 bypass alignment, in the context of the above, and also of the additional points noted below.
- Provide enhanced facilities at Foxton Station including car and cycle parking, passenger waiting facilities, ticket machines.

4.3 In addition it is recommended that the development of options should:

- Explore the opportunity for Foxton Station to act as a Travel Hub with a Park and Ride facility for onward rail trips into Cambridge and Cambridge North stations, and the future Cambridge South station.
- In discussion with Network Rail, consider the implications of an East West Rail alignment through the Foxton area and how it would impact on the level crossing and station improvement options (including whether East West Rail trains might stop at Foxton).
- Be future-proofed against a possible future requirement for further platform lengthening to allow 12 carriage trains to stop at Foxton.

5. Next steps and milestones

5.1 This report has identified a number of feasible proposals for interventions at the Foxton level crossing. It is now proposed to recommend the review of these options and the development of a 'full business case' for a preferred option.

5.2 The proposed timetable for the business case development work is as set out below in Table 1:

Activity	**Target completion date**
Review the existing GRIP 2 report and options recommended	June 2017
Develop series of distinct options for bypassing the level crossing (including consideration of developing additional parking arrangements)	August 2018
Present options for consultation to GCP Executive Board	December 2018
Public Consultation on Options	March / April 2019
Final Option recommendation to GCP Executive Board to be considered for approval subject to other investment priorities.	October 2019

5.3 Subject to the above the following key milestones will be undertaken:

Detailed design and other preparatory tasks for planning process	2020
Obtain relevant planning powers to construct	January 2021
Start construction	Summer 2022
Scheme completion	December 2023

Table 1 – Key Milestones (s*ubject to statutory permissions)*

6 Recommendations to Joint Assembly

6.1 Joint Assembly is asked to comment on the overall approach being recommended to the Executive Board.

List of appendices

Appendix 1	NR Foxton Level Crossing Closure: GRIP 2 Feasibility Study Report. May 2013

NR Foxton Level Crossing Closure

GRIP 2 Feasibility Study Report

MMD-301848-FS-01 Rev C

May 2013

Network Rail

NR Foxton Level Crossing Closure

GRIP 2 Feasibility Study Report

May 2013

Network Rail

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Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	March 2013	F Ul Haq	F C W Yeung	M A Alton	First Issue
B	April 2013	F Ul Haq	F C W Yeung	M A Alton	Second Issue
C	May 2013	F Ul Haq	F C W Yeung	M A Alton	Third Issue
		Farhan	W Yeung	M.A. Alton.	

Contents

Mott MacDonald

Report Control Sheet		
Document Issue No.	**01**	
Prepared By	**Name: Mark Alton**	
	Job Title: Contractor's Engineering Manager	
	Date: 9th May 2013	
Integration Review Undertaken By	**The Team**	
Signature	**Name**	**Job Title**
M. A. Alton.	Mark Alton	CEM/Project Director
	Freddy Yeung	CRE Civils/Project Manager
	David Teasdel	CRE Signalling
	Paul Hammonds	CRE Telecoms
	Garry Roberts	CRE M&E

Issue Record

Issue No.	Brief History of Amendments	Date of Issue
01	For Stakeholders review (Draft)	25th March 2013
02	For stakeholder discussion (working)	30th April 2013
03	Third Issue	9th May 2013

Distribution List

Name	Role and Organisation	Copy No.
Robert Bolton	Sponsor – Network Rail	1
Matthew Wright	Scheme Project Manager – Network Rail	2
Colin Water	Designated Project Engineer	3
Alistair Frost	Cambridgeshire County Council	4

Abbreviations

AFC	Approved for construction
DNO	Distribution network operator
EA 2010	Equality Act 2010
ELR	Engineers line reference
GRIP	Governance in railway investment projects
LV	Low voltage
OLE	Overhead line equipment
TOC	Train Operating Companies
OSR	Option Selection Report
RAM	Route asset manager
DMRB	Design Manual for Roads and Bridges
NR	Network Rail
ROR	Rules of Route
OC	Overhead Cables
DCO	Development Consent Order
BGS	British Geological Survey
OS	Ordnance Survey
SWOT	Strength, Weaknesses, Opportunity & Threats

Executive Summary

Mott MacDonald Ltd has been appointed by Network Rail to undertake a GRIP-2 feasibility study to review options to close the existing railway level crossing at Foxton, Cambridgeshire, and provide a suitable replacement infrastructure to cross the railway safely. The existing level crossing accommodates traffic using the A10, pedestrians, cyclists and equestrians. This report discusses the impact of closing the existing rail crossing on the local community and the A10 road user and identifies options investigated to close the crossing.

The rail level crossing at Foxton is on the Up and Down main Cambridge line which intersects with the A10 Cambridge Road adjacent to the station and is located approximately 7.6miles south of Cambridge City Centre and 2.2 miles west of junction 11 of the M11 motorway. Foxton's population is currently approximately 1300 with the village bisected by the A10 and the railway line.

Option Study

The options considered mainly fall into three categories,

1. Route options (Route A, B and C).
2. Structural Options (Overbridge or Underbridge).
3. Pedestrian/cyclist and equestrians crossing (footbridge or subway adjacent to the existing level crossing designed in compliance to the Equality Act (EA) 2010).

Route Options

The option study evaluated a number of routes and types of construction which would be feasible. The online option (Route A) was dismissed due to the likely disruption caused to the A10 users and local network, and the option of a route to the south of the A10 (Route B) was not developed due to the presence of existing dwellings and statutory undertakers services. The area to the north of the A10 consists of large areas of farm land which can be utilised for the scheme development. The four sub-routes considered on the north of existing crossing (Route C) have been identified for further development and considered in the feasibility assessment. Each route is considered with the option of an overbridge and underbridge at the proposed crossing location, with approach embankments or cuttings of 1 vertical to 3 horizontal, with this stable slope dictating the acquisition of land for the scheme development. The speed limit on the existing highway is 50mph which is maintained in all the options considered with all routes allowing A10 traffic to flow freely without any disruption and is designed to minimise the impact on the local community.

Sub-Route C1: Highway alignment is designed to maintain the current design speed of 50mph for both horizontal and vertical alignment in accordance with TD 9/93 Highway Link Design.

Sub-Route C2: This Route is designed to consider a relatively smaller curve radius as compared to route C1. The route is designed to maintain 40mph design speed for the vertical and 50mph for the horizontal alignment. The 40mph design speed is below the desirable limit but falls within the acceptable range of TD 9/93.

Sub-Route C3: This route was developed to avoid land take to the Network Rail Depot on the north/west of the existing level crossing. This is the largest curve radius compared to other routes which leads to a significantly large structural span (54m) increasing the area of land take. The route is designed to maintain 40mph design speed for vertical and horizontal alignment.

Sub-Route C4: Similar to route C3, this alignment is designed based on 40mph design speed for both vertical and horizontal with a minimum curve radius. This route would require demolition of the existing Network Rail depot.

Bridge Options

Each by-pass route considers an option of an underpass and an overpass at the proposed crossing point. Numerous forms of construction were studied based on the cost, constructability in a railway environment and environmental impact. In this option study, attention is given to limit the amount of work and time on site by considering a solution which involves as much prefabrication as possible.

The existing level crossing at Foxton is a highway crossing with full pedestrian, cycle and equestrians rights of way. Once the existing level crossing is closed, pedestrian, cyclist and equestrian access must be provided over the existing level crossing to maintain the connectivity between neighbourhoods and link between the station platforms. To achieve this, the report discusses options of providing a footbridge or subway at or adjacent to the existing level crossing location. The options would comply with the Equality Act 2010 and provide full disabled access either by ramps or provision of lifts. This report also illustrates the provision of providing bridle route over the main bridge crossing and at the existing level crossing.

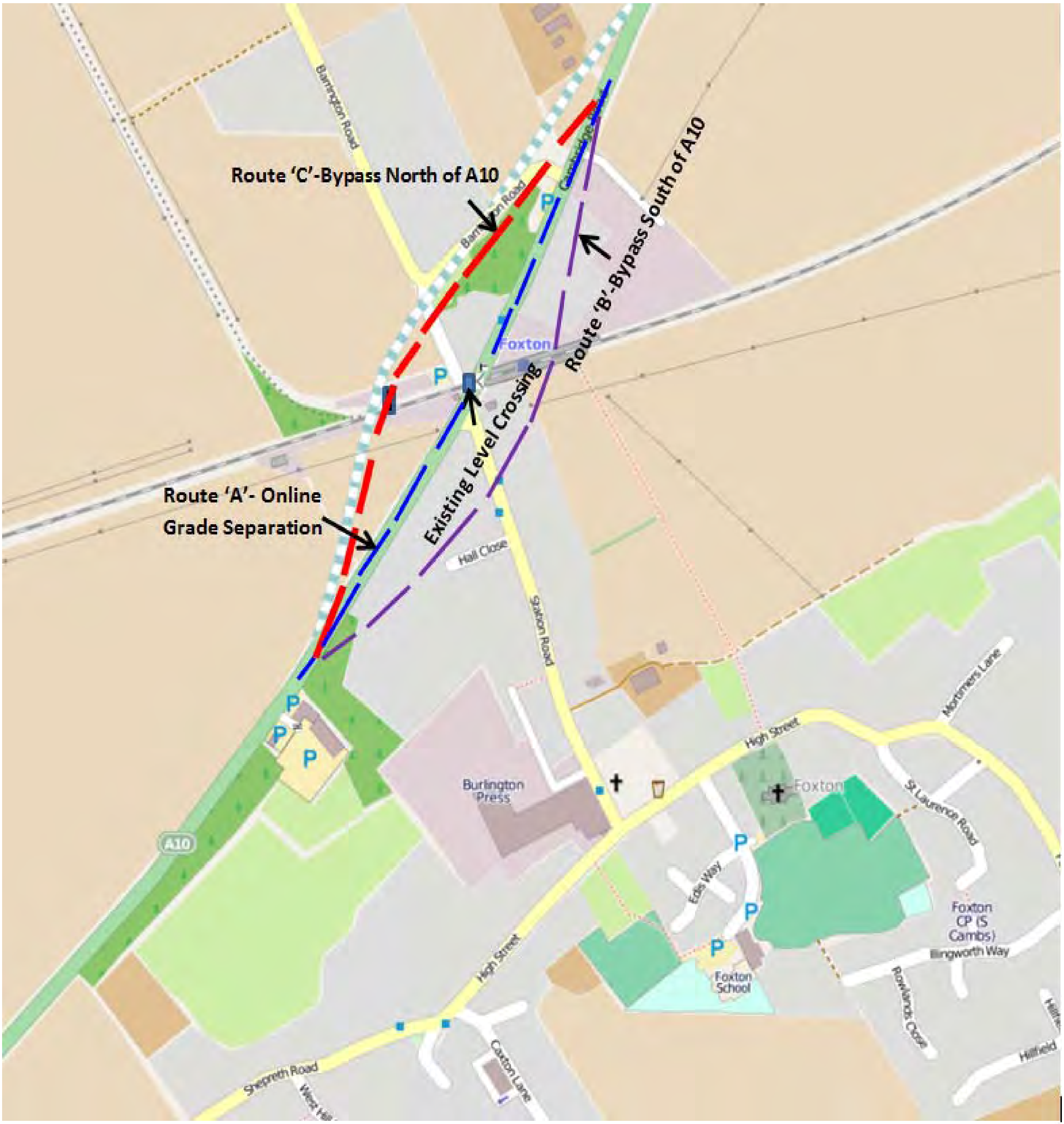
Preferred Options

Taking into account the capital cost, the advantages and disadvantages of the respective options, and the opportunities for minimising risks; it is recommended that route option C4 with a road overbridge proposal is developed as the preferred solution. This is the shortest of all the routes which has an advantage of minimum land acquisition and improves site safety by limiting the construction period. This route offers a minimum structure span over the new level crossing thus minimising the disruption to rail movement and impact on the local community. The overbridge option limits the requirement for possessions when compared to an underpass option. The capital cost estimate of this option is **£11,650,000** which is the cheapest of all options and is one of the key factors in preferring this route.

In addition to the main road overbridge option, to facilitate pedestrians and cyclists at the existing level crossing, a footbridge will be provided with lift access. The provision of this additional pedestrian route will require a minimum land take and will limit the impact on local community during construction. The capital cost estimate of this option is **£2,300,000**. The preferred route for equestrians is the bypass route over the main road bridge crossing. This route will be more convenient for the riders compared to a combined footbridge for pedestrians and equestrians over the existing level crossing.

In order to progress the work we recommend the review of the following key issues in the next GRIP stage,

- Undertake detail ground investigation and prepare a factual report based on the investigation.
- Carry out a topographic survey of areas where the proposed works impact on existing infrastructure or external land owners.
- Investigate the existing buried services and negotiate with the land owners.
- Carry out an outline design of the structure, to facilitate early acceptance from key stakeholders.
- Consult with the local community.



Indicative Route Plan – Figure 1

Mott MacDonald

1 Introduction

1.1 General

There are approximately 9,000 level crossings in Great Britain and of these, around 7,700 are on the national rail network. Within Cambridgeshire, Network Rail has 176 level crossings (on the Anglia Route), 72 carry public vehicular rights, 51 carry public footpath or bridleway rights, and 53 carry private vehicular rights.

Almost half of all rail related accidents occur at level crossings and the number of incidents of near misses and misuse of level crossings is increasing steadily. Network Rail (NR) is committed to reduce this risk by closing level crossings where reasonably practicable, to improve safety for the general public (refer to NR policy statement in Appendix 'U').

The level crossing at Foxton crosses the A10 Royston to Cambridge Road. The NR assessment score for this level crossing is within tolerable limits as no major accidents have been reported, but there have been a number of recorded instances of misuse and threatening behaviour by members of the public impatient to cross the line.

1.2 Foxton Level Crossing

The level crossing is currently carrying the A10 Royston to Cambridge Road (indicated as 2 in figure below) across the Up Cambridge and Down Cambridge line at a skew.

The level crossing at Foxton is a highway crossing with full pedestrian, cyclist and equestrian right of way. Currently, the crossing is controlled from the adjacent gate box located to the west of Foxton station. The crossing has an electronic barrier across the full width of the road which stops the A10 traffic passing. There is no footbridge at the crossing but there are two pedestrian/cycle and bridleway points at the intersection (indicated as 1 & 3 in figure below). These points are secured by steel gates on either side of the crossing and are locked remotely using electromagnets during train crossings to prevent pedestrian or equestrian movements. The risks associated with the level crossing are discussed in section 2.1 of this report.

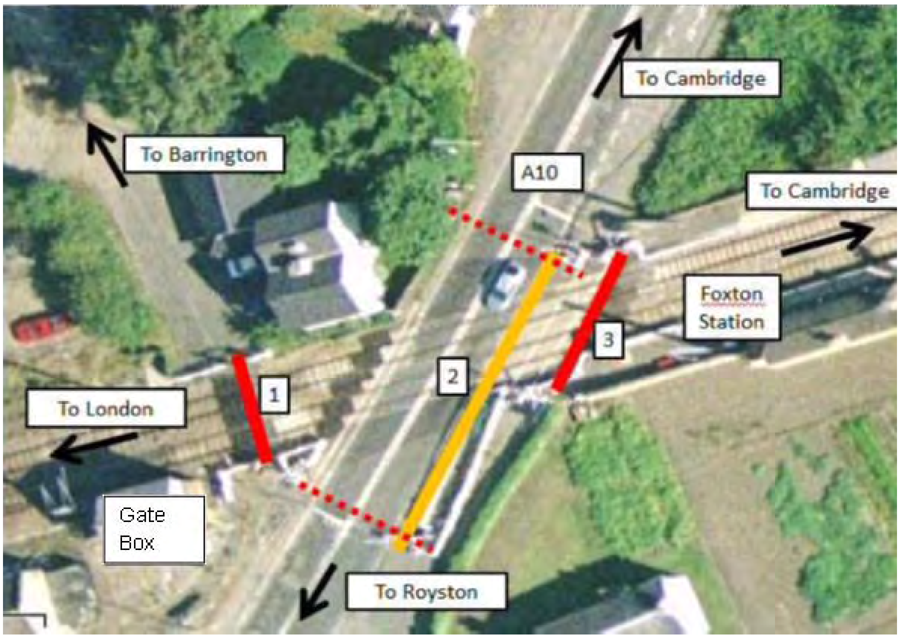


Figure 1.1: Plan of existing crossing

1.3 Report Objectives

The aim of this GRIP 2 Feasibility report is to assess engineering options for replacing the level crossing with a grade separated solution, which would comprise either an overbridge over the railway or an underbridge which allows the A10 vehicular traffic to go under the existing railway lines.

A separate pedestrian facility to link the existing platforms and to maintain the existing public rights of ways for pedestrians, cyclist and equestrians will be considered local to the existing level crossing. The facility must be in full compliance with the Equality Act 2010. The fundamental design goals of this scheme are to:

- Promote efficient operation of railway and highway and aims to reduce risk of accidents/collision;
- Promotes village amenity;
- Provide neighbourhood connectivity;

- Facilitates pedestrian/cyclist and bridleway safety and
- Provide a parking facility for the railway station.

The scheme will relieve A10 traffic congestion and delays from barrier closure due to frequent train movements. It will also allow the local highway and railway network to develop in the future, if required.

The report identifies the options to close the existing Foxton level crossing and adjacent Barrington Road foot crossing, including the removal /alteration of associated signalling equipment and the provision of suitable fencing/vehicle incursion restraint systems at the site of the crossing.

The proposal highlighted in this study must ensure that Network Rail's plan to improve the platform lengthening in the future is safeguarded.

This report considers the following:

- It discusses the options to provide relief from traffic congestion and improve the road safety of the A10 traffic, and convenience for the community using the level crossing;
- It summarise the forms of construction and discusses structural alternatives based on the existing constraints, buildability, associated risks, traffic management, track possession, cost estimation, maintenance and sustainability;
- It lists the technical studies and analysis that have been prepared as part of this study;
- It lists the estimated construction time and cost of considered options;
- It lists the advantages and disadvantages of the options studied and
- It recommends a preferred option, which will require further design development during the GRIP 3 stage.

This report describes the evolution of the project from the original scope of works, describing the key decisions taken and the reasoning behind them.

This report forms the preliminary stage of the Technical Approval process with the preferred option being taken forward to the next GRIP stage.

1.4 Geographical Boundaries

The geographical scope of this work covers the Foxton Level crossing and interface infrastructure.

The Engineering Line Reference of the crossing is SBR. Shepreth Branch: Hitchin, Cambridge Jn-Shepreth Branch Jn. Mileage is 50 miles 74 chains Grid Reference TL408407.

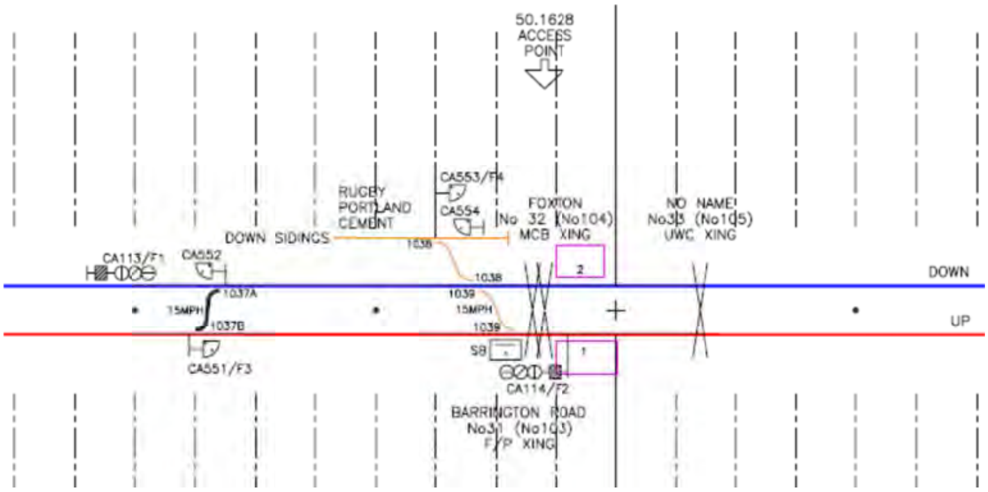


Figure 1.2: Extract from the 5 mile Plan

Figure 1.3: Foxton OS extract (Crown copyright and database rights 2012 (0100040692)

Photo 1.1: Foxton Level Crossing looking west

Photo 1.2: Foxton Level crossing looking north-east

2 Objectives and Considerations

2.1 Description of the challenges

The A10 is a main route which links the Greater London Boroughs with Cambridge and Royston. A traffic survey was carried out by WS Atkins in 2001 to establish the existing traffic levels on the A10. The manual traffic count (12 hours) survey revealed approximately 11,800 vehicles crossing the junction every day.

A minimum off peak traffic count was undertaken in November 2012 by Network Rail, which provides a more up to date data on volume of traffic using the level crossing. See Appendix ‘M’ for details.

The volume of through traffic using this crossing point is expected to grow in line with national trends and due to the future development of local housing. The existing railway level crossing stops the road traffic frequently due to the busy nature of the main railway route into London via Royston, therefore causing traffic delays and inconvenience to the road users. The existence of the level crossing also presents a possible weakness to the operation of the Train Operating Companies (TOC) services and safety to their staff.

2.1.1 Risks Involved

The level crossing at Foxton does pose a safety risk to road and rail users. The particular risks involved at the existing level crossing(s) are highlighted below:

- If the gates for the pedestrian crossing are locked of use, then pedestrians, cyclists and equestrians have to use the route under the main barrier, sharing this with the high speed (50 mph) traffic on the A10;
- If the crossing is not used correctly (i.e. ‘misuse’), there is a significant risk of an accident and injury;
- There is a risk of slips, trips and falls while crossing the railway line;
- Equipment may be damaged due to vandalism.

In order to eliminate these risks, this study discusses different options for the removal of this level crossing.

It must be noted that the crossing in its current form is safe if used correctly, and is fully compliant with Network Rail's Level Crossings Standards.

2.2 Key Challenges in the scheme development

The key issues relevant to this feasibility study are summarised below:

1. Local community;
2. Network Rail;
3. Statutory Undertakers';
4. Land ownership;
5. Geography and general site condition;
6. Ground data and groundwater condition.

2.2.1 Local community

The impacts on local residents are considered to take a key issue during the scheme development. The route options selection will be developed to minimise the potential social effects on the local community by providing easy access as part of the preferred option. Where possible conflict between the through traffic and local village traffic will be minimised. The options have been assessed to meet the importance of providing continuous emergency and police service access to the village of Foxton.

Construction traffic movements and noise during construction will have a detrimental impact on the community. Construction stages and techniques that minimise the disruption to rail traffic and noise impact on the local community are considered in this feasibility study.

All route options have to ensure considered by ensuring that the existing public right of way and bridleway is facilitated. This can be incorporated into Network Rail's passengers' requirement to link platform 1 and platform 2.

2.2.2 Network Rail

Network Rail is keen to ensure that the continuous operation of the network is maintained. Therefore, in any option selected, the effects on the operational railway operation must be kept to a minimum, and any proposed structural options must be constructible during any rule of the route (ROR) possession, and or within reasonable blockade duration.

Network Rail requires a direct link between platforms 1 and 2 to be maintained to ensure passenger connectivity and operational flexibility of their network.

An existing Network Rail Depot is located to the northwest of the level crossing, adjacent to Barrington Road. It is understood that this Depot is of a non-critical operational nature, and the land can be considered as non-essential during the options study.

Due to the presence of the level crossing, the overhead line equipment (OLE) adjacent to the crossing is set at a higher level than desirable. Where possible, the OLE is to be lowered to meet Network Rail standards.

It is understood that the level crossing signal/gate box building is not listed. Therefore it can be demolished as part of the proposal, if considered necessary. However, the interlocking building to the west of the signal/gate box must be maintained to allow the continuous operation of the line.

2.2.3 Statutory Undertakers

Based on the data provided by the Network Rail, various statutory undertakers' apparatus have apparatus present in the area of the level crossing, along the A10, Station Road and Barrington Road.

A medium pressure gas main, BT and virgin media cables run underneath the existing level crossing location. Electricity and telecom cables supporting the railway operation run at the ground level. Drawing records also indicate the presence of a 3" diameter water main crossing the track from the existing bridleway crossing point. These services are would require diversion if an underpass online option is considered.

A pumping station is located to the northwest of the level crossing together with an associated foul sewer (6" rising main) crossing the A10 carriageway from north and south of the existing crossing point.

Diversion of this foul sewer will need to be considered for any underpass route option.

A number of overhead cables (OC), supported on timber posts were observed during the initial site visit on 15th Jan 2013. The overhead cables run from the village of Foxton, crossing the A10 to the west of Station Road, and the farm field before running almost parallel to the railway. The cable location will need to be reviewed, for any route options to the north of the railway.

The service information provided by Network Rail is a guide indicating the approximate location of the existing services. It will be necessary to investigate these further with Statutory Undertakers' to determine the exact location and any other allocated apparatus. If there is a clash with a proposed option, then this will need to be discussed with affected Statutory Undertaker and costs for relocation or protection will need to be included. This will be undertaken in the next GRIP stages.

2.2.4 Land ownership

Bypass options will require a large area of land (approx. 45,000 m^2) to be purchased. The land width will have to be wide enough to allow for future maintenance. The route options developed are based on the availability and ownership of land, attention is given to limit the level of land acquisition and optimise the land readily available. The majority of the site area for the new routes proposed consists of undeveloped farmland. Where the use or the permanent acquisition of land is required, Network Rail will seek to acquire the land or rights of land through negotiations. However, if this is not possible to reach an agreement with the current land owner, then a compulsorily purchase of the land may be required, which will be obtained through the Development Consent Order (DCO) process.

Based on the information provided by the Land Registry Department, the primary land owners affected by this project are indicated in the plan of land ownership attached to Appendix 'O'.

2.2.5 Geography and general site condition

The area of the study includes land within the village of Foxton. The proposed route options will commence approximately 220m along the A10 from the level crossing in both directions. The total length of any proposed by-pass will be approximately 500m.

The approximate National Grid Reference co-ordinates of the proposed level crossing are 540862 Easting and 248752 Northing. The terrain of the site area is generally flat comprising undeveloped farm land to the northwest and southeast, with domestic properties and small farm holdings to the northeast and southwest.

Based on the Environment Agency's website information, the site is located within Flood Zone 1, which is defined as land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year. Therefore the site is located in an area of lowest flood risk.

In the absence of any topographic information, the topography of the site is considered to be flat, based on observation from the initial site visit.

2.2.6 Ground data and groundwater conditions

The British Geological Survey (BGS) records have been searched to ascertain the ground data records adjacent to the proposed site. Records of a number of exploratory boreholes in close vicinity of the site were available as follows:

- BGS Ref TL44NW11- a borehole located towards the eastern end of the route options, less than 50m from the site near the existing petrol filling station on the A10 (see figure 2.1 below).
- BGS Ref TL4NW7- a borehole located less than 200m from the site, at the junction of Station Road and Hall Close (see figure 2.1 below).

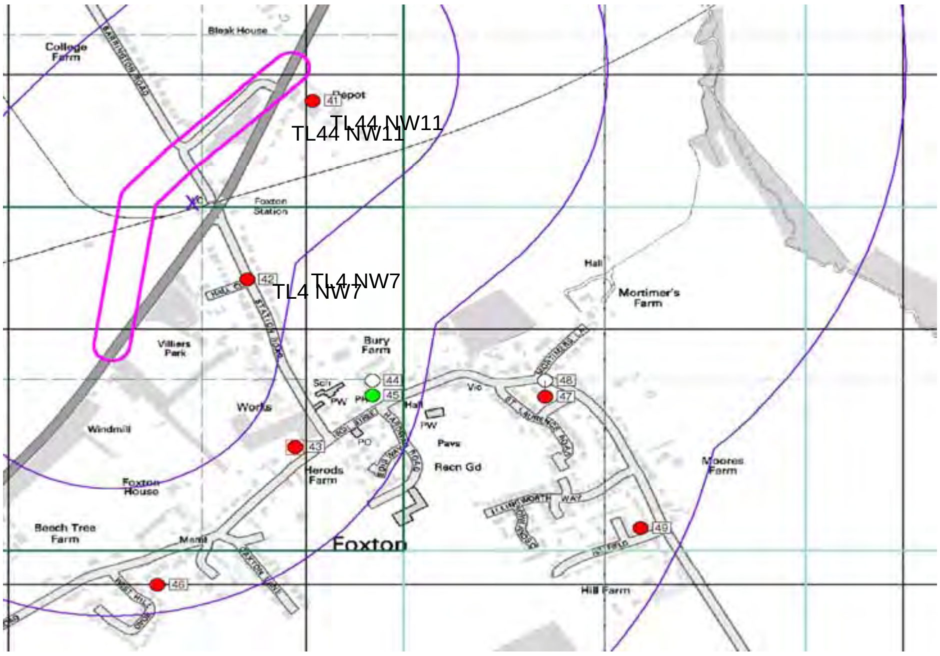


Figure 1.4: Borehole Locations

The borehole records indicate the following strata in the vicinity of site:

The bore hole record TL44NW11 indicates:

FROM	TO	MATERIAL
EGL	0.3m	Topsoil
0.3m	2.8m	River gravels (Gravels and sand)
2.8m	21.4m	Chalk Marl and Cambridge Greensand

The bore hole record TL4NW7 indicates:

FROM	TO	MATERIAL
EGL	0.3m	Topsoil
0.3m	3.0m	River gravels (Gravels and sand)
3m	18.3m	Chalk Marl and Cambridge Greensand

Ground water levels were encountered at 2.4m bgl in borehole TL44NW11 and 1.8m bgl in borehole TL4NW7. Based on this information, the water table will have a significant impact on the structural form, so a detailed ground investigation and preparation of factual and interpretation reports are recommended in the next GRIP stage to justify the options discussed.

3 Options

3.1 Route Options

This section provides an outline evaluation of the route options considered to eliminate the Foxton level crossing. The route options are developed based on the Ordnance Survey (OS) mapping available. The following sections discuss each Route option considered and the reasoning behind its continued development or discounting from the process. Following the completion of evaluation, recommendations will be made as to which options are not viable and which proposal should be taken forward into the next GRIP stage. A summary of the strengths, weaknesses, opportunities and threats (SWOT) of each option is provided which can be found in Appendix 'A' of this report.

This study considers the Do-nothing option as well as the following road route options:

- Route A – On-line Option Grade Separation
- Route B – By-pass South of the A10
- Route C – By-pass North of the A10

While considering the options, reference was made to the previous study undertaken by WS Atkins on behalf of Cambridgeshire County Council (CCC) in 2002.

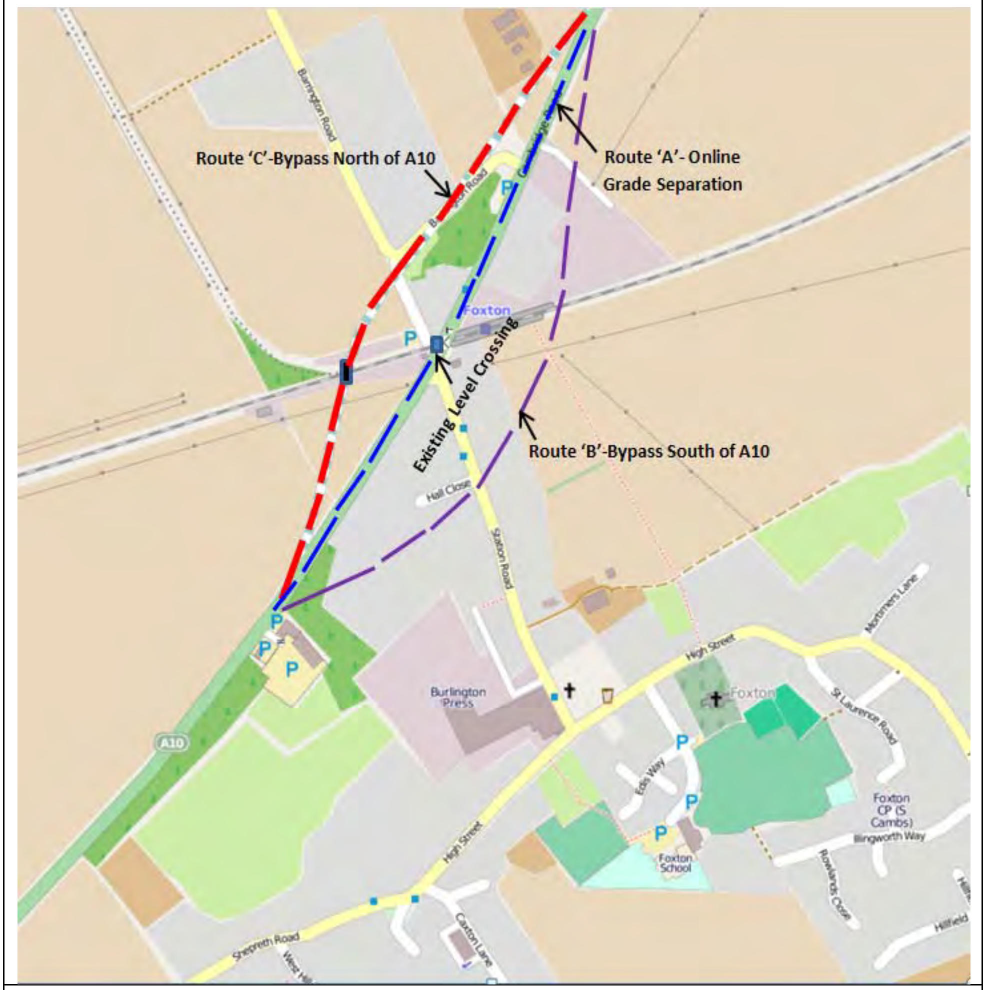


Figure 1.5: Indicative Route Plan

3.1.1 Do-Nothing Option

The Do-nothing scenario considers no change from the existing situation at the level crossing. Whilst the level crossing is currently in compliant with Network Rail's requirement, the safety/security risks and highway congestion remain unresolved, which was the primary driver of this study. Furthermore, the Do-Nothing Option does not meet the aspiration of Network Rail's current policy statement with regards to level crossings, (see Appendix 'U' for NR's Approach to level crossing safety), therefore the Do-nothing Option will not be taken forward at this stage for further consideration, but may be revisited once all other options have been exhausted.

Photo 1.3: Existing Level Crossing

3.1.2 Route A: On-line Grade Separation

On-line grade separation option utilises the existing A10 corridor. This proposal maintains the railway line on its current alignment and level:

- Option A1 - is the construction of a new underpass to take the A10 below the railway line.
- Option A2 - is the construction of a new flyover to take the A10 above the railway line.

The underpass option A1 will require the construction of a railway underbridge to carry the existing railway lines and OLE. This will require a substantial length of approach retaining walls on either approaches to the railway, approximately 220m long and up to 6.5m in height, to support the existing ground and adjacent properties.

The flyover option A2 will consist of a bridge constructed over the existing railway line to carry the A10 with a series of approach structures on either side of the railway line supported on piers. An alternative option is to support the approaches to the flyover on solid earth embankments with retaining walls, or with a standard 1 in 3 sloped embankment. This option will require a significant land take outside the current A10 footprint and has been discounted for this reason.

Issues cited as reasons to favour or not favour this option are listed in section 10 of this report.

Due to the significant traffic disruption envisaged on the A10, the disruption to Foxton Railway Station, the permanent closure of Station Road, the significant adverse effects to the residences immediate to the A10, together with the other Route option available, the On-line grade separation option is consider in practicable, hence will not be considered further in this report.

3.1.3 Route B: By-Pass South Side

The Route B option is to construct a by-pass for the A10 to the south of the existing route as indicated in fig 1.5.

This route option will have a significant impact on the local environment and population. This route option will have direct impact on the residential dwellings immediately to the south of the A10 which will make selection of this route difficult. Up to 10 houses will be affected by this route, located on both the east and west side of the level crossing and would have to be demolished. Noise and dust emission levels during construction would be high directly affecting the residents of the community in the short term. This route option is likely to receive strong opposition from local residents, resulting in a public inquiry.

Station Road is a main route to Foxton Village Centre; this route option will require a closure of Station Road with a provision of either an alternate route or an overbridge over the road which would significantly increase the cost of the scheme. This route will interface with existing utility services (water mains and sewer). The diversion of these services is unavoidable and will have significant cost implications. Moreover, the presence of the station platform on the south side is unavoidable and would require a long span crossing over the existing platform. The route to avoid station platform is not advisable as it would restrict future extension of platforms in that direction.

3.1.4 Route C: By-Pass North Side

Unlike the area to the south of the A10, the area to the north comprises of open farm land which allows several sub-routes to be developed without having, as a severe direct impact on residential properties, as Route B.

Cambridgeshire County Council's (CCC) current requirement for the by-pass is to accommodate a 7.3m wide two lane carriageway with a 1m grass verge to accommodate equestrian use and a further 3m for a combined pedestrian footway and cycleway on one or both sides of the carriageway. During the next stage of this scheme development, the detail of this will be agreed.

The sub-route options consider alternatives for a fly-over and an underpass. The sub-route alignments are designed based on the appropriate vertical and horizontal alignment curve to comply with the relevant design speed, in accordance with TD 9/93 Highway Link Design. The highway alignment will be designed to:

- To keep the connectivity of local streets to the A10 Cambridge Road, particularly to a number of dwellings in Barrington Road.
- To provide turning facilities for the vehicles due to the closure of the main road at the existing level crossing.
- To create a new car parking facility in between the bypass route junction on the south side and existing level crossing. The proposal will create upto 85 car parking spaces which will encourage further train usage.

The alignments are developed using the geometric requirements contained within TD9/93. Cambridge County Council as the local Highway Authority has stipulated a 50mph design speed limit for the by-pass; therefore in accordance with TD 9/93, the vertical and horizontal design curves appropriate to 50mph will be preferred. However, TD 9/93 also accepts design curves for 40mph.

The following sub-routes are considered for Route C.

1. Sub-Route C1: 50mph road design speed for vertical and horizontal alignment ;
2. Sub-Route C2: 40mph road design speed for vertical and 50mph design speed for the horizontal alignment ;
3. Sub-Route C3: 40mph road design speed for vertical and horizontal alignment avoiding the existing Network Rail depot.
4. Sub-Route C4: 40mph road design speed for vertical and horizontal alignment (min land take).

3.1.4.1 Route C1 – Highway Alignment with 50V & 50H Curves

This option proposes to provide a by-pass route north of the A10, and crosses the railway line with an option of an overbridge or underbridge to the west of the Foxton station. In this option, the highway alignment is designed to meet the desirable minimum vertical and horizontal curves, appropriate for a design speed of 50mph. The slope of approach embankments or cutting considered for the highway alignment is generally 1 in 3. This slope is chosen to check the design feasibility of routes, although embankment slopes can be varied to limit the level of land take if necessary. The route leads to larger curve radius resulting in a 32m span bridge span. The route will require a small retaining structure at Barrington Road (as shown on the scheme plan). The main drawback of this route is that it clashes with the rear garden of a residential property located on the Barrington road. This route clashes with Network Rail depot car park.

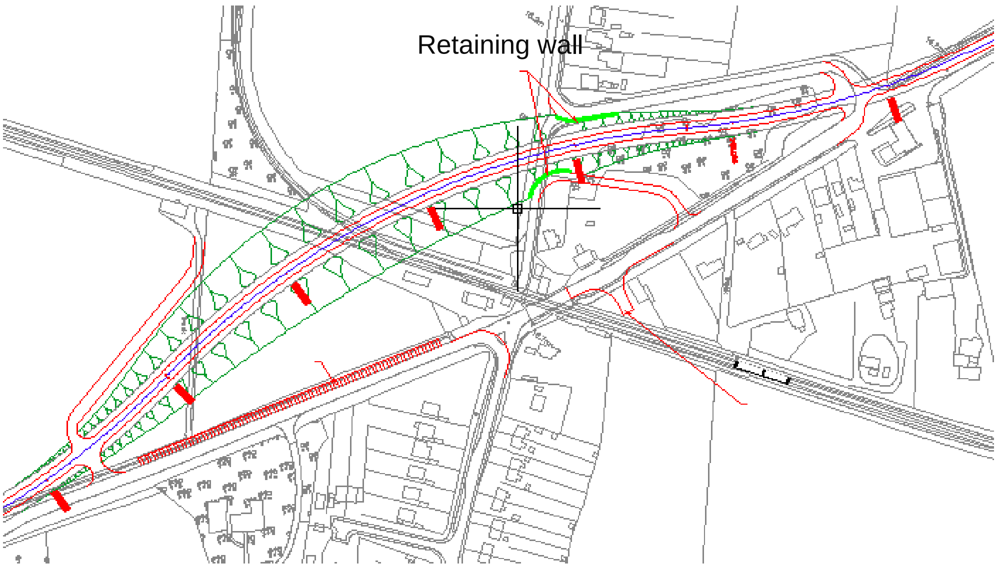


Figure 1.6: Route C1 Layout

Route C1 Structure Configurations

An overbridge/flyover at this location will comprise a single span bridge, approximately 32.6m clear skew span, with a 40 degrees skew between the abutments and the deck. The width of the structure will be approximately 22.6m.

An underbridge/underpass at this location will comprise a single span bridge, approximately 20.1m clear skew span, with a 42 degrees skew between the abutments and the deck. The width of the structure will be approximately 26.6m.

3.1.4.2 Route C2 – Highway Alignment with 40V & 50H Curves

This option is similar to the Route C1; the highway alignment is designed to maintain a vertical alignment suitable for a design speed of 50mph and a horizontal alignment suitable for a design speed of 40mph. Although the horizontal design speed is less than the desirable limit it still lies within the acceptable standard of TD 9/93. This route option has slightly smaller curve radius compared to route C1, resulting in reduction to the total length of the by-pass. Similar to Route C1, this route clashes with Network Rail depot car park.

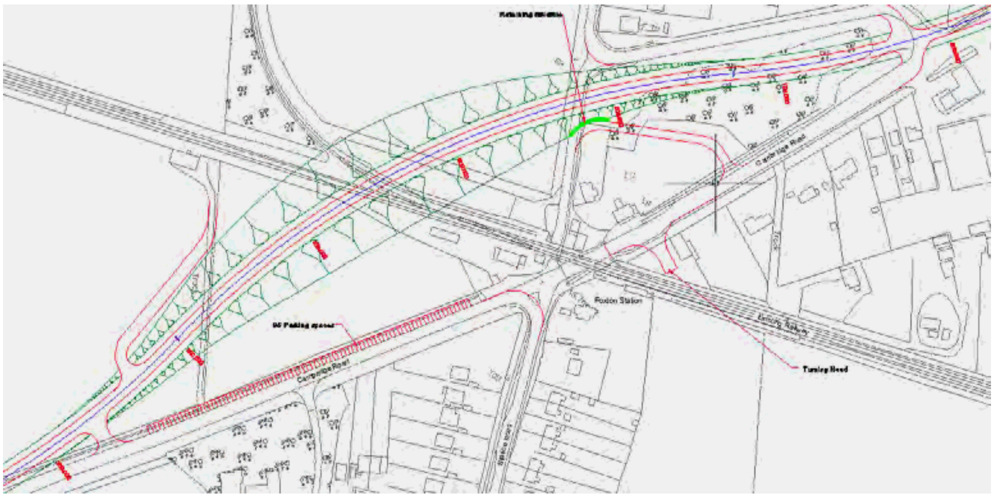


Figure 1.7: Route C2 Layout

Structure Configurations

The proposed overbridge/flyover at this location will comprise of a single span bridge, approximately 31.5m clear skew span, with a 42 degrees skew between the abutments and the deck. The width of the structure is approximately 22.5m.

The proposed underbridge/underpass at this location will comprise a single span bridge, approximately 19.8m clear skew span, with a 43 degrees skew between the abutments and the deck. The width of the structure is approximately 26.6m.

3.1.4.3 Route C3 – Highway Alignment with 40V & 40H Curves (Avoiding the existing depot)

For this route, the highway alignment design is based on the design speed of 40mph for both horizontal and vertical alignment, which is less than desirable but within the acceptable standard of TD 9/93. The option is proposed to limit the effects to the existing Network Rail Depot located northwest of the existing level crossing. As illustrated below, this option has largely avoided the Depot and also eliminates the need for retaining walls at Barrington Road, but has increased land take substantially, as well as increase in the size of the over or under bridge.

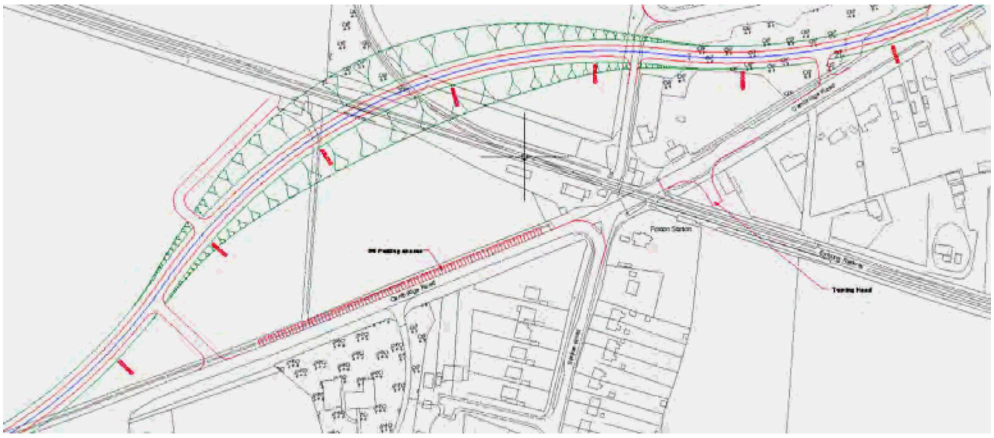


Figure 1.8: Route C3 Layout

Structure Configurations

The proposed overbridge/flyover at this location will comprise a two or three span bridge, of overall length of approximately 50m clear skew span, with a 40 degrees skew between the abutments and the deck. The width of the structure is approximately 22.8m. The increase in bridge span (compared to Routes C1 and C2) is necessary to support the railway track on the branch line.

The proposed underbridge/underpass at this location will comprise of a single span structure, approximately 22.9m clear skew span, with a 43 degrees skew, between the abutments and the deck. The width of the structure is approximately 50m. Alternatively, the structure can be split into two small width structures, one to carry the Cambridge Up and Dn line, and the other to carry the branch line.

The merit of these underpass options should be considered further if this sub-route option was selected for further consideration.

3.1.4.4 Route C4 – Highway Alignment with 40V & 40H Curves (Min land take)

The highway alignment of this sub-route option is based on the design speed of 40mph for both horizontal and vertical alignment. The proposed alignment is shown in Figure 1.9 below.

This route is the shortest of proposed options and minimises the area of land take and the structural span of the bridge. This route will require demolition of the existing Network Rail Depot. Unlike other routes, this route protects the access track to the derelict building located to the west of bypass.

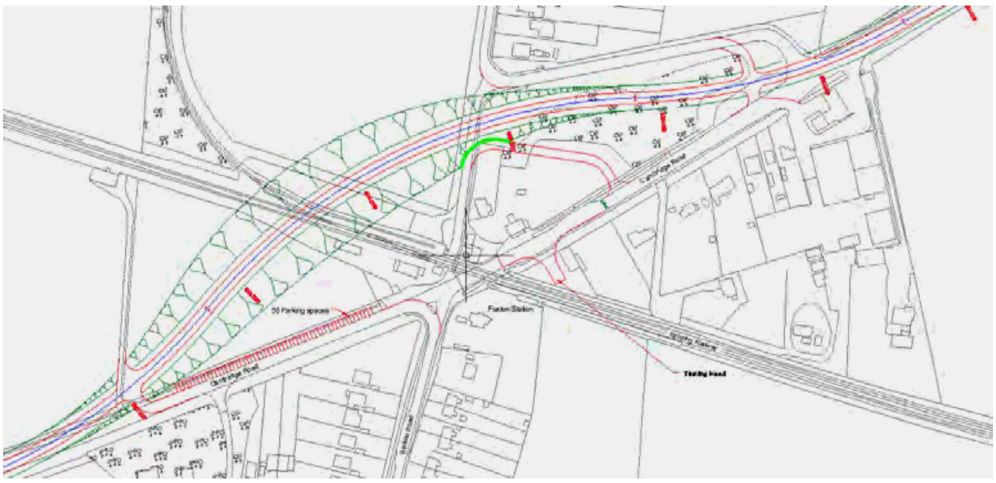


Figure 1.9: Route C4 Layout

Route C4 Structure Configurations

The proposed overbridge/flyover at this location will comprise a single span bridge, approximately 19.7m clear skew span, with a 36 degrees skew between the abutments and the deck. The width of the structure is approximately 26.7m.

The proposed underbridge/underpass at this location will comprise a single span bridge, approximately 20.8m clear skew span with a 36 degrees skew, between the abutments and the deck. The width of the structure is approximately 21.7m.

3.2 Bridge Options

The level crossing is on the main Up and Down Cambridge line which is the main route to London and has been assessed as a high demand route with restricted access. Therefore, in any structure option selection, the option effects on the railway operation must kept to a minimum, and any proposed structural options must be constructible during a 'Rules of the Route' (ROR) possession or within a reasonable blockage duration.

3.2.1 Overbridge Options

For all overbridge options, the substructure will be set 4.5m back from the running edge of the cess rail on either side. This is to ensure that the substructures can be constructed with minimum or no possession. This setback will also eliminate the need to design the substructure for derailment impact, which means the substructure can be more cost-effective.

To minimise the possession requirement for constructing the superstructure, a quick and self-supporting solution should be considered, e.g. beam and slab deck. The beams can be erected during a night-time possession, with permanent shutters spanning between the beams. This would allow the construction of the deck to follow continuously without possession.

The overbridge option should be able to accommodate future widening of the A10 to a dual carriageway with minimal to no demolition.

3.2.1.1 Precast Prestressed Concrete (PPC) Beams on Cantilever abutments (Option 1)

This form of superstructure construction is quick and requires minimum possession time. The bridge will consist of PPC beams simply supported on full height reinforced concrete abutments. An insitu reinforced concrete deck is designed to act compositely. Permanent formwork will be used to support the wet deck concrete during construction.

PPC beams are heavy and require a bigger crane for lifting when compared to other forms of construction. As the access and space at site is unlikely to be restricted, the lifting requirement for a heavy crane is not considered to be an issue.

A preliminary assessment of the foundation type required for the proposed structure has been undertaken based on the available ground information in the proximity of the level crossing. The assessment concludes that spread foundations are not appropriate for the bridge abutments and a piled solution is required with the piles socketed into Chalk Marl. A detailed investigation of the pile design has not been undertaken at this GRIP stage, but an initial assessment suggests that a CFA piling system will be appropriate due to its vibration free and quick installation. A high groundwater table will require casing for the installation of the CFA piles. Note that full height abutments will generate additional horizontal pressures on the piles but these can be designed accordingly. The piling activity and full height abutments will increase the proportion of wet concreting on site, which will have an impact on health and safety, and will be a risk for the site force working in the close proximity of the live rail traffic.

It is important to mention here that the final choice of foundation should be confirmed following a more detailed site investigation, which is outside the scope of this study.

3.2.1.2 Integral/Semi Integral Bridge on bankseat abutments (Option 2 & 3)

This form of structure will comprise of PPC beams cast integral or semi-integral with insitu reinforced concrete bank-seats and spread footings. Bank seat abutments will comprise of one of the forms of construction discussed below.

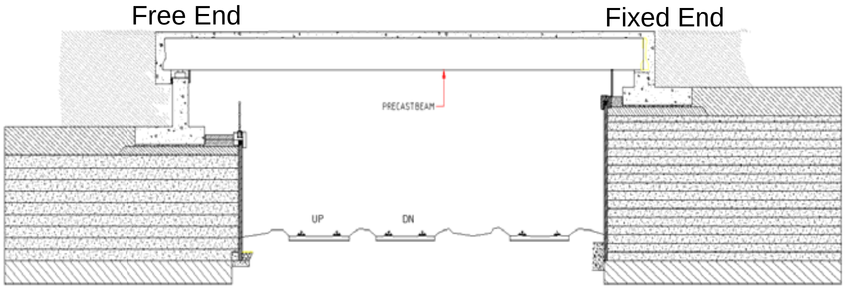


Figure 1.10: Semi-Integral Bridge

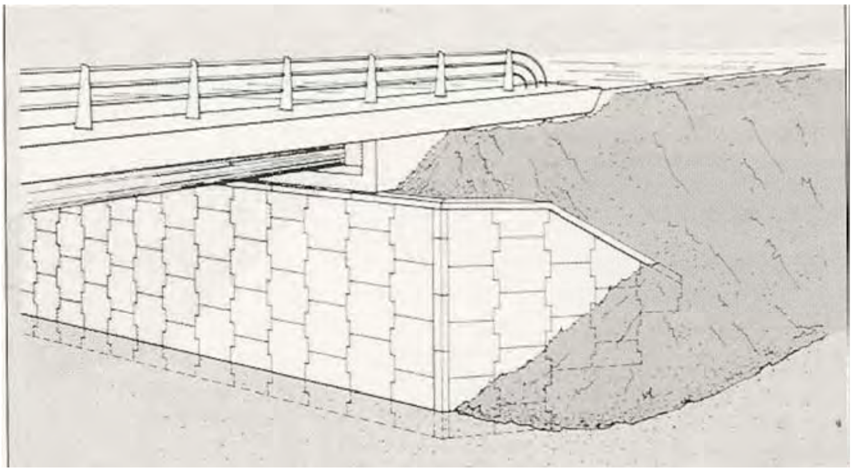


Figure 1.11: Semi-Integral Bridge

Fully Integral Bridge (Option 2)

The use of an integral form negates the need for bearings and movement joints. This will minimise the maintenance requirements and reduce the whole life cost of each structure. In this option, bankseat abutments would be seated on compacted granular fill material normally at 1:2.5. The bankseat would require to be set back at some distance from the track to accommodate slopes of the material and would significantly increase the span of the bridge and the construction cost associated to this when compared to full height abutments.

The span of the structure can be reduced by supporting the bankseats on vertical reinforced earth walls founded on an unreinforced concrete levelling pad (as discussed in option 3 below). This option is not viable in this situation due to a significantly larger span of the structure (40m), as the reinforced earth walls are not normally designed to take significant thermal movements occurring from a fully integral connection. The maximum span limit for a fully integral bridge resting on reinforced earth wall is 18m in accordance with BD70/03.

Based on the available ground data, it is difficult to justify the feasibility of this option at this stage. The available ground strata may be too soft to support the fill material and a piled foundation underneath the bankseat footing may be necessary, which would make this option more expensive. A detailed ground investigation is recommended in the next GRIP stage to confirm the viability of this option.

Semi-Integral Bridge (Option 3)

The proposal is similar to the fully integral option. Instead of resting bankseats on granular fill material, the bankseat abutments will be supported on vertical reinforced earth walls founded on an unreinforced concrete levelling pad. Independent reinforced earth wingwalls to retain approach embankments will also form part of the structure.

Reinforced earth walls consist of interlocking precast concrete facing panels tied back to the granular backfill with reinforcing straps. The structure is a standard form of construction and would overcome the issue of an increased span with bankseat abutments as discussed in the integral option above. In this option, one abutment will be cast integral with the superstructure providing full movement continuity. The other abutment will have bearings to accommodate the thermal movements of the deck. An end screen will be provided at the bearing abutment to protect the bearings from the backfill material. The end screen will be separated from the back face of cantilever abutment by means of a compressible joint filler. The joint will cater for the movement of the superstructure arising from thermal, shrinkage and creep effects, and the possibility of deck leakage through expansion joints will be significantly reduced. The maintenance cost of the structure will be higher than fully integral bridge will be lower than a full abutment height option. However there will be significant cost savings in terms of the overall construction cost of the structure.

The construction will be undertaken in phases. In the first phase, reinforced earth abutments will be constructed along with embankment construction using precast concrete facing panels and reinforcing strips. Backfilling activity behind abutments will be carried out in stages as the facing panels progressed towards top. This phase will give programme advantage in terms of construction.

The integral end of the structure will eliminate the need for the inspection of bearings, thus minimising maintenance and inspection costs. The option is economical as the reinforced earth walls use reinforced concrete facing panels as opposed to a full height abutment. Pre-stressed beams are low maintenance and there is also a minimal requirement for insitu concrete, which reduces the health and safety risk on site. The structure can be decommissioned easily and recycled at the end of its serviceable life.

The reinforced earth option minimises the amount of excavation. The inherent flexibility of the reinforced earth solution makes it possible to construct bridge abutments on relatively soft soil. The settlement of compacted reinforced earth material is normally the main risk in this design, which can be controlled with traditional soil improvement techniques.

3.2.1.3 Steel Composite deck (Option 4)

A steel composite deck on cantilever abutment or semi-integral structure on bankseat is another option considered for overbridges. This form of construction will require rail possessions for the installation of the steel beams. The steel beams can be installed in pairs with cross bracing, with the permanent framework already attached, providing the necessary stability during erection and reducing the possession duration. The steel beams are generally spaced between 2.5 to 3.5m apart resulting in fewer girders compared to a PPC beams solution.

Steel beams are lighter compared to PPC and allow for quick installation utilising a smaller crane with minimal possession duration. A steel composite bridge will also benefit the construction by minimising the construction depth and the height of the approach embankments when compared to the PPC option.

However, the long term maintenance cost of steel structure is generally recognised as higher than a PPC beam solution, particularly with regards to the protected paint system. Alternatively, the use of weathering steel should be considered to eliminate the requirement of maintenance painting. A steel bridge will require earth bonding as it will be adjacent to the OLE.

3.2.1.4 Summary of Overbridge Options

A summary of the advantages and disadvantages of overbridge options is shown below.

Ref	Bridge Type	Advantages	Disadvantages
1	PPC Beams-Cantilever abutments	1. Low maintenance cost compared to steel construction but higher than integral form of construction. 2. Horizontal thrust will be sustained by the substructure when compared to integral options.	1. Large amount of crane lifts during erection. 2. High volume of insitu concrete. 3. Maintenance cost due to bearings and movement joints. 4. Prestressed beams are heavier than steel beams. 5. Construction depth will be greater than integral or semi-integral option. 6. Will require longer construction time when compared to the integral form of construction. 7. Substructure cost will be higher than integral or semi-integral options.

2.	PPCs Beams-Semi-integral bridge	1. Can be constructed on soft ground. 2. Low construction depth. 3. Low maintenance cost. 4. Easy to demolish 5. Simple, rapid and safe construction. 6. Reduced need for piles or foundation improvement. 7. Less volume of in-situ concrete when compared to alternatives. 8. Panels can be modified on site to suit geometric constraints.	1. As (1) above 2. Drainage outlets are required to prevent settlement. 3. No cracks or warning of settlement is apparent on the structure. 4. Requires additional cost of ground improvement to limit settlement issues.
3	Steel Composite Deck.	1. Easy to pre-camber during fabrication. 2. Due to its lighter weight, smaller crane may be used during erection. 3. Easy transportation and rapid erection. 4. Shallow construction depth compared to PPC beams. 5. Less number of beams will reduce the possession requirement.	1. Bracing between beams is required for their stability during erection. 2. Higher long term maintenance cost. 3. Bonding require for steel deck, due to close proximity to OLE.

Table 1.1: Bridge Option's Comparison Summary

3.2.2 Underbridge/Underpass Options

The underbridge/underpass option will follow the road geometry similar to the overbridge option and will accommodate a 7.3m wide carriageway and 4.5m wide verges to protect pedestrian/cycleway and equestrian right of ways. The underbridge option will require a significant amount of excavation, which could be an issue due to the high ground water table. The risk of slope instability can be mitigated by considering cutting a slope of 1:3 in the alignment design, but this requires greater land acquisition. The amount of land take could be minimised by providing steeper slopes stabilised by ground anchors or retaining structures. In the absence of sufficient geotechnical information, this report does not consider the feasibility of soil strengthening or retaining wall techniques. Based on the initial assessment, it seems that acquisition of additional land will not be a major problem, but a detailed cost-effective analysis will required in the next GRIP stage.

A lower structure headroom can be achieved with this type of construction. The minimum headroom clearance of 5.3m (from carriageway level to the soffit) will be achieved in accordance with TD 27/01. This minimum headroom will require a structure to be designed for collision loading. Based on the site constraints, the following underpass construction proposals are considered feasible for the scheme.

To meet Network Rail's construction requirements, a reinforced concrete box option is the only feasible underbridge option.

The concrete box can be installed using the following methods:

1. Gradual jacking, under live railway operation;
2. Jacking during a blockade (cut and cover).

In both methods, a reinforced concrete box will be constructed in the approach cutting excavation adjacent to the rail track. No bearings or movement joints would be required for this option, thus significantly reducing the maintenance costs. Both types of construction will require large wingwalls on all four corners of the box, which could consist of steel sheet piles or concrete bored piles construction, and be constructed prior to the installation to retain any excavation or cutting. The configuration of wingwalls has a huge impact in determining the box length, which ultimately affects the construction cost of the structure. The configuration of the wingwalls parallel or perpendicular to the box will lead to significant larger lengths and is not considered to be an optimum solution. It is appropriate to angle wingwalls and provide battered slopes at the ends, which will minimise the construction cost of wingwalls and visual tunnelling effect of the underbridge. However, the high water table level may affect the decision on the alignment of the wingwalls. This must be investigated further in the next GRIP stage.

The methods considered for the box construction are discussed in the following sections:

3.2.2.1 Gradual Jacking method (Option 5).

This technique provides the benefit of construction with minimal disruption to the rail movement. This method will generally require a deeper road alignment to accommodate more fill over the structure, and constant track monitoring. Train speed over the structure will need to be restricted during the box installation for safety.

In this method, the concrete box will be constructed in an excavation adjacent to the rail track, with a leading cutting shield attached to the front of the box. As the box is jacked into the embankment, the existing ground is excavated carefully from within the box from the cut face. The process will continue until the structure is pushed to its final position.

This non-disruptive nature of the process, together with its safety mitigation measures and simplicity, has been considered as a best possible solution for tunnelling under the busy track. This type of construction requires a high level of precision and accuracy, along with constant track monitoring of track levels during the process, as this could affect the twist and cant of the permanent way.

3.2.2.2 Jacking During a Blockade (Cut and Cover) (Option 6)

In this method, the reinforced concrete box will be constructed adjacent to the railway in the approach cutting excavated for the road alignment as discussed above. Once the box is constructed the rail track would be closed to remove totally the fill under the track for the positioning of the box. This type of construction will require a possession of approximately 65 hours.

This technique was adopted for the replacement of Owen Street level crossing in Tipton. A photograph of the underpass showing excavation of the existing railway embankment in readiness for the jacking of the box structure are shown below, together with the completed structure.

Photo 1.4: Owen Street during main possession for installation.

Photo 1.5 – Owen Street Underpass after completion.

When planned and resourced properly, this type of installation can be successful. Unlike the gradual jacking method, this method eliminates the need for track monitoring, the risk of potential unforeseen objects within the excavation, and potential emergency stoppage due to any unacceptable settlement.

This installation technique will require minimum fill material over the structure. Therefore, the approach road alignment design will be shallower, potentially reducing cost for the excavation and retaining wall heights associated to the structure.

Construction Issues for the Underpass Options:

This option will require the use a considerable amount of concrete and reinforcement, not just for the box structure, but also for the jacking slab built beneath the box. The volume of excavation will be an issue for this form of construction due to the existing ground conditions.

The high water table on site may lead to a high risk of flooding during the construction requiring de-watering works. The high water table will also have an great impact on the long term maintenance of the structure and may require constant pumping of water to ensure the structure is not subject to flooding. From a design perspective, the structure will have to be designed to withstand high hydrostatic pressures which will make this option an expensive alternative. The presence of existing 8" diameter Anglian water foul sewer (rising main) is also an obstruction in the development of the underpass, which makes this option expensive and difficult to achieve.

A portal frame structure was considered as an alternative option, but discounted at early stage due to the complex construction requirements, extensive concreting and possession periods involved in building the structure.

3.2.3 Passenger/Public Footbridge-Options

The closure of the existing level crossing at Foxton will require an alternative safe crossing route for the pedestrians, cyclists and equestrians. This section investigates the different options to facilitate the community and provide a link between station platforms after the level crossing has been closed. The following requirements have been identified as critical for the optioneering of the proposals:

- Minimal adverse impact on the local environment, adjacent land and properties;
- Minimal capital cost implications;
- Long term maintenance liabilities;
- Compliance with Network Rail design standard and Equality Act 2010 requirements;
- Constructability;
- Safeguard plan for future extension of the existing platforms;
- Continuous operation of the railway.

The following footbridge options are considered to be reasonable options and are discussed further in the report:

1. Footbridge with approach ramps and stairs;
2. Footbridge with stairway and lift shaft. ;

3. Footbridge with approach ramps to accommodate equestrians;
4. Subway with approach ramps.

3.2.3.1 Footbridge with approach ramps and stairs (MMD-318484-C-DR-BR-103) (Option 7)

In this option, the bridge will be facilitated with stairs and Equality Act 2010 compliant ramps. The ramps will form a U-shape formation in line with station platforms. The footbridge and ramps will be owned and maintenance by Network Rail and the main aim of the footbridge is to provide the link between station platforms. It is preferred to position the bridge over the platforms or as close to the station as possible. The footbridge also serves as a local public right of way over the railway. The provision of using the footbridge for equestrians is considered as a separate option (refer to section 3.2.4.3).

Based on the available information, there were no undue constraints identified that will preclude the construction of a bridge or ramps.

There is an opportunity to minimise the land acquisition by opening the corridor between station platforms and the land owned by Network Rail which is currently being obstructed by a residential property (No. 2 Barrington Road). If this property was acquired, it will not only benefit the construction of proposed footbridge but will also facilitate the future extension of platforms.

The bridge span configuration is derived by positioning the bridge square to the track. An initial assessment suggests that this will provide a span saving of approximately 15% compared to its position in line with the carriageway. The footbridge supports will be set to a minimum of 4.5m away from the nearest rail or constructed at the back of the platforms. The proposed footbridge will be 2m wide, with a span of approximately 16m.

The ramps are located on private land, parallel to and behind the back of the existing station platforms. The approach ramps are designed to comply with Equality Act 2010 requirements for full disabled access with a maximum slope of 1:20, with 2m landings at 6m intervals.

The minimum required width of a bridge is 2m for unsegregated cycle and pedestrian access with a minimum headroom requirement of 5.1m from rail level as specified in NR/L2/TRK/2049. This headroom clearance will dictate a total ramp length of approximately 128m in accordance to Equality Act 2010 requirements. This will require more land acquisition and cause significant problems for people with walking difficulties and wheelchair users. This is not recommended by the 'Code of Practice for Disable People'.

3.2.3.2 Footbridge with stairs and lift shafts (MMD-318484-C-DR-BR- 102 & 104) (Option 8)

In this option, lift shafts will be provided instead of ramps to facilitate disabled access which satisfies the requirement for wheelchair users and other people with disabilities. Stairways can be provided in a form of normal stairs or a wrap round solution which will provide a smaller structural footprint when compared to a normal. This option will comprise of two sets of stairs and lift shafts, located on each side of the footbridge. The configuration of bridge span will remain same as discussed above. Lift lobby areas will have a minimum headroom of 2.3m to canopies and suspended fittings and should accommodate minimum 16 passengers at a time. The main advantage of this option over the ramp is that it minimises the requirement for land acquisition, hence reducing the cost of the option. However, the continuous operational and maintenance cost of this option will also need to be considered in the whole life cost.

As with the previous footbridge option, this option cannot accommodate equestrian use on safety grounds. Therefore, equestrians will be directed to use the path provided by the by-pass.

3.2.3.3 Footbridge with approach ramps to accommodate Equestrians (MMD-318484-C-DR-BR-105) (Option 9)

In this option, a footbridge and access ramps will be provided to accommodate pedestrians, together with a cyclists and equestrian. The minimum width of the footbridge and ramps, for a combined equestrian/ pedestrian access would be 3.5m (BD29/04) with solid side panels/parapets of 1.8m height to accommodate equestrian use. The construction of ramps will be similar to option 7, but they will not be and suitable for wheel chairs and people with walking difficulties as discussed above in section 2.4.4.1.

A steel deck is unacceptable due to its noise under equestrian use with the clanging noise made by hooves which could frighten the horses. A timber decking over steel deck plate would be adopted on the bridge and ramps to deaden the sound of horses hooves. Small gaps are recommended in between the decking panels to aid drainage. The requirement for equestrian use on the bridge will require regular cleaning and maintenance. This option does not lead to a safe solution, as there is a possibility of horses being startled while crossing the bridge during train movement. However, this option is still viable should be considered in the next GRIP stage for further development. With an alternate route available, it is considered likely that riders would prefer to use a larger bridge (bypass route) rather than small steel pedestrian footbridge.

Footbridge Form and Construction

The bridge construction will require a night closure or a day possession during the weekend. The possession requirement and restricted site access will limit the amount of work and time on site and will require as much prefabrication as possible. A steel bridge is considered to be the best option as it can be installed in a single lift operation in a limited possession time. The Network Rail standard U-frame steel bridge is the preferred option due to its long term success and popularity. The bridge should include a minimum 1.5m high steel clad restraint system for pedestrians or 1.8m high for equestrians.

3.2.3.4 Subway with approach ramps (MMD-318484-C-DR-BR- 101) (Option 10)

An alternative is to construct a subway with approach ramps under the existing platforms and tracks. As the existing level crossing is a designated bridleway route, this underpass option will accommodate equestrians along with pedestrians and cyclists. The structure will be a precast reinforced concrete box with a width and headroom clearance (mounted access) of 5.0m and 3.5m respectively as specified in BD29/04 in compliance with IAN 124/11. It is proposed to provide chamfers at the bottom of subway for pedestrian safety. There is another option of reducing the headroom of the structure to 2.7m, but this would restrict equestrians to dismounted access. Equality Act 2010 compliant ramps associated with the structure will require approximately 90m long ramps (based on full mounted equestrian access) which will require substantial land acquisition to create the length of path needed for such a height gain and fall.

Construction Issues

The main issues that would be involved in the construction of a subway are:

- The subway will be constructed under the existing tracks, which will stop train movements during the construction period;
- The subway will be constructed under the existing platforms. This option will not be feasible if platforms are founded on piles (not likely);
- The available data shows no presence of existing services but unforeseen obstructions i.e. HV cables could have a great impact on the construction cost and timescale;
- Due to high groundwater table level, other issues involving possible flooding during construction and the high cost of maintenance are similar to an underpass option as already discussed in section 2.4.2 above. These issues will increase financial cost and preclude this from further consideration.

The estimated construction cost of these options is given in section 7.1.

Equestrian Route

Equestrian right of way must be consideration, following the closure of Foxton level crossing. Below is a summary of equestrian route options considered as part of this study.

At the existing level crossing, equestrian have been consider in:

- Option 9 - Footbridge with approach ramps to accommodate equestrian;

- Option 10 - Subway with approach ramps.

Alterative to the above options, equestrian will be directed to use the by-pass route option (Route C).

4 Development Requirements for the Existing Equipment

4.1 Survey & Mapping

Refer to 'Topographic Survey Specification Report' in Appendix 'N'

4.2 Electrification and Plant

Drawing MMD-318484-C-DR-HW-07

- The road lighting will be designed in accordance with BS5489-1; 2013;
- The design will take into account the surrounding area and any environmental issues;
- Where necessary the lighting will be integrated with the existing road lighting;
- All lighting will conform to the Local Authority's standards;
- Lighting adjacent to the railway will be provided by full cut-off flat glass lanterns, taking in to account Network Rail standards and requirements.

Drawing MMD-318484-C-DR-BR-101 & 102

- Lighting adjacent to the railway will be provided by full cut-off flat glass lanterns, taking into account Network Rail standards and requirements;
- Lighting to the footbridge across the tracks will be provided by low level lighting contained within the bridge structure;
- All lighting levels provided for accessible routes will be in accordance with the Equalities Act 2010.

Subway

- Lighting adjacent to the railway will be provided by full cut-off flat glass lanterns, taking into account Network Rail standards and requirements;
- All lighting levels provided for accessible routes will be in accordance with the Equalities Act 2010;
- Lighting to the subway will include emergency coverage.

4.3 Signalling

It is understood that this line is currently scheduled for resignalling, with Foxton LC being renewed as MCB-OD. The following assessment assumes that the crossing is closed prior to this signalling scheme taking place. It should be noted that closure prior to resignalling will entail a cost benefit of approximately £1M."

The assets requiring alteration are as follows:

- Foxton Gate Box;
- Foxton Interlocking;
- Cambridge PSB relay room;
- Cambridge PSB control panel;
- Interlocking interface.

This assessment has been undertaken as a desktop study using information provided by Network Rail in the form of Signalling Infrastructure Condition Assessment (SICA) reports. The findings are as follows:

Foxton Gate Box. This was the subject of a secondary SICA inspection on 13th December 2012 (Report ref. NR/AN/SIG/ACR/12-13/40). Foxton Gate Box will be made fully redundant by these works and will therefore be decommissioned. There is no listed structure in close proximity which could affect the proposed scheme. The level crossing was completely renewed in 1998, with further minor renewals and additions in 2012. The wiring is classified as Normal and all equipment is in a generally good condition.

Foxton Interlocking. This was the subject of a secondary SICA inspection on 16th January 2013 (Report ref. NR/AN/SIG/ACR/12-13/53). Foxton interlocking will require alteration to remove the slotting controls on signals 113 and 114. The interlocking dates from 1983 and the overall category of the wiring is poor due to significant dry degradation. The risk of disruption due to wire damage is significant. Alterations to this interlocking will therefore require special measures to ensure that unaffected circuits are not damaged. The technician's indication panel will also require updating to remove the level crossing. This consists of a single-piece fascia which is in good condition.

Cambridge PSB relay room. This was the subject of a secondary SICA inspection on 25th February 2010 (Report ref. NR/AN/SIG/ACR/10/09). Alterations will be required to recover the slot indications associated with the level crossing. The interlocking dates from 1983, with wiring of the geographical sets classified as Fair but other wiring classified as Poor due to dry degradation. The limited nature of the alterations suggests that the risk of disruption due to wire damage is low.

Cambridge PSB control panel. This is assessed in the same report as the relay room and its overall condition is considered to be good. The panel is an Entrance-Exit (NX) type panel of domino tile construction. Alterations to remove the level crossing and slot indications will be required.

Interlocking interface. This is provided via a GETS Delphin 1024 TDM provided in 2010. This equipment will be suitable for alteration.

Signal Sighting Issues

The road bridge is currently planned to be positioned above 1038B and 1039A points. Whilst the OLE design would normally prohibit points under bridges, the crossover (1039) and siding connection (1038) are not electrified. The closest signal on the Up Royston line is CA114, located on Foxton station platform. Sighting of this signal will not be affected by the road bridge. The signal ahead, CA110, is located at Shepreth station, 1990 yards beyond CA114. This signal will not be affected by the road bridge. The Down Royston signal closest to the road bridge is CA113, located 808 yards on the approach to the level crossing, placing the bridge between the signal and the crossing. The signal ahead of the bridge, CA115, is not visible from Foxton station. As a result of the above, the current planned road bridge has no impact on signal sighting.

The current design of the footbridge, as depicted on drawing MMD-318484-C-DR-BR-01, shows the bridge deck approximately above CA114 signal with the DDA-compliant ramps on the outside of the platform. This signal is approached along a gradual right-hand curve with the last 200 yards or so being straight. This information has been deduced from Google Earth and Google Street view. This arrangement means that the current bridge design should not adversely impact the sighting of CA114, although this will be subject to a formal signal sighting committee at a later development stage. This may be undertaken using the Bentley signal sighting tool applied to a Building Information Management (BIM) model of the bridge design prior to construction. No other signals are affected.

4.4 Telecoms

4.4.1 Operational

The proposed works will have no effect on the existing Track/P' way alignment and signal sighting.

At the existing level crossing point it is proposed to provide a palisade fence gate controlled by Network Rail which will be used as a railway access point (RAP) for future Track/ P'way maintenance

It is understood that the existing gate box is to be made fully redundant and decommissioned. Any associated telephones and fax machines contained therein will be recovered and handed back to the maintainer as maintenance spares if required.

Once the level crossing has been decommissioned any existing emergency telephones will also be recovered and handed back to the maintainer as maintenance spares if required.

Any GSM-R coverage issues (e.g., the provision of lifts and/or footbridge) will be investigated at the GRIP 4 stage of the project and the requirements of Project Advice Notes PAN/E/TE/FT/0060 and PAN/E/TE/FT/0061 will be required to be adhered to.

4.4.2 SISS

Telecommunications – SISS

Site visits were carried out by others and the following conclusions reached:

Closed Circuit Television (CCTV)

There is currently no CCTV coverage of the station, although there is coverage of the level crossing. It is understood that at present the CCTV is provided by Cambridge County Council or the police to monitor movements at existing level crossing and is not part of the NR infrastructure.

Customer Information System (CIS)

There are currently two existing CIS Information Boards at the station. One Next Train Indicator (NTI) is located on the shelter of Platform 1 and a Next Train Indicator is located on a gallows post on Platform 2. The indicator displays appear to be new but at the time of a site visit did not appear to be working correctly.

The customer information systems appeared to be in good condition but their life expectancy and the condition of the associated cabling cannot be confirmed.

Public Address (PA)

There are a number of PA speakers on both Platforms 1 & 2 and as the station is unmanned these are thought to be Long Line Public Address (LLPA), but it has not been confirmed from where the announcements are made.

The public address (PA) appears to be in good condition, but will require maintaining. The life expectancy and the condition of the associated cabling cannot be confirmed.

Passenger Help Point (PHP)

There is an existing help point at the station on Platform 1, only sited on the wall of the shelter.

The PHP appears to be in good condition, but is understood not to be working and will require maintaining. The life expectancy and the condition of the associated cabling cannot be confirmed.

Proposed Telecoms Options

As there is currently no CCTV coverage at the station, it is assumed that the addition to any existing CCTV system or the provision of any new CCTV system will be the responsibility of the TOC.

New Subway

CCTV

CCTV coverage will be required in order to view the top and bottom of the ramps leading to and from Platforms 1 and 2 and at each end of the underpass covering its length.

It is proposed that CCTV coverage will consist of a camera looking at the ramps leading to and from Platforms 1 and 2 and two cameras at each end of the underpass covering its length.

Customer Information Systems

There is an option to provide new NTI screens at the top of each ramp leading to and from to Platforms 1 and 2 in order to inform passengers as to which platform their train is arriving/departing from and the time of the next train from that platform.

It is proposed that one new CIS screen will be provided at the top of each of the ramps leading to and from Platforms 1 and 2 and will be of the same type as the existing.

Public Address

New PA speakers will be required within the new underpass in order to inform passengers as to which platform their train is arriving/departing from and of any delays/disruptions to services.

It is proposed that a new PA speaker will be provided within the underpass.

PHP

There will no requirement for PHP units within the new underpass.

New footbridge and Ramps

CCTV

CCTV coverage will be required in order to view the stairs leading to and from Platforms 1 and 2, covering the footbridge itself.

It is proposed that the CCTV coverage will consist of two cameras looking at the stairs leading to and from Platform 2, one camera looking at the stairs leading to and from Platform1, and two cameras at each end of the footbridge covering its length.

Customer Information Systems

There is an option to provide new NTI screens at the top of each ramp leading to and from Platforms 1 and 2 in order to inform passengers as to which platform their train is arriving/departing from, and the time of the next train from that platform.

Public Address

There will not be a requirement for PA speakers on the footbridge or the ramps.

PHP

There will not be a requirement for PHP units on the footbridge or the ramps.

New footbridge with lifts

CCTV

CCTV coverage will be required in order to view the stairs leading to and from Platforms 1 and 2, the lifts and the footbridge.

CCTV coverage will also be required within each lift.

It is proposed that CCTV coverage will consist of a camera at ground level looking at the stairs leading to and from Platforms 1 and 2, a camera at ground level looking at the lifts leading to and from Platforms

1 and 2, two cameras on the footbridge covering the lifts and top of the stairs, and two cameras at each end of the footbridge covering its length.

A new camera will be provided within each lift as part of the lift build.

Customer Information Systems

There is an option to provide new NTI screens at the bottom of the stairs and the bottom of the ramps, in order to inform passengers as to which platform their train is arriving/departing from, and the time of the next train from that platform.

Public Address

There will not be a requirement for PHP units on the footbridge or the ramps or within the lifts.

PHP

A new assistance unit will be required within each lift as part of the lift build.

4.5 Track

Due to the existing condition of the track over the crossing, it is proposed to replace 18m (60 feet) length of track over the level crossing.

4.6 Vehicle Incursion Measures

This study considers the following measures to improve road safety and mitigate risk of vehicle incursion:

1. Appropriate road signage will be provided on both sides of the existing level crossing, at the proposed A10 tie-in as well as at the blocked off location to confirm new layout.
2. Vehicle access to the existing level crossing will be made impossible with permanent kerbs and protection bollards (if deemed necessary).

3. When the new alternative for pedestrian crossing is constructed, the existing level crossing route will be permanently blocked for pedestrians by installing 1.8m high steel palisade fence.
4. Driver's visibility at night will be improved by illuminating the area with an appropriate lighting system.
5. The new A10 by-pass route will be protected by the appropriate class of safety barriers on either side to prevent errant vehicles falling from the embankment or encroach into cutting.
6. Road gradients and bend radii are designed to improve visibility, thus reducing probability of accidents.
7. Wider footways on the bridge will be proposed to reduce risk and give drivers extra width to avoid accidents.
8. For an overbridge option, a high containment parapet (1.8m high) is proposed at each side of the structure continuing past the abutment and connecting with the highway safety fence by means of transition.

4.7 Platform Gauging Compliance

Based on the platform gauging information provided by Network Rail, the existing platforms at Foxton Station are non-compliant. These should be brought up to current standard when the proposed platform extension improvement works are planned.

Refer to Appendix 'Q' for platform gauging data.

Since the work proposed in this work scope is outside the boundary of platforms, there is no effect on existing platform gauging.

4.8 Drainage

There are open watercourses on 3 sides of the site (north, east and west) within a distance of 1km from the current crossing point. Based on the available sewer records, there appears to be no public surface water drains in the vicinity of the site. There may be some local streams or tributaries that drain the surface water of the area to these watercourses. These will need to be confirmed at the next stage of the project via consultation with the Local Authorities and site visits. The flooding potential of these local streams, if present, and their impacts to the proposal will need to be assessed.

The available sewer records show only foul drains present in the vicinity of the current crossing point. They are generally of 150mm diameter. There appears to be a pumping station located next to the existing crossing point. The local foul sewers are draining to this pumping station and a 250mm dia. rising main is also connecting to it from the east. From the pumping station, twin rising mains take the flow to the west. No information on the depths of the foul sewers and rising mains is available at present.

Potential Flood and Drainage Impacts of the Proposed Options

Overbridge Option

The approximately 0.5km long embankment will alter the current surface water overland flow paths. The impacts of this are not known at this stage and will need to be assessed at the next stage of the project. There may be requirements to provide culvert crossings underneath the embankment to maintain the current flow conditions. Similarly, if there are existing local watercourses draining the area which are disturbed by the embankment proposal, they will also need to be diverted. This will need confirmation at the next stage of the project.

Part of the embankment will be constructed on top of the existing foul sewers and rising mains. Anglian Water will need to be consulted on the proposals and they may require diversion of these services for the construction of the proposed works. Similarly, the proposed embankment may also affect other services serving the existing pumping station such as signalling and power cables. These services will also need to be positioned if affected.

For the new road itself, the new paved area will generate additional surface water runoff and it should not be discharged to the foul system unless Anglian Water agrees to it. Consultation with Anglian Water will need to be made at the next stage of the project on this matter. If it is confirmed not acceptable to drain to the foul system, alternative options including a soak away, draining to the local, or other nearby, watercourses will need to be considered.

Underpass Option

Most of the impact of the overbridge option, including its impact on existing overland flow paths, and additional surface water generated by the new paved surface also applies to the underpass option. However, the underpass option will very likely require diversions of the existing sewers and rising mains where the new cutting intercepts with these services. The scale of the diversion works required are also expected to be more significant than that required for the overbridge option, as the new sewer alignments will need to clear the cutting area.

For draining the new underpass, pumping facilities will probably be required. As with the overbridge option, the outfall for the additional runoff will need to be investigated.

5 Environment and Ecological Study

5.1 Environmental appraisal

Refer to Appendix 'R' for 'Environmental Appraisal and Action Plan'.

5.2 Ecological Constraints Study

Refer to Appendix 'S' for 'Ecological Constraints Study'.

6 Programme and Construction Methodology

6.1 Disruption to Rail Operations

None

6.1.1 Existing possession opportunities

The underpass structure option will be constructed adjacent to the rail embankment. The bridge will be installed using a box jacking technique, and will approximately require 65 hour blockade of the line during Easter or Christmas period. This possession duration is too long for operational requirement and against the Network Rail's policy of possessions. For this reason, the underpass solution is not considered as a viable option and is not considered for further development.

The substructure of the overbridge can be constructed in a separated green zone working, but the installation of the superstructure will require approximately a 24 hour possession plus other ROR possessions which can be achieved during the weekend blockade.

Recent possession planning meeting held at the end of April 2013 identified the following possessions are available on this line:

- 4no 27hours weekend possession in October 2017;
- 2no 27 hours weekend possessions in December 2017.

The following is the extract from the Network Rail Engineering Access statement for 2013 version 4.2 and 2014 version 2 that shows possession opportunities for the route between Royston to Shepreth Branch Junction.

NETWORK RAIL
EAP Milton Keynes
Anglia Route

Engineering Access Statement 2013
Final Principal and Final Subsidiary Rules
Section 4 - Standard Possession Opportunities

Version : 4.2
Date : 1st February 2013
Page : 85 of 155

EA1230 ROYSTON TO SHEPRETH BRANCH JN

SECTION		PERIOD A & B 09.12.2012 – 10.02.2013	PERIOD C 11.02.2013 – 24.03.2013	PERIOD D 25.03.2013 – 18.05.2013	PERIOD E TO G 19.05.2013 – 08.09.2013	PERIOD H & J 09.09.2013 – 07.12.2013	REMARKS
Royston (exclusive) and Shepreth Branch Jn 1230.1	WEEK END	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0615 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	If any isolation takes out power to Letchworth CSD the possession must be applied for pre CPPP publication. If post CPPP then late notice process to be adhered to. (Isolation finish time of 0540 Sun.)
	SUN/ MON	0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED **until 31.12.2012 and from 06.01.2013** 0135 Mon to 0625 Mon Down BLOCKED 0055 Mon to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED 2355 Sun to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED 2355 Sun to 0500 Mon Up BLOCKED **until 21.10.2013 and from 27.10.2013** 0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED	Part sections 83ABC, 84CDEFG only to be taken –standard possession opportunities not available west of Royston except for weeknight cyclics,
	MID WEEK	0005 T-F to 0430 T-F Down and Up Cambridge/ Chord/ Branch / Single BLOCKED 4 w.p.a (WA Cyclic Type 2a,2c) 2345 M-Th to 0430 T-F Down and Up Cambridge/ Chord / Branch / Single BLOCKED 3 w.p.a (WA Cyclic Type 2b) ① 0135 T-S to 0625 T-S Down BLOCKED 2345 M-F to 0500 T-S Up BLOCKED					

NOTES

① Divert and/or re-time via STP. See Section 5. These cyclics must align with LNE cyclical maintenance possessions between Hitchin (Cambridge Jn) & Meldreth. Hitchin & Tottenham Hale depots to liaise on possession limits at Royston.

EA1230 ROYSTON TO SHEPRETH BRANCH JN

SECTION		PERIOD A & B 08.12.2013 – 09.02.2014	PERIOD C 10.02.2014 – 23.03.2014	PERIOD D 24.03.2014 – 17.05.2014	PERIOD E TO G 18.05.2014 – 07.09.2014	PERIOD H & J 08.09.2014 – 13.12.2014	REMARKS
Royston (exclusive) and Shepreth Branch Jn 1230.1	WEEK END	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0615 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	0140 Sun to 0730 Sun Down BLOCKED 2335 Sat to 0630 Sun Up BLOCKED	If any isolation takes out power to Letchworth CSD the possession must be applied for pre CPPP publication. If post CPPP then late notice process to be adhered to. (Isolation finish time of 0540 Sun.)
	SUN/ MON	0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED ~~2355 Sun~~ 0005 to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED 2335 Sun to 0500 Mon Up BLOCKED	0135 Mon to 0625 Mon Down BLOCKED ~~2355 Sun~~ 0005 to 0500 Mon Up BLOCKED	Part sections 83ABC, 84CDEFG only to be taken –standard possession opportunities not available west of Royston except for weeknight cyclics,
	MID WEEK	0005 T-F to 0430 T-F Down and Up Cambridge/ Chord / Branch / Single BLOCKED 4 w.p.a (WA Cyclic Type J) ① 0135 T-S to 0625 T-S Down BLOCKED 2345 M-F to 0500 T-S Up BLOCKED					

NOTES

① Divert and/or re-time via STP. See Section 5. These cyclics must align with LNE cyclical maintenance possessions between Hitchin (Cambridge Jn) & Meldreth. Hitchin & Tottenham Hale depots to liaise on possession limits at Royston.

6.2 Indicative construction programme

The route options considered will have a similar construction programme. The construction programme is prepared based on the options of approach embankments or cutting.

Refer to 'Appendix I' for indicative construction programme.

6.2.1 Construction Sequence

Once the construction site is mobilized:

- Remove site constraints and divert required services.
- Construct new bypass route;
- Divert A10 traffic to new route;
- Close A10 road for traffic at existing level crossing by installing proposed incursion protection;
- Construct footbridge foundations and supports with associated ramps or lift shafts;
- Block existing level crossing with palisade fence;
- During a night possession, remove OLE and install footbridge;
- Reinstate OLE to reduce height below the bridge.

6.3 Reliability and maintainability

Removal of the crossing asset reduces the scope for problems occurring and on-going maintenance of the asset.

7 Cost Estimates

7.1 Option cost estimates

Estimates have been developed for the options identified, based on assumptions and exclusions mention in section 7.2.

Contingencies of 30% and 40% are considered for the main bridge options and pedestrian access options respectively. Estimates are detailed in Appendix 'E' and are summarised below, (*Estimated cost not calculated as the options are unfeasible).

Route Options	Estimated Cost
Route C1 based on Overbridge Option	£ 13,200,000
Route C1 based on Underpass Option	£ 21,150,000
*Route C2 based on Overbridge Option	-
*Route C2 based on Underpass Option	-
*Route C3 based on Overbridge Option	-
*Route C3 based on Underpass Option	-
Route C4 based on Overbridge Option	£ 11,650,000
Route C4 based on Underpass Option	£ 19,170,000
Structure Options - Pedestrian/Cycleway Crossing	
Footbridge with Ramps	£ 3,000,000
Footbridge & Lift shafts - straight stairs	£ 2,300,000
Footbridge & Lift shafts - Compact stairs	£ 2,400,000
Footbridge with Ramps for Equestrians	£ 4,500,000
Subway/Bridleway with Ramps	£ 3,100,000

7.2 Assumptions and exclusions

The assumptions and exclusions are included within the cost estimates detailed in Appendix ‘E’.

7.3 Risk

Main risks applicable to all options are as follows:

1. Land acquisition;
2. Existing buried services;
3. Exceptional inclement weather during construction;
4. Estimate variance.

Refer to Appendix ‘F’ for detailed description.

8 Consultation

8.1 Stakeholders

The primary groups of stakeholders identified so far for this scheme include full Network Rail list are:

a. Internal:

- Sponsors
- Network Operations
- RAM Team
- Foxton Maintenance Depot
- Maintenance
- Operations Manager
- ORA Team and Level Crossing Manager
- Liabilities Manager
- Network Strategy and Planning
- IP Anglia

b. External:

- ORR
- DfT
- FCC
- FOCs
- Barrington Cement Works
- Local Authority (CCC)
- Highways Agency
- Local Residents
- Road Users
- Rail Users
- Adjoining Landowners
- Utilities
- Environment Agency
- Natural England
- Protection for Rural England
- Cycle User Groups
- Equine User Groups (British Horse Society)
- Pedestrians/Ramblers

c. CDM Stakeholders:

- Client
- Clients Representative
- CDM Coordinator
- Designer
- Principal Contractor

9 Discussion Summary

Options Comparison Summary

Route	Advantages	Disadvantages
Route A	1. Relatively short span bridge 2. No additional structure required for pedestrians and equestrians at the level crossing. 3. Minimises the requirement of land acquisition. 4. No significant cost compared to bypass options.	1. Disruption to the A10 traffic. The A10 will have to be closed for a significant period (over 18 months), with traffic being diverted via A1198 and B603 to the north or via A505 to the south for the duration of the construction period. 2. Diversion of existing services is unavoidable and expensive for both the flyover and underbridge options. 3. Frontage access to existing dwelling adjacent to the A10 will be severely restricted, due to the embankment or retaining structure required to support/retain the adjacent ground from the road. 4. In order to accommodate this option, two properties (No.2 Barrington Road and No.4 Royston Road) adjacent to the level crossing will need to be acquired and demolished. 5. Noise and dust emissions due to demolition and construction. 6. The overbridge flyover headroom will be higher due to higher OLE at the existing level crossing location. 7. Station Road will be permanently closed. 8. There will be considerable disruption to rail services during construction. 9. Future extension of platforms will be affected.

Route	Advantages	Disadvantages
Route B	None	1. Clash with existing residential properties (approx. 10. No. properties will be affected). 2. Noise and dust emission levels during construction would be high. 3. Diversion of existing services is unavoidable and will have significant cost implication. 4. Existing of station would require long span crossing over the existing platforms. 5. Station Road is a main route to Foxton Village Centre, this route option will require alternate route to Station Road.

Route C Sub-Routes			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Sub-Route C1	£13,200,000 (overpass) £21,150,000 (Underpass)	1. Designed to maintain existing design speed. 2. Cheaper than route C3. 3. No interface with Network Rail Depot.	1. Relatively bigger structural span (32.6m). 2. Significant land acquisition (approximately 45,000 m^2). 3. Interfaces with private property located on Barrington Road. 4. Requires a short retaining structure at Barrington road.
Sub-Route C2	*	1. Slightly shorter route compared than C1. 2. Cheaper than route C1 and C3. 3. No interface with Network Rail Depot.	1. Interfaces with private property located on Barrington road. 2. One step down from current design speed but within limit TD 9/93. 3. Requires a retaining structure at Barrington road.

Route C Sub-Routes			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Sub-Route C3	*	1. Least impact on properties. 2. No requirement of retaining structure. 3. No impact on Network Rail Depot.	1. Required most land takes (approximately 45,000 m^2). 2. Largest structural span (54 m). 3. Most expensive of all routes. 4. Longest construction timescale. 5. One step down from current design speed but within limit TD 9/93.
Sub-Route C4	£ 11,650,000 (Overpass) £ 19,170,000 (Underpass)	1. Cheapest of all options 2. Minimum land take 3. Smallest structural span 4. Shortest of all routes	1. Interfaces with network rail depot which would require relocation/demolition. 2. Noise and dust emissions due to demolition. 3. One step down from current design speed but within limit TD 9/93.

Bridge Alternatives			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Overbridge Option	£ 2,200,000	1. Minimises disruption to rail movements during construction. 2. No risk of flooding during construction. 3. Minimises the construction programme. 4. Cheaper than the underpass option. 5. Less chances to interface with buried services.	1. High headroom requirement due to existing OLE. 2. High headroom requires high abutments and approach embankments which extensively increase the construction cost. 3. High containment parapet is required over the bridge. 4. Possible clash with existing overhead power lines.

Bridge Alternatives			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Underpass Option	£ 2,450,000	1. Lower headroom requirement. 2. Using box jacking method, rapid construction can be done without any disruption to train movements.	1. Box jacking technique requires high level of precession and accuracy. 2. Constant monitoring of track levels is required during construction. 3. Risk of flooding during excavation due to high water table. 4. Risk of flooding will enhance the construction timescale. 5. De-watering required during construction due to low water table i.e. 2m from ground level. 6. High water table will require permanent pumping station which enhances the cost of this option. 7. Diversion of unknown buried services or obstructions would significantly increase the cost and timescale of construction. 8. Would require extensive site work due to insitu concrete.

Pedestrian, Cycle & Bridleway Crossing Alternatives			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Pedestrian Footbridge with Equality Act 2010 Ramps	£ 3,000,000	1. Easy and cheaper to construct compared to the subway option. 2. Prefabricated steel footbridge minimises disruption to train movements. 3. Does not require any casting of concrete over the track and is a quick and clean solution.	1. Ramps would require bigger land acquisition. 2. Longer ramps will cause significant problems for people with walking difficulties and wheelchair users. 3. Capital cost of ramps will be higher than lift shafts. 4. Ramp will require departure from standard. 5. Cannot accommodate a bridleway. 6. Footbridge would require regular inspections and maintenance of bearings.

Pedestrian, Cycle & Bridleway Crossing Alternatives			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Footbridge with Equality Act 2010 Ramps for Pedestrians & Equestrians	£ 4,500,000	1. Shorter route for the riders. 2. Existing route, familiar to riders and horses. 3. Non-traffic route, much safer for the riders.	1. Horses likely to get frightened while crossing the bridge. 2. Riders would prefer to choose longer route over small metal bridge. 3. Will require wooden decking over the bridge to deaden the noise. 4. Inconvenient for pedestrians & cyclists. 5. Regular cleaning of ramps & surface.
Footbridge with Equality Act 2010 Lift shafts	£ 2,400,000	1. Cheapest of all options 2. Easy and quick to install. 3. Minimum land acquisition. 4. Convenient for wheel chairs and people with walking difficulties. 5. Minimum disturbance to neighbourhood communities.	1. Lift shafts will require constant maintenance to keep it in operation. 2. Steel footbridge requires regular painting which will require possession thus increases the whole life costs of the structure. 3. Cannot accommodate a bridle way. 4. The new steel structure will require earth bonding.

Pedestrian, Cycle & Bridleway Crossing Alternatives			
Options	**Estimated Cost**	**Advantages**	**Disadvantages**
Equality Act 2010 Compliance Subway	£ 3,100,000	1. Subway can a accommodate bridleway route. 2. Low maintenance cost. 3. Lower headroom requirement would minimise ramps length in compliance DDA standard.	1. Most expensive of all options. 2. Risk of flooding during excavation due to high water table which is approximately 2m below existing ground level. 3. Bigger land acquisition and higher maintenance cost. 4. Subway construction will require longer possession compared to other options. 5. This will undermine the foundations of existing platform. The option would be unfeasible if platforms are founded on piles. 6. Unknown buried services will have an impact on the cost and construction timescale. 7. Longer ramps will cause significant problems for people with walking difficulties and wheelchair

9.1 Preferred Options

Based on SIFT study, following options to be considered in GRIP 3 stage. Underpass options have not been forwarded due to the high risks involved during the construction. The matrix produced is attached in Appendix ‘B’ of the report.

9.1.1 Routes

Based on the significant direct effect on the number of residential properties, the Route A and B is considered to be inappropriate, particular with other Route options available for consideration. Therefore, Route B is not considered for further development.

Following a sift exercise, it is concluded that route option C1 and C4 has been put forward for further development. The route option C3 has not been put forward due to its complex construction and high cost.

9.1.2 Overbridge Options

- Precast Prestressed Concrete (PPC) Beams on Cantilever abutments (Option 1)
- Integral Bridge on bankseat abutments (Option 2)
- Integral Bridge on bankseat abutments (Option 3)

9.1.3 Underbridge Options

None

9.1.4 Pedestrian Access Options

- Footbridge with approach ramps and stairs (Option 7).
- Footbridge with lift shafts and stairs (Option 8).
- Footbridge with approach for pedestrian and equestrians (Option 9).

10 Conclusion and Recommendations for Further Work

The feasibility study of existing level crossing closure identified three main routes A-C. Route C is divided into four sub-route options, and each route discusses the opportunity of underpass or overpass, across the railway lines. All routes have been evaluated and their strength, weaknesses, opportunities and threats are highlighted in Appendix ‘A’. Risks and opportunities that have arised from the study are detailed in Appendix 'F' of this report.

Route A (online) & Route B (bypass south side) has been discounted at early stage because these present the least attractive solutions in terms of disruption to vehicular users along the A10, and potential demolition of up to 10 residential properties along the proposed line of the by-pass respectively. The remaining Route C, was further developed and an outline estimated cost (Refer to Section 7) was produced to compare the cost of sub-options C1 & C4 which were deemed the most favourable sub-options. Sub-option C3 was determined to be the most expensive solution due to its larger curve radius which in turn extended the limit of the works and increased the difficulties due to the larger bridge span. This route avoids the interface with existing Network Rail Depot but the benefits achieved versus cost comparison is not significant therefore this route is not taken forward to the next GRIP stage. Further consideration was given to develop routes with an approach cutting or embankment. The study concluded that an approach cutting with an underpass option is more problematic to construct due to the presence of high water table and will require a permanent pumping system within the cutting area, with considerable long term financial maintenance impact.

During the bridge option development an RC box insitu construction was considered at early stage but was discounted due to the extensive concreting and possession requirements. The bridge feasibility considers a solution which involves as much prefabrication as possible to minimise disruption to rail movements. The overbridge options are economical and simple to construct and will require less possession time when compared to an underpass solution. The estimated cost of the overbridge is 18.5% less than underpass for the same route. The estimated cost of an overbridge and underbridge proposal is given as below:

Overbridge Option	Underpass Option
£2,000,000	£2,450,000

The increased cost of an underpass option is mainly due to the significant excavation and it is anticipated that the construction work programme for the underpass structure will be longer than overbridge solution (refer to Appendix 'E' for estimated construction work programmes). It is concluded that an underpass solution is an undesirable option due to its complex construction and increased capital and maintenance cost.

Different overbridge options were discussed in the report (refer to section 2.4.1), but it is not intended to draw specific conclusion or make recommendations on the choice of bridge type at this stage. This study will allow the next GRIP stage to develop these options further and conclude the optimum solution.

The report has also identifies a preferred location for the construction of a new footbridge or subway at existing level crossing. Provision of providing a combine footbridge for bridleway and pedestrian has been anticipated over the existing level crossing but this would significantly increases the capital cost of the structure and is a serious safety risk. The option of 'Footbridge with ramp approaches and stairways' is considered as an unfeasible alternative due to the requirement for excessive ramp lengths adding to the construction cost. Moreover, this option does not compliance fully with Equality Act 2010 requirements and will require departure for acceptance. A tunnel/subway option may incur excessive costs due to unforeseen site constraints and unfavourable ground conditions. The works programme to construct the subway will be considerably longer and will require a longer possession of the track when compared to alternatives. A footbridge with lift shafts is considered to be a preferred alternative as it provides simple and cost effective solution, so this option is sifted for further development.

The recommendation of the above options is based on a number of considerations that have been taken into account to achieve the most suitable form of structure for the client, road users, construction issues and the surrounding environment. The options recommended for further development are summarised in the SIFT sheet (refer Appendix 'B').

In order to progress the work we recommend the review of the following key issues in the next GRIP stage,

- Undertake detail ground investigation and prepare a factual report based on the investigation.
- Carry out a topographic survey of areas where the proposed intervention impacts on existing infrastructure or external land owners.
- Investigate the existing buried services and negotiate with the land owners.
- Carry out an outline design of the structure, to facilitate early acceptance from key stakeholders.
- Consult with the local community.

11 Appendices

Appendix A. Strengths Weaknesses Opportunities and Threats (SWOT) Analysis

Options	Description	Strengths and Opportunities	Weaknesses and Threats
Do Nothing	**No change from the existing**	▪ No infrastructure works required. ▪ No blockade or possession requirements. ▪ No requirement of land acquisition.	▪ Does not meet the basic objectives of the study. ▪ Safety risk to the public. ▪ Disruption to A10 traffic. ▪ Weakness to the operation of Train Operating Companies.
Route A	**On-line Grade Separation**	▪ No additional structure requirement for pedestrians, cyclist and bridleways. ▪ Can achieve the requirement with minimal investment compared to other options. ▪ Minimum land acquisition. ▪ Relatively smaller bridge span.	▪ Disruption to the A10 traffic. The A10 will have to be closed for a significant period (over 18 months), with traffic being diverted via A1198 and B603 to the north or via A505 to the south for the during the construction period. ▪ Presence of existing services makes this expensive for both over and underbridge options. ▪ Demolition of existing houses adjacent to the level crossing. ▪ Noise and dust emission due to demolition. ▪ Would have an effect on future extension of platforms. ▪ Station Road will be permanently closed. ▪ 청엏얼siderable disruption to rail services during construction.
Route B	**Bypass-South Side**	▪ Bridge would span over two track lines resulting in shorter span of the structure.	▪ Interface with existing residential dwellings requiring demolition. ▪ Noise and dust emission due to demolition. ▪ Diversions of existing services are unavoidable and possibly would increase the cost of the scheme. ▪ May result in longer route in order to avoid existing station.
Sub-Route C1	**Bypass-North Side**	▪ Designed to maintain existing design speed. ▪ Shorter Route than Sub-Route C3. ▪ Minimal effect on Network Rail Depot.	▪ Relatively bigger structure span than c2 and C4. ▪ Large land acquisition compared to C4. ▪ Interfaces with private property located on the Barrington Road. ▪ Requires a short retaining structure at Barrington road. ▪ Will be cheaper than C3 but expensive than C2 and C4.
Sub-Route C2	**Bypass-North Side**	▪ Slightly shorter route compared to C1. ▪ Cheaper than route C1 and C3. ▪ Minimal effect on Network Rail Depot.	▪ Interfaces with private property located on Barrington road. ▪ One step down from current design speed but within limit TD 9/93. ▪ Requires a retaining structure at Barrington road
Sub-Route C3	**Bypass-North Side**	▪ Least impact on properties. ▪ No requirement of retaining structures. ▪ No impact on Network Rail Depot.	▪ Required maximum land take. ▪ Would require large span structure. ▪ Most expensive of all routes. ▪ Enhance construction timescale. ▪ One step down from current design speed but within limit TD 9/93.

Options	Description	Strengths and Opportunities	Weaknesses and Threats
Sub-Route C4	**Bypass-North Side**	▪ Cheapest of all options. ▪ Minimum land take. ▪ Small structure span. ▪ Shortest of all routes.	▪ Interfaces with network rail depot which would require demolition. ▪ Noise and dust emissions due to demolition. ▪ One step down from current design speed but within limit TD 9/93.
Bridge Alternatives			
Option 1	**Simply supported deck - Prestress beams**	▪ Low maintenance cost compared to steel construction but higher than integral form of construction. ▪ Horizontal thrust will be lowered on substructure and foundations compared to integral options.	▪ Large amount of crane lifts during erection. ▪ High volume of insitu concrete. ▪ Maintenance cost due to bearings and movement joints. ▪ Prestress beams are heavier than steel beams. ▪ Higher construction depth compared to Integral/semi-integral options. ▪ Would require longer construction time scale compared to integral for of construction.
Option 2	**Fully Integral bridge on bank seats**	▪ Minimum maintenance cost. ▪ Minimises insitu concreting for the substructure. ▪ Relatively less vertical load on the foundations. ▪ Minimal construction depth of the structure. ▪ Easy to demolish due to less smaller substructure.	▪ This form would significantly increase the structural span. ▪ Longer span is likely to increase the cost of the structure compared to other options.
Option 3	**Semi -integral bridge on bank seats**	▪ Can be constructed on soft ground. ▪ Low construction depth. ▪ Low maintenance cost ▪ Easy to demolish ▪ Simple rapid & safe construction. ▪ Reduce need for piles or foundation improvement. ▪ Less volume of concrete compared to alternatives. ▪ Panels can be modified on site to suit geometric constraints. ▪ No requirement for scaffolding & formwork during installation.	▪ Drainage outlets are required to prevent settlement. ▪ No cracks or warning of settlement is apparent on the structure.
Option 4	**Steel Composite Deck.**	▪ Easy to pre-camber during fabrication. ▪ Due to its lighter weight, smaller crane may be use during erection. ▪ Easy transportation and rapid erection. ▪ Shallow construction depth compared to prestress beams.	▪ Bracing between beams is required for their stability during erection. ▪ Higher long term maintenance cost.

Options	Description	Strengths and Opportunities	Weaknesses and Threats
Option 5 & 6	Underpass Options	▪ Lower headroom requirement compared to overbridge. ▪ Using box jacking method, rapid construction can be done without any disruption to train movements.	▪ Box jacking technique requires high level of precession and accuracy. ▪ Constant monitoring of track levels is required during construction. ▪ Diversion of unknown buried services or obstructions would significantly increase the cost and timescale of construction. ▪ Risk of flooding during excavation would require de-watering works which will enhance the construction time scale. ▪ High water table will require permanent pumping station which enhances the cost of this option. ▪ Would require extensive site work due to insitu concrete.
Pedestrian/Cyclists/Equestrian Crossing Alternatives			
Option 7	Footbridge with Equality Act 2010 Ramps	▪ Easy and cheaper to construct compared to the subway option. ▪ Prefabricated steel footbridge minimises disruption to train movements. ▪ Does not require any casting of concrete over the track and is a quick and clean solution.	▪ Ramps would require bigger land acquisition. ▪ Longer ramps will cause significant problems for people with walking difficulties and wheelchair users. ▪ Capital cost of ramps will be higher than lift shafts. ▪ Ramp may require departure from standard. ▪ Cannot accommodate a bridleway. ▪ Footbridge would require regular inspections and maintenance of bearings.
Option 8	Footbridge with Equality Act 2010 lift shaft	▪ Cheapest of all options ▪ Easy and quick to install. ▪ Minimum land acquisition. ▪ Convenient for wheel chairs and people with walking difficulties. ▪ Minimum disturbance to neighbourhood communities.	▪ Lift shafts would require constant monitoring/maintenance to keep it in operation. ▪ Steel footbridge requires regular painting which will require possession thus increases the whole life costs of the structure. ▪ Cannot accommodate a bridle way. ▪ The new steel structure will require earth bonding.

Option 9	**Footbridge with ramps for Pedestrians/Cyclists/Equestrians**	▪ Allow equestrians to cross the railway at or close to existing bridleway route. ▪ Prefabricated steel footbridge minimises disruption to train movements. ▪ Does not require any casting of concrete over the track and is a quick and clean solution.	▪ Ramps would require bigger land acquisition. ▪ Longer ramps will cause significant problems for people with walking difficulties and wheelchair users. ▪ Wider footbridge and ramps to accommodate equestrians as well as pedestrians, hence capital cost will be higher. ▪ Ramp may require departure from standard. ▪ Risk of horses being frightened by passing train, while they are crossing the bridge. ▪ Potential higher daily maintenance required to remove horse excrement. ▪ Potential requirement for additional wooden decking to reduce noise from horse crossing the steel deck. ▪ Footbridge would require regular inspections and maintenance of bearings.
Option 10	**Subway with Equality Act 2010 Ramps**	▪ Subway can a accommodate bridleway route. ▪ Low maintenance cost. ▪ Lower headroom requirement would minimise ramps length in compliance DDA standard.	▪ Most expensive of all options. ▪ Risk of flooding during excavation due to high water table which is approximately 2m below existing ground level. ▪ Bigger land acquisition and higher maintenance cost. ▪ Subway construction will require longer possession compared to other options. ▪ This will undermine the foundations of existing platform. The option would be unfeasible if platforms are founded on piles. ▪ Unknown buried services will have an impact on the cost and construction timescale. ▪ Longer ramps will cause significant problems for people with walking difficulties and wheelchair users.

Appendix B. SIFT Determination

Project	**318484**
Intervention	**Foxton**
Grip Stage	**2**

Key

High Impact, not beneficial or does not meet basic requirement
Neutral;no significant effect;middle cost effect (relative to options considered)
Meets requirement;beneficial;low capital cost (relative to options considered)

Carry forward to Next GRIP Stage
Option dismissed - due to the clear fact the option is not practical.
Option dismissed with stakeholders' agreement

Option	Option Type	Operational Flexibility	Capital Cost	Construction Methodology	Construction Access	Disruption to Rail Operations	Impact on third Parties	Benefit Realisation	Environmental Constraints	Land Intake	System Safety	Stakeholder Issues	Consents Required	Performance	Operational Saving	Provision for future Proofing	Take Option Forward	Commentary
Route Options																		
Do Nothing Option	No Infrastructure works																NO	Does not meet the objective
Route A	Online route																NO	Disruption to A10 traffic, Interface with existing houses & services.
Route B	Bypass south side																NO	Interface with existing houses
Route C1	Bypass north isde																YES	Interfaces with private property located on Barrington road.
Route C2	Bypass north side																YES	Not designed to current design speed but within the desirable limit of
Route C3	Bypass north side																NO	Longer route, capital cost not feasible
Route C4	Bypass north side																YES	Shortest of all route, minimum land intake, shorter structure span.
Structural Options at new level crossing																		
Option 1	Simply supported, overbridge																YES	High volume of insitu concrete.
Option 2	Integral, overbridge																YES	Longer bridge span, minimum maintainance cost
Option 3	Semi-Integral, overbridge																YES	Less concrete, no excavation, easy to demolish, low maintainance
Option 4	Steel composite overbridge deck																NO	High maintenance and capital cost
Option 5	Box Jacking technique, Underpass																NO	Requires high level of precession and accuracy
Option 6	Cut & Cover, Underpass																NO	Risk of flooding during excavation due to high water table
Structural Option - Pedestrains, Cyclist and Equestrians																		
Option 7	Footbridge with ramps for Pedestrain																YES	Long ramp lengths, unsuitable for disable people.
Option 8	Footbridge with stairs and lift shaft																YES	Cost effective, minimum land acquisition.
Option 9	Footbridge with ramps for Pedestrains, Cyclist and Equestrains																YES	Non traffic route but could friegthen horses during train movement.
Option 10	Subway with ramps																NO	Expensive, possible flooding during construction & max land intake

GREATER CAMBRIDGE PARTNERSHIP

Growing and sharing prosperity

Delivering our City Deal

Report to: Greater Cambridge Partnership Joint Assembly 18 January 2018

Lead officer: Chris Tunstall – Greater Cambridge Partnership

Recommendations from the Ely to Cambridge A10 Transport Study and proposed next steps

1. Purpose

1.1. Transport improvements along the A10 corridor north of Cambridge are a key part of the feasibility of planned housing and employment growth at Cambridge Northern Fringe, Cambridge Science Park, Ely and Waterbeach (collectively around 17,500 new homes and 9,400 new jobs between 2011 and 2031).

1.2. The Ely to Cambridge Transport Study has been funded principally by the Greater Cambridge Partnership to help inform priorities for future funding. The study has now reached the conclusion and its recommendations are coming before the Joint Assembly and Executive Board to be endorsed. The Joint Assembly is asked to comment on the Study's initial findings.

2. Key issues and considerations

Background

2.1. The Ely to Cambridge Transport Study is a wide-ranging multi modal study which has made recommendations on the transport schemes needed to accommodate the major development planned at a new town north of Waterbeach, Cambridge Northern Fringe East (CNFE) and the Cambridge Science Park (CSP). The study has three strands:

- Strand 1 looks at the overall transport requirements on the corridor
- Strand 2 looks at the specific requirements for growth at Waterbeach
- Strand 3 looks at the specific requirements for growth at CNFE/CSP

2.2. The commission has delivered:

- An options study and Strategic Outline Business Case for the overall package of interventions on the Ely to Cambridge corridor, including principles/mechanisms for securing appropriate developer contributions. The Preliminary Strategic Outline Business Case is appended to this report in **Appendix 1.**
- A transport study supported by modelling that identifies the infrastructure package and phasing of that package to provide for the transport demand of the development of a new town north of Waterbeach
- A transport study supported by modelling which provides evidence for the level of development which could be supported in the CNFE/CSP area and its phasing, in transport terms

2.3. The scope of the study was drawn up to incorporate three separate, but interlinked issues; namely the need for a Strategic Planning Document or Area Action Plan for both Waterbeach New Town and the CNFE, hence providing a Transport Evidence Base for Plan Making as required by National Planning Practice Guidance. Early thinking was also required on the requirements of the whole corridor to inform future delivery of delivering the Greater Cambridge 'City Deal'.

Technical work

2.4. Strategic modelling using Cambridgeshire County Council's Cambridge Sub Region model (CSRM2) forms an intrinsic part of the technical work and has taken place in two phases. The first phase tested the effect of development at land north of Waterbeach and new development at CNFE/CSP on the transport network with no mitigation measures except for the most basic enabling measures, such as site access. This phase of the modelling provided a 'red flag' for areas on the highway network that were of concern and where mitigation measures needed to be considered. It also provided a baseline against which the effect of various mitigation measures could be tested.

2.5. The second phase of modelling tested potential mitigation measures. As a starting point, schemes which were already broadly identified in policies set out in the Long Term Transport Strategy and the Transport Strategy for Cambridge and South Cambridgeshire were included, however this was not a constraint.

2.6. A series of mitigation packages were tested, starting with a public transport/active modes package which was then built upon with various levels of highway capacity. The six tests are explained in more detail in section 3.1.

Key issues from the technical work that have informed the study recommendations

2.7. The results from the first phase of modelling highlighted that unsurprisingly, the Milton interchange has an important influence on how traffic behaves on the A10. When all the development was included and based on other assumptions within the model, the results suggest that the following route choices and movements are likely:

- Between the Milton interchange and Waterbeach, traffic flows on the A10 remain relatively stable, confirming that this stretch of the road is already operating at capacity and is unable to carry significantly more traffic.
- From Waterbeach village, and locations further north on the A10, from where people do have a route choice, flows on less appropriate routes south increase, for example through Clayhithe and Horningsea to the east, through Landbeach to the west, and along the B1049 Wilburton-Cottenham-Histon route, as traffic re-routes to avoid the congested A10.
- From the new development north of Waterbeach where motorists don't have a route choice to travel south, vehicles are either joining the back of the queue on the A10, or turning right and heading north before turning west at Stretham then travelling south through Cottenham
- From Ely, traffic flows on alternative routes along the A142 west towards Sutton and east towards Newmarket increase, suggesting that some motorists try to avoid the A10 corridor altogether.

2.8. Further analysis of demand along the route was undertaken to help understand the type of trips that the A10 is used for. This has shown that without the significant development at the new town north of Waterbeach and at the CNFE and CSP, some 79% of trips on the A10 start or finish outside the study area, highlighting the strategic nature of the corridor. Even once these developments are included – which should encourage more local trip-making - this figure remains at about two-thirds. This has an implication for the ability to encourage a shift from car to non-car modes and consequently what proportion of trips might be able to be catered for by non-highway measures.

2.9. To the south of the study area at Cambridge Northern Fringe East and Cambridge Science Park, the modelling work suggests that to unlock further development on these sites a policy of radical parking restraint will be fundamental to making the sites work in transport terms.

2.10. Whilst a package of non-highway measures is necessary in policy terms and has some effect on mitigating the impacts of development, because of the strategic nature of trips on the A10 the modelling work suggests that this does not go far enough and as such, significant investment in highway capacity will also be required.

3. Options and emerging recommendations

3.1. Options modelled for mitigation
As indicated in section 2.6, six mitigation packages were modelled. Table 1 sets out what these packages were.

Table 1: Mitigation packages

Option	Composition of package
Option 1 Mode-shift	Significant investment in cycling/pedestrian routes Segregated public transport route between development north of Waterbeach and Cambridge Bus-based P&R at development north of Waterbeach Relocated railway station Parking restraint at CNFE/CSP
Option 2 Junction improvements	Option 1 PLUS Improvements to eight junctions along the A10, including Milton Interchange
Option 3 North dual	Options 1 and 2 PLUS Dualling of A10 between Ely and development north of Waterbeach to encourage users to use new P&R site
Option 4 South dual	Options 1 and 2 PLUS Dualling of A10 between development north of Waterbeach and Milton Interchange to provide additional capacity on most congested section of route
Option 5 Full dual	Options 1, 2, 3 and 4 Dualling of length of A10 between Ely and Milton Interchange
Option 6 sensitivity test Offline alternative to A10	Options 1 and 2 PLUS New offline route to remove strategic traffic from the A10 and potentially form the southern section of an M11-A47 link

3.2. A separate study has been commissioned by the Combined Authority to consider whether there is a business case for extending the M11 northwards to connect with the A47. Whilst the full route is outside the scope of this study, option 6 has been included as a sensitivity test to investigate the principle of an offline link which could give strategic traffic an alternative to the A10, thus freeing up capacity on the route between Ely and Cambridge. Such a link could potentially form the southern section of a longer M11-A47 link. Due to the geographical limitations of the model, it has not been tested in the same way as the previous five options, however a commentary on the performance of this option is given in section 3.8.

3.3. Initially, each of the options was analysed using the three key metrics from the model outputs: the effect on mode-share, the effect on traffic flow and delay, and the effect on journey time.

3.4. Considering mode-share, all options increase the number of trips on the corridor. The first two options reduce car mode share. However, once more substantial highway improvements are made, the car mode share starts to increase, at the expense of other modes, predominantly rail and active modes. This suggests that new car trips are being induced onto the route. Bus and Park & Ride mode share increase in all options, although little additional benefit is seen beyond Option 2 for the investment that would be required.

3.5. In terms of the effect each option has on flow and delay - compared to what would happen in a scenario without any mitigation measures - flows progressively increase on the A10 and A14 with each option. The increase on these two routes is accompanied in general by decreases in flows on parallel, less desirable routes suggesting that through traffic is being drawn back on to appropriate routes rather than rat-running through villages such as Horningsea, Clayhithe, Landbeach, Cottenham, Histon and Impington. However, in terms of delay, the more flow that starts to arrive in Ely as the options progress, the more delay that is introduced on certain junctions around the city. A full dual option also starts to present further delays at Milton Interchange.

3.6. Journey time has been measured along the A10, between the A10/A142 junction south of Ely and Chesterton Road in Cambridge. In the future scenario with no development at Waterbeach or CNFE/CSP and no mitigation measures, journey times southbound between these two points in the am peak are between 10 and 15 minutes more than in free flow conditions. In the future scenario with development at Waterbeach and CNFE/CSP, the journey time is between 15 and 20 minutes more than in free flow conditions. In the pm peak northbound, for the same two scenarios, the journey time is some 40 minutes greater than in free flow conditions with no development at Waterbeach and CNFE/CSP and around 50 minutes greater with development in these locations.

3.7. None of the options returns traffic flow to free-flow conditions in the morning or evening peaks, however each of the highway options progressively improves upon the end to end journey time in relation to the scenario without any mitigation measures. In the am peak, where the predominant flow is south-bound, only the south dual, or full dual options improve upon the journey times predicted for the future scenario without development and this improvement is less than five minutes. In the pm peak where the predominant flow is north bound, all the highway options improve upon the journey times for this same scenario and are slightly greater than the am peak, between 5 and 10 minutes.

3.8. The results from the offline option (Option 6) do seem to show the scheme has some merit, in that flows decrease on the A10 and most of the routes where rat running was seen in the first phase of modelling. This seems to confirm the analysis that a significant proportion of traffic currently using the A10 is strategic in nature and has an origin and/or destination outside the study area. Regarding journey times in the morning peak towards Cambridge, enough traffic appears to divert onto the alternative route to make journey times on the A10 comparable to the south dual option and better than options 1, 2 and 3, between the two points analysed. In the evening peak heading away from Cambridge however, the modelling suggests that journey times are better with the full dual and north dual options.

Study recommendations

3.9. The study has confirmed the existing policy position that a multi-modal package of measures will be needed for the whole corridor. This will include a package of measures to encourage a mode shift away from car, including a high quality, segregated public transport route between Waterbeach and Cambridge, the relocation of Waterbeach station, significant investment in cycling and walking measures around the new development north of Waterbeach and a new Park and Ride facility.

3.10. Furthermore, whilst not being prescriptive about the level or type of development that is brought forward at CNFE or CSP, the study is clear that the transport characteristics of these significant sites will need to be very different to traditional housing, Science Park or office developments. These will be fundamentally driven by a policy of radical parking restraint.

3.11. The study also confirms that smaller scale highway measures to discourage rat running will be required along parallel routes, as well as improvements to junctions along the A10 in the short term. Finally, the study recommends that to accommodate the significant proportion of strategic trips through the study area, major investment in additional highway capacity along the A10 is made. In the medium term it recommends dualling the southern section, with a view to dualling the northern section in the longer term. This would take a broadly online alignment to the existing A10, although it is acknowledged that some sections would of necessity need to be offline.

3.12. The study also recognises that an offline alignment that potentially forms the southern part of an M11-A47 link has some merit by providing an alternative route for the significant proportion of strategic traffic using the A10. The M11-A47 study will consider this particular scheme further, however more work would need to be undertaken to establish whether there is a business case for both schemes

3.13. The study suggests that the package as a whole, including a full dual of the A10 could cost upwards of £500 million reflecting the level of investment that is considered necessary to accommodate the development aspirations in the area. This does not include a cost for the offline western option. Further work on each aspect of the recommendation will be required to progress any scheme through the next phases of feasibility, decision-making and delivery. Given the breadth of the recommendations and the level of investment required, a multi-agency approach is needed to progress the recommendations in a cohesive and joined up way.

Recommendations to the Executive Board

3.14. Since the Ely-Cambridge Transport Study was commissioned, the political structure in Cambridgeshire has changed significantly with the formation of the Cambridgeshire and Peterborough Combined Authority. Whilst the Greater Cambridge Partnership has substantially funded the study, given the geographic coverage of the recommendations, it is considered appropriate that from this point forward the Combined Authority should have the responsibility for approving the recommendations and taking them forward for consultation. However, in terms of delivery, some elements of the package may be best delivered by other bodies, including the Greater Cambridge Partnership, Cambridgeshire County Council, the district councils or the private sector. GCP could then take forward those proposals identified in Option 1, specifically walking, cycling and public transport improvements. Specifically aligning the public transport improvements with the funding of the Cambridge Mass Rapid Transit Options Appraisal findings.

3.15. Given the analysis that has been undertaken through the study, it is clear that a multi-modal package of measures is needed to accommodate the development aspirations set out in the Local Plans for this area. The recommended package consists of a combination of demand-side measures to minimise the need to travel and to maximise trips by non-car modes, coupled with supply side measures to alleviate the residual highway impacts of car trips, as set out in section 3.9. Therefore, the officer recommendation that will be made to the Executive Board is that the package recommended by the Ely-Cambridge Transport Study should be endorsed and commended to the Cambridgeshire and Peterborough Combined Authority for approval. Furthermore, officers will also be recommending that the Executive Board support the proposal that the Combined Authority begins preparations to consult on the recommendations in summer 2018, once the purdah period has ended.

4. Next steps and milestones

Progression of business case work

4.1. The recommendations from the study concludes the research phase of the work. In order to conclude the DfT's WebTag Stage 1 Option Development, there is a need for work to roll forward into the feasibility phase, which includes:

- Consulting on initial options set out in this study
- Developing options in further detail
- Further consultation on the detail of developed options

4.2. If the proposal to consult on the recommendations from the study in the summer of 2018 is approved, the results from this will then be used to inform and shape the development of options in more depth. It is suggested that alongside preparations for the consultation, joint consideration is given to which bodies might be best placed to deliver the various elements of the package, in order that the next phase of feasibility work can begin once the consultation is complete.

List of appendices

Appendix 1	Preliminary Strategic Outline Business Case
Further technical documents	To review related technical report, please refer to the documents section on the following web page: https://www.greatercambridge.org.uk/a10elytocambridge

Ely to Cambridge Transport Study

Preliminary Strategic Outline Business Case

January 2018

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Executive summary

The role of the Ely to Cambridge area in the Cambridgeshire economy

This report sets out the findings of a transport study into the transport network linking Ely and Fenland to Cambridge and the strategic transport network in the county of Cambridgeshire.

The A10 Primary Route and the parallel Cambridge to Kings Lynn railway line are the main transport links between Ely and Cambridge. They provide for travel between Fenland, East Cambridgeshire, West Norfolk and Cambridge, and directly serve a number of key centres of economic activity on the northern fringe of Cambridge and on the routes themselves.

The Cambridge Science Park and neighbouring innovation centres and business parks on the northern fringe of Cambridge are home to an exceptionally high-performing cluster of high-tech and knowledge-based businesses which have benefited from close associations with the University of Cambridge and generate Gross Value Added well in excess of national and county averages.

Capacity constraints threaten further growth

Because of their position linking these employment sites to residential areas in Ely and beyond, the road and rail links in the study area are already very busy, particularly at peak times, when there is extensive congestion. There is limited capacity to accommodate further travel demand on this key corridor, which will impede further economic and housing growth if not addressed.

To support the continued success and growth of the high tech and knowledge-based cluster, more employment floorspace close to the existing sites is needed, as is affordable housing for those working in these businesses. The lack of employment space and affordable housing constrain further growth of the cluster.

Employment constraints reflect the natural growth of existing businesses occupying additional space allocated in designated science and business parks. Meanwhile the housing constraint reflects both national trends towards increasing housing costs and also the relative affluence of those working in these businesses, which (in the context of limited supply) has pushed house prices in and around Cambridge to very high levels.

The need to address these constraints

Given local and national policies supporting further growth of the Cambridge area's strongly performing economy, there is a pressing need to address these constraints.

Accordingly, local planning policy is supportive of a programme of significant development of both employment land and residential land, focused on the southern end of the Ely to Cambridge study area where the main existing economic activity is located, and extending northwards to Ely, taking advantage of the availability of relatively large tracts of brownfield and undeveloped land.

The key sites for this development are at a new town north of Waterbeach, at the Cambridge Science Park, on the Cambridge Northern Fringe East and at sites around Ely. Between them, these developments could bring up to 17,000 new homes and 14,000 new jobs.

Without further investment to manage and accommodate new travel demand, the increased volume of travel which arises from these developments will exacerbate congestion and crowding problems which are apparent today, and will displace traffic onto less suitable parallel routes.

There is therefore a need to develop and deliver a package of transport measures both to address the problems experienced today and to manage the impacts of growth.

Objectives to inform option development and assessment

A series of objectives have been agreed, distilling the key challenges and opportunities identified through this transport study. They also reflect:

- the high-level policy requirements set out in the Transport Strategy for Cambridge and South Cambridgeshire, the Third Cambridge Local Transport Plan, and the Cambridgeshire Long Term Transport Strategy, and
- the detailed policy position set out in the Cambridge and South Cambridgeshire Local Plans and the transport strategies in relation to the new town north of Waterbeach and developments on the Cambridge Northern Fringe.

The objectives seek to:

1. Maintain traffic at or below 2011 traffic levels in Cambridge
2. Minimise vehicle mileage whilst providing for increased travel demand
3. Improve reliability, capacity and speed of alternative transport modes
4. Minimise potential impact on alternative "rat-runs" to the A10
5. Intercept or substitute car trips with alternative transport modes
6. Address transport demand from the new town north of Waterbeach
7. Enable development in the Cambridge North Fringe East/Cambridge Science Park to proceed

Developing options for assessment

This study has assessed options to reduce highway travel demand and options which assist in accommodating increased travel demand as sustainably as possible. A key finding is that the level and management of parking space at the development sites will be critical, and parking standards for key employment sites will need to be reviewed.

In conjunction, this study has assessed progressively greater levels of transport investment – initially testing in isolation measures aimed at encouraging a shift from car use to public transport, walking, and cycling, and subsequently testing these in conjunction first with junction improvements along the A10, and finally with the implementation of dual carriageway standards on the South, North, and full A10 corridor between Ely and Cambridge.

The packages of transport measures that were developed for assessment are:

- **Mode-shift (DS1) – indicative cost, £150 million**
  Minimal highway network improvements providing only for direct access to the development sites, and measures to encourage mode shift to non-car modes of transport, including:
  - a relocated Waterbeach railway station serving both the village and the new town,
  - segregated public transport links between the new town at Waterbeach and Cambridge, and park and ride capacity at the new town to intercept trips into the city,

  - a comprehensive pedestrian and cycle network serving the new town and linking it to Cambridge and neighbouring villages, and
  - Parking restraints and travel planning measures at all of the major development sites.
- **Junction+ (DS2) – indicative cost, £225 million**
  Mode-shift option measures from DS1, and additionally, improvements to provide additional capacity at junctions on the A10 between Ely and Cambridge.
- **North-dual (DS3) – indicative cost, £415 million**
  Mode-shift and Junction+ measures from DS1 and DS2, and additionally, the provision of a dual carriageway route, on an alignment to be determined, between the new town north of Waterbeach and Ely
- **South-dual (DS4) – indicative cost, £310 million**
  Mode-shift and Junction+ measures from DS1 and DS2, and additionally, the provision of a dual carriageway route, on an alignment to be determined, between the new town north of Waterbeach and the A14 at the Milton Interchange.
- **Full-dual (DS5) – indicative cost, £510 million**
  Mode-shift and Junction+ measures from DS1 and DS2, and additionally, the provision of a dual carriageway route, on an alignment to be determined, between Ely and the A14 at the Milton Interchange.

A key finding is that while the mode-shift options without highway improvements provide additional travel capacity and have significant benefits, they do not substantially address the congestion and traffic displacement issues identified. Options with highway improvements are more effective in addressing these issues.

Costs and Benefits

Options involving substantial highway improvement and capacity enhancement works entail higher capital costs; fully upgrading the A10 between Ely and Cambridge to dual carriageway standard has the highest capital cost of all interventions that have been assessed.

However, those same options also deliver greater levels of benefit, and all packages assessed generate sufficient benefits to more than outweigh the estimated cost of implementation, and are assessed as providing ‘high value for money’.

The best value for money was derived from the mode shift and Junction + option (DS2), which generated a benefit to cost ratio (BCR) of 3.6 to 1. The next best value for money was the upgrading of the southern stretch of the A10 from Waterbeach to Cambridge to dual carriageway, together with mode shift measures, which delivered a BCR of 3.2 to 1. The greatest level of benefit was generated by the full upgrading of the A10 from Ely to Cambridge, which generated benefits at present value of some £760m over the lifetime of the scheme, at a BCR of 2.8 to 1.

The costs noted for the tested packages are indicative, and at this stage of the business case process, are not based on specific scheme designs. More refined scheme costs would emerge as part of further scheme development. Similarly, the assessment of benefits would also be refined, and would bring in consideration of wider economic benefits.

Commercial and Management cases

At this stage in the development of measures to support the growth in the study area, it is sufficient to note that there are a variety of routes through which the eventual scheme(s) could and would be procured, and that Cambridgeshire County Council has experience of successfully delivering substantial infrastructure schemes and has robust governance in place for such undertakings.

Conclusions

A joined-up strategy is required that seeks to introduce both demand and supply-side measures in and around the study area to cater towards all modes of transport and ensure that potential issues are mitigated. Mechanisms should be put in place to secure developer funding to deliver, or substantially contribute towards the strategy, thus ensuring that adverse transport impacts are mitigated. The recommended strategy has been divided into three stages;

1. Policy, Planning and Regulation

A demand management approach should be adopted for development and applied to planning applications for proposals in, and impacting, the corridor, whereby development should:

- Minimise external vehicular trip generation through maximising trip internalisation
- Provide significantly lower levels of car parking than has traditionally been provided, particularly at employment locations
- Promote a site-wide approach to car parking management to reduce the need for significant increases in car parking provision
- Promote the use of non-car modes through appropriate investment in supply-side measures and aggressive travel planning to encourage the required mode shift

Acceptable and stretching highway ‘trip budgets’ should be identified for each site and permission for continued stages of development should be made contingent on the ability of the developers to demonstrate their sites are meeting these targets through effective promotion of non-car-mode take-up and site-based demand management. Developers might be able to accelerate the phasing of their sites should they be able to demonstrate that their sites are hitting targets for car trips and are not exceeding an agreed budget. This would encourage effective promotion of non-car-mode take-up to free up “headroom” for further development.

2. Delivery of multi-modal “quick wins”

The recommended strategy requires sequential delivery of “quick wins” – comprising public transport, pedestrian and cycle enhancements and active parking restraint to promote mode shift away from the private car, and a series of prioritised on- and off-line localised highway improvements to create capacity for additional trips and manage potential re-assignment of trips onto less suitable routes.

The recommended non-private car strategy is for:

- early implementation of the cycle measures,
- a relocated railway station at Waterbeach and
- early progression of the segregated public transport corridor from Waterbeach to Cambridge’s Northern Fringe, together with park and ride provision at the new town.

Implementation of the non-highway proposals alongside ambitious travel planning for new and existing communities in the corridor could create some headroom for early, moderate scale, development at Waterbeach and at Cambridge Northern Fringe East and the Cambridge Science Park.

Options for junction improvements and other localised highway capacity improvements should be developed for early implementation. Targeted improvements at junctions along the A10 itself will lead to some improvements in conditions and reduce traffic rerouting elsewhere. These improvements should be accompanied by measures to discourage use of less suitable parallel routes including the B1049 and B1047.

3. Longer-term major highway interventions

Model-based analysis shows that the above "quick wins" alone will not mitigate more significant development-related growth, nor substantially address existing or future congestion.

Beyond the investments noted above, this study indicates that there could be significant additional transport benefits from providing increased carriageway capacity in the Ely to Cambridge corridor, and that this will be required to mitigate both longer-term background growth in travel demand and more significant proposals for development, particularly at the new town north of Waterbeach.

The initial study work suggests that, subject to more detailed work including examining environmental and operational impacts further, provision of increased carriageway capacity would represent a high value for money investment. This provision might be in the corridor itself, or on an alternative corridor if such an alignment were shown to remove a significant proportion of longer distance/through-traffic from the A10, or potentially through improvements to both.

Next steps

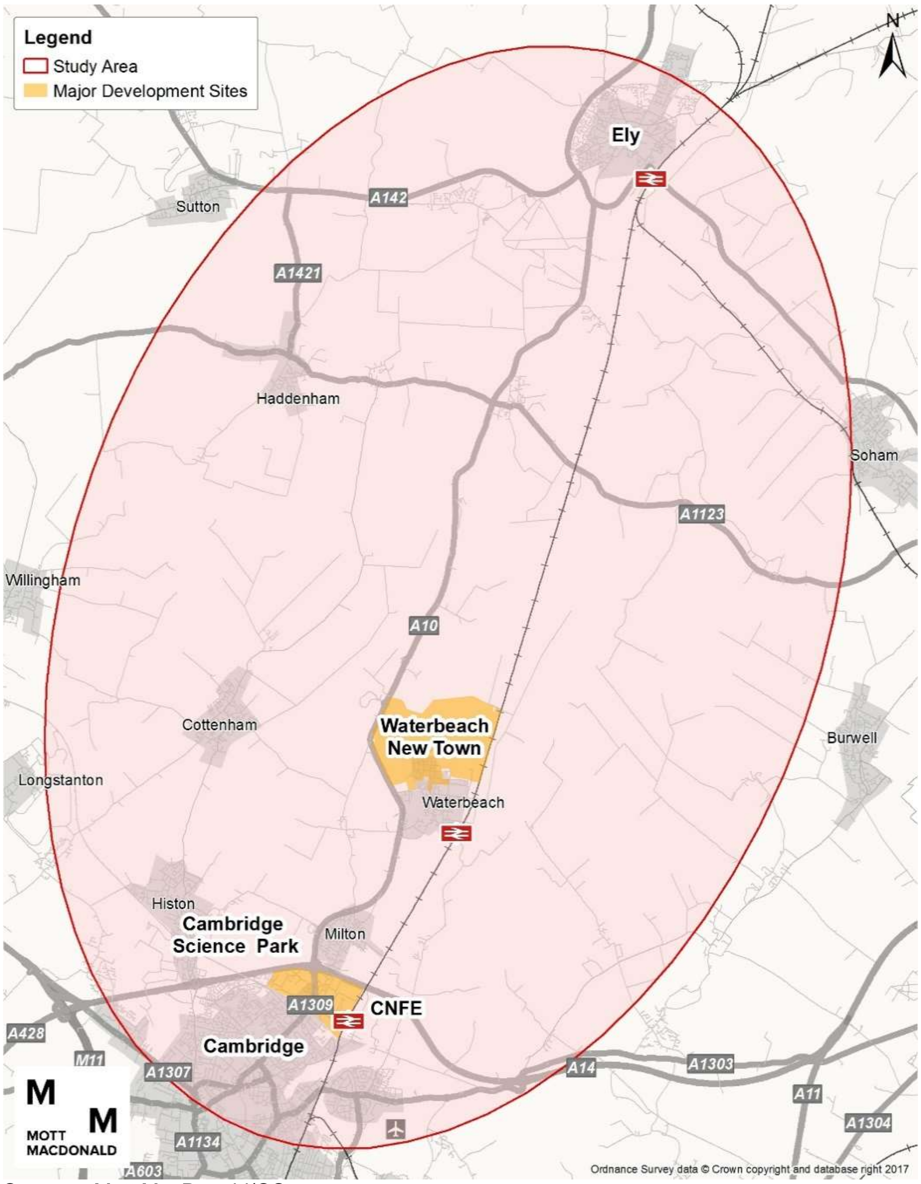
Further work will be needed to develop the case and options for intervention to support growth in the A10 corridor, and it is recommended that detailed follow-on studies are undertaken for the key elements of each package to refine the options and develop business cases for those investments. Thought will also be needed as to how to secure appropriate contributions from developers towards these strategic interventions.

1 Introduction

1.1 Headline Description

The Ely to Cambridge study area comprises the A10, a key north-south link in the Cambridgeshire highway network, and the parallel Cambridge to Kings Lynn railway line. The A10 is part of the Primary Route Network with the section in the study area being of single carriageway standard, linking the A14 Milton Interchange in the south to the A142 roundabout to the north at Ely. It passes adjacent to the villages of Milton, Landbeach, Waterbeach and Stretham. The study area is illustrated in Figure 1.

Figure 1: Indicative Ely to Cambridge Transport Study Area



Source: Mott MacDonald/OS

Currently, the route is subject to queueing and delays in peak times. These issues will be compounded in future years with further population, employment and traffic growth, and via development proposals at locations including Ely, at Waterbeach and on Cambridge's Northern Fringe.

The corridor is a focus for growth with strategic sites and other development anticipated in the study area up to 2031 and beyond. The Transport Strategy for Cambridge and South Cambridge (TSCSC) identifies a number of potential transport interventions in this corridor across the two districts which will provide for the transport demand associated with high levels of employment and population growth.

This Preliminary Strategic Outline Business Case (SOBC) sets out the case for interventions to address problems in the Ely to Cambridge study area. It represents the first stage of scheme appraisal and development, and as such will focus on establishing what the best transport strategy for the corridor will be, based on the assessment of differing levels of intervention.

1.2 Scheme Background

Mott MacDonald has been commissioned by Cambridgeshire County Council (CCC) on behalf of the Greater Cambridge Partnership to deliver the Ely to Cambridge Transport Study.

This important rail and primary route highway corridor provides one of the main links between Cambridge, its north eastern sub-region, including Ely, and beyond. It is also the focus of significant planned future development, with the Waterbeach New Settlement and the Cambridge Northern Fringe East (CNFE) and Cambridge Science Park (CSP) sites being the potential future location for significant residential and employment development. These key elements are shown in the indicative study area plan above.

As specified in the study brief, the outputs of the study are:

- An Options Study and Strategic Outline Business Case for the overall package of interventions between Ely and Cambridge, including development of principles/mechanisms for securing appropriate developer contributions.
- A Transport Study, supported by modelling, that identifies the infrastructure package and phasing of that package to provide for the transport demand of the development of a new town north of Waterbeach.
- A Transport Study, supported by modelling, which provides evidence for the level of development which could be supported in the CNFE and CSP areas and their phasing, in transport terms.

This report comprises the first output of the study listed above.

1.3 Report Structure

This report has been aligned with DfT's 'The Transport Business Cases' guidance, which sets out the 5-case structure for demonstrating the viability of transport proposals. These include:

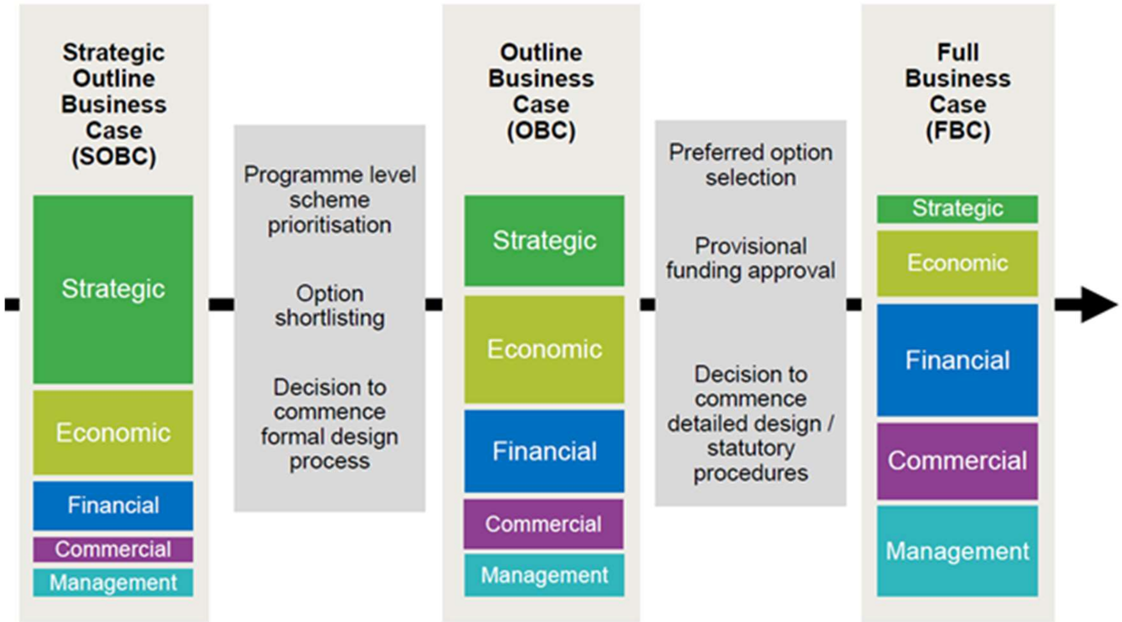
- Strategic Case
- Economic Case
- Financial Case
- Commercial Case
- Management Case

As the projects evolve, each of the cases is developed in further iterations of the Business Case documentation. These are:

- Strategic Outline Business Case (SOBC): Outlines the need for intervention in the context of established policy and current/future network issues. Undertakes a high-level appraisal of options that address locally developed objectives and a high-level strategy for delivering the interventions.
- Outline Business Case (OBC): Updates and builds upon the evidence base developed in the SOBC to incorporate a more detailed appraisal of intervention options focusing on estimating the likely performance and impact of intervention(s) in sufficient detail.
- Full Business Case (FBC): A further update of the OBC which considers the deliverability and management of the preferred intervention into the construction phases.

The relative level of input required at each phase is illustrated in Figure 2.

Figure 2: Summary of Business Case Development



This report acts as a precursor to full SOBC reports that will be required for individual schemes and measures and consequently is titled a Preliminary SOBC. The purpose of producing a report at this stage is to identify appropriate transport packages that can be implemented on the Ely to Cambridge Corridor. It is recognised that early option development forms a key part of the business case process and therefore a preliminary appraisal of five transport packages has been undertaken in this report to inform the ongoing development and delivery of a transport strategy for the Ely to Cambridge study area.

The contents of this report, alongside a summary of each part of the report is set out below in Table 1.

Table 1: SOBC Contents

Business Case Element	Report Sections	Description
Introductions	Section 1	Introduction to report structure and study area
Strategic Case	Section 2	Definition of the need for intervention and summary of option appraisal, based on evidence from policy, socio-economics and transport modelling
Financial Case	Section 3	Quantification of financial requirements for delivering the interventions
Economic Case	Section 4	Quantification of the benefits of interventions to counterbalance the cost of investment
Commercial Case	Section 5	Description of potential procurement and contractual arrangements required to deliver interventions
Management Case	Section 6	Outline of potential governance structures and project processes/interfaces required to deliver interventions.
Summary and Conclusions	Section 7	Outline of key findings and next steps

Source: Mott MacDonald

2 Strategic Case

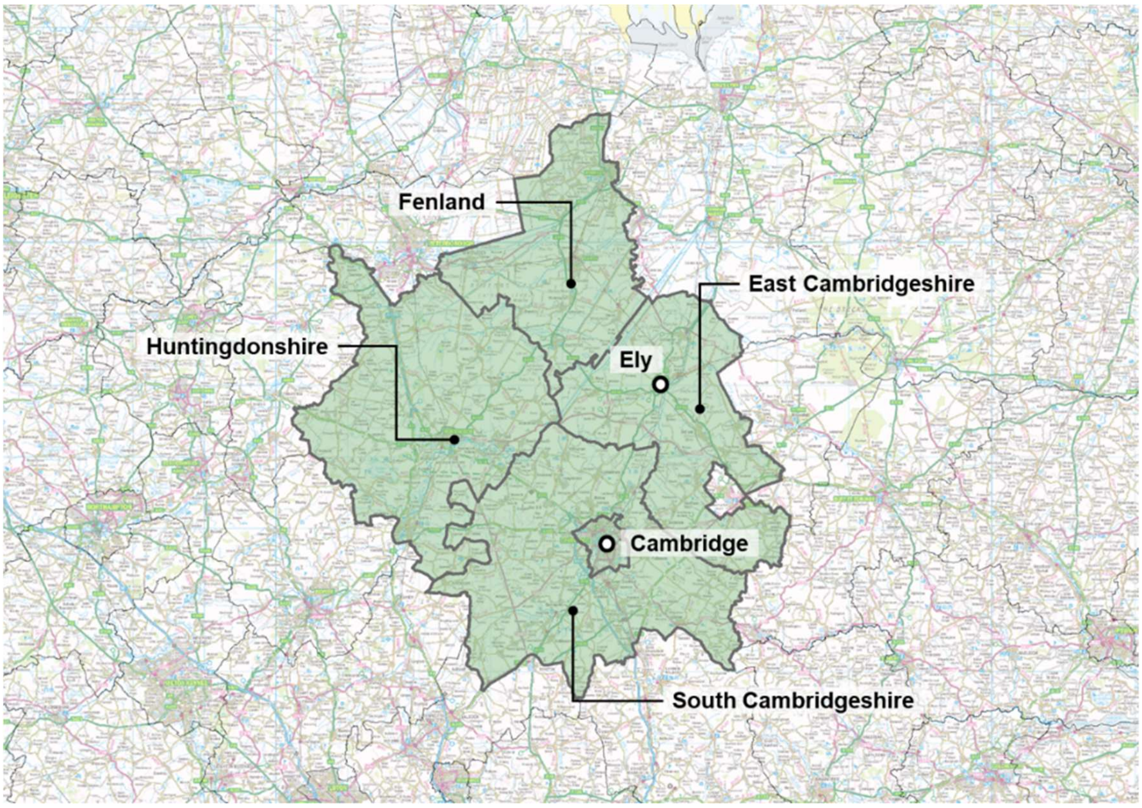
The purpose of the Strategic Case is to provide a wider narrative of the issues and opportunities in the study area that demonstrate a need for intervention. It then identifies five potential packages of interventions that could be adopted, and highlights the key findings from traffic modelling undertaken for each option. This section is based on a more detailed analysis and identification of problems and opportunities on the corridor included in an accompanying Evidence Base Report.

2.1 Economy and Population

The City of Cambridge: the engine of the Cambridgeshire economy

Together, the five districts of Cambridgeshire are home to a population of some 650,000 (647,000 in 2015). Nearly a quarter of these live in the Cambridge area in the south of the county. The boundaries of the county's districts are highlighted in Figure 3 below.

Figure 3: Cambridgeshire Authority Boundaries



Source: Ordnance Survey

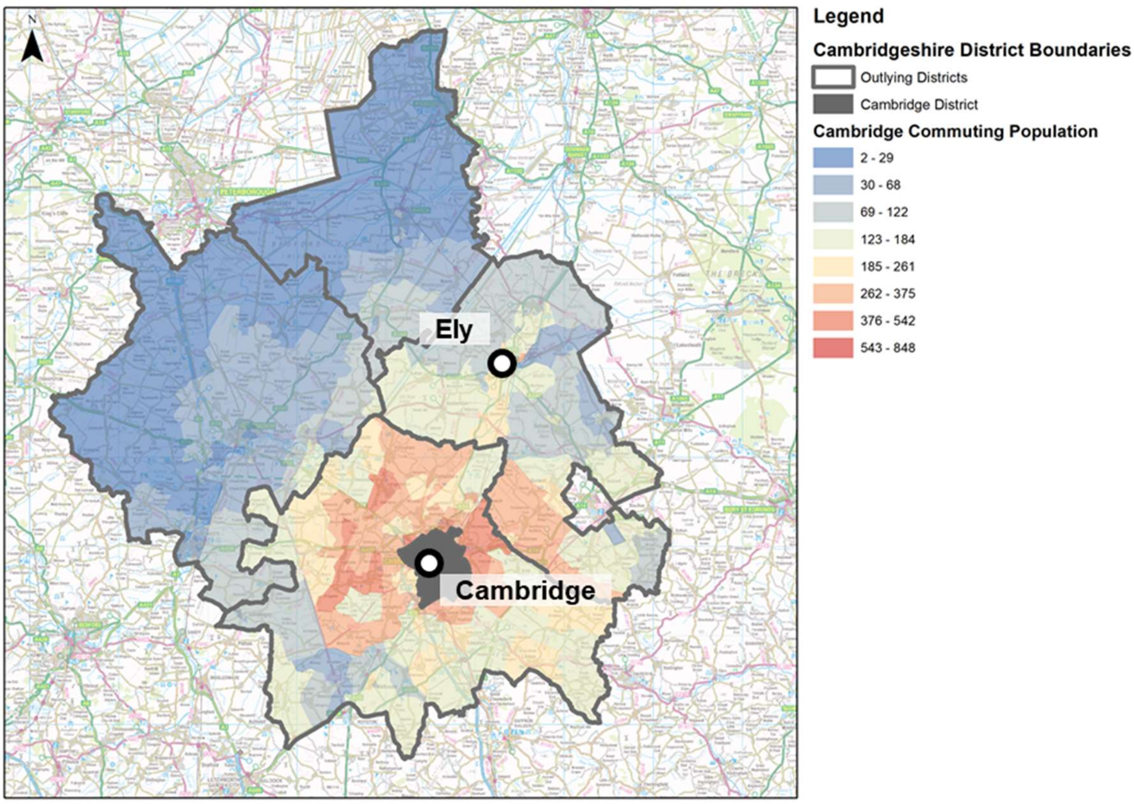
Cambridge is both the geographical and the functional heart one of the UK's most economically important areas, and also serves as the county's administrative centre. It is the site of the world-leading University of Cambridge and Anglia Ruskin University, and possesses a thriving knowledge economy. As well as being a major employer in its own right, the university sector generates associated business activity of exceptionally high value through spin-off technology enterprises located at the science and business parks located to the north of the city and in South Cambridgeshire, at the Cambridge Biomedical Campus to the south of the city, and at other locations in the sub-region.

These digital and life science businesses make Cambridge a major centre for employment in the technology sector across the UK, and indeed across Europe, with major businesses such as Acorn Computers (and the related microprocessor designer ARM), Solexa, Raspberry Pi, and Darktrace having emerged there since the late 1970s, and global tech companies such as Amazon and Apple establishing a presence in the city. Beyond science and technology, Cambridge has a strong business and management sector which has grown up around the universities and the cluster businesses.

As a result of all this activity layered on top of the many jobs traditionally associated with the day-to-day functioning of a major urban centre, Cambridge is home to by far the largest share of the jobs in Cambridgeshire, with a ratio of 1.2 jobs to every working age resident[1] (a statistic which includes the resident student population, many of whom do not in fact participate actively in the labour market). Accordingly, many of those employed in and on the fringes of Cambridge live in surrounding areas and travel some distance to their places of work.

This pattern is clearly visible in Figure 4 below, which shows how large numbers of people from across South Cambridgeshire and parts of East Cambridgeshire (notably northwards along the Ely to Cambridge corridor) commute to the Cambridge.

Figure 4: Population commuting to the Cambridge



Source: Ordnance Survey/NOMIS

[1] NOMIS data

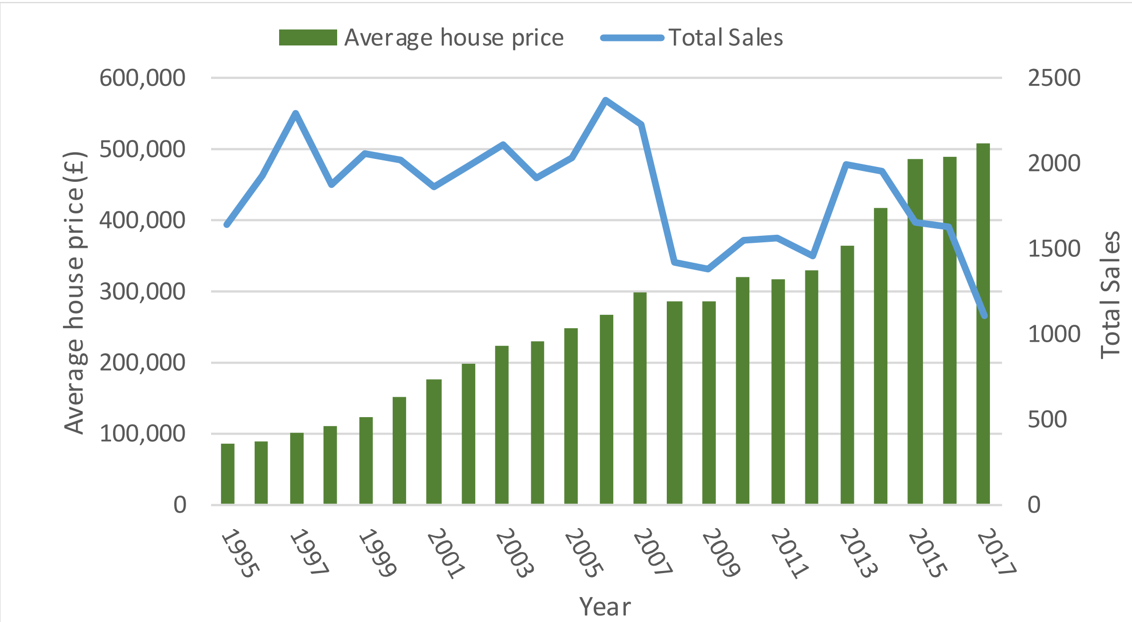
Beyond Cambridge, there is a ring of towns – St Neots, Huntingdon and St Ives in Huntingdonshire, Ely in East Cambridgeshire, Newmarket and Haverhill in Suffolk, and Royston in Hertfordshire, from which sizeable numbers of those living find employment in Cambridge. The same is true of the many smaller settlements across particularly the southern parts of Cambridgeshire.

Escalating demand for housing and the City's growing labour catchment

Over the last two decades, the strong economic performance of the Cambridge area has created many jobs of very high value (with GVA per head around £45,000 compared to between £22,000 and £28,000 across the rest of the county and around £25,000 across the UK as a whole). Consequently, it has attracted a large and affluent workforce. These successes have rightly been widely celebrated, but alongside its many positive impacts, growth has nonetheless contributed to a situation in which house prices have risen much faster than inflation over the past twenty of more years.

Figure 5 below illustrates an upward trend since 1995 which saw the average house price in Cambridge City climb from under £100,000 to some £500,000 in 2017, while the volume of sales fell over the same period. This is strong evidence of increasingly intense competition among a growing number of (increasingly affluent) would-be purchasers for what is effectively a fixed supply of housing, with those on lower income being priced out of the Cambridge housing market.

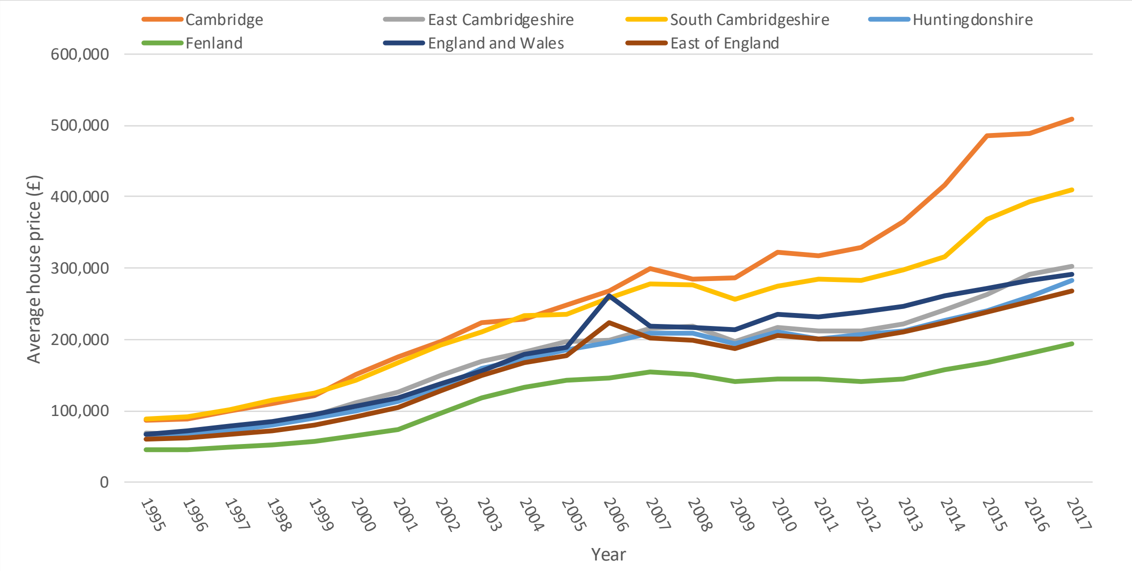
Figure 5: House prices and sales in Cambridge City, 1995-2017



Source: HM Land Registry

Figure 6 below makes clear that this is a particular problem in Cambridge and South Cambridgeshire; prices here have grown by between £300,000 and £400,000 since 1995, while prices in Fenland have risen by around £150,000.

Figure 6: House prices by district, regions and nations, 1995-2017



Source: HM Land Registry

The travel to work catchment for Cambridge has increased markedly, such that it is now not uncommon to commute to Cambridge from towns and villages around Norfolk, Suffolk, Hertfordshire, Essex, and even the north of London – while at the same time, the numbers of people commuting from the surrounding districts of Cambridgeshire which have always supplied the City with workers also continue to grow.

As the following section will make clear, the trend towards more and longer-distance commuting from within and beyond Cambridgeshire has led to increased pressure on the radial highway and public transport connections into Cambridge, leading to increases in journey times, reductions in journey time reliability, and increases in crowding.

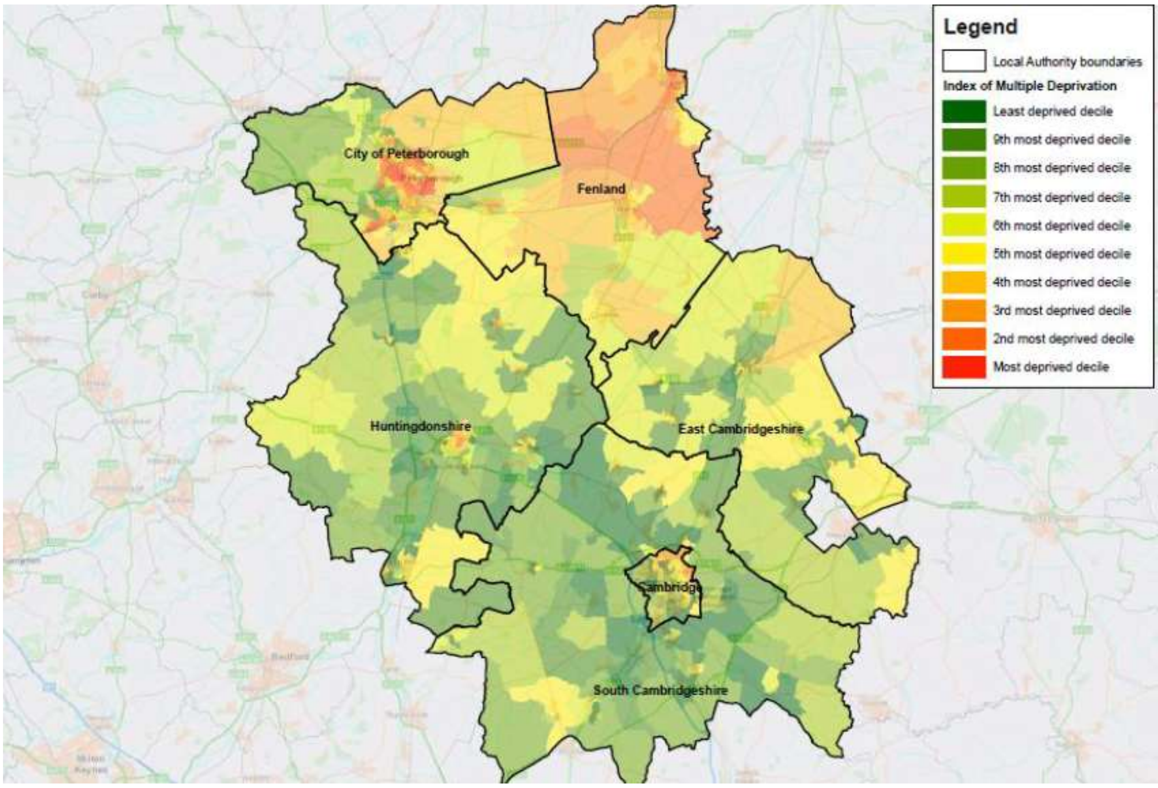
These issues not only lead to frustration and delay for those travelling in the affected areas, but at the extreme, an inability to efficiently deliver employees to their places of work may also threaten the county's otherwise strong prospects for growth.

The availability of affordable housing has caused difficulty for employers to recruit suitably qualified employees who may be required both to commute long distances, and also to locate in parts of the county which offer fewer of the conveniences such as ready access to high quality public transport, which are on offer closer to the urban core of Cambridge City.

Ultimately, if the cost of suitable accommodation in areas with sufficient transport connections and amenities becomes prohibitive within the context of the wages that businesses in Cambridge and the surrounding areas of South Cambridgeshire are able to pay, then businesses may find themselves unable to recruit appropriately qualified staff.

A further issue is the wide disparities between life outcomes which are found across different parts of Cambridgeshire. Fenland and East Cambridge, for example, lag well behind the Cambridge city average for incomes, and have rates of multiple deprivation far in excess of those in most other parts of the county, as illustrated in Figure 7 . Local policy seeks to ensure that these areas are able to share in the success of the activity clustered in and around Cambridge.

Figure 7: Indices of Multiple Deprivation across Cambridgeshire & Peterborough



For all these reasons, the identification of suitable locations for development of both residential and employment space, coupled with an effective strategy for delivery of supporting infrastructure is a key objective of the emerging Local Plans. Significant levels of development are proposed in the study area, including the proposed new settlement north of Waterbeach, where there are opportunities to focus growth along with the necessary infrastructure. The Local Plans were prepared in parallel with the Transport Strategy for Cambridge and South Cambridgeshire, which established the transport interventions that would be necessary to support growth. This includes measures to provide access to developments by walking and cycling, public transport, and to address highway impacts.

Clearly however, to ensure that growth is not simply accommodated at the expense of problematic deteriorations in travel conditions, development will need to be carefully planned, and supported by an appropriate strategy for transport.

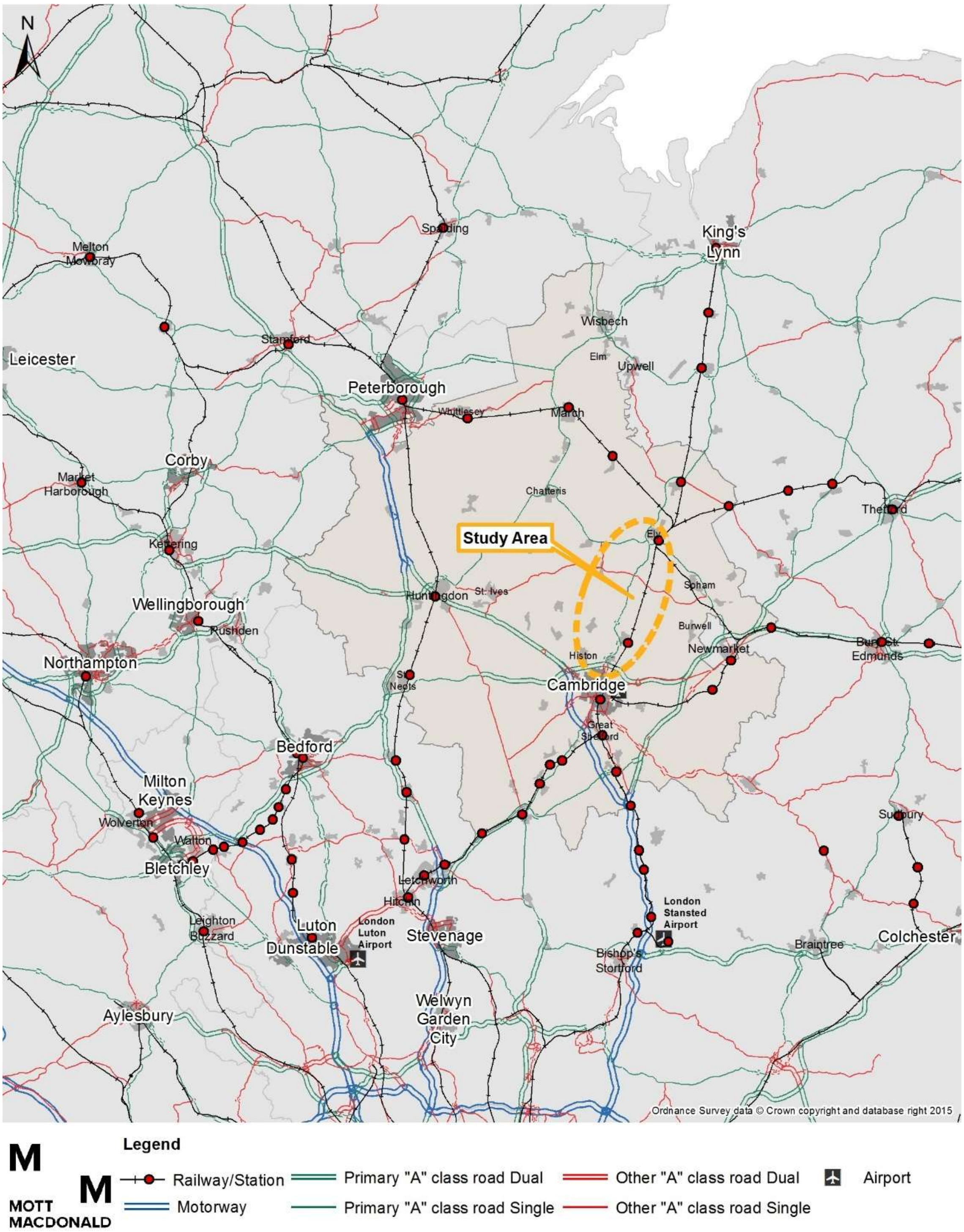
2.2 Transport

Strong transport connections link Cambridge to the county beyond

In view of its role as the county's main area of economic activity, and the trend towards commuting from outlying areas, the transport connections between Cambridge and other towns and settlements within and beyond Cambridgeshire are clearly of very significant strategic importance to the effective functioning of the entire county.

These links ensure that key employment zones can be readily reached by those living in the county at large, as well as by those living within the city and its immediate surroundings. The map below highlights the railway, busway, and main road connections in the county.

Figure 8: Cambridgeshire's strategic transport network



Source: Ordnance Survey

As is apparent from the map in Figure 8, the county is relatively well served by fixed public transport infrastructure. Several routes converge at Cambridge station, which lies just to the south east of the city centre. These provide direct regional links to Peterborough, Kings Lynn, Norwich, Ipswich, Stevenage, Newmarket, Ely, March and Stansted Airport, as well as frequent services to London Liverpool Street and London Kings Cross, and an hourly service to Birmingham. Cambridge railway station is the busiest in the East of England and was used by almost 11.5 million passengers in 2016/17.

Cambridge is further served by Cambridge North station, located approximately 3km to the north east of the city centre. This new station opened in May 2017 and serves travellers living nearby, as well as allowing access from across the county and beyond to employment opportunities at Cambridge Science Park, and the Cambridge Business Park, both of which are close at hand.

The Cambridgeshire Guided Busway (which also provides a connection to St Ives, the new town of Northstowe, and intervening villages) also calls at Cambridge North station, along with a number of local bus services. The station is well-placed for access by bike and on foot and includes parking for 1,000 cycles. The station also incorporates some 450 parking spaces, supporting park and ride journeys from across the surrounding area.

Ely Station, some 25km north of Cambridge, is a hub for trains running to destinations including Cambridge, Stansted Airport, London, Ipswich, Norwich, King's Lynn, Peterborough, Leicester, Birmingham, Nottingham, Sheffield, Manchester and Liverpool. It also provides interchange for a number of intermediate local stations.

Highway connectivity across the county is underpinned by a network of strategically important roads, many linking Cambridge City to important locations nearby – the M11 to Stansted Airport and London, the A14 to Huntingdon and Newmarket, the A10 to Ely and Royston and the A428 to St Neots.

The A10, M11 and the A14 to Newmarket all run broadly in parallel with a rail route. The A10 is single carriageway road. The M11, A14 and A428 are motorways or dual carriageway A-roads and form part of the national Strategic Road Network.

Most sizeable settlements within Cambridgeshire have at least one A-road connection to the highway network. Supporting this is a network of direct connections which link the settlements around the county to one another via lower capacity routes.

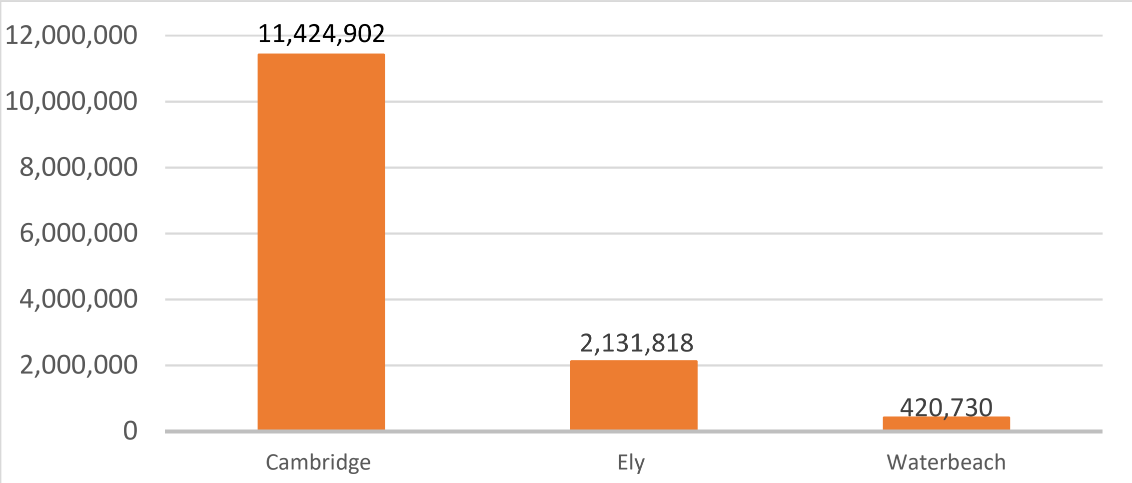
2.2.1 Rail

High and growing levels of demand, and performance issues on key corridors

Based on data from the Office of Rail and Road (ORR), the following figures compare total passenger entries/exits at Cambridge, Ely and Waterbeach in the study corridor. Cambridge North Station opened only recently in May 2017, and was used by around 2,500 people in its first week of opening. This had grown to around 5,000 people a week by September 2017.

Figure 9 shows that Cambridge station serves over five times as many passengers as Ely station, and nearly thirty times as many passengers as Waterbeach station.

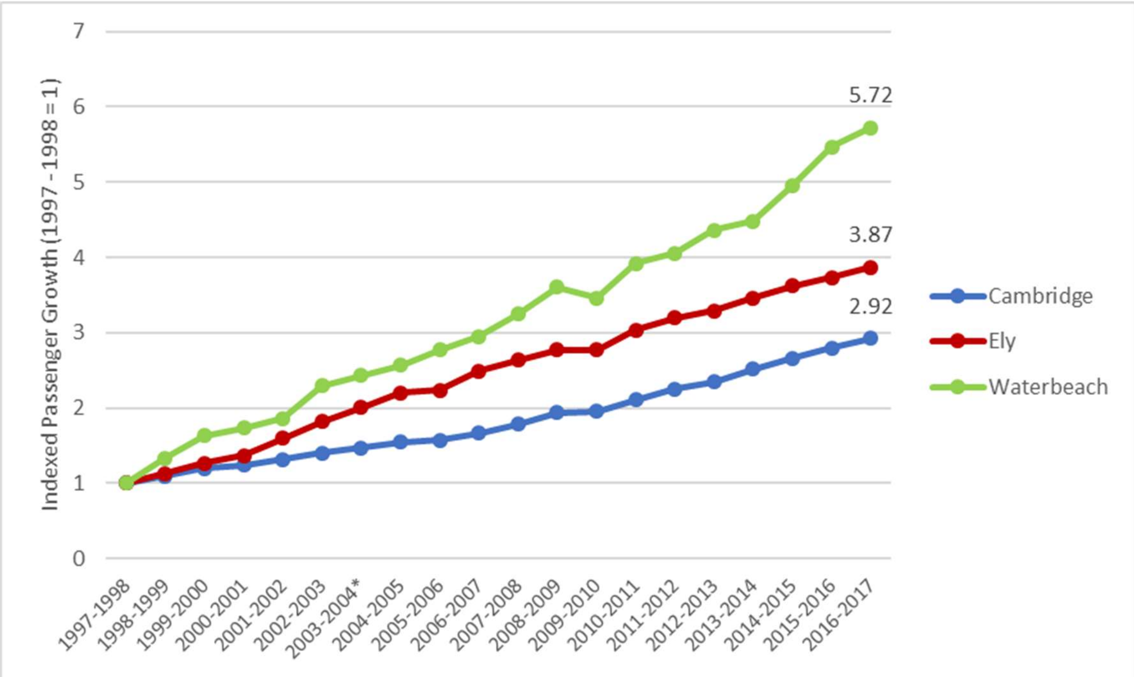
Figure 9: Total 2016/17 annual passenger entries/exits per station on study corridor



Source: ORR data

Figure 10 below shows growth of passenger numbers at each station relative to each station's 1997/98 level of passenger throughput.

Figure 10: Indexed growth in passenger throughput at each study area station



Source: ORR data (2003 - 2004 figures estimated due to ORR data excluding that year)

This shows that all stations have experienced significant growth in passenger numbers since 1997-98, exceeding the averages for the East Region and for England over the same period. Growth has been proportionately greatest at Waterbeach station, which now handles over five times as many passengers as it did in 1997/98, while Ely is approaching a fourfold increase. While Cambridge station has grown the least, in proportional terms, in absolute terms the growth it has experienced represents an increase of over seven million passenger entries/exits per year on a 1997/98 base of around four million – a very substantial increase indeed.

This growth is naturally reflected in increased loading of individual train carriages, and in peak periods there are substantial levels of crowding on key services.

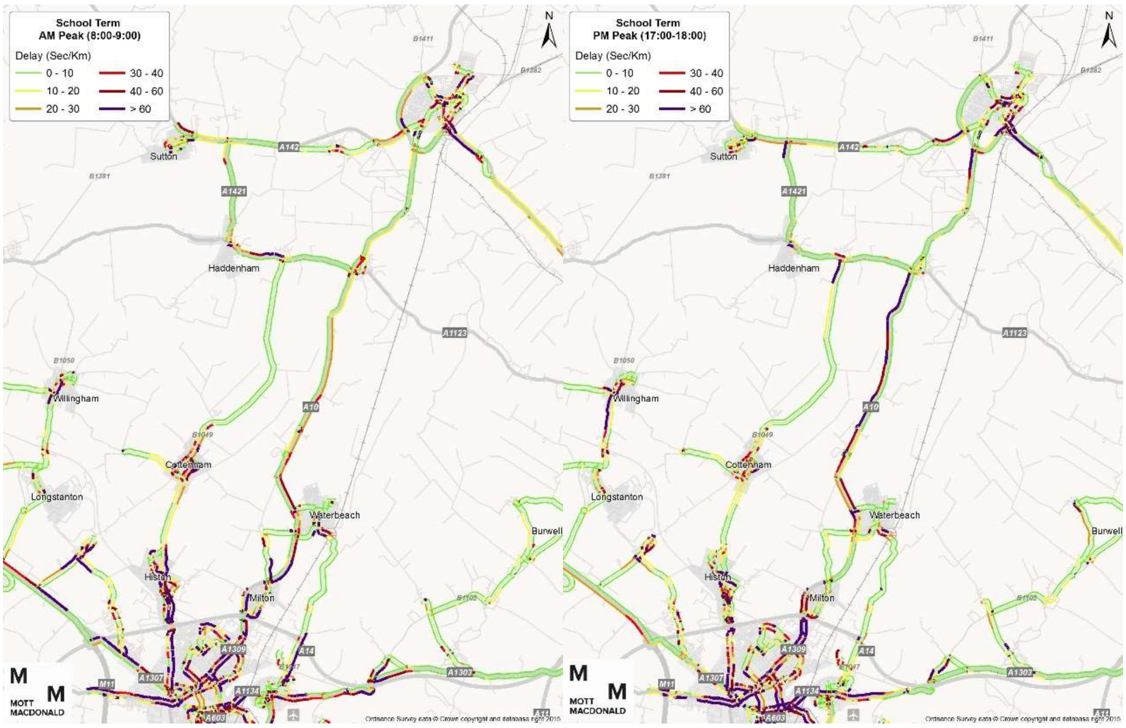
Both the Greater Anglia and Thameslink Great Northern are introducing significant additional carriage capacity over the next two years, on services from Cambridge to London Liverpool Street and Kings Cross, and on regional services across the East of England. This will provide some additional rail capacity between Ely and Cambridge.

2.2.2 Bus

In order to undertake the analysis of bus performance within the study corridor, TrafficMaster journey time data was used to calculate the delays per km along different bus routes in the study area. Figure 11 shows numerous southbound delays in the AM peak hour. Delays are notably severe along the A10 from Waterbeach to the Milton Interchange. Following the Milton Interchange, delays worsen along the Milton Road and reach over 2 minutes per kilometre near the Science Park and within Cambridge city centre. Delays are also prevalent on the B1049 from Histon into Cambridge. In the AM peak, there are also significant southbound delays on the Horningsea Road between the A14 and Newmarket Road.

In the PM peak hour, bus journey time delays are less severe. However, there are still significant delays in both directions between the Science Park and Milton Interchange, and northbound between Waterbeach and Stretham roundabout.

Figure 11: Average journey time delay on bus routes 2013/14 – AM Peak (l) PM Peak (r)



Source: Traffic Master

2.2.3 Park and Ride

The Milton Park and Ride (P&R) site is the only P&R within the study area. It offers 792 parking spaces and is located on the west side of the A10, half a mile north of the Milton Interchange and less than four miles from the city centre.

The Park and Ride service operates every 10 minutes Monday to Saturday. The first bus of the day departs at 06.21 and the last departure from Cambridge City Centre is at 20.39. On Sundays, the service operates every 15 minutes, which begin at 09.00 with the final service returning from Central Cambridge at 18:35. The journey time into the city centre is approximately 16 minutes. Current charges comprise a parking charge of £1, which will be abolished in April 2018, and a return ticket to the city centre for £3.

The Milton P&R site has the lowest capacity and is the least utilised of the five bus-served P&R sites around Cambridge. Historic trends in the usage of the Park and Ride at Milton suggest a decline in patronage since 2014 of 19%.

2.2.4 Walking and Cycling

In comparison to the national average, cycle commuting is generally high within the study corridor. The highest cycle flows are found within populated areas and the 'necklace' villages closet to Cambridge. Therefore, the highest levels of cycle trips are concentrated in the southern section of the corridor, with the central rural areas and Ely and its hinterland experiencing lower flows.

There are substantial cycle traffic flows on radial routes in and out of Cambridge on weekdays, suggesting that it is a key mode for commuters and students accessing employment and education sites. The shared footway/cycleway that runs alongside the guided busway is particularly well used, carrying nearly a thousand cycle trips on weekdays. National cycle route 11, which runs from north Cambridge to Waterbeach, and national cycle route 51 (east), which runs through Bottisham and Burwell, both carry between 200 and 400 weekday trips.

Beyond Waterbeach, national cycle routes 51 and 11 are predominately used by leisure cyclists whose journeys take place at the weekends. Cycle data for Ely is limited, but shows a variety of users across the week, with weekday trips being the most numerous.

The highest proportion of cycling commuting also corresponds with where high-quality cycle infrastructure is provided, as demonstrated by the large number of cyclists make use of the Busway cycle route.

A key area of weakness in the study corridor is the lack of cycle routes serving a north to south journeys, with cycling provision along the A10 being particularly poor.

Collision figures involving pedestrians and cyclists are more frequent around populated areas and where changes in the speed limit occur. These collision clusters demonstrate the need for safe and appropriate transport infrastructure where different modes of transport interact.

2.2.5 Highway

As noted above, the county's strategic highway routes carry varying designations and have correspondingly varied levels of effective traffic capacity. The volumes of traffic using them also differ significantly by route – and indeed in many cases by time of day and direction of travel. The plots in Figure 12 below, demonstrate this significant variability based on outputs from the County Council's Cambridge Sub-Regional Model (CSRM).

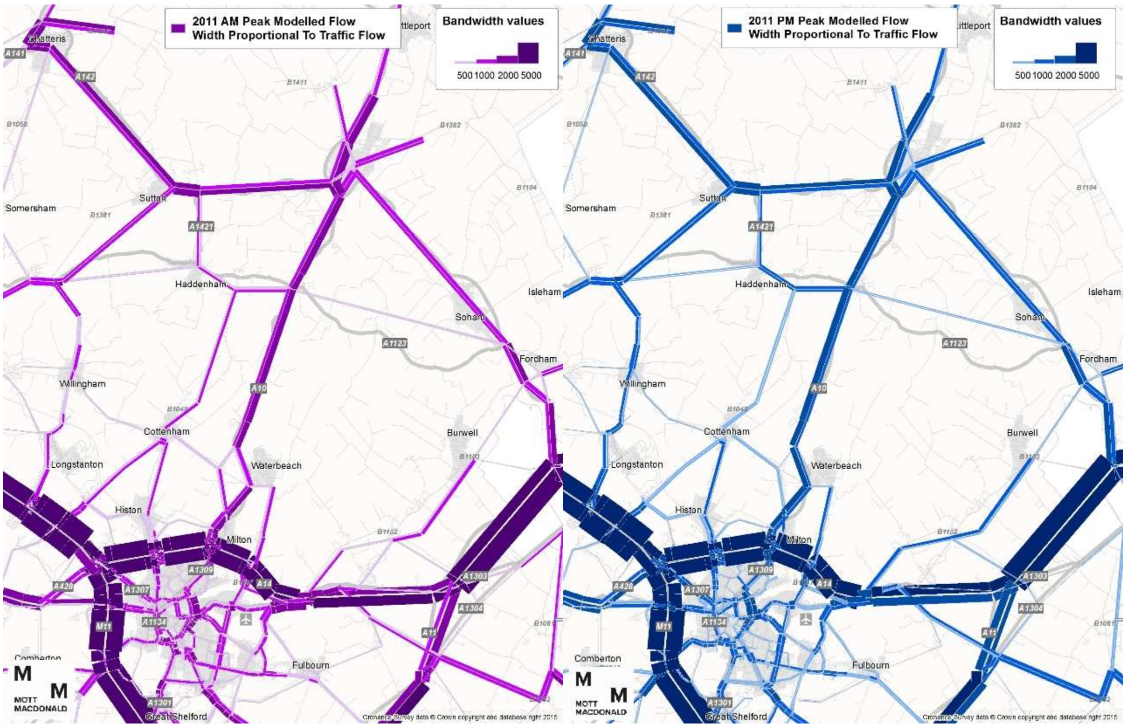
The most heavily used routes by far are the M11 between Cambridge and London (via Stansted), A14 to Huntingdon (dual carriageway), and A14 to Newmarket (dual carriageway), each of which carries upwards of 2,000 Passenger Car Units (PCUs) in each direction in both the morning and evening peak hours

The A10, the single carriageway A-road linking Cambridge and Ely, carries the highest north-south flows in the county. It carries between 1,000 and 2,000 PCUs southbound towards Cambridge in the morning peak hour, and a similar flow northbound in the evening peak/peak hour.

Meanwhile, traffic levels in the 'counterpeak' direction are in both cases much lower – around half of the peak direction flow – suggesting that demand in the corridor is very tidal.

The result of this concentration of travel demand is a very significant level of congestion which can extend almost the full length of the A10 from Ely to Cambridge in the morning peak, and from Cambridge to Ely in the evening peak hours.

Figure 12: Modelled traffic flows in study area – 2011 AM peak (l) and PM peak (r)



The plots in Figure 13, below, are based on data from TrafficMaster, which aggregates the journey times from a large fleet of vehicles equipped with GPS navigation devices.

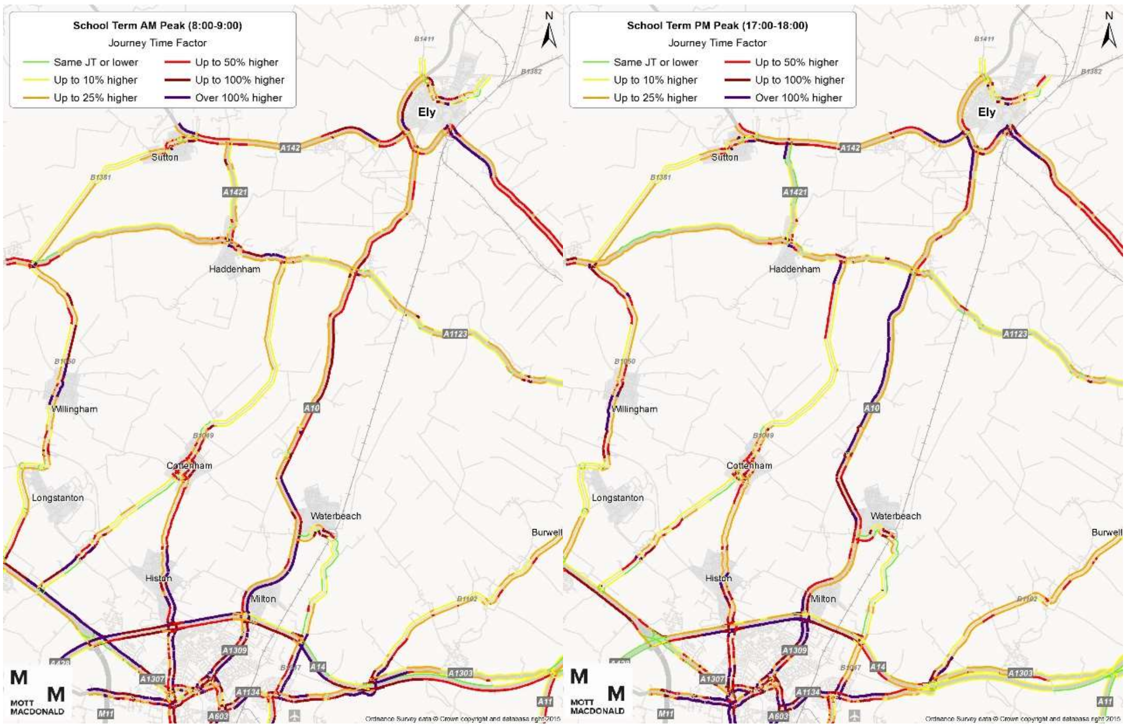
The plots show that during peak periods travel times along the A10 are frequently up to 100% longer than during free-flow periods, and are in many places more than 100% longer. Travel times in the counter-peak direction also deteriorate compared to free-flow conditions, but to a far lesser extent, reflecting the strongly tidal pattern of travel along this route across the standard working day.

It is also apparent from Figure 13 that the B1049 route (which runs parallel to the A10 and passes directly through two sizeable settlements at Cottenham and Histon) also experiences significant congestion in the peaks. Congestion is particularly apparent southbound at the approach to the A14 Histon Interchange in the morning peak and northbound at the junction with the A1123 in Wilburton in the evening peak. As well as local traffic demand, this in part reflects a displacement of traffic which would be most appropriately accommodated on the A10, bypassing major settlements, onto less suitable routes as a result of the congestion on the A-road itself. Figure 12 above, shows that traffic flow on the B1049 is around 1,000 PCUs at points southbound in the morning peak and northbound in the evening peak.

On the A14 north of Cambridge, journey times eastbound between junctions 31 (Girton) and 32 (Histon), as well as the approach to the Milton Interchange (J33) take twice as long in peak times than they do in free-flow conditions. In the PM peak, the same is true of the westbound direction.

On the east-west A142 route there are significant delays in both directions in both periods. Notably, journey times are longer for southbound travel in the AM peak, and the opposite in the PM peak. Despite this, Figure 12, shows that traffic flows on the route are less tidal than on the A10.

Figure 13: Average delay – School term-time 2013/14 – AM Peak (l) PM Peak (r)



Traffic levels on all these routes are anticipated to grow in future years, thus exacerbating issues that are already being experienced on the transport network, leading to increases in problematic transport impacts. And as the following section will demonstrate, the presence of several proposed major developments on and around the transport links connecting Ely to Cambridge will worsen these issues.

2.3 Future Issues and Opportunities

Growth will bring major opportunities, and intensify some existing challenges

The number of journeys made each day in Cambridgeshire will grow over the coming years as a result of the anticipated population and job growth and the scale of committed and proposed development within the study area.

Ely to Cambridge study area. Table 2 outlines the ONS 2011 sub-national population projections by local authority area. It forecasts significant population growth across the county between 2011 and 2031. The predicted population growth will likely correspond with an increase in commuting trips within the study area. Of particular relevance to this study is the fact that a large proportion of the development taking place in the Cambridge area will be concentrated in sites close to or impacting the Ely to Cambridge study area. Table 2: ONS 2011 Population Projections

Area	2001	Observed Change 2001-09	% Change	2009	Forecast Change 2009-31	% Change	2031
Cambridge City	109,900	9,200	8.4%	119,100	32,700	27.5%	151,800
East Cambridgeshire	70,900	9,400	13.3%	80,300	17,900	22.3%	98,200
Fenland	83,700	9,600	11.5%	93,300	19,900	21.3%	113,200
Huntingdonshire	157,200	7,400	4.7%	164,600	12,200	7.4%	176,800
South Cambridgeshire	130,600	13,000	10.0%	143,600	38,300	26.7%	181,900
Cambridgeshire	552,100	48,700	8.8%	600,800	120,600	20.1%	721,400
Cambridgeshire and Peterborough	707,400	66,200	9.4%	773,600	185,300	24.0%	958,900
East England*	5,400,000	370,100	6.9%	5,770,100	1,246,400	21.6%	7,016,500
England*	49,450,000	2,367,100	4.8%	51,817,100	8,253,600	15.9%	60,070,700

Source: ONS Mid-year population estimates (2011)

As described above, clusters of high tech employment on sites in the Cambridge Northern Fringe are supporting many jobs for the sub-region and creating significant economic value. Consequently, there is a clear incentive to facilitate further growth at these sites. Planning policy across the City of Cambridge, South Cambridgeshire, and East Cambridgeshire seeks to address this need both directly (through large scale release of land close to the existing cluster to B1, B2 and B8 development), and indirectly (by enabling further growth in housing supply, where currently constraints are acting as an impediment to business growth in and around Cambridge).

Within the study area, the three most significant of these proposed developments are those at Cambridge Northern Fringe East (CNFE) and at the Cambridge Science Park (CSP) adjacent to it, and three miles further north, north of Waterbeach village at the site of the former Waterbeach Barracks and on adjacent land.

Together with development at Ely, these developments should enable existing businesses to expand, both by offering physical floorspace for expansion and by providing residential space for new employees to live in, and by the same token should attract other businesses in related sectors who are likely to see benefits in joining a tightly agglomerated economic cluster offering a ready pool of experienced labour to take up new opportunities as they become available.

This development will help to address the pressing issue of constrained housing supply and rising prices in Cambridge, and by providing both space to expand and space for workers to live, will enable businesses in the thriving knowledge economy to grow.

However, as the following section will show, growth will lead to increased demand for north-south travel along the A10 and the road, public transport, pedestrian and cycle routes around it. Although the development of Cambridge North Station and additional services linking with the Cambridgeshire Guided Busway have significantly improved public transport connections to and from these southern sites, road and rail connections are already under significant strain. The addition of further travel demand will exacerbate these issues and make consideration of complementary transport measures essential.

2.4 Impacts of Growth

The separate Strand 1 Options Modelling Report describes in detail an analysis of the modelled performance of the A10 highway corridor showing the impacts of the proposed Waterbeach new town, CNFE and CSP developments, in the absence of any measures to mitigate transport impacts.

The modelling tool used in the analysis is Cambridgeshire County Council's Cambridge Sub-Regional Model (CSRM2). CSRM2 is a WebTAG-compliant strategic highway model which uses base data from 2015, including:

- Validation against recently collected traffic and transportation counts
- All networks (highway, PT, walk, cycle)
- Representation of parking and Park & Ride
- Base transport movement data
- Base land use data
- Matrices with up-to-date mobile phone data

Cambridgeshire County Council have agreed that they consider the model to be fit for purpose for use in the assessment of this phase of the project.

Comparing statistics from the 2031 modelled year with and without the development sites outlined above (and assuming no change in transport provision between the two scenarios), the key implications for the A10 and surrounding roads are set out below.

Travel demand on the A10 and surrounding routes would increase

The following paragraphs consider the transport impacts of planned development as they would occur without any provision infrastructure or services to cater for the new transport demand. The report then goes on to explore potential mitigation measures.

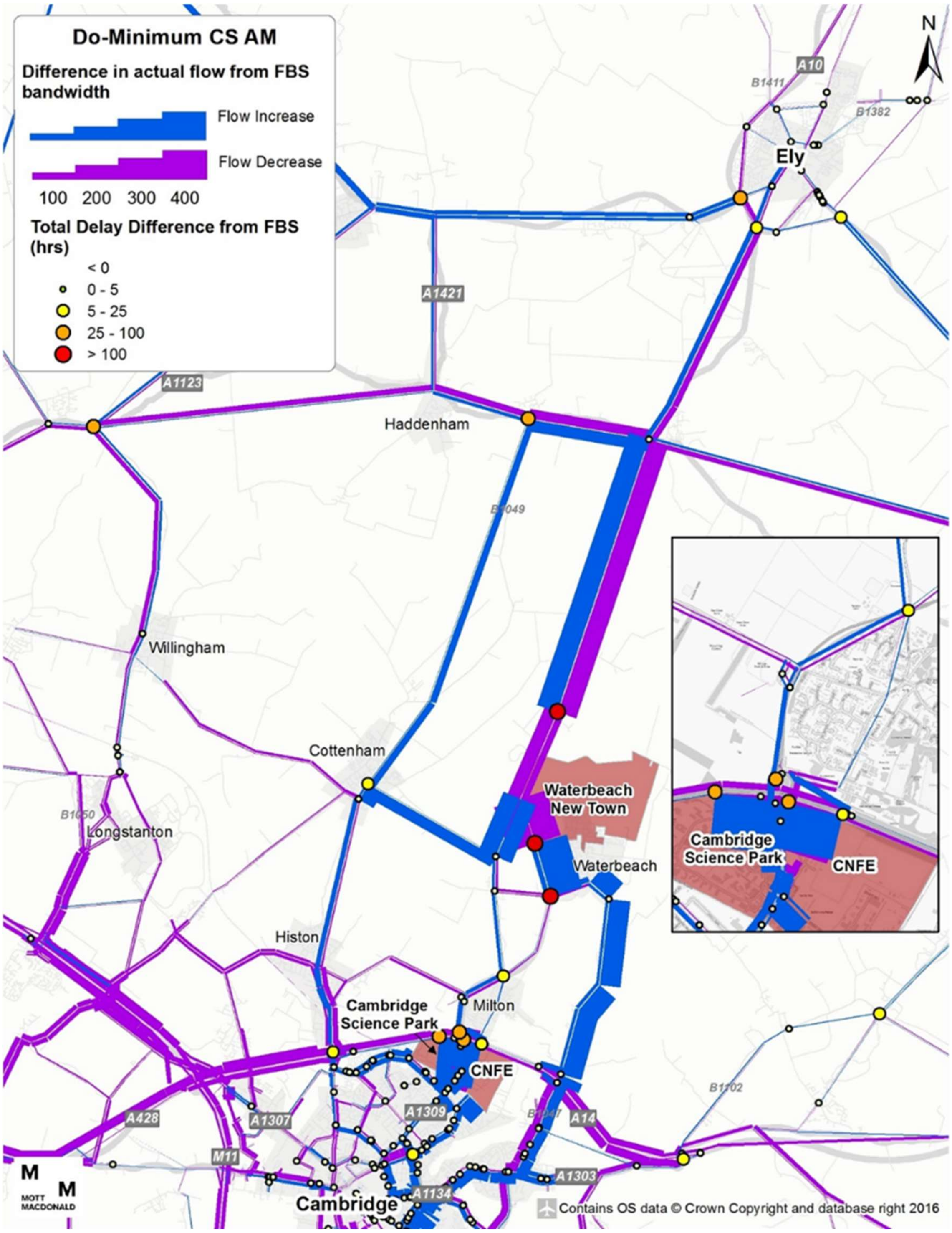
The development of these sites is likely to lead to significant change in travel demand along and around the A10, with the overall proportion of trips with both local origins and local destinations increasing, as the development adds many more such trips to the A10 at the expense of trips with both external origins and external destinations which nearly halve in proportion, reflecting the greater availability of alternative routes (and frequently leading to increases in traffic along less suitable routes or indeed increasing pressure on other strategic network links).

The overall impact of development on traffic levels and delay can be seen in Figure 14, showing a comparison of two scenarios in the 2031 modelled year, one in which the development sites adjacent to the A10 are not implemented, and a second in which the development takes place as outlined above without any mitigating transport measures.

It is notable that while there is growth at some points along the A10, the main impact is in fact an increase in traffic on nearby routes. The negligible change in traffic levels evident south of the Waterbeach development on the A10 itself essentially demonstrates that the effective capacity of the route has already been reached, even without the implementation of the development, and that new trips arising here from the development sites can therefore only be accommodated at the expense of other existing traffic which is displaced to other routes.

Some sections of the A10 are projected to experience reductions in traffic volumes as a result of development. This is principally a reflection of the impact of traffic accessing the Waterbeach development which adds delay to junctions on the route, and thereby leads to the displacement of longer distance traffic which has a route choice onto neighbouring routes – most particularly the B1047 Clayhithe Road but also the B1049 through Cottenham.

Figure 14: Change in traffic flows and junction delays resulting from development at Waterbeach, CNFE and CSP (AM peak 2031)

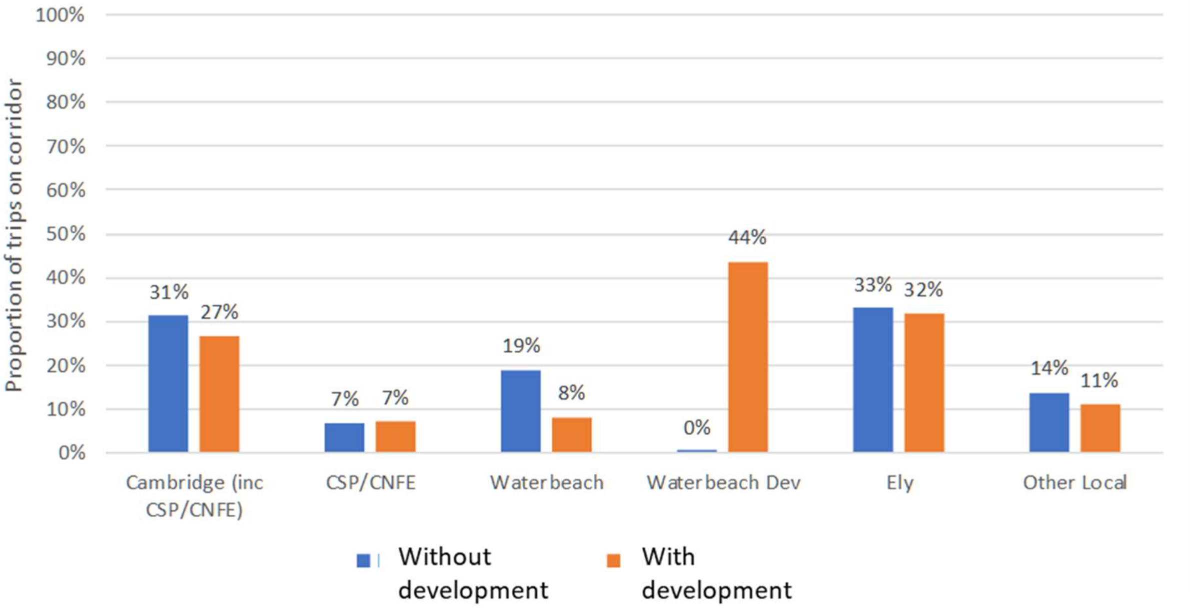


Source: Mott MacDonald/OS

Significant additional delays are evident at three junctions on the A10 – all close to the Waterbeach development, while there are also projected to be additional delays at the junctions on the A10/A14 to the north of the Science Park and Northern Fringe developments. More modest increases in delay are also visible at many junctions in inner Cambridge, along Kings Hedges Road, Milton Road, and Horningsea Road.

The chart in Figure 15 below, shows the proportion of trips on the A10 corridor which are predicted to be generated by the local locations shown both with and without development. (Note that because some trips pass through more than one location, individual values should not be added together as this would result in double-counting.)

Figure 15: Distribution of trips on A10N corridor by site of origin in 2031



Source: Mott MacDonald

The chart shows how significantly the development at Waterbeach is likely to affect the makeup of traffic on the A10 between Ely and Cambridge – once implemented in full, the modelling indicates that it would be the origin or destination for some 44% of all travel demand on the route.

It is also noticeable that the increased development at both the Science Park and Cambridge Northern Fringe East sites does not lead to an overall increase in the proportion of these trips on the corridor (notwithstanding that in absolute terms there is an increase in trips). A key reason for the relatively modest impact on the A10 from these sites is that traffic to and from the Science Park and Northern Fringe sites can use alternative routes such as the A14 and the B1049, and the A10 is slower than these routes for many of those trips without any mitigation. However, traffic to and from the new town north of Waterbeach has no choice but to use the A10 as it is the only road connecting to the site.

Overall, the modelling indicates that an average of 39% of background traffic will be displaced from the A10 as the trips generated by the new developments take up a large proportion of the constrained capacity of the route.

Traffic would increase on some routes parallel to the A10

Figure 16 sets out the level of traffic changes on each of the main parallel routes to the A10 by comparing with and without development scenarios in 2031. It is notable that with the exception of the B1047 which would see substantial increases in traffic in both the AM and PM peaks, the increases are otherwise concentrated in the AM peak.

Figure 16: Changes in traffic levels on parallel routes

AM Peak

Parallel Route	CS Do Min
B1047	52%
B1049 South	-2%
B1049 North	14%
Landbeach Rd	18%
All routes	15%

PM Peak

Parallel Route	CS Do Min
B1047	56%
B1049 South	1%
B1049 North	-10%
Landbeach Rd	-89%
All routes	-7%

Source: Mott MacDonald

Journey times would increase on key routes

Even with large amounts of traffic being displaced to other routes, the traffic generated by the development is likely to lead to significant increases in journey times along sections of the A10 between Ely and Cambridge (up to 73% in the evening peak hour at the southern section), and an overall increase of around 15% and 10% in journey times along the whole Ely to Cambridge section of the A10 in the AM and PM peak respectively, as shown in Figure 17, below (again this compares the with and without development scenarios in 2031).

Figure 17: Journey time impacts of growth

AM Peak

A10(N) Section	CS Do Min
South section	30%
Mid section	1%
North section	8%
Full route	15%

PM Peak

A10(N) Section	CS Do Min
South section	73%
Mid section	-12%
North section	-17%
Full route	9%

Source: Mott MacDonald

Given that (as outlined above) peak period journey times along some sections of the A10 are already as much as double the free-flow times, such increases would add further to an already problematic level of delay.

Car mode share would fall

The modelling indicates a likelihood of a statistically significant (5%) reduction in the share of trips along the Ely to Cambridge corridor which are undertaken by car in the AM peak hour, a slight increase in car mode share in the PM peak hour, and a slight decrease across the overall modelled network. This indicates that the concentration of development in locations close to

Cambridge with good public transport and walking and cycling access tends to facilitate more sustainable travel patterns than siting development elsewhere.

Figure 18: Change in car mode share levels

AM Peak

Area	CS Do Min
Study corridor	-5.3%
Modelled network	-1.06%

PM Peak

Area	CS Do Min
Study corridor	0.5%
Modelled network	-0.87%

Source: Mott MacDonald

The modelling results described above confirm that the major developments proposed along the A10, and in particular the Waterbeach development, would further exacerbate existing and future problems for travel on key routes in the county if implemented without some form of complementary transport measures.

Some impacts would be felt mostly by those already living and working in Cambridge, notably those close to some of the routes running parallel to the A10 who would see traffic and journey times increase as traffic is displaced from the A10 by new traffic from the developments. Other effects, such as the increase in journey times on the A10, might actually undermine the prospects of the new developments themselves by reducing the accessibility of the sites and thereby making them relatively less attractive places to expand or set up businesses.

In order to capture the many positive benefits of this development for the economy of the county and indeed the UK as a whole, without causing detriment to those already living and working in the area, it is therefore essential to develop a suitable package of complementary transport measures.

The process of identification of potential measures and sifting and prioritisation among them is described in the following sections.

2.5 Addressing the Challenges

Following a review of the emerging and policy objectives, the following Objectives have been defined in consultation with project team. The objectives are set out in the study brief and have been identified in response to the problems and opportunities highlighted in the accompanying Evidence Base Report, and refined through examination of objectives set out in key transport policy documents for the county – notably the Transport Strategy for Cambridge and South Cambridge, the Third Cambridge Local Transport Plan, and the Cambridgeshire Long Term Transport Strategy.

Table 3 summarises these agreed objectives.

Table 3: Summary of Study Objectives

ID	Scheme Objective
1	Maintain traffic at or below 2011 traffic levels in Cambridge
2	Minimise vehicle mileage whilst providing for increased travel demand
3	Improve reliability, capacity and speed of alternative transport modes
4	Minimise potential impact on alternative "rat-runs" to the A10
5	Intercept or substitute car trips with alternative transport modes
6	Address transport demand from the new town north of Waterbeach
7	Enable development in the Cambridge North Fringe East/Cambridge Science Park to proceed

Source: Mott MacDonald and Cambridgeshire County Council

These objectives will ensure that the package of interventions is fully realised and is able to address the need for intervention, as well as helping to meet local strategic priorities.

2.6 Scope of Options

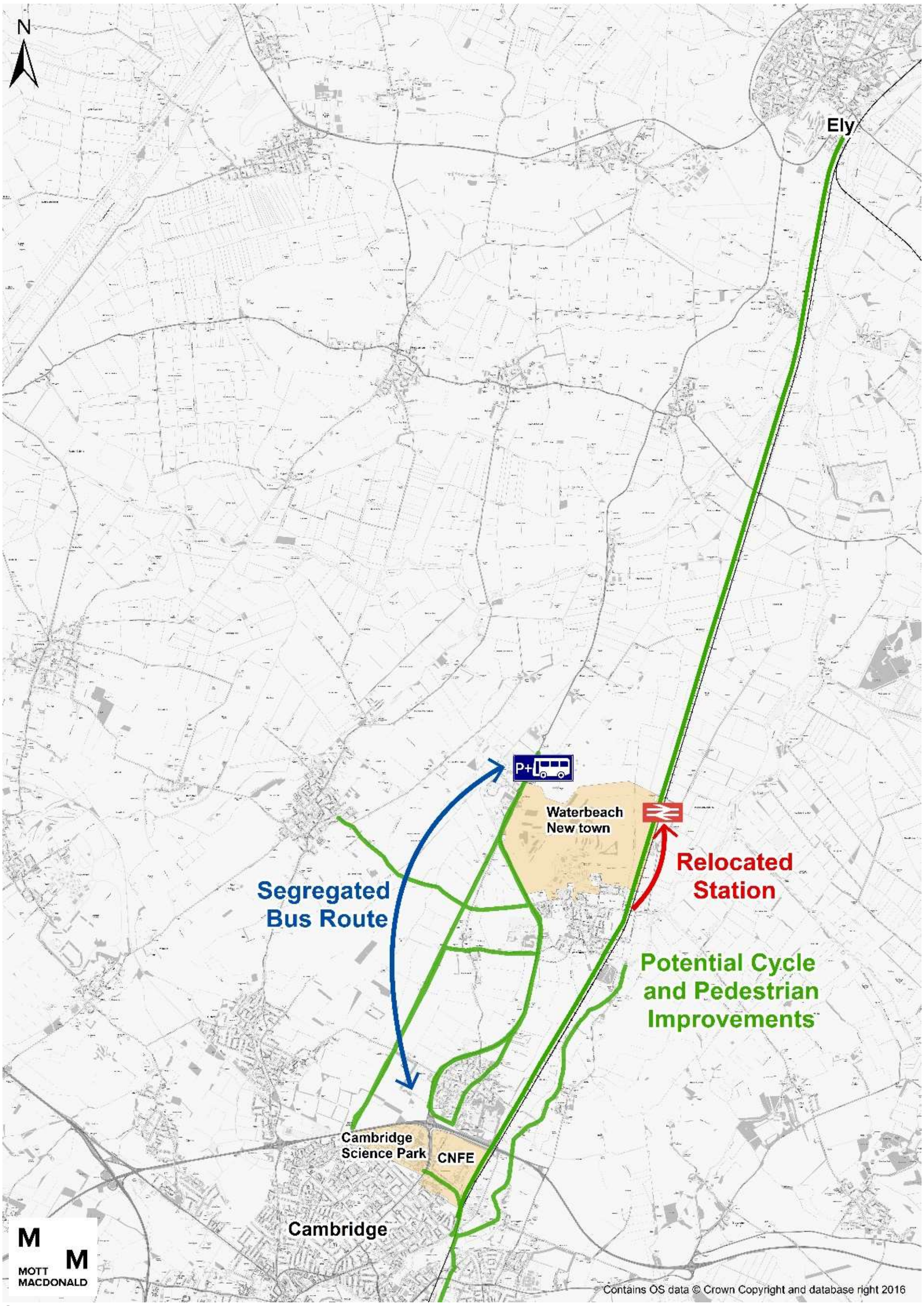
The objectives clearly highlight the role of all modes of transport in addressing the challenges in the Ely to Cambridge corridor. The options assessed will therefore include a package of multi-modal interventions as a minimum requirement, with additional options entailing increasing levels of interventions on the highway network. This approach is described further in the Strand 1 Options Modelling Report.

In light of the objectives described above, a set of potential packages has been developed. Broadly, these packages represent incrementally greater levels of intervention – ranging from packages including only measures focused on non-highway measures through to packages with an increasing level of complementary highway intervention.

This range of packages and the rationale behind them is described in the following table, and shown schematically in the five figures beneath.

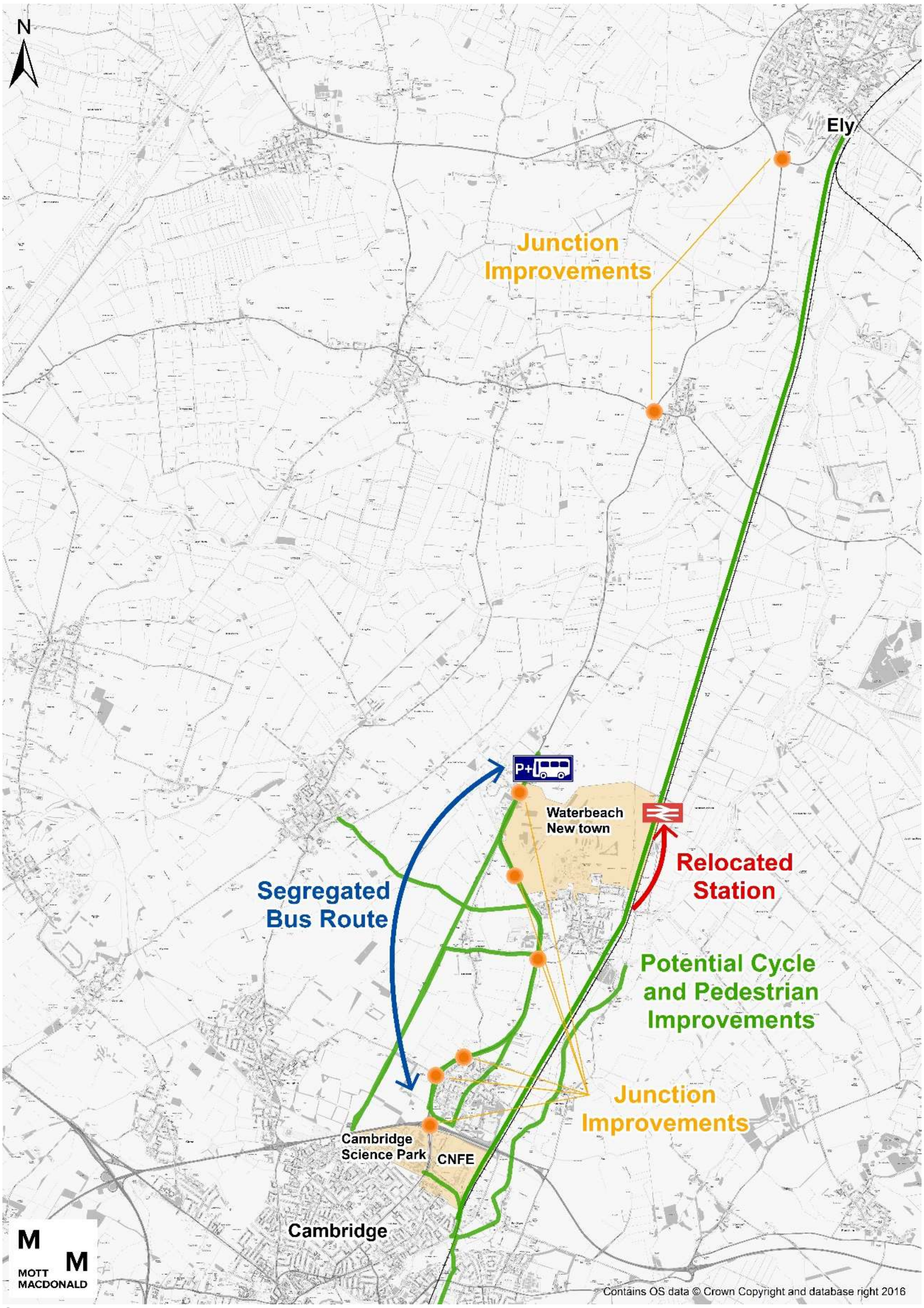
Package	Description	Rationale
Mode-shift	Measures to encourage mode shift, including: • New or improved walking/cycling routes between Ely, Waterbeach and Cambridge • New high-quality segregated public transport provision (route TBC) between Waterbeach development and Cambridge • New park and ride sites at Waterbeach development, to remove car trips from southern section of A10 • Existing Waterbeach railway station relocated closer to Waterbeach development	To test the impact of non-highway interventions only
Junction +	Mode-shift option measures, together with additional junction improvements to Ely to Cambridge corridor, including: • Improved capacity on the slip roads joining the roundabout and from Cambridge Road at Milton Interchange • Increased capacity for vehicles travelling northbound on the A10 at the Milton Park and Ride southern access, whilst keeping the left slip to access the P&R site. • Increased capacity on the southern A10 at the Butt Lane junction for flow travelling northbound, and on the Butt Lane arm, with left turns only still being implemented. • Improved capacity on Landbeach Road and Humphries Way junctions on the A10 • Increased capacity on Car Dyke Road and Waterbeach Road junctions on the A10. • Increased capacity from the site and on the southern A10 arm at the southern access to the Waterbeach Development. • Increased capacity on Green End at the junction with the A10 • Increased capacity on the site access arm at the northern access to the Waterbeach development • Increased capacity at the A10 / A1123 roundabout in Stretham. • Increased capacity at the A10 / A142 Angel Drove roundabout at Ely.	To test the impact of adding a first level of highway improvements
North-dual	As per 'Junction+' option, but with the A10 upgraded to dual carriageway from the Waterbeach development's northern access north to Ely – alignment to be determined	To test the impact of a further highway upgrade, which encourages use of Waterbeach Park and Ride to Cambridge
South-dual	As per 'Junction+' option, but with the A10 upgraded to dual carriageway from the Waterbeach development's southern access south to the A14 Histon Interchange – alignment to be determined	To test the impact of upgrading capacity on the southern half of the corridor, where it is most needed
Full-dual	As per 'Junction+' option, but with the A10 upgraded to dual carriageway along the entire length from the A14 Histon Interchange to Ely – alignment to be determined	To test the impact of a full corridor dual carriageway upgrade

Figure 19: Mode-Shift Option



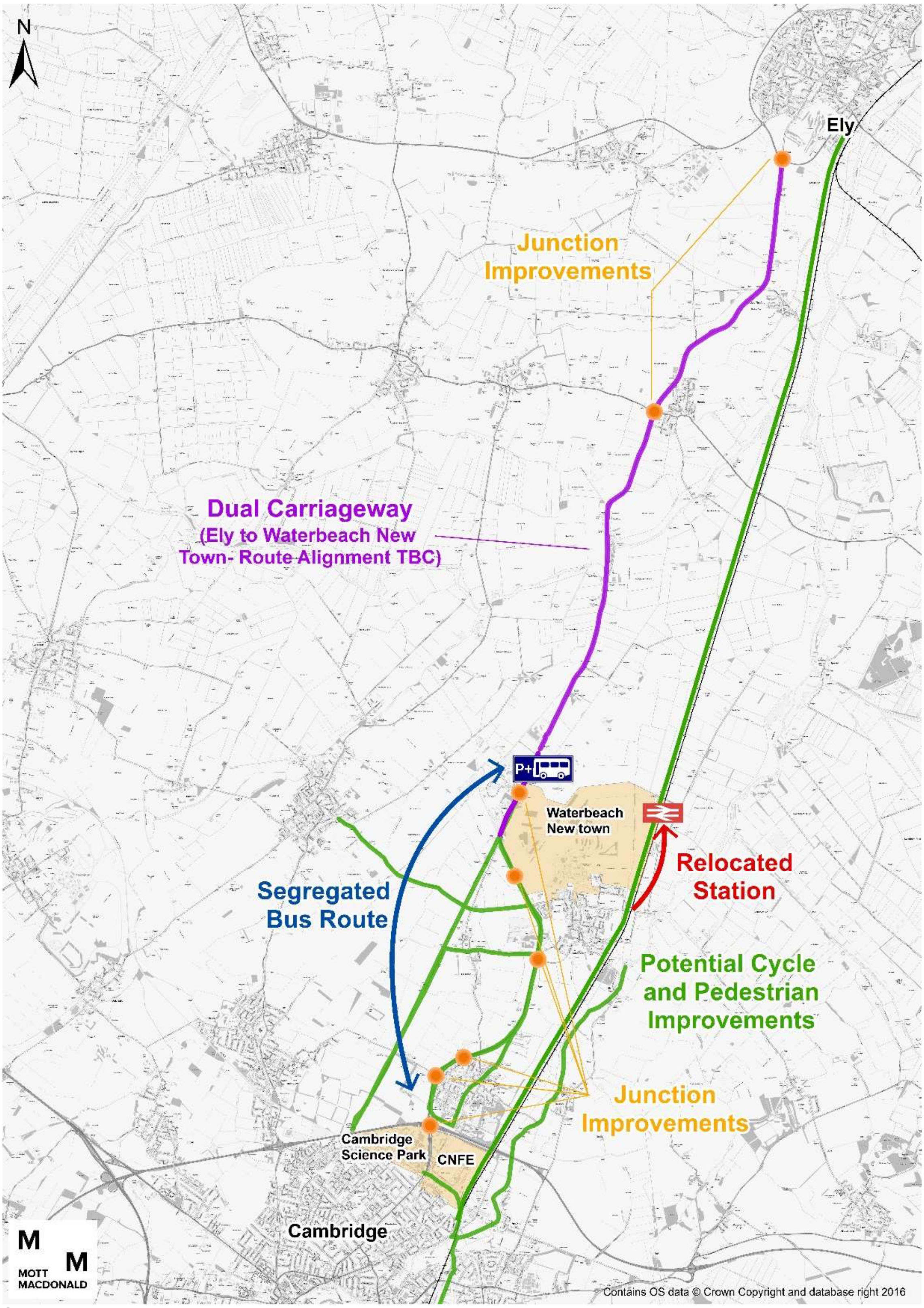
Source: Mott MacDonald

Figure 20: Junction + Option



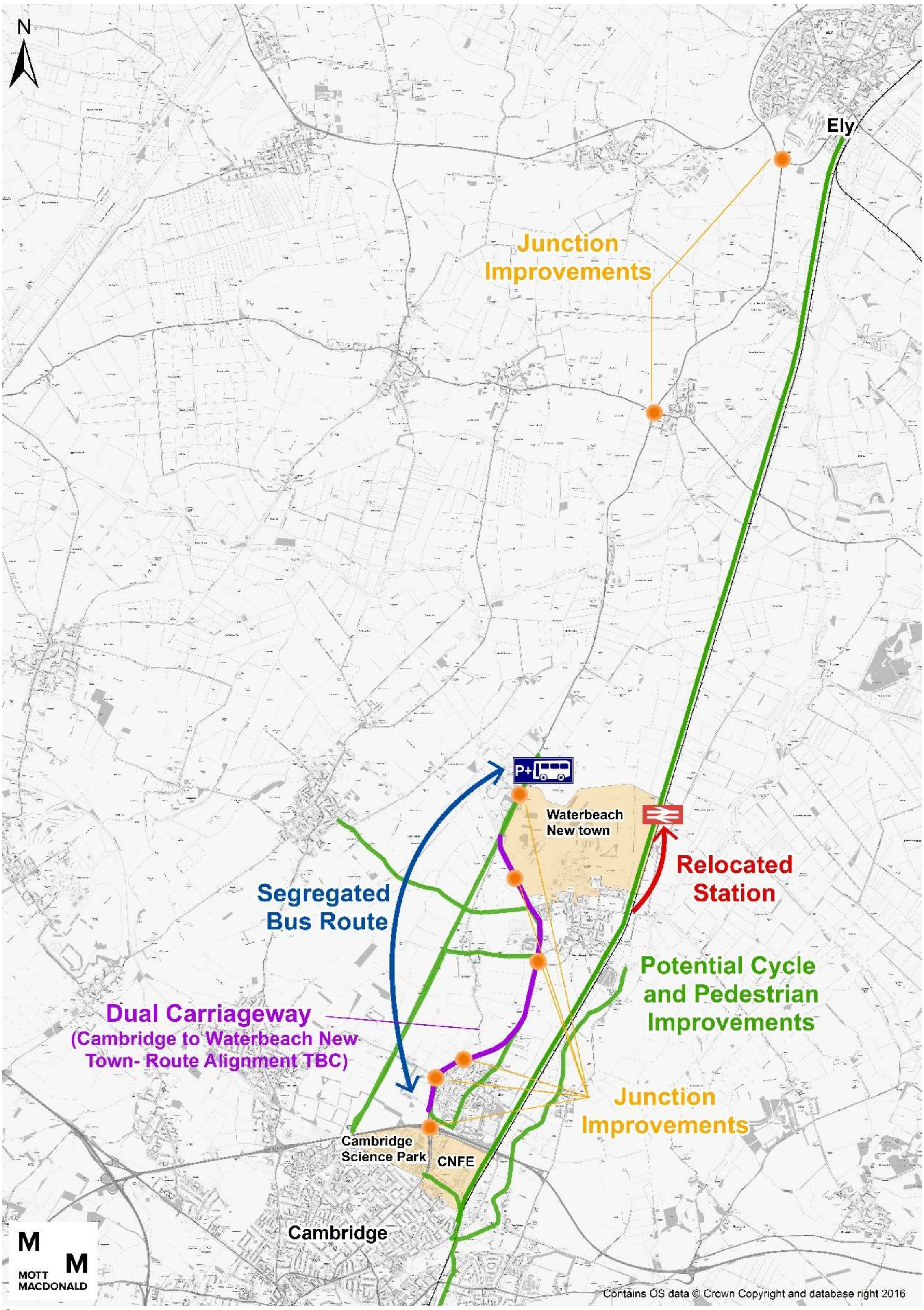
Source: Mott MacDonald

Figure 21: North Dual Option



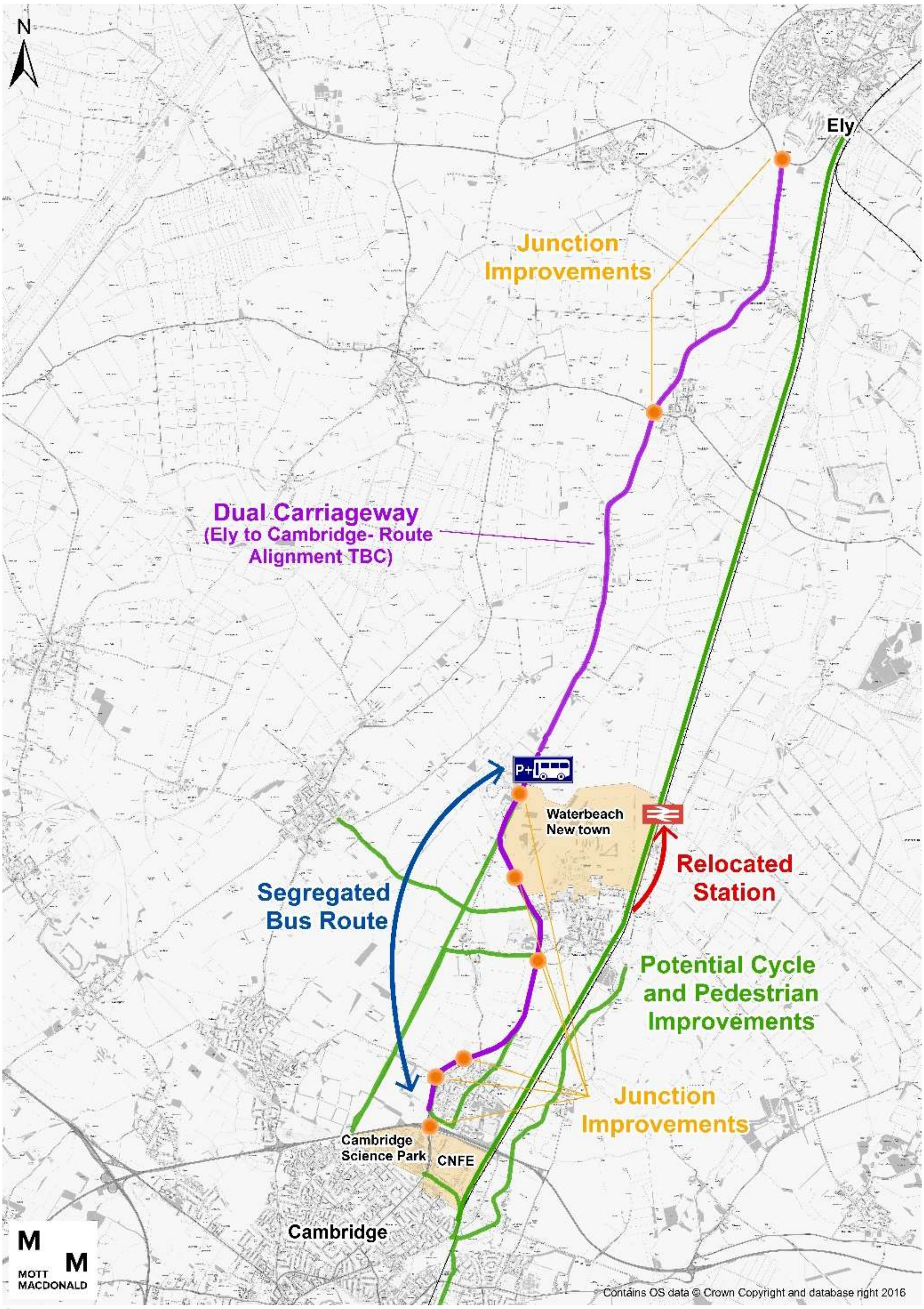
Source: Mott MacDonald

Figure 22: South Dual Option



Source: Mott MacDonald

Figure 23: Full Dual Option



Source: Mott MacDonald

2.7 Model Testing

To inform an assessment of the effectiveness and suitability of these options, the schemes in each of these packages were incorporated into scenarios within the transport model, together with the development proposals, producing forecasts of their impacts. This work is documented in full in the Strand 1 Options Modelling Report completed in parallel with this report.

The modelling work is based on two future modelling scenarios as follows:

- The 'Future Base' case – this represents the 2031 scenario where Local Plan projected levels of population and employment growth have been achieved for Cambridgeshire, but where the proposed developments at Waterbeach new town, CNFE and CSP do not take place. This therefore represents the 'without development' scenario for the A10.
- The 'Combined Scenario' case – this represents the 2031 scenario where Local Plan projected levels of population and employment growth have been achieved for Cambridgeshire and where the proposed developments at Waterbeach new town, CNFE and CSP take place. This therefore represents the 'with development' scenario, though without any additional transport investment, and is regarded as the Do-Minimum scenario.

The addition of the above mitigation package options to the Combined Scenario Do-Minimum case results in a Combined-Scenario 'Do Something' network. Each of the Combined-Scenario Do-Something network options below was then compared against both the Combined-Scenario Do-Minimum situation and the Future-Base Do-Minimum situation in order to understand the effectiveness of each mitigation package against both the unmitigated 'with development' case and the 'without development' case respectively.

It should be noted that all modelling results presented below are for the AM and PM weekday peak hours, which are:

- AM peak: 08:00-09:00
- PM peak: 17:00-18:00

In order to provide a summary of the modelled mitigation package performance, each Do Something package model run is compared against the equivalent Do Minimum run across three key model performance indicators:

- Car mode share
- Journey time
- Parallel route traffic level

The results of the scenarios in each of these respects is set out below.

2.7.1 Car Mode Share

Figure 24 shows the modelled change in car mode share levels for the Combined-Scenario Do-Minimum situation and each Combined-Scenario Do-Something mitigation package compared to the Future-Base Do-Minimum situation.

Car mode share is a primary measure of the relative sustainability of trip-making on and beyond the corridor, where a lower result is generally regarded as better. It is measured both for trips most likely to use the study corridor and for the whole modelled area, and is defined as absolute change from Future Base Do Minimum car mode share.

The results listed are taken from the above analysis and are based on all weekday AM and PM peak hour trips:

- Between sectors most likely to use the study corridor
- Across the full modelled network

Figure 24: Change in car mode share levels compared to Future-Base Do-Minimum

AM Peak

Area	CS Do Min	CS Mode Shift	CS Jn+	CS North Dual	CS South Dual	CS Full Dual
Study corridor	-5.3%	-8.8%	-8.4%	-7.9%	-6.8%	-5.9%
Modelled network	-1.06%	-1.11%	-1.08%	-1.05%	-0.98%	-0.92%

PM Peak

Area	CS Do Min	CS Mode Shift	CS Jn+	CS North Dual	CS South Dual	CS Full Dual
Study corridor	0.5%	-2.1%	-1.7%	-1.4%	-0.6%	0.0%
Modelled network	-0.87%	-0.89%	-0.82%	-0.81%	-0.75%	-0.71%

Source: Mott MacDonald

These results show that:

- Compared to the Future-Base Do-Minimum (the ‘without development’ case), the Combined-Scenario Do-Minimum (the unmitigated ‘with development’ case) results in a significant decrease in the car mode share of trips using the Ely to Cambridge corridor in the AM peak hour, and a slight increase in the PM peak hour. Across the modelled network, the scenario results in an overall car mode share decrease. This therefore indicates that the concentration of development in locations close to Cambridge, rather than being dispersed across the county, results in more sustainable travel patterns overall.
- Compared to the Combined-Scenario Do-Minimum, the five Do-Something mitigation packages all result in an improved car mode share on the Ely to Cambridge corridor, with a descending level of improvement from the Mode-Shift option to the Full-Dual option. At a modelled network level, improvement against this scenario is seen for the non-dualling mitigation options only, but all Do Something packages show a car mode share reduction against the Future-Base Do-Minimum scenario in all cases.

In summary, therefore, all the Do Something mitigation packages deliver a car mode share reduction on the Ely to Cambridge corridor when compared to the equivalent Do Minimum scenario, with the Mode-Shift package delivering the greatest reduction, and the Full-Dual package the least.

2.7.2 Parallel route traffic levels

Figure 25 shows the change in modelled traffic levels on routes parallel to the A10(N) corridor for the Combined-Scenario Do-Minimum situation and each Combined-Scenario Do-Something mitigation package compared to the Future-Base Do-Minimum situation.

Displacement of traffic onto unsuitable parallel routes through the addition of new traffic to the A10 itself is a key area of concern for any proposals in this area, and hence a lower result is regarded as better. Parallel route traffic levels are measured across the B1049 (Histon Road and Twenty Pence Road), the B1047, and on Landbeach Road, in percentage change from Future Base Do Minimum traffic levels.

Figure 25: Change in parallel route traffic levels compared to Future-Base Do-Minimum

AM Peak

Parallel Route	CS Do Min	CS Mode Shift	CS Jn+	CS North Dual	CS South Dual	CS Full Dual
B1047	52%	49%	40%	43%	-34%	-36%
B1049 South	-2%	-3%	-2%	-4%	-11%	-13%
B1049 North	14%	12%	14%	-18%	-6%	-37%
Landbeach Rd	18%	19%	8%	-10%	10%	-12%
All routes	15%	14%	11%	0%	-10%	-23%

PM Peak

Parallel Route	CS Do Min	CS Mode Shift	CS Jn+	CS North Dual	CS South Dual	CS Full Dual
B1047	56%	53%	50%	55%	26%	21%
B1049 South	1%	-1%	1%	-2%	0%	2%
B1049 North	-10%	-10%	-11%	-5%	-13%	5%
Landbeach Rd	-89%	-80%	-30%	-48%	-47%	-41%
All routes	-7%	-7%	3%	1%	-6%	-2%

Source: CSRM

These results show that:

- For the B1047 route, the Combined-Scenario Do-Minimum (the unmitigated ‘with development’ case) results in an increase in traffic levels compared to the Future-Base Do-Minimum (the ‘without development’ case). This increase is progressively addressed by each Do-Something mitigation package, with the Mode-Shift option yielding the least improvement and the Full-Dual option the greatest. In the AM peak, the South-Dual and Full-Dual options are also able to deliver improvements over the Future-Base Do-Minimum situation, though not in the PM peak.
- For the B1049 route, results are mixed. On the southern section, very little change from Future-Base Do-Minimum traffic levels are seen in any of the Combined-Scenario cases. On the northern section in the AM peak, there is a distinction between the dualling and the non-dualling options, with the former delivering improvements and the latter not while, in the PM peak, all Combined-Scenario cases apart from the Full-Dual option deliver improvements. Overall, though, the impact of the mitigation packages for this route is generally positive.
- Landbeach Road shows similar results to the B1049 in the AM peak, with the dualled mitigation options generally performing better than the non-dualled options, and with all options except Mode-Shift delivering improvements over the Combined-Scenario Do-Minimum. In the PM peak, however, all mitigation options perform progressively worse than the Combined-Scenario Do-Minimum, but still substantially better than the Future-Base Do-Minimum.

Overall, all Do Something mitigation options perform better than the Combined-Scenario Do-Minimum situation or the Future-Base Do-Minimum in both peak hours, except for the Junction+ and North-Dual options in the PM peak. However, only the South-Dual and Full-Dual options deliver an overall improvement against the Future-Base Do-Minimum scenario in both peak hours.

2.7.3 Journey time

Figure 26 shows the change in modelled two-way highway journey times on the A10(N) corridor for the Combined-Scenario Do-Minimum situation and each Combined-Scenario Do-Something mitigation package compared to the Future-Base Do-Minimum situation.

Journey time is the primary measure of corridor performance, where a lower result is regarded as better. It is measured here on the A10 between the A14 and Ely bypass, as a percentage change from Future Base Do Min journey time.

The journey times are shown by route section and for the full route, where the sections are as follows:

- South section – Milton Interchange to Cambridge Research Park
- Mid section – Cambridge Research Park to Stretham roundabout
- North section - Stretham roundabout to Ely bypass

Figure 26: Change in Ely to Cambridge Corridor journey time compared to Future-Base Do-Minimum

AM Peak

A10(N) Section	CS Do Min	CS Mode Shift	CS Jn+	CS North Dual	CS South Dual	CS Full Dual
South section	30%	26%	26%	36%	-26%	-10%
Mid section	1%	3%	4%	-40%	18%	-40%
North section	8%	8%	3%	-37%	10%	-37%
Full route	15%	14%	13%	-6%	-3%	-26%

PM Peak

A10(N) Section	CS Do Min	CS Mode Shift	CS Jn+	CS North Dual	CS South Dual	CS Full Dual
South section	73%	73%	77%	88%	6%	44%
Mid section	-12%	-10%	-13%	-54%	3%	-46%
North section	-17%	-16%	-53%	-72%	-49%	-68%
Full route	9%	10%	-5%	-22%	-19%	-31%

Source: CSRM

These results show that:

- Compared to the Future-Base Do-Minimum, the south section of the A10 shows the greatest journey time deterioration in the Combined-Scenario cases. This is because this is the section which experiences the greatest increases in demand with the proposed developments in place. This deterioration is improved the most by the South-Dual and Full-Dual options, delivering an overall improvement in the AM peak but not in the PM peak.
- On the mid and north sections in the AM peak, the situation is reversed, with only the North-Dual and Full-Dual options delivering improvements against the Future-Base Do-Minimum, as these options add link capacity to these sections. In the PM peak, however, all Combined Scenario cases improve over the Future-Base case on these sections, except the South-Dual option on the mid section.

- Overall, when measuring across the full route, all Do Something mitigation options show a journey time improvement against the equivalent Do Minimum case in both peak hours, except for the Mode-Shift option in the PM peak. However, only the three dualling options deliver an improvement against the Future-Base Do-Minimum situation in both peak hours.

2.7.4 Modelling results summary

The following table summarises, for the above three key modelling performance indicators, the level of improvement delivered by each Do Something mitigation package when compared to:

- The Future-Base Do-Minimum case (the 'without development' scenario)
- The Combined-Scenario Do-Minimum case (the unmitigated 'with development' scenario)

Table 4: Improvement over Future-Base and Combined-Scenario Do-Minimums in both peak hours

Indicator	Mode-Shift	Junction+	North-Dual	South-Dual	Full-Dual
Car Mode Share (corridor)	✓✓	✓✓	✓✓	✓✓	✓✓
Parallel Route Traffic Levels	✗✗	✗✗	✗✗	✓✗	✓✗
Journey Time	✗✗	✗✓	✓✓	✓✓	✓✓

Source: MM

This table shows a general progression in performance benefits from the mode shift package towards the full dual carriageway upgrade package as follows:

- The Mode-Shift option, which involves non-highway measures only, delivers mode share improvements, but not highway performance improvements.
- The Junction+ option, which includes the non-highway measures but also modest highway measures, shows a mode share improvement, but also some journey time improvements. It doesn't, however, deliver overall parallel route traffic level improvements.
- The North-Dual option, which includes the non-highway measures but also more substantial highway measures, shows a mode share improvement, but also full journey time improvements. Similarly, though, it fails to deliver overall parallel route traffic level improvements.
- The South-Dual and Full-Dual options are the only ones to deliver overall improvements in all three performance indicators when compared against the Future-Base Do-Minimum option.

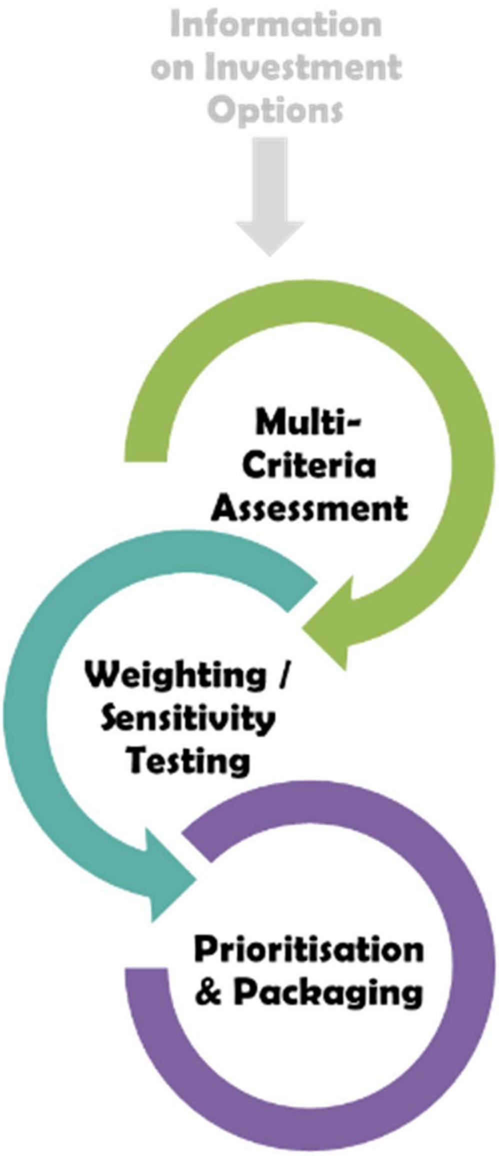
In the subsequent section, these outputs are assessed within the wider context of the full SOBC objectives defined above in order to identify a preferred option.

2.8 INSET Appraisal

In order to guide the selection of the most appropriate options, the five intervention options appraised in the traffic modelling scenarios have been subjected to a multi-criteria option appraisal using Mott MacDonald's Investment Sifting and Evaluation Tool (INSET).

INSET is a decision support toolkit based on Green Book compliant multi-criteria decision analysis and DfT's early assessment and sifting tool, 'EAST'. The INSET process is illustrated in Figure 27.

Figure 27 Outline of the INSET Appraisal Process



Source: Mott MacDonald

For this project the appraisal criteria have been developed around the project objectives, enabling a tailored assessment of the performance of the options against each criterion. Individual criteria have also been weighted to reflect their relative importance.

This section first sets out the INSET appraisal process in terms of the definition of themes, criteria and sub-criteria, before moving on to an examination of the scores applied and the weightings assigned.

The weighted scores for the options are then presented at the end of the section.

2.8.1 Definition of Scoring Criteria

The INSET appraisal is organised according to a hierarchy of themes, main criteria and sub-criteria. These are outlined in detail below:

- **Themes:** Represent broad policy or strategy categories that enable the main package or scheme criteria to be classified and weighted differently, depending on local priorities
- **Main Criteria:** Correspond to specific package or scheme objectives, classified into the themes defined above
- **Sub-Criteria:** Comprises measurable metrics that can be used to appraise the degree to which each package or scheme objective/main criterion has been met

For the purposes of this appraisal, three themes have been defined; Strategic Outcomes, Transport Outcomes and Cost Implications. The first two themes cover the study objectives set out in Table 3, above and defined in the study brief, whilst the third theme is intended to enable the perceived benefits of the scheme to be balanced against the likely costs, as defined in Section 3.

The *main criteria* simply set out the seven scheme objectives. For the purposes of the INSET appraisal, Scheme Objective 7 was separated into two parts so that the benefits of the options for access to Cambridge Science Park and Cambridge Fringe North East could be appraised separately. The *themes* and *main criteria* are outlined in Table 5 below.

Table 5: Summary of INSET Themes and Study Objectives

ID	Theme	ID	Main Criteria
A	Strategic Outcomes	6	Address transport demand from the new town north of Waterbeach
		7a	Enable development in the Cambridge Science Park to proceed
		7b	Enable development in the Cambridge Northern Fringe East to proceed
B	Transport Outcomes	1	Maintain traffic at or below 2011 traffic levels in Cambridge
		2	Minimise vehicle mileage whilst providing for increased travel demand
		3	Improve reliability, capacity and speed of alternative transport modes
		4	Minimise potential impact on alternative "rat-runs" to the A10
		5	Intercept or substitute car trips with alternative transport modes
C	Cost	-	N/A

Source: Mott MacDonald

Sub-criteria were then defined against each of the main criteria to enable an appraisal of each package based on measurable data from the transport models. These are outlined in **Table 6** below.

Table 6: Summary of INSET Sub-Criteria

ID	Main Criteria	ID	Sub-Criteria
6	Address transport demand from the new town north of Waterbeach	i	Provides adequate road access to Waterbeach New Town
		ii	Provides improved rail access to Waterbeach New Town
		iii	Provides improved bus access to Waterbeach New Town
		iv	Provides improved active travel access to Waterbeach New Town
		v	Minimises car mode share to/from Waterbeach New Town
7a	Enable development in the Cambridge Science Park to proceed	i	Provides adequate road access to Cambridge Science Park
		ii	Provides improved rail access to Cambridge Science Park
		iii	Provides improved bus access to Cambridge Science Park
		iv	Provides improved active travel access to Cambridge Science Park

ID	Main Criteria	ID	Sub-Criteria
		v	Minimises car mode share to/from Cambridge Science Park
7b	Enable development in the Cambridge North Fringe East to proceed	i	Provides adequate road access to Cambridge Northern Fringe East
		ii	Provides improved rail access to Cambridge Northern Fringe East
		iii	Provides improved bus access to Cambridge Northern Fringe East
		iv	Provides improved active travel access to Cambridge Northern Fringe East
		v	Minimises car mode share to/from Cambridge Northern Fringe East
1	Maintain traffic at or below 2011 traffic levels in Cambridge	i	Cordoned Traffic Flows to/from Cambridge City
2	Minimise vehicle mileage whilst providing for increased travel demand	i	Average journey times on the A10 Corridor
		ii	Total distance travelled across the whole network
		iii	Average delay across the whole network
3	Improve reliability, capacity and speed of alternative transport modes	i	Improved Bus Journey Time reliability
		ii	Improved Bus Capacity
		iii	Improved Train Reliability
		iv	Improved Train Capacity
		v	Improved Active Travel Efficiency
		vi	Improved Active Travel Capacity
4	Minimise potential impact on alternative "rat-runs" to the A10	i	Reduced rat running on Cottenham Road
		ii	Reduced rat running on Twenty Pence Road
		iii	Reduced rat running on Horningsea Road
		iv	Reduced rat running on Green End Landbeach
5	Intercept or substitute car trips with alternative transport modes	i	Car mode share across the whole network
-	Capital Cost of Delivery	i	Capital cost of delivery

Source: Mott MacDonald

2.8.2 Scoring of Packages

The scoring was undertaken using a predefined scale to determine the relative impact of each package. These varied from simplified "Yes/No/Neutral" answers with scores of 1 to -1 respectively to more varied scores such as "Significant/Slight Benefit, Neutral, Slight/Significant Disbenefit" scored from 2 to -2 respectively. The scoring criteria for the strategic and transport themes are outlined in Table 7; scores marked as "N/A" were not used for appraising particular sub-criteria.

Table 7: INSET Appraisal Scoring Criteria

Sub-Criteria	2	1	0	-1	-2
Provides adequate road access to	Large improvement in road access to	Small improvement in road access to	No change in road access to	Small reduction in road access to	Large reduction in road access to

Sub-Criteria	2	1	0	-1	-2
Waterbeach New Town	Waterbeach New Town	Waterbeach New Town	Waterbeach New Town	Waterbeach New Town	Waterbeach New Town
Provides improved rail access to Waterbeach New Town	Large improvement in rail access to Waterbeach New Town	Small improvement in rail access to Waterbeach New Town	No change in rail access to Waterbeach New Town	Small reduction in rail access to Waterbeach New Town	Large reduction in rail access to Waterbeach New Town
Provides improved bus access to Waterbeach New Town	Large improvement in bus access to Waterbeach New Town	Small improvement in bus access to Waterbeach New Town	No change in bus access to Waterbeach New Town	Small reduction in bus access to Waterbeach New Town	Large reduction in bus access to Waterbeach New Town
Provides improved active travel access to Waterbeach New Town	Large improvement in active travel to Waterbeach New Town	Small improvement in active travel to Waterbeach New Town	No change in active travel to Waterbeach New Town	Small reduction in active travel to Waterbeach New Town	Large reduction in active travel to Waterbeach New Town
Minimises car mode share to/from Waterbeach New Town	Large improvement in mode share to Waterbeach New Town	Small improvement in mode share to Waterbeach New Town	No change in mode share to Waterbeach New Town	Small reduction in mode share to Waterbeach New Town	Large reduction in mode share to Waterbeach New Town
Provides adequate road access to Cambridge Science Park	Large improvement in road access to Cambridge Science Park	Small improvement in road access to Cambridge Science Park	No change in road access to Cambridge Science Park	Small reduction in road access to Cambridge Science Park	Large reduction in road access to Cambridge Science Park
Provides improved rail access to Cambridge Science Park	Large improvement in rail access to Cambridge Science Park	Small improvement in rail access to Cambridge Science Park	No change in rail access to Cambridge Science Park	Small reduction in rail access to Cambridge Science Park	Large reduction in rail access to Cambridge Science Park
Provides improved bus access to Cambridge Science Park	Large improvement in bus access to Cambridge Science Park	Small improvement in bus access to Cambridge Science Park	No change in bus access to Cambridge Science Park	Small reduction in bus access to Cambridge Science Park	Large reduction in bus access to Cambridge Science Park
Provides improved active travel access to Cambridge Science Park	Large improvement in active travel to Cambridge Science Park	Small improvement in active travel to Cambridge Science Park	No change in active travel to Cambridge Science Park	Small reduction in active travel to Cambridge Science Park	Large reduction in active travel to Cambridge Science Park
Minimises car mode share to/from Cambridge Science Park	Large improvement in mode share to Cambridge Science Park	Small improvement in mode share to Cambridge Science Park	No change in mode share to Cambridge Science Park	Small reduction in mode share to Cambridge Science Park	Large reduction in mode share to Cambridge Science Park
Provides adequate road access to Cambridge Northern Fringe East	Large improvement in road access to Cambridge Northern Fringe East	Small improvement in road access to Cambridge Northern Fringe East	No change in road access to Cambridge Northern Fringe East	Small reduction in road access to Cambridge Northern Fringe East	Large reduction in road access to Cambridge Northern Fringe East
Provides improved rail access to Cambridge Northern Fringe East	Large improvement in rail access to Cambridge Northern Fringe East	Small improvement in rail access to Cambridge Northern Fringe East	No change in rail access to Cambridge Northern Fringe East	Small reduction in rail access to Cambridge Northern Fringe East	Large reduction in rail access to Cambridge Northern Fringe East
Provides improved bus access to Cambridge Northern Fringe East	Large improvement in bus access to Cambridge Northern Fringe East	Small improvement in bus access to Cambridge Northern Fringe East	No change in bus access to Cambridge Northern Fringe East	Small reduction in bus access to Cambridge Northern Fringe East	Large reduction in bus access to Cambridge Northern Fringe East
Provides improved active travel access to Cambridge Northern Fringe East	Large improvement in active travel to Cambridge Northern Fringe East	Small improvement in active travel to Cambridge Northern Fringe East	No change in active travel to Cambridge Northern Fringe East	Small reduction in active travel to Cambridge Northern Fringe East	Large reduction in active travel to Cambridge Northern Fringe East

Sub-Criteria	2	1	0	-1	-2
Minimises car mode share to/from Cambridge Northern Fringe East	Large improvement in mode share to Cambridge Northern Fringe East	Small improvement in mode share to Cambridge Northern Fringe East	No change in mode share to Cambridge Northern Fringe East	Small reduction in mode share to Cambridge Northern Fringe East	Large reduction in mode share to Cambridge Northern Fringe East
Cordoned Traffic Flows to/from Cambridge City	Traffic levels are below 2011 totals	No change in traffic levels	N/A	Traffic levels increase in line with national forecasts	Traffic levels in excess of national forecasts
Average journey times on the A10 Corridor	Greater than 5-minute decrease in journey times	Up to 5-minute decrease in journey times	No change in journey times	Up to 5-minute increase in journey times	Greater than 5-minute increase in journey times
Total distance travelled across the whole network	Significant decrease in total trip distance	Slight decrease in total trip distance	No change in total trip distance	Slight increase in total trip distance	Significant increase in total trip distance
Average delay across the whole network	Significant decrease in average delay	Slight decrease in average delay	No change in average delay	Slight increase in average delay	Significant increase in average delay
Improved Bus Journey Time reliability	Bus journey times improved by more than 5 minutes	Bus journey times improved by up to 5 minutes	Bus service reliability does not change	Bus journey times decrease by up to 5 minutes	Bus journey times decrease by over 5 minutes
Improved Bus Capacity	N/A	Bus service capacity is improved	Bus service capacity does not change	Bus service capacity is compromised	N/A
Improved Train Reliability	Train journey times improved by more than 5 minutes	Train journey times improved by up to 5 minutes	Train service reliability does not change	Train journey times decrease by up to 5 minutes	Train journey times decrease by over 5 minutes
Improved Train Capacity	N/A	Train service capacity is improved	Train service capacity does not change	Train service capacity is compromised	N/A
Improved Active Travel Efficiency	Active Travel journey times improved by more than 5 minutes	Active Travel journey times improved by up to 5 minutes	Active Travel service reliability does not change	Active Travel journey times decrease by up to 5 minutes	Active Travel journey times decrease by over 5 minutes
Improved Active Travel Capacity	N/A	Active Travel capacity is improved	Active Travel capacity does not change	Active Travel capacity is compromised	N/A
Reduced rat running on Cottenham Road	Significant decrease in rat running	Slight decrease in rat running	No change in rat running	Slight increase in rat running	Significant increase in rat running
Reduced rat running on Twenty Pence Road	Significant decrease in rat running	Slight decrease in rat running	No change in rat running	Slight increase in rat running	Significant increase in rat running
Reduced rat running on Horningsea Road	Significant decrease in rat running	Slight decrease in rat running	No change in rat running	Slight increase in rat running	Significant increase in rat running
Reduced rat running on Green End Landbeach	Significant decrease in rat running	Slight decrease in rat running	No change in rat running	Slight increase in rat running	Significant increase in rat running
Car mode share across the whole network	Significant modal shift away from private car	Slight modal shift away from private car	No change in modal splits	Slight modal shift towards private car	Significant modal shift towards private car

Source: Mott MacDonald

Scoring for the cost theme was undertaken using a scale of -1 (least costly package) to -5 (most costly package) as a means to offset the benefits generated from scoring in the strategic and transport themes.

The full scores from the appraisal are summarised in Table 8.

Table 8: Summary of Sub-Criteria Scoring

ID	Sub-Criteria	Mode-Shift	Junction +	North Dual	South Dual	Full Dual	Rationale
6i	Provides adequate road access to Waterbeach New Town	0	0	1	1	1	Journey time savings to site are > 1 minute in dualling options
6ii	Provides improved rail access to Waterbeach New Town	2	2	2	2	2	All scenarios deliver significant journey time savings by train to the site
6iii	Provides improved bus access to Waterbeach New Town	1	1	1	2	2	South/Full Dual deliver >5 minute journey times savings for bus trips
6iv	Provides improved active travel access to Waterbeach New Town	0	0	0	0	0	All active travel journey time savings are < 1 minute
6v	Minimises car mode share to/from Waterbeach New Town	1	1	1	1	-1	Car mode share decreases in all but the Full Dual, where it increases
7ai	Provides adequate road access to Cambridge Science Park	0	0	0	1	1	Journey time savings are > 1 minute for south/full dual options
7aii	Provides improved train access to Cambridge Science Park	1	1	1	1	1	All scenarios generate similar train journey time savings
7aiii	Provides improved bus access to Cambridge Science Park	0	0	0	1	1	Bus journey times are only improved by south/full dual
7aiv	Provides improved active travel access to Cambridge Science Park	0	0	0	0	0	All active travel journey time savings are < 1 minute
7av	Minimises car mode share to/from Cambridge Science Park	-1	-1	-1	-1	-1	All scenarios lead to an increase in car mode share from the site
7bi	Provides adequate road access to Cambridge Northern Fringe East	0	0	0	1	1	Journey time savings are > 1 minute for south/full dual options
7bii	Provides improved rail access to Cambridge Northern Fringe East	1	1	1	1	1	All scenarios generate similar train journey time savings

ID	Sub-Criteria	Mode-Shift	Junction +	North Dual	South Dual	Full Dual	Rationale
7biii	Provides improved bus access to Cambridge Northern Fringe East	0	0	0	0	0	All bus journey time savings are < 1 minute
7biv	Provides improved active travel access to Cambridge Northern Fringe East	0	0	0	0	0	All active travel journey time savings are < 1 minute
7bv	Minimises car mode share to/from Cambridge Northern Fringe East	-1	-1	-1	-1	-1	All scenarios lead to an increase in car mode share from the site
1i	Cordoned Traffic Counts to/from Cambridge City	-2	-2	-2	-2	-2	All scenarios record traffic levels into Cambridge >20% from 2011 levels
2i	Average journey times on the A10 Corridor	1	1	2	2	2	Dualling options generate >5 minute journey time savings for all modes
2ii	Total distance travelled across the whole network	-1	-1	-1	-1	-1	All options bring about a slight increase in total trip distances
2iii	Average delay across the whole network	0	2	2	2	2	All highway interventions are able to significantly reduce the level of delay on the network
3i	Improved Bus Journey Time reliability	1	1	1	2	2	Bus journey times along corridor improved >5 minutes for south and full dual options
3ii	Improved Bus Capacity	1	1	1	1	1	Bus capacity is improved across all options
3iii	Improved Train Reliability	2	2	2	2	2	Train journey times improved by over 5 minutes in all scenarios
3iv	Improved Train Capacity	1	1	1	1	1	Train capacity is improved across all options
3v	Improved Active Travel Efficiency	2	2	2	2	2	Active travel journey times are improved > 5 minutes along the corridor

ID	Sub-Criteria	Mode-Shift	Junction +	North Dual	South Dual	Full Dual	Rationale
3vi	Improved Active Travel Capacity	1	1	1	1	1	Active travel capacity is improved across all options
4i	Reduced rat running on Cottenham Road	1	1	1	2	2	South/Full dual option reduce demand by >100 pcus
4ii	Reduced rat running on Twenty Pence Road	1	1	2	2	2	All dualling options reduce demand by >100 pcus
4iii	Reduced rat running on Horningsea Road	1	2	1	2	2	Highway options benefitting the southern end of the corridor reduce demand by >100 pcus
4iv	Reduced rat running on Green End	-1	-2	-2	-2	-2	Highway interventions all add >100 pcus to road
5i	Car mode share across the whole network	1	-1	-1	-1	-1	Highway interventions generate a slight modal shift towards private car
-i	Capital cost of delivery	-1	-2	-4	-3	-5	Schemes ranked in order of cost

Source: Mott MacDonald

2.8.3 Weighting of Criteria

Scores were then weighted according to their perceived relative importance. These have been defined as follows:

- **Themes:** Each have been weighted evenly as 1 as strategic, transport and cost outcomes are all perceived to be of equal importance
- **Main Criteria:** Access into Waterbeach has been assigned a weighting of 2 as it directly affects the Ely to Cambridge Corridor more than the Cambridge Science Park or Cambridge North Fringe East. Similarly, improving the reliability of alternative transport modes and reducing rat runs have been given weightings of 2 compared to more car-based outcomes. Minimised vehicle mileage has been given a weighting of 3 to reflect its overall strategic importance
- **Sub-Criteria:** Non-car accessibility criteria have all been given weightings of 2 to reflect the importance of modal choice on the A10 corridor. Reductions in delay have similarly been weighted as 2 as this is seen as more important as changes in trip distance. Changes to journey times have been given a weighting of 3 given their importance in determining economic benefits for the scheme. The cost scores were given a weighting of 0.2 to normalise the scoring (from -1 to -5) in line with the other outputs

2.8.4 Weighted Scores

The weighted scores are presented in and are grouped by each theme.

Table 9: Final INSET Scores

Package	Strategic Theme	Transport Theme	Cost Theme	Total Score
Modal Shift	1.00	0.93	-0.20	**0.58**
Junction Plus	1.00	1.33	-0.40	**0.64**
North Dual	1.13	1.93	-0.80	**0.76**
South Dual	1.67	2.20	-0.60	**1.09**
Full Dual	1.40	2.20	-1.00	**0.87**

Source: Mott MacDonald

These show that the South Dual option scores the highest overall, given its strong scoring in both strategic and transport outcomes and its relative cost compared to the other dualling options.

Out of the non-dualling options, both the modal shift and junction plus options deliver modest strategic and transport benefits at relatively low cost. The Junctions Plus option performs slightly better given that its highway impacts are more beneficial, despite its slightly higher cost.

Overall the dualling options all score higher than the non-dualling options as they are able to unlock significant benefits from both a strategic perspective and from a highway perspective.

This indicates that benefits could be gained by first undertaking comparatively low-cost packages which are likely to have shorter implementation programmes as well as lower costs, together with effective measures to encourage mode shift. Higher cost packages which generate significant benefits could then be adopted subsequently in line with the scale and pace of development.

2.8.5 Development-related transport planning

The model-based analysis set out above makes clear that transport conditions in the Ely to Cambridge corridor will deteriorate through time, and that this will be exacerbated with further development, unless measures are introduced both to target travel demand (and particularly private highway travel demand) and also to enhance the capacity and effectiveness of the transport networks on which people travel.

Beyond this analysis, however, there is also the case that a key responsibility for securing positive transport outcomes for the county lies with the detailed planning of individual developments and managing demand to travel, particularly by private car, at source. Moreover, it is clear that major development cannot continue to be delivered with a ‘business-as-usual’ approach to transport planning which frequently does little to discourage the frequent use of private motor vehicles.

To avoid the problematic impacts described above in this document, development must in future seek very carefully to:

- minimise external vehicle trip generation through maximising trip internalisation;
- provide significantly lower levels of car parking than has traditionally been provided, particularly at employment locations;
- promote a site-wide approach to car parking management to reduce the need for significant increases in car parking provision; and
- promote the use of non-car modes through significant investment in supply-side measures and aggressive travel planning to encourage the required mode shift.

The development of major sites at CNFE, CSP, and Waterbeach, as well as sites to the north of the corridor at Ely and beyond therefore represent an opportunity to take a more proactive approach to planning which maximises the likelihood of sustainable future travel patterns.

The planning and transport authorities should also ensure that processes for monitoring, managing, and reviewing transport outcomes are implemented and secured by and from developers through the consenting process.

Acceptable and stretching highway ‘trip budgets’ should be identified for each site and permission for continued stages of development should be made contingent on the ability of the developers to demonstrate their sites are meeting these targets through effective promotion of non-car-mode take-up and site-based demand management.

This is particularly relevant for the CNFE and CSP sites, given the constraints on highway capacity at, and south of, the Milton Interchange, the need for parking restraint here, and the availability of non-car travel options.

3 Financial Case

The Financial Case concentrates on the costs of each transport intervention, and how these are expected to be profiled out over time. It also discusses how allowances for risk have been accounted for in the cost estimates.

3.1 Methodology

The financial cost estimates were developed in line with national standards and guidance for individual elements of each transport intervention package.

As detailed in Section 2.6, there are five options which have been identified through the initial analysis for a more detailed appraisal:

- Mode-shift (DS1) - Do Minimum highway network, but new measures to encourage mode shift
- Junction+ (DS2) - Mode-shift option measures, but with additional junction improvements to the Ely to Cambridge Corridor
- North-dual (DS3) - Junction+ option, but with the provision of a dual carriageway, on an alignment to be determined, from the Waterbeach development north access to Ely
- South-dual (DS4) - Junction+ option, but with the provision of a dual carriageway, on an alignment to be determined, from the Waterbeach development south access to the A14 at Milton
- Full-dual (DS5) - Junction+ option, but with the provision of a dual carriageway, on an alignment to be determined, from the A14 to Ely

The cost estimates for individual scheme components have been included in this section, which are then combined to provide overall costs for each proposed option.

3.2 Assumptions

The following assumptions and exclusions have been incorporated into the cost estimates:

- **General Assumptions:**
  – The estimate is based at 4Q17 (no inflation has been allowed for beyond this time)
  – Works can be carried out under half road closure wherever possible
  – Existing ground level approximately same as finished construction levels
  – The A10 is not a Highways England maintained asset therefore no allowances have been included for roadside technology signs for NRTS
  – All signage to be unlit
  – All street lighting for the (non-rail) dedicated public transport route, ped/cycle and junction improvements is at 20m intervals
  – New Waterbeach Park and Ride site allowance for 1,000 spaces as per the Waterbeach Transport Assessment document
  – The generic layout of the relocated railway station platform uses assumptions taken from the Waterbeach Transport Assessment which is considered a reasonable basis for estimates at the early stage in the process

- If existing lane configurations not clear then a minimum of 100m allowed on the approach to major junctions where the lane configuration changes
- Roundabout inscribed circle diameter assumed as 30m unless existing roundabout is larger
- Assume (non-rail) dedicated public transport route is through a greenfield site
- Assume cycle/ped way is through a greenfield site
- The crossing over the River Great Ouse will be widened, not demolished and rebuilt
- Replacement of pedestrian bridge for Milton Park and Ride for the South and Full Dual Options
- Site Compounds included in the prelims except for the Guided Busway which needs site compound for a batching plant
- Where possible budget quotations have been used from specialist subcontractors

- **Exclusions:**
  - VAT
  - 3rd party compensation costs
  - Planning and approval charges
  - Costs associated with Statutory Fees (e.g. HMRI, Local Authority, etc.)
  - Costs associated with taxes, levies and licences
  - Costs associated with changes in legislation and any form of applicable standards
  - Christmas, Easter and Bank Holiday working
  - Environmental mitigation works
  - Archaeological digs
  - Inflation beyond the base date
  - Land deemed relatively flat - minimising the use of safety barrier in the verges allowed for 50% barrier
  - Re-location of affected businesses
  - Road diversions
  - Landscaping
  - Retaining walls
  - Footpaths for the full length of the dual carriageway
  - Any works to the existing A14
  - Tactile paving
  - Procurement of new vehicles for the (non-rail) dedicated public transport route
  - New depot for vehicles for the (non-rail) dedicated public transport route

It is common practice when schemes and measures are in the early stages of their assessment for there to be a number of exclusions such as those noted above. For the purposes of assessing the economic performance of the packages (see the Economic Case), however, factors reflecting optimism bias, risk and other elements including an assumed uplift for land costs have been applied.

3.3 Capital Costs

3.3.1 Baseline Costs

Baseline costs have been developed for individual components of each package of interventions. At this early stage of scheme development, these have been defined as follows:

- **All options**
  - New Station at Waterbeach (including car park)
  - Waterbeach Park and Ride site
  - Pedestrian and Cycle upgrades
  - Provision of dedicated (non-rail) public transport corridor
  - Localised measures on Milton Road in vicinity of CNFE and Science Park
- **Highway Intervention options (Junctions Plus, North Dual, South Dual, Full Dual)**
  - Highway Works (scaled according to level of intervention)

Costs for each component were profiled out according to the following items:

- **Construction:** Cost of building and contracting the scheme itself
- **Preliminaries (Prelim):** Cost of administering construction, assumed as 23% of construction estimate
- **Overheads & Profit (OH&P):** Business costs associated with construction, assumed to be 10% of construction + preliminary costs
- **Design:** Costs associated with the planning and design phases prior to construction, assumed to be 10% of overall Construction, Prelims and OH&P costs
- **Project Management (PM):** Costs associated with administering the design process, assumed to be 11% of overall Construction, Prelims and OH&P costs

These are presented in Table 10 alongside the scheme options and their components.

Table 10: Baseline Intervention Costs (£000s, 2017 costs & prices)

Cost Item	All Options (DS1 – DS5)					DS2	DS3	DS4	DS5
	W'beach New Station	W'beach P&R	Ped & Cycle	Public transport corridor	Milton Rd local measures	Junction Plus	North Dual	South Dual	Full Dual
Const	7,500	3,500	5,200	21,900	1,100	18,700	67,700	39,800	91,300
Prelim	1,800	800	1,200	5,000	200	4,300	15,600	9,100	21,000
OH&P	900	400	600	2,700	100	2,300	8,300	4,900	11,200
Design	1,500	700	1,100	4,500	200	3,800	13,800	8,100	18,500
PM	1,100	500	800	3,300	200	2,800	10,100	5,900	13,600
TOTAL	**12,800**	**5,900**	**8,800**	**37,400**	**1,800**	**31,900**	**115,500**	**67,800**	**155,600**

Source: Mott MacDonald

3.3.2 Risk Allowances

At this stage in the option development process, a degree of risk has been factored into the cost estimates, given the level of uncertainty associated with each package of interventions.

Several risk items have been identified as follows:

- **Risk Allocation:** Set at 10% of baseline costs – this will be updated based on a Quantified Risk Cost Allocation (QRCA) as the scope of interventions becomes more defined

- **Legal Fees:** Set at 2% of baseline costs
- **Business Case Fees (BC):** Assumed to be 3% of baseline costs
- **Land Costs:** Potential costs associated with purchasing up land for to each scheme in order to progress development, discounting any land required for construction compounds. At this stage this is assumed to be 20% of baseline costs, minus the preliminaries associated with construction compound setup but this will need to be subject to detailed review as the interventions are refined
- **Utilities Diversions (Utils):** Assumed to be 1% of baseline costs

These allocations are summarised in Table 11 alongside each option

Table 11: Risk Allocation Costs (£000s, 2017 costs & prices)

Cost Item	All Options (DS1 – DS5)					DS2	DS3	DS4	DS5
	W'beach New Station	W'beach P&R	Ped & Cycle	Public transport corridor	Milton Rd local measures	Junction Plus	North Dual	South Dual	Full Dual
Risk	3,200	1,400	2,200	9,300	400	8,000	28,900	17,000	38,900
Legal	300	100	200	800	50	600	2,300	1,400	3,100
BC	400	200	300	1,100	100	1,000	3,500	2,000	4,700
Land	800	400	500	2,300	100	1,900	7,000	4,100	9,400
Utils	100	100	100	500	50	400	1,400	800	1,900
TOTAL	**4,800**	**2,200**	**3,300**	**14,000**	**700**	**11,900**	**43,100**	**25,300**	**58,000**

Source: Mott MacDonald

Additional optimism bias uplifts have been added to these costs for the purposes of the economic appraisal, as discussed in Section 4.1.

3.3.3 Point Estimate

The total cost for each package of measures combines the baseline costs with the risk allowances for each scheme component. These are summarised in Table 12.

Table 12: Point Estimates – Scheme Components (£000s, 2017 costs & prices)

Cost Item	All Options (DS1 – DS5)					DS2	DS3	DS4	DS5
	W'beach New Station	W'beach P&R	Ped & Cycle	Public transport corridor	Milton Rd local measures	Junction Plus	North Dual	South Dual	Full Dual
Baseline Cost	12,800	5,900	8,800	37,400	1,800	31,900	115,500	67,800	155,600
Risk Allowances	4,800	2,200	3,300	14,000	700	11,900	43,100	25,300	58,000
Point Estimate	**17,500**	**8,100**	**12,100**	**51,200**	**2,500**	**43,800**	**158,500**	**93,100**	**213,700**

Source: Mott MacDonald

These individual component costs have been combined into intervention package costs for each option, as listed in Table 13.

Table 13: Point Estimates – Transport Options (£000s, 2017 costs & prices)

Cost Item	DS1 (W'beach New Station, W'beach P&R, Ped & Cycle, dedicated public transport corridor, Milton Road local measures)	DS2 (DS1 + Junction Plus)	DS3 (DS1 + North Dual)	DS4 (DS1 + South Dual)	DS5 (DS1 + Full Dual)
Baseline Cost	66,500	98,500	182,000	134,400	222,200
Risk Allowances	24,800	36,700	68,000	50,200	82,900
Point Estimate	**91,400**	**135,200**	**250,000**	**184,600**	**305,100**

Source: Mott MacDonald

3.4 Operational Costs

At this stage, operational costs have not been estimated as the scope of any changes to the maintenance regime or public transport services have not been fully defined.

3.5 Cost Profile

For the purposes of the economic assessment, it has been assumed that the total cost of each intervention package will be profiled out evenly across a four-year period leading up to an assumed package opening year of 2031. In practice, delivery of individual elements would be phased with some potentially delivered significantly earlier than others. However, for the purposes of this initial assessment, this has been used as a working assumption and to allow for a like-for-like comparison across the scenarios.

The cost profiles will therefore need be examined in additional detail once the transport interventions, and their delivery timescales, have been scoped out further.

4 Economic Case

The economic case for each package will be demonstrated by an analysis of all its impacts and their associated value for money. DfT guidance on undertaking a SOBC requires that only initial findings on the associated value for money of a scheme are provided at this stage.

4.1 Methodology

As detailed in Section 2.6, there are five do-something options which have been identified through the initial analysis for a more detailed appraisal. These all include improvements to public transport and encouraging a mode shift away from private vehicles.

In order to undertake economic assessment, a ‘do minimum’ case is also required for comparison purposes. The options appraised were:

- Do Minimum (DM) – the existing transport network, amended to include committed schemes as agreed with the County Council, and with increased demand reflecting planned growth in jobs and population to 2031
- Mode-shift (DS1) - Do Minimum transport network, but new measures to encourage mode shift
- Junction+ (DS2) - Mode-shift option measures, but with additional junction improvements to the Ely to Cambridge Corridor
- North-dual (DS3) - Junction+ option, but with provision of a dual carriageway, on an alignment to be determined, between the proposed Waterbeach development access and Ely
- South-dual (DS4) - Junction+ option, but with provision of a dual carriageway, on an alignment to be determined, between the proposed Waterbeach development access and the A14 at Milton
- Full-dual (DS5) - Junction+ option, but with the provision of a dual carriageway, on an alignment to be determined, between the A14 and Ely

The assessment of the transport user benefits has been undertaken using the software TUBA, with inputs provided using the County Council’s CSRM2 SATURN-based strategic model.

4.2 Assumptions

This section provides a description of the assumptions used in order to undertake the economic appraisal. The approach has generally followed WebTAG criteria, but in certain cases a simplified approach has been used to reflect the early development of the interventions. The key assumptions of the economic assessment are:

- A 60-year appraisal period with a package opening year of 2031 (as noted previously, this will be refined should the packages be developed further, assuming that some elements would be delivered significantly earlier than others)
- Appraisal based on model forecast years of 2031 and 2041. Only 2031 models were available for this study and given that TUBA requires two modelled years in order to interpolate and extrapolate benefits across the 60-year appraisal period, the 2031 inputs have been repeated with a forecast year of 2041. This assumes that benefits generated by each scheme will remain fixed from 2031 to 2041. Whilst not considered unreasonable at

this early stage of the process, more detailed modelling and profiling of benefits will clearly be needed should package elements be taken forward.

- Three modelled hours including:
  - AM Peak Hour (08:00 – 09:00)
  - PM Peak Hour (17:00 – 18:00)
  - Average Inter-Peak Hour (10:00 – 16:00)
- Annualisation factors have been derived to enable modelled time periods to represent the full year. The annualisation factors used assume 253 working days in a year and also assume that the benefits generated in the AM peak hour will be repeated for each hour of the 3-hour period from 07:00 – 10:00. Similarly, the PM peak hour benefits will be repeated for each hour of the 3-hour period from 16:00 – 19:00 and the inter-peak hour will be repeated for each hour of the 6-hour period from 10:00 – 16:00.

Furthermore, the following assumptions have been used with particular consideration for scheme cost inputs:

- Optimism bias taken as 66%, taken from WebTAG A1.2, Table 8
- All costs have been assumed to be construction costs with no operation and maintenance costs included, and a general uplift factor applied for land costs, which will require detailed review should the component schemes be taken forward
- A 4-year build period of 2028 to 2031 inclusive, with costs spread 25% across each year
- All costs calculated used a 2017 price base, these are converted to a 2010 price base for TUBA calculations with all TUBA output given in a 2010 price base.

4.3 Benefits Appraisal

In this section, a description of the benefits generated from travel time improvements and operating cost reductions for each option is presented, along with a commentary on the findings. Each of the five transport interventions have been compared against the “Do Minimum” option outlined in Section 2.7.

4.3.1 Transport Economic Efficiency

The Transport Economic Efficiency (TEE) table provides a summary of the monetised journey time savings and operating cost savings generated by different user classes in each modelled scenario compared to the Do Minimum scenario. The outputs for all scenarios are summarised in Table 14.

Table 14: Transport Economic Efficiency Summary (2010 values, discounted to 2010)

Benefits Category	Benefits Sub-Category	DS1 Value (£000)	DS2 Value (£000)	DS3 Value (£000)	DS4 Value (£000)	DS5 Value (£000)
Consumer - Commuting user benefits	Travel Time	149,038	276,982	405,061	317,926	407,952
	Vehicle operating costs	20,500	19,804	21,199	7,050	6,608
	NET CONSUMER - COMMUTING BENEFITS	*169,538*	*296,786*	*426,260*	*324,976*	*414,560*
Consumer - Other user benefits	Travel Time	2,065	58,031	124,883	116,105	183,163
	Vehicle operating costs	1,473	3,866	-4,471	1,267	-9,340

Benefits Category	Benefits Sub-Category	DS1 Value (£000)	DS2 Value (£000)	DS3 Value (£000)	DS4 Value (£000)	DS5 Value (£000)
	NET CONSUMER - OTHER BENEFITS	*3,539*	*61,897*	*120,412*	*117,372*	*173,823*
Business – User benefits	Travel Time	32,776	66,940	139,684	79,762	138,986
	Vehicle operating costs	3,412	11,753	23,679	17,558	27,574
	NET BUSINESS IMPACT	*36,188*	*78,693*	*163,363*	*97,320*	*166,560*
TOTAL		**209,265**	**437,376**	**710,035**	**539,668**	**754,943**

Source: Mott MacDonald

The DS1 scenario offers significant travel time and VOC benefits to all trips. The net overall impact of the mode shift scenario generates approximately £210m benefits over the entire appraisal period when compared to the do-minimum.

DS2 consists of both mode shift package measures along with junction upgrades on the Ely to Cambridge corridor. These improvements result in an uplift in benefits when compared to the mode shift measures alone (DS1). This scenario also offers benefits to all trip purposes with the largest portion coming from commuter trips.

Providing a dual carriageway between Waterbeach and Ely (ie the northern section of the Ely to Cambridge corridor – alignment to be determined (DS3)) increases benefits further due to the increased capacity and speeds likely to be experienced as a result of the upgraded infrastructure.

Providing a dual carriageway between Waterbeach and the A14 (ie the southern section of the Ely to Cambridge corridor – alignment to be determined (DS4)) generates more modest benefits compared to the northern dualling, in part due to the shorter distance covered by the improvements.

Provision of a full dual carriageway from the A14 to Ely (the alignment would need to be determined through further detailed assessment work) offers the largest benefits.

4.3.2 Analysis of Monetised Costs and Benefits (AMCB)

The AMCB table summarises the outcomes of the TEE calculations from Section 4.3.1, alongside an outline of greenhouse gas benefits and indirect taxes for each of the options. It also includes the cost components derived in Section 3, discounted to 2010 at 2010 prices. These are included in Table 15

Table 15: Analysis of Monetised Costs and Benefits Summary (2010 prices discounted to 2010)

Benefits/Costs Category	DS1 Value (£000)	DS2 Value (£000)	DS3 Value (£000)	DS4 Value (£000)	DS5 Value (£000)
Greenhouse Gases	976	2,473	155	329	-4,284
Economic Efficiency: Consumer Users (Commuting)	169,538	296,786	426,260	324,976	414,560

Benefits/Costs Category	DS1 Value (£000)	DS2 Value (£000)	DS3 Value (£000)	DS4 Value (£000)	DS5 Value (£000)
Economic Efficiency: Consumer Users (Other)	3,539	61,897	120,412	117,372	173,823
Economic Efficiency: Business Users and Providers	36,188	78,693	163,363	97,320	166,560
Wider Public Finances (Indirect Taxation Revenues)	-1,870	-4,435	229	-132	8,828
Present Value of Benefits (PVB)	**208,371**	**435,414**	**710,419**	**539,865**	**759,487**
Present Value of Costs (PVC)	**82,856**	**122,376**	**222,947**	**166,856**	**267,482**

As described in Section 4.3.1, the full dualling option offers an increase in benefits from both the north and south dualling options in isolation but at greater present value cost.

4.3.3 Safety Benefits

Due to the strategic nature of the options under consideration, the safety benefits have not been examined at this stage.

4.3.4 Environmental Benefits

Environmental benefits have been calculated based on the AMCB outputs above. These calculate the approximate monetised value of changes in greenhouse gas emissions between the Do Minimum scenario and each of the options.

The Junction + (DS2) option appears to generate the greatest greenhouse gas benefits, as it does little to change the speed and classification of the Ely to Cambridge corridor, but alleviates key areas of congestion which would have adversely affected emissions.

There are also modest greenhouse gas benefits for both the north (DS3) and south (DS4) dualling options, as the impact of congestion alleviation counter-balances the impact of increased speeds on the dualled parts of the route.

There are greenhouse gases disbenefits associated with the full dual option (DS5), which could be attributed to higher levels of traffic using the fully dualled route and travelling at higher speeds along the corridor, which outweighs the environmental benefits of any congestion alleviation.

4.3.5 Wider Economic Benefits

Wider Economic benefits have not been investigated at this stage due to the strategic nature of the interventions under consideration. Once the preferred options are refined, the impacts of the proposals on business, the economy and regeneration can be assessed as part of business case development for the recommended schemes

4.3.6 Reliability Benefits

The reliability benefits have not been quantified at this stage, although consideration was given to potential reliability impacts as part of the wider INSET appraisal outlined in Section 2.8.

4.3.7 Summary of Benefits

Each of the packages bring about monetised benefits in terms of journey time savings and reduced vehicle operating costs, particularly for commuting traffic on the Ely to Cambridge Corridor.

The level of benefit calculated for each intervention package at this stage suggests that the package including all of the public transport measures and provision of a full dual carriageway will generate the most benefits, followed by the package including the north dual proposal, then the package with the south dual proposal. The non-dualling options also generate benefits, with the junction improvement option providing more benefits than the mode shift option.

However, these benefits are counterbalanced by the relative costs of each scheme, with the packages that include the full dual and the north dual also being the costliest options, followed by the south dual, junction improvements and mode shift. The relationship between these costs and benefits are outlined further in the next section.

4.4 Value for Money

This section draws together the benefits calculations from the above section alongside the cost calculations from Section 3 to understand the net present value and benefit to cost ratios for each intervention package. These illustrate the value for money can be offered through each set of interventions.

4.4.1 Package Costs

The estimates in Table 16 have been calculated for each scenario, which incorporate the estimated costs of design, construction and risk allowances, but do not allow for the purchase of land or the ongoing operation and maintenance costs.

Table 16: Package Cost Summary (£000, 2017 prices)

Cost Item	DS1 (Mode Shift)	DS2 (Junction Plus)	DS3 (North Dual)	DS4 (South Dual)	DS5 (Full Dual)
Baseline Cost	66,500	98,500	182,000	134,400	222,200
Risk Allowances	24,800	36,700	68,000	50,200	82,900
Point Estimate	**91,400**	**135,200**	**250,000**	**184,600**	**305,100**

4.4.2 Risk and Optimism Bias

Risk allowances have been included in the prices outlined above, as detailed in Section 3.3.2. For the purposes of the economic appraisal, an additional 66% optimism bias has been added to the estimates to account for the level of uncertainty associated with the scope of the packages and the cost estimates themselves at this early stage of scheme development.

This is consistent with WebTAG Unit A1-2 on Scheme Costs, which states that early scheme development involving public transport components should apply a 66% uplift.

Table 17: Package Cost Summary (£000, 2017 prices)

Cost Item	DS1 (Mode Shift)	DS2 (Junction Plus)	DS3 (North Dual)	DS4 (South Dual)	DS5 (Full Dual)
Point Estimate	91,400	135,200	250,000	184,600	305,100
Optimism Bias (66%)	60,300	89,300	164,900	121,800	201,500
Total Scheme Estimate	**151,700**	**224,500**	**414,900**	**306,400**	**506,600**

4.4.3 Present Value of Costs

As described in Section 3, assumptions have been made regarding the years in which the schemes will be built and therefore the years in which costs will be incurred. It is assumed that all schemes will be built and operational in the year 2031 and, for the purposes of this high-level initial appraisal, that each package will be built in the three years prior to 2031 then finished and opened that year.

TUBA uses a 2010 price base and therefore the costs given in Section 3 are converted to a 2010 price base using the GDP deflator and then discounted to the assumed build year at 3.5% per year until 2031 and 3.0% after. This results in the present value of costs (PVC) given in Table 18.

Table 18: Application of package cost discounts (£000s)

Cost Item	DS1 (Mode Shift)	DS2 (Junction Plus)	DS3 (North Dual)	DS4 (South Dual)	DS5 (Full Dual)
Package Estimate (2017 Prices)	151,700	224,500	414,900	306,400	506,600
Package Estimate (2010 Prices)	82,856	122,376	222,947	166,856	267,482

Source: Mott MacDonald

4.4.4 Present Value of Benefits

Table 19 summarises the benefits described in Section 4.3. The table currently only displays the benefits generated through transport system efficiency improvements and currently does not take into account any safety, reliability or wider economic benefits that are likely to be generated by the packages.

This demonstrates that the full dual package (DS5) generates the highest level of benefits of around £760 million over the 60-year appraisal period, followed by the south dual package.

Table 19: Present Value Benefits (£000s, 2010 prices discounted to 2010)

Benefits/Costs Category	DS1 Value (£000)	DS2 Value (£000)	DS3 Value (£000)	DS4 Value (£000)	DS5 Value (£000)
Present Value of Benefits (PVB)	**208,371**	**435,414**	**710,419**	**539,865**	**759,487**

Source: Mott MacDonald

4.4.5 Benefit to Cost Ratios

Following on from the processes outlined above, the present value of benefits (PVB) are offset against the present value of costs (PVC) for each of the intervention options. The absolute difference between both values is referred to as the net present value (NPV), whilst the ratio between the two is referred to as the benefit to cost ratio (BCR). The BCR is then used to determine the value for money offered by each intervention package. These figures are given in Table 48 below.

Table 20: Benefit to Cost Ratios (£000s, 2010 prices discounted to 2010)

Benefits/Costs Category	DS1 Value (£000)	DS2 Value (£000)	DS3 Value (£000)	DS4 Value (£000)	DS5 Value (£000)
Present Value of Benefits (PVB)	208,371	435,414	710,419	539,865	759,487
Present Value of Costs (PVC)	82,856	122,376	222,947	166,856	267,482
Net Present Value (NPV)	125,515	313,038	487,472	373,009	492,005
Benefit to Cost Ratio (BCR)	**2.515**	**3.558**	**3.186**	**3.236**	**2.839**

4.4.6 Value for Money Statement

All intervention packages generate sufficient levels of benefits to offset the estimated cost of implementation.

The DfT's Value for Money Framework outlines different categorisations for schemes achieving BCR values within defined ranges. This classifies any schemes that score a BCR above 2 as demonstrating "High Value for Money". All packages tested here generate a BCR greater than this and, at this stage in the development process, are considered to demonstrate high value for money.

Based on the BCR scores, the package containing the southern dual scored highest out of the dualling options, followed by the packages including the north dual and then the full dual. The package including junction improvements and the mode shift proposals scores the highest BCR overall, whilst the mode shift package alone scores the lowest BCR overall. All packages have BCRs significantly in excess of 2 and therefore represent high value for money

This demonstrates that both lower-cost modal shift packages and higher cost highways packages have the potential to deliver significant benefits, although the greatest benefits have been derived from the packages which entail the provision of dual carriageway capacity to part or all of the A10 between Ely and Cambridge.

5 Commercial Case

The Commercial Case considers whether a transport investment is commercially viable and the potential procurement strategies that will be used to engage the market. It presents evidence on risk allocations and transfer, contract timescales and implementation timescales

5.1 Introduction

The main purpose of the Strategic Outline Business Case is to set out the need for intervention and define a preferred way forward. At SOBC stage, the Commercial Case is therefore typically presented as a high-level outline, which will be further developed as the scheme becomes more defined and the decision-making process reaches the Outline Business Case Stage.

5.2 Outline of Procurement Options

Different elements of the packages will likely be implemented using different routes depending on the type of scheme to be delivered and the lead authority be this the Combined Authority, the Greater Cambridge Partnership, or the County Council (possibly on behalf of the CA and / or the GCP). Some measures might also be implemented by third parties such as developers (potentially via Section 278 highways works), Network Rail, and others.

Further work by the authorities on the preferred procurement route for the different elements of the emerging preferred package will therefore be required but this could include:

- For large scale schemes (up to £20M), the Eastern Highways Alliance Framework
- For smaller scale schemes, the use of the County Council's Highway Services Contract
- Potential open invitation to tender (OJEU procurement) to select a contractor for the works from the open market
- Network Rail procurement mechanisms for rail-related works
- Developer-led works on the public highway via S278 Highways Act agreements
- Developer implementation of on-site works secured via planning condition

The advantages and disadvantages of these procurement routes, and their relevance to the different elements of the emerging preferred package will be considered in more detail as the different component schemes move through the Business Case process.

5.3 Programme Implications and Risk

An indicative timeline for delivery of a typical major scheme has been provided in the management case section to this report. However, more detailed programmes for each element of the emerging preferred package will need to be developed as these are progressed. This will need to include consideration of the following matters:

- Risk identification, allocation/transfer between commissioning authorities and contractor
- Timescales for procurement
- Contractor management strategy
- Payment mechanisms and arrangements should there be cost overruns

These issues will all be refined as the schemes move through the Business Case process, with full details being required at the Full Business Case stage.

6 Management Case

The management case demonstrates that the proposed packages are deliverable. It covers issues of the project planning and governance structure, risk management, communications and stakeholder management, benefits realisation and assurance.

6.1 Introduction

The Ely to Cambridge Transport Study has assessed a number of schemes, all of which require significant further development work and each with their own delivery mechanisms. At this early stage in the Business Case cycle, the management case is therefore high-level only. It is, however, considered important that programme-level oversight across the development and delivery of the whole package is retained and the recommended governance and management structures proposed in this section provide a start point for doing this.

6.2 Evidence of Similar Projects

Cambridgeshire County Council has successfully delivered a number of large-scale transport projects across the County in recent years. These include:

- **The Addenbrooke's Access Road** is a single carriageway route with several junctions and structures that connect Hauxton Road in Trumpington on the south side of the city, to Addenbrooke's Hospital. The route provides access to the expanding hospital and Bio Medical Campus, together with development on the Cambridge Southern Fringe, and reduces traffic in the Trumpington area, and on Long Road. The scheme was funded through a combination of Growth Area Fund and developer contributions, and was completed in October 2010
- **The Ely Southern Bypass** is a single carriageway highway, currently under construction, connecting the A142 at Angel Drove to Stuntney Causeway. The scheme include bridges over the railway line and the River Great Ouse and its floodplains and, when open to traffic will relieve heavy traffic around Ely station, remove the need for heavy goods vehicles to use the railway level crossing, and avoid an accident-prone low-bridge. The route will open to traffic in late summer 2018
- **The Cambridgeshire Guided Busway** provides a high quality public transport connection between Huntingdon and St Ives, to the north west of Cambridge, and Addenbrooke's Hospital and Trumpington Park and Ride to the south of Cambridge. Access to Cambridge City Centre is provided via on-street running. The overall route is 42km long with 25km of that being guided busway and 17km of on-street provision including bus priority measures. Construction began in March 2007 with the busway opened in August 2011. Although there were challenges during the delivery of the scheme, learning from this can benefit the delivery of future significant transport measures in the County.

6.3 Governance Arrangements

6.3.1 Existing Governance and Management Arrangements

To date, the development of the proposed package of measures for the Ely to Cambridge corridor has been overseen by a two-tier structure as set out in Table 21 below.

Table 21 Existing Project Management

Body	Role	Composition
Project Board	Strategic oversight and direction	Cambridgeshire County Council (Chair) Cambridge City and South Cambridgeshire District Councils East Cambridgeshire District Council Cambridgeshire and Peterborough Combined Authority Greater Cambridge Partnership Greater Cambridge Greater Peterborough Local Enterprise Partnership Highways England University of Cambridge
Project Team	Day-to-day project management	Cambridgeshire County Council (Chair) Cambridge City and South Cambridgeshire District Councils Greater Cambridge Partnership

Source: CCC

Given the work to date has largely been technical in nature, engagement with decision-makers has largely been on a ‘for-information’ basis via briefing sessions with members of all of the directly impacted local authorities, GCP and CA members, and the local Member of Parliament.

6.3.2 Potential Future Governance and Management Arrangements

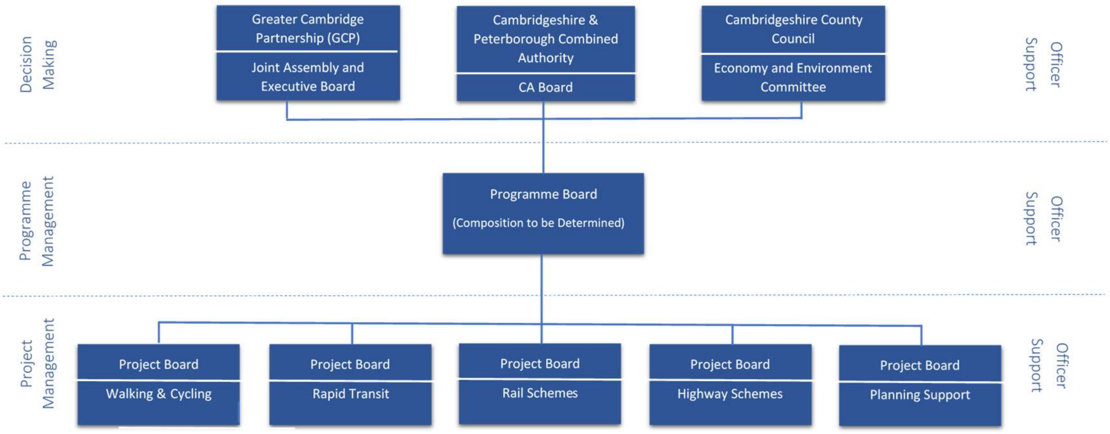
This initial phase of technical work has recommended a package of measures from walking and cycling improvements, through to larger-scale highway and dedicated public transport works.

The detailed governance and management arrangements for this package, should it be taken forward, will need to be developed in detail following approvals to proceed from the various decision-making bodies. However, the scale of the measures will invariably require strong project-level governance, with Project Boards and technical/administrative officer support for each element of the package, together with over-arching Programme Board oversight to manage the programme overall.

Given the complex transport funding and decision-making landscape in Cambridgeshire, and the variety of measures in the recommended package, strategic direction and approvals will likely need to be sought from all of the Combined Authority, the Greater Cambridge Partnership, and the County Council (depending on the element of the package being considered). The three bodies already work together on transport delivery so this could effectively be an extension to existing arrangements.

Figure 28 shows the potential governance arrangements. Clearly this may need to evolve as greater certainty emerges on the schemes, their funding, and the roles and responsibilities of the different bodies but this is considered to represent a sound initial basis for further development and agreement.

Figure 28: Potential Future Governance Structure



Source: CCC

6.4 Programme and Preliminary Indications of Delivery Timeline

The packages tested have a number of sub-elements. The programme for delivery of each of these, and their integration into a package-level programme, will need to be developed in detail as part of the next phase of the work depending on the recommendations and approvals from the various decision-making bodies.

The packages include a number of larger scale interventions including for dedicated public transport and increased highway capacity. Such interventions can have significant lead-times but an indicative traditional programme for their delivery, assuming approval to move towards major scheme business case development is given by September 2018, is shown in Figure 29.

This indicative programme will need significant development and refinement when agreement has been reached on the phasing of individual scheme delivery and as part of the development of scheme-level Business Cases when the scope to compress delivery timescales can be examined in detail.

Figure 29: Indicative potential delivery programme for an individual major scheme in Ely to Cambridge Corridor based on traditional timelines and DfT guidelines

6.5 Assurance, approvals and reporting

As shown in the indicative programme above, there are a number of key decision-making points at which a major scheme needs to be formally reviewed before it can proceed further.

These decision-making points include:

- Approval of the Outline Business Case;
- Approval of the Major Scheme Business Case; and
- Approval of the planning application (or other statutory processes depending on the nature of the scheme).

The exact assurance and approvals process to be followed will depend on the scheme itself (e.g. highways, rapid transit, other) and the type and source of funding that is used to deliver the scheme.

If a scheme is funded locally (i.e. the final decision to invest is taken by either the Combined Authority, and/or the Greater Cambridge Partnership), a detailed assurance and approvals plan for the scheme will need to be developed using the existing CA and GCP Assurance Frameworks. These describe the two bodies' processes for ensuring that investments provide value for money, based on best practice guidelines and require transport schemes to be appraised in line with the Department for Transport's (DfT) WebTAG guidance.

Given the devolved transport funding regime within Cambridgeshire, local funding is considered to be the most likely route. However, if funding from central Government were to be sought then any subsequent Outline Business Cases and Major Scheme Business Cases would need to be submitted directly to DfT, with scrutiny of the business case provided by DfT officials and the final investment decision taken by a Minister.

In addition to these formal decision-making points, the identified scheme sponsor will also undertake regular operational reviews. The operational reviews will form part of project monitoring meetings conducted every month by the relevant Project Manager and Senior Responsible Owner and will sit within the overall governance and management regime proposed in Figure 28 above.

The outcomes from the operational reviews will need to be reported to the relevant Project Board, potentially using a BRAG (Black, Red, Amber, Green) process with processes for remedy and escalation worked up in detail as overall governance arrangements for the projects are firmed up.

6.6 Communications and Stakeholder Engagement

At present, the package for the Ely to Cambridge corridor scheme is still in the early stages of development. The stakeholders to be involved and the communication methods used to engage with them will therefore evolve as the package, and its constituent schemes, progress.

At Outline Business Case stage, a 'stakeholder mapping' exercise will be developed to understand the potential levels of interest in, and influence over, the package that various stakeholders have.

This will be used to develop a full Stakeholder Management and Communications Plan, which will include full details of who will be consulted, for what purpose, when, how and how often.

6.7 Risk Management Strategy

The lead authorities will adopt a robust risk management strategy to ensure effective management of risk for the proposed programme of works. The partners (CPCA, GCP, and CCC) already have well established, proactive processes to managing of risk, therefore risk management plans will be implemented in accordance with those principles and with best practice. All risk registers will be reviewed regularly throughout the detailed design, procurement, construction and post-construction phase.

This well-established process has enabled the successful development and delivery of many transport projects within the County from smaller scale cycling and traffic management projects through to the larger scale projects set out in Section 6.2.

6.8 Monitoring and Evaluation

Scheme monitoring and evaluation for those measures taken forward from the emerging preferred package will follow established best practice procedures as set out by DfT and/or the local bodies. The delivery partners will agree clear objectives which will be documented within each scheme level (and potentially at programme level) monitoring and evaluation plan.

A logic map linking project inputs to outputs, outcomes and impacts will establish data requirements. The required baseline data, and the proposed methodology for monitoring impact/ outcomes will all be established prior to formal project commencement. It is proposed that the level of reporting of the monitoring and evaluation plan will be at appropriate intervals, and will provide data to assess the success of each project in meeting the agreed objectives.

7 Summary and Conclusions

Following a review of the transport options and their cost and delivery implications, this section proposes a recommended approach for implementing a transport strategy on the Ely to Cambridge Corridor and the next steps for progressing the business case.

7.1 Recommended Strategy

The findings of this report have demonstrated that:

- The Ely to Cambridge Corridor is currently affected by congestion and connectivity issues
- Model analysis shows that travel demand will increase further on the Ely to Cambridge Corridor
- Significant additional developments are also planned around the Ely to Cambridge Corridor
- This will exacerbate issues on the corridor, leading to deterioration of economic opportunities, the environment and the wider transport offer

A joined-up strategy is therefore required that seeks to introduce both demand and supply-side measures along the corridor that cater to all modes and ensure that potential issues are mitigated. The strategy has been divided into 3 stages;

1. Policy, Planning and Regulation
2. Delivery of multi-modal “quick wins”
3. Longer term major highway interventions

These are described further in the sections below.

7.1.1 Policy, Planning and Regulation

Securing funding for the transport strategy on the Ely to Cambridge corridor will form a core element of the delivery process.

Model-based analysis suggests that transport conditions in the Ely to Cambridge corridor will deteriorate through time, and that this will be exacerbated with further development, unless both demand and supply-side measures are introduced.

Therefore, mechanisms should be put in place to secure developer funding to deliver, or substantially contribute towards demand management and non-car infrastructure to ensure that adverse transport impacts are mitigated.

A demand management approach should be adopted for development and applied to planning applications for proposals in, and impacting, the corridor, whereby development should:

- Minimise external vehicular trip generation through maximising trip internalisation
- Provide significantly lower levels of car parking than has traditionally been provided, particularly at employment locations
- Promote a site-wide approach to car parking management to reduce the need for significant increases in car parking provision
- Promote the use of non-car modes through appropriate investment in supply-side measures and aggressive travel planning to encourage the required mode shift

The planning and transport authorities should also ensure that processes for monitoring, managing, and reviewing transport outcomes are implemented and secured by and from developers through the consenting process.

Acceptable and stretching highway ‘trip budgets’ should be identified for each site and permission for continued stages of development should be made contingent on the ability of the developers to demonstrate their sites are meeting these targets through effective promotion of non-car-mode take-up and site-based demand management.

Developers might be able to accelerate the phasing of their sites should they be able to demonstrate that their sites are hitting targets for car trips and are not exceeding an agreed budget. This would encourage effective promotion of non-car-mode take-up to free up more “headroom” for further development.

Developers should propose an approach to this for agreement with the planning and transport authorities.

Residual development-related highway impacts will need to be addressed through either direct delivery of schemes by developers, or through appropriate developer contributions based on proportionate impact to the proposed strategic highway and non-highway interventions.

7.1.2 Delivery of Multi-Modal “Quick Wins”

The recommended strategy requires sequential delivery of “quick wins” – comprising both non-car based service/infrastructure enhancements and active parking restraint to promote mode shift and a sequence of prioritised on and off line localised carriageway improvements to create capacity for additional trips and manage potential re-assignment of trips onto less suitable routes.

The recommended non-private car strategy is for early implementation of the cycle measures, a relocated railway station at Waterbeach and early progression of the segregated public transport corridor from Waterbeach to Cambridge’s Northern Fringe, together with park and ride provision at the New Town. Implementation of the non-highway proposals alongside ambitious travel planning for new and existing communities in the corridor could create some headroom for early, moderate scale, development at Waterbeach and at CNFE/CSP. The details of this will need to be explored through detailed transport assessments accompanying any planning applications.

7.1.3 Wider Highways Interventions

Model-based analysis shows that the above “quick wins” alone will not mitigate more significant development-related growth or substantially address existing or future congestion. Predicted uplifts in travel demand is forecast to lead to greater displacement of traffic onto less suitable parallel routes including the B1049 and the B1047 unless it can be managed effectively.

Therefore, following on from the multi-modal improvements, a series of localised carriageway improvements should be pursued in the short to medium-term to reduce the likelihood of any additional trips rerouting via less suitable routes.

Options for junction improvements and other localised highway capacity improvements should therefore be developed for early implementation. Targeted improvements at junctions along the A10 itself lead to some improvements in conditions and reduces traffic rerouting elsewhere. These improvements should be accompanied by measures to discourage use of less suitable parallel routes including the B1049 and B1047. The traffic modelling demonstrates that such improvements would also be high value for money in transport appraisal terms. However, the details of these measures will need to be developed through further study work. It is expected that development will make a substantial contribution to funding / delivering these measures.

Beyond these investments, this study indicates that there could be significant additional transport benefits from providing increased carriageway capacity in the Ely to Cambridge corridor, and that this will be required to mitigate both longer-term background growth in travel demand and more significant proposals for development, particularly at Waterbeach.

The initial study work suggests that, subject to more detailed work including examining environmental and operational impacts further, provision of increased carriageway capacity would represent a high value for money investment. This might be in the corridor itself, or on an alternative corridor if such an alignment were shown to remove a significant proportion of longer distance/through-traffic from the A10, or potentially through improvements to both.

7.2 Next Steps

Key stages following on from the publication of this report are set out below, with a view to delivering the transport strategy as set out in the recommendations above:

1. Undertake a consultation exercise to seek the views of decision-makers, members of the public, and other stakeholders, on:
   a. the proposed sequencing of transport measures proposed
   b. the content of each package and responsibilities for delivery
   c. the implications for phased growth along the corridor arising from the measures proposed and opportunities to increase the impact of such measures
   d. progression of a strategic option assessment for dealing with longer distance/through-traffic on the network, and the interaction this has with local traffic demand, via the ongoing M11-A47 study.
2. Along with this consultation exercise, it is recommended that detailed options are developed for all of the key elements of each package, including examination of their impacts, and developing business cases for those investments. Detailed assessments of environmental, operational, wider economic impacts will form part of this stage of the appraisal, along with consultation with local people and other stakeholders
3. Additional feasibility work for the cycling schemes, and the public transport components, should be considered an early priority. Similarly, it is recommended that early, detailed, exploration of the highway proposals is also undertaken.
4. The Highway Authority and Local Planning Authorities should develop funding/delivery options for the delivery of transport and related infrastructure to be explored with developers and key stakeholders to provide certainty to a package of transport investments required to facilitate planned future growth in the corridor. The model-based analysis shows that, although existing transport demand and that associated with wider growth, creates pressures on the network, this is exacerbated by development. Development will therefore be required to deliver, or substantially fund, key non-highway elements of the recommended strategy. Residual development-related highway impacts will need to be addressed through either direct delivery of schemes by developers, or through appropriate developer contributions based on proportionate impact to the proposed strategic highway interventions.

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Growing and sharing prosperity
Delivering our City Deal

Report to: Greater Cambridge Partnership Joint Assembly 18 January 2018

Lead officer: Beth Durham – GCP Head of Communications

Our Big Conversation

1. Purpose

1.1. The report presents the interim findings from the Greater Cambridge Partnership's (GCP's) autumn 2017 public awareness and engagement programme 'Our Big Conversation' (OBC).

1.2. The exercise aimed to strengthen the evidence-base needed to inform the GCP's Future Investment Strategy (FIS) by generating public dialogue on the Greater Cambridge growth story, testing emerging GCP proposals with the public and undertaking a comprehensive travel survey to refresh 2011 census data.

2. Key issues and considerations

2.1 The GCP is in the process of developing a 10 year Future Investment Strategy (FIS), looking beyond the next 'gateway review' to focus on its long term vision for economic growth in order to align its future resources accordingly.

2.2 A period of focused stakeholder engagement, under the banner 'Our Big Conversation', was undertaken between September 25 and November 30 2017.

2.3 OBC was delivered via a multi-channel marketing communications campaign targeting key GCP stakeholders including residents of Cambridge and South Cambridgeshire, employers and commuters within Greater Cambridge, elected Councillors, private and public services employees, students and school children. A consolidated report, prepared by Cambridgeshire County Council's Research Group, can be found at **Appendix A** which will follow.

2.4 The campaign used three mechanisms for recording public feedback: a) Comments generated at OBC events, paper and online OBC survey (led by the GCP Communications and Engagement Team); b) A Computer Aided Telephone Interview (CATI) travel survey of a representative sample of 1,021 Cambridge and South Cambridgeshire residents, commissioned from industry experts Systra, full report found at **Appendix B;** and c) A wider, largely self-selecting public travel survey with 200 Computer Aided Personal Interviews (CAPI) carried out door-to-door and commissioned from Travel for Cambridgeshire. Evaluation on-going.

2.5 Census data was used to seek a representative sample of residents in the Systra survey. In the case of the Travel for Cambridgeshire travel survey, consumer insight analysis software (Acorn) was used to identify, engage and seek feedback from traditionally seldom-heard groups, for example younger households with people at the early stages of their careers (people with a stake in the future) and also people from low income households (particularly where income limited transport or travel choices).

2.6 In all, 38 public events were held, primarily at high footfall venues including supermarkets, transport hubs, hospital concourses and a Cambridge United football match. This number includes five targeted business workshops, two elected Councillor briefings, and events targeting children and young people.

2.7 The exercise created wide public awareness, generated 10,160 responses in total including 1,020 individual comments, 484 OBC survey responses and 8,656 travel survey responses. A full campaign impact evaluation report can be found at **Appendix C**.

2.8 While evaluation of the full data set remains on-going, it is anticipated that themes and key findings will remain largely the same.

3. Key findings

General

3.1 The engagement showed high levels of awareness of growth with 89.4% of OBC respondents 'aware' or 'very aware'.

3.2 Traffic congestion was ranked as the highest challenge or travel challenge at 64.6%, with associated issues of sufficient and reliable public transport (both 42%) while 67% of respondents said they were unhappy with their current housing situation; over 50% cited the cost of buying as a the key issue; 44% of Cambridge respondents also cited the cost of renting property.

3.3 In priority order, people said the following GCP investments would help them get on better in life: 1. Improved public transport (55.9%) 2. Access to housing (17.5%) 3. Smart technology solutions (8.9%) and 4. Linking training opportunities to employment (4.6%).

3.4 In general, people showed support for both immediate and long-term solutions to address these challenges. In the case of transport, there was a general acceptance that behaviour change is required alongside the introduction of new public transport infrastructure. Most of the comments received focused on the travel behaviour of particular groups and how this needed to change. In particular, people pressed for a switch out of cars and onto public transport.

Transport

3.5 OBC survey results showed strong support for the developing GCP transport strategy with 85.3% 'supporting' or 'strongly supporting' improving public transport, followed by 83.3% for improving cycling and walking and 72.9% for reducing general traffic in the city.

3.6 The residents' travel survey showed an increase in car/van use for commuting since the 2011 census in both Cambridge (32% to 37%) and South Cambridgeshire (64% to 75%). However, there was clear potential and appetite for modal shift within this group with over half (56%) saying they would like to make more journeys without their car or van – bus, minibus, coach services and cycling are identified as the most likely alternatives.

3.7 Speed and reliability were the most common reasons for car/van drivers not using alternatives at present. Only 6% of those who currently make journeys by car/van said that none of the proposed initiatives would encourage them to shift mode.

3.8 The proportion of people commuting by bicycle has also shown an increase (30% to 39%) whilst commuting by foot shows a decreased (from 16% to 5%). 62.3% of OBC respondents said that a significant increase in access to safe cycle, walking and non-motorised pathways would benefit them.

3.9 The survey results showed some clear preferences for certain incentives to encourage modal shift. The top five incentives were:

1. Introducing new public transport routes;
2. Improving reliability of public transport services;
3. Making public transport cheaper;
4. Improving the frequency of services on public transport; and
5. Introducing free parking at Park & Ride sites.

3.10 There was a clear public view that that the key to encouraging modal shift is to increase the cost of car travel and decrease the cost/time taken for other modes (most noticeably bus travel).

3.11 A range of options for managing down general traffic in the city centre, coupled with the potential to raise on-going revenue to reinvest in an improved public transport network were presented. Of these, beyond exceptionally high support for improvements to public transport, there were higher levels of support from both residents and businesses for a dynamic or "intelligent" road charging system (applied according to levels of congestion) and for pollution charging than for a Workplace Parking Levy (p. 33 Systra).

Housing

3.12 The vast majority of people now recognise the supply of affordable housing as the critical issue for the sub-region

3.13 Respondents were concerned about the cost of housing in Cambridge and South Cambridgeshire. Some respondents commented that travelling from outside of Cambridge into the city every day was more affordable than living there (but increased pressure on the transport network). Others related how, even on above average incomes, they could not afford a home. Help to Buy schemes were mentioned and were not felt to make a home affordable.

3.14 Respondents felt there was not enough choice in housing. There were comments that houses in Cambridge centre were being sub-divided into flats. People were also concerned that the housing market was focused towards providing expensive property towards the centre of Cambridge and that this approach was changing the whole nature of the city centre.

Skills

3.15 A relatively small proportion of OBC respondents expressed a need for help to access skills or employment (16%).

3.16 For those who were seeking to access skills, the lack of courses available locally was an issue with people citing having to go to London to access some vocational courses.

3.17 For those looking to alternate employment, they cited an imbalance in the local labour market with jobs in the hi-tech / Bio-tech sector (and other areas of growth) not matching their own skill set.

Smart

3.18 Generally, people welcomed any technological solutions that would smooth the end-to- end journey – especially across different public transport services.

3.19 Of specific smart solutions presented for feedback, the most popular investment was shown to be in improvements to ticketing in terms of use across different forms of transport and pricing discount structures that recognised current patterns of use. There was also support for improved accuracy of real-time transport information.

3.20 At the same time, the challenge back was for GCP to broaden smart working to include 'smart ideas' and 'smart design' rather than simply focusing on new technology. People with disabilities that had an impact on their ability to travel wanted better (smarter) design of the public transport network. Others wanted public transport services to be better designed to match non 9-to-5 working patterns.

4. Next steps and milestones

4.1 Work to analyse the complete data set for the Travel for Cambridgeshire survey is on-going. As a result, the final report will be published as a supplement to the Future Invest Strategy (FIS) reports in February/March.

List of appendices

Appendix A	Our Big Conversation key findings
Appendix B	Systra Greater Cambridge Residents Travel Survey Report
Appendix C	Big Conversation campaign impact analysis

 15/12/2017

FUTURE TRANSPORT RESEARCH
Cambridge and South Cambridgeshire Residents' Survey

CAMBRIDGESHIRE TRAVEL RESEARCH

IDENTIFICATION TABLE	
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APPROVAL

Version	Name		Position	Date	Modifications
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SYSTRA

EXECUTIVE SUMMARY

Study Background

The Greater Cambridge Partnership (GCP) commissioned SYSTRA to undertake research with residents in Cambridge and South Cambridgeshire to better understand people's travel behaviour, and reasons for their travel choices, in and around Cambridge.

The GCP aims to develop a sustainable transport network for Greater Cambridge that keeps people, business and ideas connected as the population grows. The research study was developed to support the design of a transport framework to reduce congestion and encourage modal shift, and shape investment from 2020 onwards.

Methodology

A total of 1,021 computer aided telephone interviews (CATI) were completed with residents across Cambridge and South Cambridgeshire between 25th September 2017 and 19th October 2017.

Landline and mobile phone numbers were compiled for households/people living in Cambridge and South Cambridgeshire from the Operator Services Information System (OSIS) and Random Digit Dial numbers matched to local area dialling codes. Telephone numbers were then dialled at random.

The first survey questions demographically profiled respondents. The final sample was weighted by district, gender and age to ensure it was representative of all residents living in Cambridge and South Cambridgeshire. A good sample was achieved and therefore weighting values were small.

Survey Results

An opportunity for modal shift away from car/van

Overall, the data shows that there is both potential and appetite for modal shift among car/van drivers.

- Over two thirds (68%) of respondents said they use a car or van, at least sometimes, to travel in and around Cambridge (56% in Cambridge and 80% in South Cambridgeshire).
- Of these, over half (56%) said they would like to make more of these journeys without their car or van (57% in Cambridge and 56% in South Cambridgeshire).

Bus, minibus and coach services, and cycling, were the most likely alternative to car/van. Travelling by bicycle was more likely to be considered an alternative for those living in Cambridge than those living in South Cambridgeshire; while travelling by bus, minibus or coach service was more likely to be considered an alternative for those living in South Cambridgeshire than those in Cambridge.

The speed and reliability of alternative modes were the most common reasons for not using alternative modes at present. In addition, Cambridge residents considered the price of transport to be a barrier, while South Cambridgeshire residents considered distance to destination to be a barrier.

Recent changes in transport modes

Respondents who stated that they made commuting journeys to/from work were asked to identify the mode of transport they usually use for these specific journeys. This question was also asked in the 2011 Census.

For residents in Cambridge and South Cambridgeshire, the proportion of people commuting to work by car/van is shown to have increased – being higher in this survey than in the 2011 Census. This increase is more dramatic in South Cambridgeshire, where the proportion has increased from 64% to 75%, than in Cambridge, where the proportion has increased from 32% to 37%.

Across both areas there also appears to have been a shift from the 2011 Census in the proportion of people commuting by bicycle and on foot, with the proportion commuting by bicycle increasing and the proportion commuting by foot decreasing. This pattern is more pronounced in Cambridge where commuting by bicycle has increased from 30% to 39%, and commuting by foot has decreased from 16% to 5%. In South Cambridgeshire, the proportion commuting by bicycle has increased from 8% to 11%, and commuting by foot has decreased from 7% to 2%.

How to encourage modal shift

The survey results show some clear preferences for certain incentives to encourage modal shift. The top five incentives were:

- Introducing new public transport routes;
- Improving reliability of public transport services;
- Making public transport cheaper;
- Improving the frequency of services on public transport; and
- Introducing free parking at Park & Ride sites.

These results were very similar for residents of Cambridge and South Cambridgeshire, with the exception of introducing free parking at Park & Ride sites. Residents in South Cambridgeshire were much more likely than those in Cambridge to say free parking at Park & Ride sites would encourage them to change their travel behaviour (73% compared with 56%).

Only 6% of those who currently make journeys by car/van said that none of the proposed initiatives would encourage them to reduce their car/van use. Those living in South Cambridgeshire were more likely to say they could be encouraged to change, with only 4% saying none of the initiatives would encourage them to switch mode, compared to 8% of Cambridge residents.

1. INTRODUCTION

1.1 Study Background

1.1.1 The Greater Cambridge Partnership (GCP) commissioned SYSTRA to undertake research with residents in Cambridge and South Cambridgeshire to better understand people's travel behaviour and reasons for their travel choices.

1.1.2 The GCP aims to develop a sustainable transport network for Greater Cambridge that keeps people, business and ideas connected as the population grows; and makes the area easily accessible by sustainable travel modes, in terms of access, egress and travel within the area.

1.1.3 This research study was developed to support the design of a transport framework to reduce congestion and encourage modal shift for people travelling in and around Cambridge, and shape investment from 2020 onwards. The research findings are a valuable addition to the GCP's evidence base and will help them develop measures within their 'Future Investment Strategy' that are most likely to be able to help reduce congestion through changes in transport infrastructure, use of smart technologies, and promoting behaviour change.

1.1.4 This report details the research methodology used and the results found.

2. METHODOLOGY

2.1.1 The population of interest for this survey was residents living in Cambridge and South Cambridgeshire. A target of 1,000 interviews were required in total for both areas. The survey was administered using 'Computer Aided Telephone Interviews' (CATI) and ran between 25th September 2017 and 19th October 2017.

2.1.2 To achieve a representative sample of Cambridge and South Cambridgeshire residents - i.e. to complete the survey with a selection of residents who reflected the same profile as the population of interest - quotas were set on district, gender and age. Quota sampling was chosen over random sampling as it is the more likely method to achieve a representative sample. Random sampling, by its definition, can by chance result in an unrepresentative sample of respondents; in addition, it can bias the sample towards respondents that are more easily reached.

2.1.3 Landline and mobile phone numbers were obtained[1] for households/people living in Cambridge and South Cambridgeshire; numbers were dialled at random; and, after introducing the survey, the first questions profiled respondents to check whether they were in quota. Interviews were carried out across a range of days and times of day to help avoid potential bias to particular demographics. Each number was tried at least three times - to cover day time, evening and Saturdays – and could be tried up to five times, after which the number was deemed 'dormant'. Residents were incentivised to take part in the survey by offering them the chance to be entered into a prize draw, for one of three chances to win £100 worth of high street shopping vouchers.

2.1.4 It proved particularly difficult to reach 16-24 year olds and, to a lesser extent, people living in Cambridge, 25-49 year olds and men. As such the quotas were not fully met. This meant that the data needed to be weighted to ensure the results were representative of the population of interest. Using ONS Population Estimates for mid-2016, the data was weighted to reflect the true population of Cambridge and South Cambridge residents in terms of gender and age.

2.1.5 The table below shows the achieved, unweighted profile of respondents to the survey, in terms of district, gender and age, and the weighted profile. A total of 1,021 interviews were completed and the weighting values required were small.

[1] Two different sources of telephone numbers were collated to create a comprehensive database for Cambridge and South Cambridgeshire. The Operator Services Information System (OSIS) file represents the most accurate and cost effective source for the appending of telephone numbers against names and addresses. This is the same database used by companies offering a 118 Directory Enquiry service. Updated daily it also includes landline and mobile telephone numbers where these are provided by operators. The OSIS file does not include numbers that are listed as Ex-Directory. Therefore to boost the numbers available a list of Random Digital Dial (RDD) numbers was purchased. RDD only targets residents with landlines. Using local area dialling codes it is possible to identify those living in Cambridge and South Cambridgeshire.

	Unweighted Frequency	Weighted frequency
District		
Cambridge	424	481
South Cambridgeshire	597	540
Gender		
Male	414	514
Female	606	506
Age		
16 - 24 years old	127	181
25 - 49 years old	366	434
50 - 64 years old	255	208
65+ years old	270	196

2.1.6 The survey was designed to capture information about respondents' demographics; current travel behaviour in and around Cambridge and reasons for their travel choices; alternative travel modes; and, the likelihood various potential initiatives might have on their travel choices.

2.1.7 The research was undertaken in accordance with the Market Research Society (MRS) code of conduct and a copy of the questionnaire can be found in Appendix A.

2.1.8 It should be noted that respondents could refuse to answer questions if they wished; the response base for each question is provided. Please note that where percentages do not total 100%, this is due either to rounding or the multiple response nature of the question.

3. SURVEY RESULTS

3.1 Introduction

3.1.1 A total of 1,021 respondents completed the Computer-Aided Telephone Interview (CATI) Survey. To ensure the sample was representative of Cambridge and South Cambridgeshire residents, data was weighted by district, gender and age. The survey results presented in this report are based on the weighted data. An overview of the sample profile is presented in section 3.12 and both the weighted and un-weighted data tables can be found in the appendices.

3.1.2 Sections 3.2 to 3.7 of this chapter set the context for the remainder of the results, detailing the current travel patterns of Cambridge and South Cambridgeshire residents. The current travel patterns are generally as one might expect, being similar to trends in the labour market.

3.1.3 Sections 3.8 to 3.11 provide interesting results on the reasons for people's travel choices; the alternatives available to them; and, the likelihood various potential initiatives might have on their travel choices.

3.1.4 The results presented can be used as a benchmark for comparing against future years.

3.2 Frequency of Travel

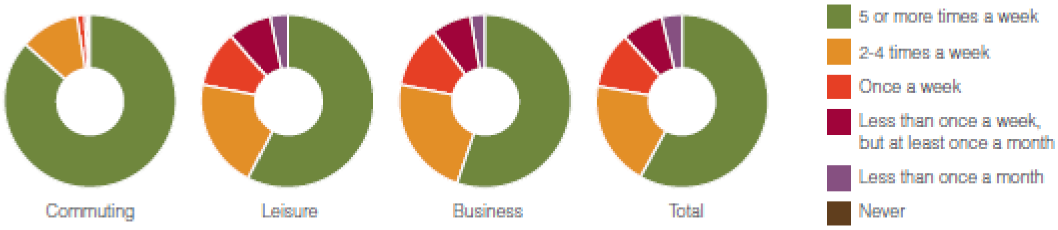
3.2.1 Respondents were asked how often they travel in and around Cambridge. Travel 'in and around Cambridge' refers to travel within the built-up area of the city and its outskirts. All 1,021 respondents answered the question, of which:

- 57.1% travelled in and around Cambridge five or more times a week;
- 19.3% travelled two to four times a week;
- 10.4% travelled once a week;
- 7.4% travelled less than once a week, but at least once a month;
- 3.7% travelled less than once a month;
- 1.9% said they never travelled; and
- 0.2% said they 'Don't know/ prefer not to say'.

3.2.2 Results show a significant difference in frequency of travel by journey purpose: 86.5% of commuters travel in and around Cambridge five or more times a week, significantly higher than both leisure travellers (57.7%) and those who travel on business/personal business[2] (55.5%).

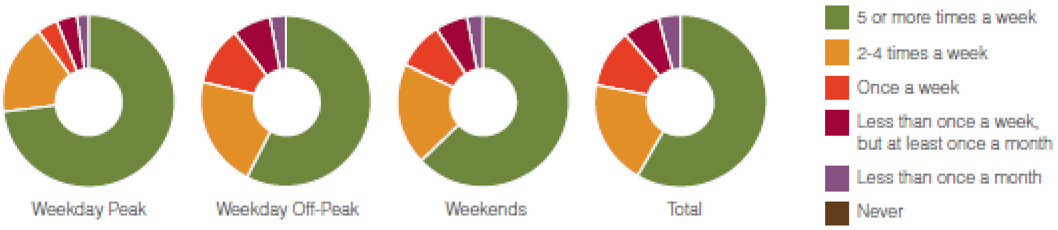
[2] The 'Business/Personal Business' category consists primarily of personal business trips (e.g. hospital appointments).

by Journey Purpose



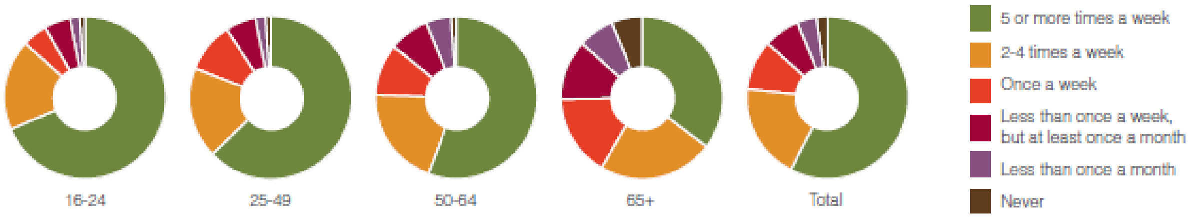
3.2.3 There was also a significant difference in frequency of travel by the time of day people travelled: respondents who travel during weekday peak times are more likely to travel five or more times a week (73.7%) than those who travel during weekday off-peak times (57.4%) or weekends (62.6%).

by Peak / Off-Peak



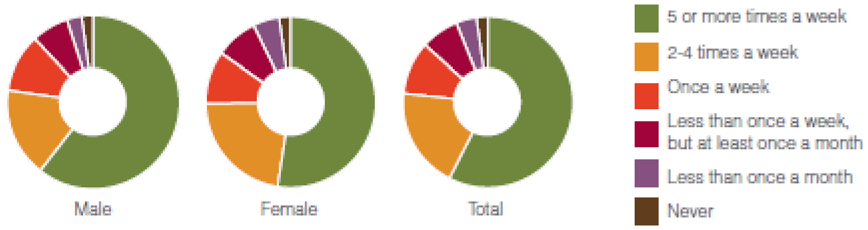
3.2.4 Frequency of travel also differs across age groups. Respondents aged 16-24, 25-49 and 50-64 are all significantly more likely than those aged 65+ to travel in and around Cambridge five or more times a week. Furthermore, those aged 65 and over are the most likely of all age groups to 'Never' travel in and around Cambridge (5.9%, compared to 1.0% of those aged 16-64).

by Age



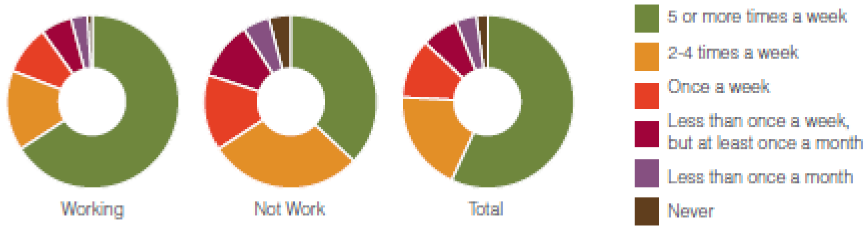
3.2.5 Additionally, there are differences between genders in their frequency of travel in and around Cambridge, with a higher percentage of males stating that they travel five or more times a week than females (61.7% compared with 52.4%, respectively). This pattern is likely driven by the fact that a significantly higher proportion of men than women in the sample work full time (81.4% compared to 46.5%).

by Gender



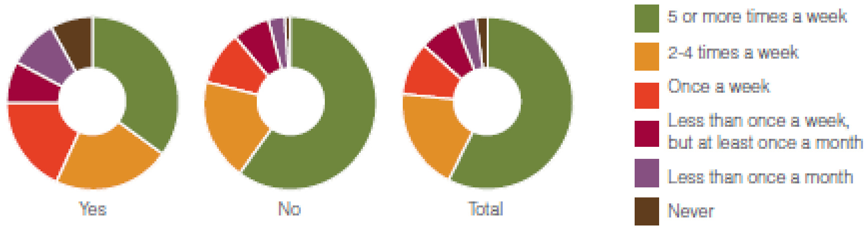
3.2.6 Respondents who work travel more frequently than those who do not work, with the greatest difference between workers and non-workers being the number of respondents who travel five or more times a week: 66.1% of those who work make journeys five or more times a week, compared to 37.1% of respondents who do not work.

by Working Status

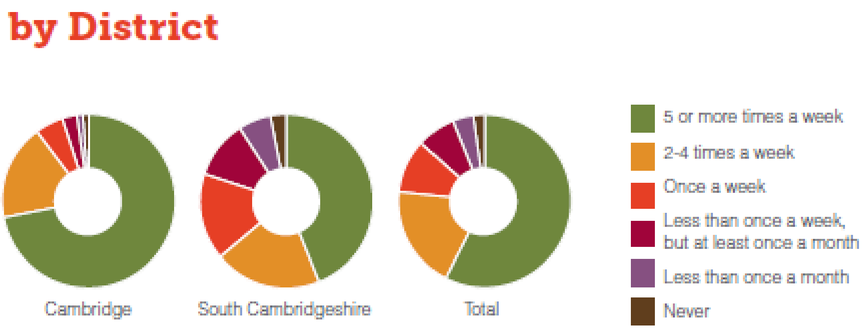


3.2.7 There are further differences in frequency of travel between respondents who have disabilities, and those who do not. Only 34.8% of those with disabilities travel five or more times a week, compared to 60.1% of those without disabilities. In addition, disabled respondents are six times more likely to 'Never' travel than those without disabilities. This finding may be driven by the fact that, in the sample, respondents with disabilities are significantly less likely to be commuters than non-disabled respondents.

by Disability



3.2.8 With regards to differences by district, 72.0% of respondents from Cambridge travel five or more times a week, significantly more than respondents from South Cambridgeshire (43.9%). These findings may be explained by the age of respondents, given a higher proportion of South Cambridgeshire residents than Cambridge residents are aged 65 years and over.



3.3 Journey Purpose

3.3.1 Respondents were asked for what reasons they made journeys in and around Cambridge. A total of 998 respondents provided details of their journey purposes. Of these:

- 530 respondents (53.1%) make commuting journeys;
- 697 respondents (69.8%) make leisure journeys; and
- 521 respondents (52.2%) make business/personal business journeys[3].

3.3.2 Journey purpose has a significant impact on the time of day in which respondents travel. For instance, those who commute are significantly more likely than those travelling for other purposes to travel at peak times on weekdays (89.4% compared to 68.3%).

3.3.3 Journey purpose differs significantly by age. Only 18.2% of respondents aged 65+ commute, compared to 61.0% of younger respondents. The eldest age range make the greatest percentage of business/personal business trips, almost double that of the 16-24 age category.

3.3.4 Whether or not respondents have a disability impacts journey purpose. Respondents who do not have a disability are more than twice as likely to make commuting journeys (56.5%) compared to respondents who have a disability (22.7%). Around half (53.7%) of respondents with a disability were aged 65 years and over, however even if those aged 65 years and over were excluded from this breakdown, those without a disability are still more likely to make commuting journeys than those with a disability.

3.3.5 Journey purpose also differs significantly between the districts in which respondents reside. Respondents from Cambridge are more likely to commute (61.1%) than those from South Cambridgeshire (45.8%). This pattern of results may be attributable in part to the age demographics of these two districts.

3.4 Time of Travel

3.4.1 A total of 996 respondents provided details of the times they travel at. Of these:

- 689 respondents (69.2%) travel at peak times on weekdays;
- 660 respondents (66.3%) travel at off-peak times on weekdays; and

[3] The 'Business/Personal Business' category consists primarily of personal business trips (e.g. hospital appointments).

- 695 respondents (69.8%) travel at weekends.

3.4.2 The age of respondents significantly impacts their time of travel. Those aged 65+ make significantly fewer journeys during peak times on weekdays than all other age groups (50% of those aged 65+ travel during weekday peak times, compared to 73.7% of younger respondents).

3.4.3 With regards to time of travel by working status, respondents who work are more likely to make journeys at peak times during weekdays than respondents who do not work (76.1% compared to 52.6%, respectively).

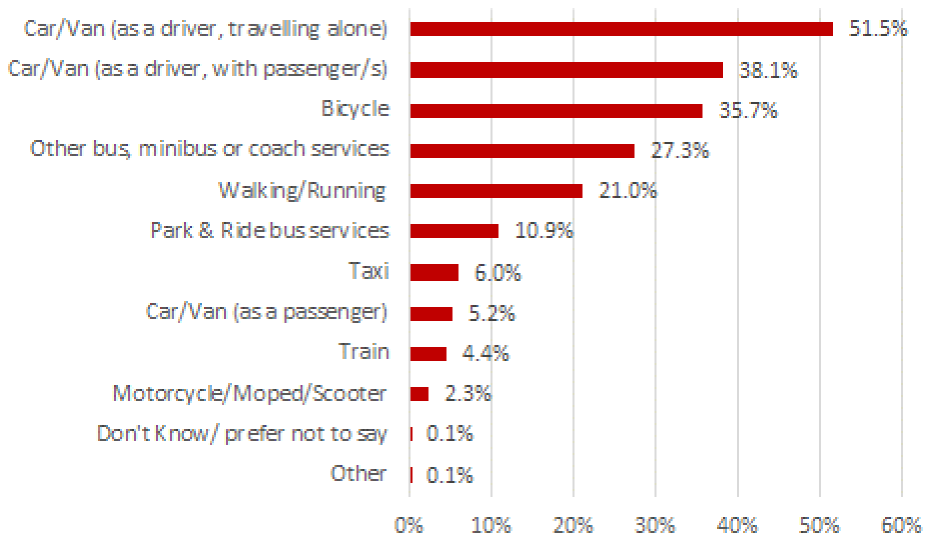
3.4.4 A similar pattern is found with regards to disability. Those who are not disabled are significantly more likely to make journeys at peak times during weekdays than those who are disabled (71.7% compared with 48.6%, respectively).

3.4.5 There is also a significant difference in the number of peak journeys made on weekdays between the two districts: 77.4% of respondents from Cambridge made journeys during this time, compared to 61.7% of those from South Cambridgeshire. This may be, at least in part, due to the differing age demographics between the two districts, with South Cambridgeshire having a greater percentage of residents aged 65 and over.

3.5 All Modes of Transport

3.5.1 Respondents were asked about the different modes of transport they used to travel in and around Cambridge: Over half of respondents (51.5%) said they used a car/van (as a driver, travelling alone) to make their journeys in and around Cambridge; a further 38.1% said they travelled by car/van (as a driver, with passenger/s); and, 35.7% said they cycled. A full breakdown of modes used can be seen in the Figure below.

Figure 1. All Modes of Transport



3.5.2 Cycling is particularly popular amongst commuters compared to those travelling for other journey purposes: 47.7% of commuters said they cycle compared to 38.7% of other respondents. However, commuters residing in Cambridge were more likely to cycle than commuters from South Cambridgeshire (64.5% compared with 27.3%, respectively).

3.5.3 Commuters are the least likely to utilise Park and Ride services with only 6.6% saying they do so compared to 12.5% of other respondents. Again this varied by where these commuters lived, with 12.0% of commuters from South Cambridgeshire saying they use Park and Ride compared to 2.2% of commuters from Cambridge.

3.5.4 Those travelling for business/personal business were more likely than other respondents to say they travelled by car/van as a driver with passengers (46.9% compared to 37.6%).

Table 1. All Modes of Transport by Journey Purpose

All Modes of Transport	Commuting	Leisure	Business / Personal Business	All
Car/Van (as a driver, travelling alone)	57.0%	51.7%	53.1%	51.6%
Car/Van (as a driver, with passenger/s)	34.5%	39.9%	46.9%	38.2%
Bicycle	47.7%	38.9%	38.3%	35.8%
Other bus, minibus or coach services	26.8%	29.0%	28.1%	27.3%
Walking/Running	23.3%	23.4%	25.6%	21.0%
Park & Ride bus services	6.6%	12.0%	13.2%	10.8%
Taxi	6.5%	6.3%	8.6%	6.0%
Car/Van (as a passenger)	4.0%	6.4%	5.9%	5.2%
Train	4.8%	5.4%	6.0%	4.5%
Motorcycle/Moped/Scooter	2.1%	2.1%	1.8%	2.3%
Other	0.2%	0.1%	0.2%	0.1%
Base	**529**	**696**	**519**	**997**

3.5.5 Looking at the modes of transport people use by age, there are some noticeable differences. Respondents in the youngest and oldest age categories are less likely to drive a car/van than the middle two age groups: 39.1% of those aged 65+ drive a car/van (travelling alone) and 41.6% of 16-24 year olds do, compared with 57.9% of those aged 25-64; similarly, 22.5% of 16-24 year olds drive a car/van (with passengers) and 34.0% of those aged 65+ do so, compared with 43.8% of 25-64 year olds.

3.5.6 In addition: those aged 65+ are far more likely than all other ages to use the Park and Ride services (24.3% compared to 7.9%, respectively); they are more likely to use the other range of bus services (40.6% compared with 24.2%); they are less likely to cycle (15.4% compared with 40.5%); and less likely to walk/run (15.6% compared with 22.3%).

Table 2. All Modes of Transport by Age

All Modes of Transport	16-24	25-49	50-64	65+	All
Car/Van (as a driver, travelling alone)	41.6%	57.5%	58.7%	39.1%	51.5%
Car/Van (as a driver, with passenger/s)	22.5%	42.8%	45.9%	34.0%	38.2%
Bicycle	43.7%	39.1%	40.4%	15.4%	35.8%
Other bus, minibus or coach services	25.8%	23.5%	24.3%	40.6%	27.2%
Walking/Running	24.2%	22.7%	19.9%	15.6%	21.1%
Park & Ride bus services	1.3%	8.1%	13.2%	24.3%	10.9%
Taxi	3.4%	6.0%	6.7%	7.7%	6.0%

All Modes of Transport	16-24	25-49	50-64	65+	All
Car/Van (as a passenger)	6.8%	4.4%	4.6%	6.3%	5.2%
Train	3.2%	4.8%	6.9%	2.2%	4.5%
Motorcycle/Moped/Scooter	4.7%	1.9%	1.4%	1.9%	2.3%
Other	0.0%	0.2%	0.0%	0.0%	0.1%
Base	**180**	**429**	**205**	**184**	**997**

3.5.7 The most notable difference between males and females was that males are more likely to cycle than females (39.2% compared to 32.2%, respectively).

Table 3. All Modes of Transport by Gender

All Modes of Transport	Male	Female	All
Car/Van (as a driver, travelling alone)	53.0%	50.0%	51.5%
Car/Van (as a driver, with passenger/s)	40.7%	35.4%	38.1%
Bicycle	39.2%	32.2%	35.8%
Other bus, minibus or coach services	25.9%	28.9%	27.4%
Walking/Running	20.9%	21.3%	21.1%
Park & Ride bus services	8.6%	13.3%	10.9%
Taxi	5.6%	6.4%	6.0%
Car/Van (as a passenger)	2.9%	7.6%	5.2%
Train	4.3%	4.6%	4.4%
Motorcycle/Moped/Scooter	3.3%	1.3%	2.3%
Other	0.0%	0.2%	0.1%
Base	**507**	**493**	**999**

3.5.8 With regards to socio-economic status, grade DE[4] are significantly less likely to drive a car/van for their journeys than grades AB[5] and C1C2[6]: 40.0% of those in group DE drive a car/van (travelling alone) compared with 58.6% of those in group AB and 51.6% of those in group C1C2; and, 25.3% of those in group DE drive a car/van (with passengers) compared to 40.8% of those in group AB and 42.9% of grade C1C2. It should however be noted that the majority of grade DE respondents were resident in Cambridge, where driving was found to be less common (see Table 8 below).

3.5.9 Interestingly, grade C1C2 has the lowest percentage of cycling journeys of all SEG classifications (27.2% of grade C1C2 cycle, compared to 41.0% of all other respondents).

Table 4. All Modes of Transport by SEG

All Modes of Transport	AB	C1C2	DE	All
Car/Van (as a driver, travelling alone)	58.6%	51.6%	40.0%	54.5%
Car/Van (as a driver, with passenger/s)	40.8%	42.9%	25.3%	40.1%
Bicycle	40.3%	27.2%	45.0%	36.1%
Other bus, minibus or coach services	23.5%	28.6%	27.4%	25.7%
Walking/Running	18.1%	21.4%	22.4%	19.7%
Park & Ride bus services	13.1%	10.8%	7.6%	11.8%

[4] Semi-skilled & unskilled manual occupations, unemployed and lowest grade occupations.
[5] Higher & intermediate managerial, administrative, professional occupations.
[6] Supervisory, clerical & junior managerial, administrative, professional occupations or skilled manual occupations.

All Modes of Transport	AB	C1C2	DE	All
Taxi	5.1%	6.3%	11.3%	6.1%
Car/Van (as a passenger)	4.4%	6.3%	3.0%	4.9%
Train	6.0%	3.4%	1.1%	4.6%
Motorcycle/Moped/Scooter	2.2%	2.3%	0.0%	2.0%
Other	0.0%	0.3%	0.0%	0.1%
Base	**498**	**315**	**81**	**893**

3.5.10 There are also differences in the modes of transport taken by respondents of differing working status. Those who work make significantly more car journeys (travelling alone), 57.7%, compared to those who do not work (37.2%). Respondents who work also make more cycling journeys than those who do not work (40.9% compared with 23.1%, respectively).

Table 5. All Modes of Transport by Working Status

All Modes of Transport	Working	Not working	All
Car/Van (as a driver, travelling alone)	57.7%	37.2%	51.7%
Car/Van (as a driver, with passenger/s)	40.5%	33.0%	38.3%
Bicycle	40.9%	23.1%	35.6%
Other bus, minibus or coach services	24.5%	33.9%	27.3%
Walking/Running	20.7%	22.0%	21.1%
Park & Ride bus services	9.1%	15.4%	10.9%
Taxi	6.0%	5.7%	5.9%
Car/Van (as a passenger)	3.9%	8.3%	5.2%
Train	5.5%	2.0%	4.5%
Motorcycle/Moped/Scooter	2.1%	2.4%	2.2%
Other	0.1%	0.0%	0.1%
Base	**700**	**293**	**994**

3.5.11 There are also differences between disabled and non-disabled respondents with regards to the modes of transport they use. Disabled respondents are less likely to drive a car/van (travelling alone) than other respondents (39.9% compared with 52.9%); less likely to cycle (11.0% compared with 38.5%); but more likely to travel as a passenger in a car/van (18.1% compared with 3.6%).

Table 6. All Modes of Transport by Disability

All Modes of Transport	Disability Identified	No disability	All
Car/Van (as a driver, travelling alone)	39.9%	52.9%	51.6%
Car/Van (as a driver, with passenger/s)	30.8%	39.1%	38.3%
Bicycle	11.0%	38.5%	35.9%
Other bus, minibus or coach services	33.8%	26.4%	27.1%
Walking/Running	13.2%	21.9%	21.1%
Park & Ride bus services	8.7%	11.3%	11.0%
Taxi	10.7%	5.6%	6.0%
Car/Van (as a passenger)	18.1%	3.6%	4.9%
Train	4.9%	4.4%	4.4%
Motorcycle/Moped/Scooter	5.0%	2.0%	2.3%
Other	0.8%	0.0%	0.1%

All Modes of Transport	Disability Identified	No disability	All
Base	**95**	**892**	**987**

3.5.12 Residents of South Cambridgeshire are more likely to drive a car/van than their Cambridge counterparts: 60.2% of South Cambridgeshire residents drive a car, travelling alone, compared to 42.1% of Cambridge residents; and 46.9% of South Cambridgeshire residents drive with passengers compared to 28.6% of Cambridge residents. Residents of Cambridge are approximately three and a half times more likely than those in South Cambridgeshire to cycle (56.7% compared with 16.6%, respectively), and five times more likely to walk/run than those in South Cambridgeshire (36.4% compared with 7.0%, respectively).

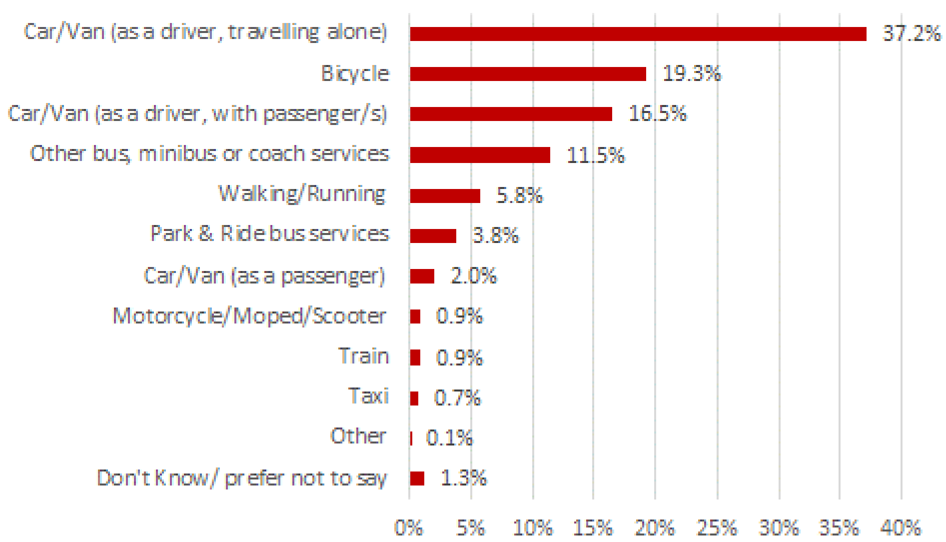
Table 7. All Modes of Transport by District

All Modes of Transport	Cambridge	South Cambridgeshire	All
Car/Van (as a driver, travelling alone)	42.1%	60.2%	51.6%
Car/Van (as a driver, with passenger/s)	28.6%	46.9%	38.2%
Bicycle	56.7%	16.6%	35.7%
Other bus, minibus or coach services	31.3%	23.7%	27.3%
Walking/Running	36.4%	7.0%	21.0%
Park & Ride bus services	2.7%	18.3%	10.9%
Taxi	9.0%	3.2%	6.0%
Car/Van (as a passenger)	6.6%	4.0%	5.2%
Train	4.6%	4.3%	4.4%
Motorcycle/Moped/Scooter	2.8%	1.9%	2.3%
Other	0.0%	0.2%	0.1%
Base	**476**	**524**	**1000**

3.6 Usual Mode of Transport

3.6.1 After detailing all modes of transport respondents used, they were asked which one mode they use most frequently to travel in and around Cambridge. Once again, travelling alone by car/van was the most common form of transport with 37.2% stating this, followed by cycling (19.3%).

Figure 2. Usual Mode of Transport



3.6.2 Commuters were more likely than those travelling for other purposes to travel most often by car (travelling alone) and by bicycle (42.4% compared with 36.2%; and 27.0% compared with 20.0%, respectively). On the other hand, business/personal business travellers were almost twice as likely to travel by car/van with passengers than commuters were (20.5% compared to 11.0%, respectively).

Table 8. Usual Mode of Transport by Journey Purpose

Usual Mode of Transport	Commuting	Leisure	Business / Personal Business	All
Car/Van (as a driver, travelling alone)	42.4%	36.7%	35.5%	37.7%
Bicycle	27.0%	20.5%	19.4%	19.5%
Car/Van (as a driver, with passenger/s)	11.0%	16.4%	20.5%	16.7%
Other bus, minibus or coach services	10.3%	10.3%	10.6%	11.6%
Walking/Running	4.8%	7.3%	5.1%	5.9%
Park & Ride bus services	1.2%	3.8%	4.6%	3.9%
Car/Van (as a passenger)	0.7%	1.9%	2.4%	2.1%
Motorcycle/Moped/Scooter	1.0%	1.2%	0.3%	1.0%
Train	0.7%	1.2%	0.9%	0.9%
Taxi	0.8%	0.6%	0.5%	0.7%
Other	0.1%	0.1%	0.1%	0.1%
Base	**525**	**691**	**511**	**985**

3.6.3 Those aged 65+ were the most likely of all the age groups to state that they travel most frequently by Park and Ride services (12.5% compared with 1.9%). However, they were the least likely to travel most often by bicycle (9.1% compared with 22.0% of all other age groups). Those aged 16-24 were less likely than older respondents to drive a car/van with passengers (6.8% compared with 18.9%, respectively).

Table 9. Usual Mode of Transport by Age

Usual Mode of Transport	16-24	25-49	50-64	65+	All
Car/Van (as a driver, travelling alone)	31.8%	42.1%	39.8%	30.1%	37.6%
Bicycle	28.1%	19.7%	21.7%	9.1%	19.6%
Car/Van (as a driver, with passenger/s)	6.8%	20.5%	18.9%	15.1%	16.7%
Other bus, minibus or coach services	18.1%	8.0%	6.5%	19.2%	11.6%
Walking/Running	10.9%	3.9%	6.1%	5.7%	5.9%
Park & Ride bus services	0.0%	1.9%	3.6%	12.5%	3.9%
Car/Van (as a passenger)	2.3%	0.9%	1.7%	5.0%	2.1%
Motorcycle/Moped/Scooter	0.3%	1.3%	1.1%	0.6%	1.0%
Train	1.6%	1.2%	0.0%	0.4%	0.9%
Taxi	0.0%	0.5%	0.6%	2.0%	0.7%
Other	0.0%	0.0%	0.0%	0.3%	0.1%
Base	**176**	**426**	**201**	**183**	**986**

3.6.4 Once again, respondents whose socio-economic status is categorised as C1C2 have the lowest percentage of bike travel of all SEG categories (14.2% compared with 23.3% for the other grades combined). As socio-economic status moves from AB through to DE, the less likely they are to travel alone by car (42.2% of grade AB do so, compared with 38.7% of C1C2 and 27.9% of DE).

Table 10. Usual Mode of Transport by SEG

Usual Mode of Transport	AB	C1C2	DE	All
Car/Van (as a driver, travelling alone)	42.2%	38.7%	27.9%	39.7%
Bicycle	22.3%	14.2%	29.3%	20.1%
Car/Van (as a driver, with passenger/s)	15.9%	20.6%	15.4%	17.5%
Other bus, minibus or coach services	6.3%	12.9%	12.5%	9.2%
Walking/Running	4.5%	4.6%	6.1%	4.7%
Park & Ride bus services	4.7%	3.2%	4.5%	4.2%
Car/Van (as a passenger)	1.2%	2.7%	3.0%	1.9%
Train	1.6%	0.3%	0.0%	1.0%
Motorcycle/Moped/Scooter	0.8%	1.5%	0.0%	1.0%
Taxi	0.3%	1.2%	1.4%	0.7%
Other	0.1%	0.0%	0.0%	0.1%
Base	**493**	**307**	**81**	**882**

3.6.5 Noticeable differences are also seen between respondents of different working statuses. Respondents who do not work are far less likely than those who do to state that their primary method of transport is traveling alone by car (25.3% compared to 43.0%) or cycling (12.4% compared with 22.6%). However, those not working are more likely to utilise bus/minibus or other coach services (20.0% compared with 7.8% of those who do work).

Table 11. Usual Mode of Transport by Working Status

Usual Mode of Transport	Working	Not working	All
Car/Van (as a driver, travelling alone)	43.0%	25.3%	37.7%
Bicycle	22.6%	12.4%	19.6%
Car/Van (as a driver, with passenger/s)	16.9%	16.6%	16.8%
Other bus, minibus or coach services	7.8%	20.0%	11.5%
Walking/Running	4.5%	9.4%	6.0%
Park & Ride bus services	2.0%	8.4%	3.9%
Car/Van (as a passenger)	0.9%	4.6%	2.0%
Motorcycle/Moped/Scooter	0.8%	1.3%	1.0%
Train	0.8%	1.0%	0.9%
Taxi	0.6%	0.9%	0.7%
Other	0.1%	0.0%	0.1%
Base	**691**	**291**	**982**

3.6.6 Disabled respondents are approximately four times less likely than non-disabled respondents to state that their primary mode of transport is bicycle (5.5% compared with 21.3%), and also less likely to say they drive a car/van alone (29.5% compared with 38.5%). However, they are more likely than those with no disability to travel by car/van as a passenger (10.6% compared with 1.0%) and to travel by bus/minibus or coach service (18.6% compared with 10.5%).

Table 12. Usual Mode of Transport by Disability

Usual Mode of Transport	Disability Identified	No disability	All
Car/Van (as a driver, travelling alone)	29.5%	38.5%	37.6%
Bicycle	5.5%	21.3%	19.8%
Car/Van (as a driver, with passenger/s)	16.5%	16.9%	16.8%
Other bus, minibus or coach services	18.6%	10.5%	11.3%
Walking/Running	7.5%	5.8%	6.0%
Park & Ride bus services	4.4%	3.9%	3.9%
Car/Van (as a passenger)	10.6%	1.0%	1.9%
Motorcycle/Moped/Scooter	3.4%	0.7%	1.0%
Train	1.2%	0.9%	0.9%
Taxi	2.3%	0.5%	0.7%
Other	0.6%	0.0%	0.1%
Base	**95**	**880**	**975**

3.6.7 Notable differences between the districts in which residents reside can also be seen: Respondents from South Cambridgeshire are twice as likely to state that their most frequently used mode of transport is travelling alone by car, compared to residents of Cambridge (49.7% compared with 24.5%). However, residents of Cambridge are significantly more likely than South Cambridgeshire residents to travel primarily by bicycle (34.6% compared with 5.9%).

Table 13. Usual Mode of Transport by District

Usual Mode of Transport	Cambridge	South Cambridgeshire	All
Car/Van (as a driver, travelling alone)	24.5%	49.7%	37.7%
Bicycle	34.6%	5.9%	19.6%
Car/Van (as a driver, with passenger/s)	11.1%	21.8%	16.7%
Other bus, minibus or coach services	14.2%	9.3%	11.6%
Walking/Running	11.1%	1.2%	5.9%
Park & Ride bus services	0.3%	7.1%	3.9%
Car/Van (as a passenger)	1.6%	2.5%	2.1%
Motorcycle/Moped/Scooter	1.2%	0.7%	0.9%
Train	0.7%	1.1%	0.9%
Taxi	0.7%	0.7%	0.7%
Other	0.1%	0.0%	0.1%
Base	**470**	**518**	**989**

3.7 Usual Mode of Transport to Work

3.7.1 Respondents who stated that they made commuting journeys to/from work were subsequently asked to identify the mode of transport they usually take for these specific journeys. Of the 477 commuters, driving a car/van, along with cycling, are the most popular modes, with 53.9% and 26.1% stating these respectively.

3.7.2 This question was also asked in the 2011 Census and the breakdown of responses is similar. The most notable differences being that the survey data shows a higher proportion of people cycling to work and a lower proportion walking/running.

Table 14. Usual Mode of Travelling to Work

Usual Mode of Transport to Work	Survey Results (%)	Census 2011 (%)
Car/Van (as a driver)	53.9%	50.1%
Bicycle	26.1%	17.3%
Bus, minibus or coach services	7.9%	5.3%
Walking/Running	3.9%	10.6%
Work mainly at or from home	2.7%	7.2%
Car/Van (as a passenger)	1.7%	3.5%
Taxi	1.1%	0.3%
Train	1.0%	4.2%
Motorcycle/Moped/Scooter	0.9%	0.9%
Underground, metro, light rail, tram	-	0.2%
Other method of travel to work	0.0%	0.5%
Don't Know/ prefer not to say	0.8%	-
Base	**477**	**138,576**

3.7.3 There are differences between respondents from Cambridge and South Cambridgeshire with regards to their usual mode of travel for work. Residents of Cambridge are far more likely to cycle compared to the residents of South Cambridgeshire (38.8% compared with 11.3%), but are less likely to travel alone by car/van (32.2% compared with 69.0%).

Table 15. Usual Mode of Transport to Work by District

Usual Mode of Transport to Work	Cambridge	South Cambridgeshire	All
Car/Van (as a driver, travelling alone)	32.2%	69.0%	49.0%
Bicycle	38.8%	11.3%	26.3%
Other bus, minibus or coach services	8.0%	6.4%	7.2%
Car/Van (as a driver, with passenger/s)	5.1%	5.7%	5.4%
Walking/Running	5.4%	2.2%	4.0%
Work mainly at or from home	4.2%	1.0%	2.7%
Car/Van (as a passenger)	2.5%	0.7%	1.7%
Taxi	1.2%	1.0%	1.1%
Train	1.5%	0.4%	1.0%
Motorcycle/Moped/Scooter	1.0%	0.7%	0.9%
Park & Ride bus services	0.0%	1.7%	0.8%
Base	**258**	**216**	**473**

3.8 Reasons for Mode Choice

3.8.1 Respondents were asked to state the reasons why they used the modes of transport they did. They were allowed to give more than one reason. The most frequently cited reasons were reliability of journey (40.6%), speed of journey (38.2%), and distance to destination (22.0%). Availability of information (<1%) and the ability to carry out other tasks during travel (1.2%) seem to have little bearing on mode choice.

Table 16. Reasons for Mode Choice

Reason for Mode Choice	Percentage
Reliability of journey	40.6%
Speed of journey	38.2%
Distance to destination	22.0%
Physical comfort	16.2%
Price of transport	16.0%
Health reasons	14.5%
Complexity of journey (e.g. number of connections)	13.7%
Frequency of service	11.1%
More environmentally friendly/ sustainable	9.1%
Work vehicle/ drive for job	6.2%
Price of parking	6.1%
Distance to station/ stop	6.1%
Availability of car parking	5.4%
Personal safety	4.9%
Availability of cycle facilities	3.1%
Ability to do other things while travelling (e.g. work/ read/ etc.)	1.2%
Availability of 'Real Time Information'	0.3%
Availability of other forms of information	0.0%
Other	25.8%
Don't Know/ prefer not to say	0.6%
Base	**1001**

3.8.2 Around a quarter (25.8%) of respondents gave 'other' reasons for their mode choice. The most common reasons given related to:

- Access to public transport;
- Flexibility of travel;
- The need to take passengers or other items;
- Convenience; and
- Lack of alternative options.

"No public transport to workplace."

"Easier – requires less planning in advance."

"All my work tools are in the van."

"Convenient to get to train station through the cycle route."

"I can't drive and I find cycling Is quicker due to traffic congestion."

3.8.3 Respondents from the youngest age range (16-24) are more concerned by the price of transport than members of other age categories (27.5% compared with 13.6%, respectively), and less concerned with the reliability of the journey (30.2% compared with 43.2%, respectively). Respondents aged 65+ were more likely to cite health reasons and physical comfort as their motives for mode choice than other age categories (22.8% compared with 12.8%; and, 23.5% compared with 14.7%, respectively).

Table 17. Reasons for Mode Choice by Age

Reason for Mode Choice	16-24	25-49	50-64	65+	All
Reliability of journey	30.2%	44.7%	42.9%	40.1%	40.9%
Speed of journey	32.9%	43.3%	43.0%	27.7%	38.5%
Distance to destination	17.6%	23.8%	22.6%	22.3%	22.1%
Physical comfort	13.3%	15.0%	15.3%	23.5%	16.3%
Price of transport	27.5%	13.1%	12.4%	16.0%	16.1%
Health reasons	14.0%	10.8%	15.8%	22.8%	14.6%
Complexity of journey (e.g. number of connections)	6.0%	18.9%	13.4%	10.3%	13.8%
Frequency of service	9.2%	10.6%	10.1%	15.7%	11.2%
More environmentally friendly/ sustainable	11.3%	8.7%	10.6%	6.8%	9.2%
Work vehicle/ drive for job	8.3%	7.6%	7.0%	0.5%	6.3%
Distance to station/ stop	2.8%	6.4%	7.2%	7.4%	6.1%
Price of parking	2.0%	6.0%	8.2%	8.0%	6.1%
Availability of car parking	1.2%	5.2%	6.9%	8.4%	5.4%
Personal safety	4.0%	4.8%	4.5%	6.5%	4.9%
Availability of cycle facilities	4.2%	3.6%	2.6%	1.5%	3.1%
Ability to do other things while travelling (e.g. work/ read/ etc.)	0.0%	1.7%	1.8%	0.5%	1.2%
Availability of 'Real Time Information'	1.0%	0.0%	0.4%	0.3%	0.3%
Availability of other forms of information	0.0%	0.0%	0.0%	0.0%	0.0%
Other	26.2%	23.1%	29.6%	28.0%	25.9%
Base	**180**	**425**	**205**	**183**	**992**

3.8.4 With regards to socio-economic status, as the status moves from DE through to AB the more likely they were to state speed of journey (41.5%) complexity of journey (17.9%) and frequency of service (13.1%) as a reason for mode choice. As socio-economic status moves from AB through to DE, the more likely they were to cite price of transport (22.5%) and driving for their job (14.7%) as a reason. However, reliability of journey was still the most common reason across all grades.

Table 18. Reasons for Mode Choice by SEG

Reason for Mode Choice	AB	C1C2	DE	All
Reliability of journey	44.0%	42.2%	38.3%	42.9%
Speed of journey	41.5%	38.8%	28.8%	39.4%
Distance to destination	24.8%	20.1%	17.8%	22.5%
Physical comfort	15.7%	16.0%	21.2%	16.3%
Price of transport	14.8%	15.6%	22.5%	15.8%
Health reasons	13.9%	15.8%	18.5%	15.0%
Complexity of journey (e.g. number of connections)	17.9%	11.1%	9.4%	14.8%
Frequency of service	13.1%	10.5%	1.8%	11.2%
More environmentally friendly/ sustainable	9.1%	7.2%	10.4%	8.6%
Work vehicle/ drive for job	4.3%	9.2%	14.7%	7.0%
Price of parking	7.4%	5.9%	4.1%	6.5%
Distance to station/ stop	6.9%	6.0%	3.1%	6.2%
Availability of car parking	6.5%	5.0%	4.4%	5.8%
Personal safety	4.1%	6.8%	4.1%	5.0%

Reason for Mode Choice	AB	C1C2	DE	All
Availability of cycle facilities	4.3%	1.2%	5.1%	3.3%
Ability to do other things while travelling (e.g. work/ read/ etc.)	1.0%	1.7%	0.0%	1.1%
Availability of 'Real Time Information'	0.0%	0.4%	0.0%	0.2%
Availability of other forms of information	0.0%	0.0%	0.0%	0.0%
Other	23.1%	30.4%	16.9%	25.1%
Base	**497**	**312**	**81**	**891**

3.8.5 Respondents who work appear to place greater value on a number of attributes, compared to their non-working counterparts: 43.0% of those who work stated speed of journey as a reason for mode choice, compared to 26.9% of those who didn't work; 44.2% stated reliability, compared to 33.2%; and, 16.5% stated complexity of journey, compared to 7.5%. On the other hand, those not working were more likely to state that physical comfort and price of transport are their reasons for mode choice (23.3% compared to 13.4%, and 22.5% compared to 13.5%, respectively).

Table 19. Reasons for Mode Choice by Working Status

Reason for Mode Choice	Working	Not working	All
Reliability of journey	44.2%	33.2%	41.0%
Speed of journey	43.0%	26.9%	38.2%
Distance to destination	23.3%	20.0%	22.3%
Physical comfort	13.4%	23.3%	16.3%
Price of transport	13.5%	22.5%	16.1%
Health reasons	13.2%	17.5%	14.5%
Complexity of journey (e.g. number of connections)	16.5%	7.5%	13.9%
Frequency of service	10.5%	12.8%	11.2%
More environmentally friendly/ sustainable	10.1%	7.3%	9.3%
Work vehicle/ drive for job	9.0%	0.0%	6.3%
Price of parking	5.6%	7.7%	6.2%
Distance to station/ stop	5.9%	6.7%	6.1%
Availability of car parking	5.3%	5.8%	5.5%
Personal safety	4.6%	5.8%	4.9%
Availability of cycle facilities	3.8%	1.6%	3.1%
Ability to do other things while travelling (e.g. work/ read/ etc.)	1.4%	0.7%	1.2%
Availability of 'Real Time Information'	0.1%	0.8%	0.3%
Availability of other forms of information	0.0%	0.0%	0.0%
Other	25.7%	26.5%	26.0%
Base	**696**	**292**	**989**

3.8.6 Disabled respondents were far less likely to state speed of journey as their reason for mode choice, compared with non-disabled respondents (19.9% compared with 40.5%, respectively). Instead, those who are disabled are more likely to cite health reasons as their motive for choosing particular modes (44.3% compared with 11.7% of non-disabled respondents).

Table 20. Reasons for Mode Choice by Disability

Reason for Mode Choice	Disability Identified	No disability	All
Reliability of journey	31.8%	41.9%	40.9%
Speed of journey	19.9%	40.5%	38.5%
Distance to destination	20.5%	22.6%	22.4%
Price of transport	18.5%	16.0%	16.3%
Physical comfort	21.0%	15.5%	16.0%
Health reasons	44.3%	11.7%	14.8%
Complexity of journey (e.g. number of connections)	10.1%	14.2%	13.8%
Frequency of service	7.5%	11.4%	11.0%
More environmentally friendly/ sustainable	6.4%	9.6%	9.3%
Work vehicle/ drive for job	0.0%	7.0%	6.4%
Price of parking	8.9%	6.0%	6.2%
Distance to station/ stop	11.4%	5.5%	6.1%
Availability of car parking	2.7%	5.7%	5.4%
Personal safety	5.5%	4.8%	4.9%
Availability of cycle facilities	1.8%	3.2%	3.1%
Ability to do other things while travelling (e.g. work/ read/ etc.)	0.8%	1.1%	1.1%
Availability of 'Real Time Information'	0.0%	0.4%	0.3%
Availability of other forms of information	0.0%	0.0%	0.0%
Other	32.8%	25.4%	26.1%
Base	**95**	**887**	**982**

3.8.7 There are also significant differences in reasons for mode choice between the districts in which respondents reside. Residents of Cambridge were more likely to cite health reasons and sustainability as their reasons for mode choice than residents of South Cambridgeshire (21.3% compared to 8.5%, and 15.9% compared to 3.1%, respectively).

Table 21. Reasons for Mode Choice by District

Reason for Mode Choice	Cambridge	South Cambridgeshire	All
Reliability of journey	39.2%	42.3%	40.8%
Speed of journey	39.1%	37.8%	38.4%
Distance to destination	24.3%	20.3%	22.2%
Physical comfort	15.9%	16.7%	16.3%
Price of transport	18.2%	14.3%	16.1%
Health reasons	21.3%	8.5%	14.6%
Complexity of journey (e.g. number of connections)	12.2%	15.3%	13.8%
Frequency of service	8.9%	13.1%	11.1%
More environmentally friendly/ sustainable	15.9%	3.1%	9.2%
Work vehicle/ drive for job	6.5%	6.1%	6.3%
Price of parking	5.7%	6.6%	6.2%
Distance to station/ stop	3.4%	8.5%	6.1%
Availability of car parking	3.9%	6.8%	5.4%
Personal safety	6.0%	3.9%	4.9%

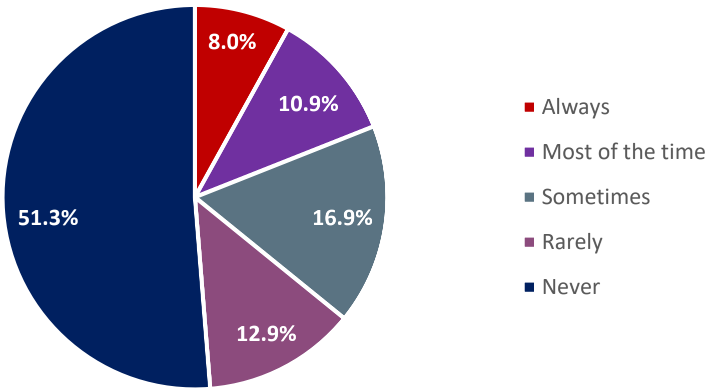
Reason for Mode Choice	Cambridge	South Cambridgeshire	All
Availability of cycle facilities	5.0%	1.4%	3.1%
Ability to do other things while travelling (e.g. work/ read/ etc.)	1.3%	1.1%	1.2%
Availability of 'Real Time Information'	0.7%	0.0%	0.3%
Availability of other forms of information	0.0%	0.0%	0.0%
Other	20.8%	30.6%	25.9%
Base	**472**	**523**	**995**

3.8.8 The reasons for using different modes also vary between the types of transport people use. Car/van drivers were more likely to cite 'reliability of journey' as a reason for mode choice than any other reason (46.4% of those travelling alone said this and 43.9% of those travelling with passengers said so); cyclists were more likely to cite speed of journey than any other reason (with 63.2% saying this); park and ride users' most common response was the price of transport (33.7%), while users of other buses, minibuses or coach services were more likely to say reliability; and, health reasons were the most common reason for walking/running (45.2%).

3.9 Journey Planning

3.9.1 The figure below shows how many respondents currently check travel conditions before starting their journeys, with just over half (51.3%) stating they never do. However, those who predominantly drive a car/van are more likely to check travel conditions than those who predominantly use another form of transport (55.9% compared to 40.0%, respectively).

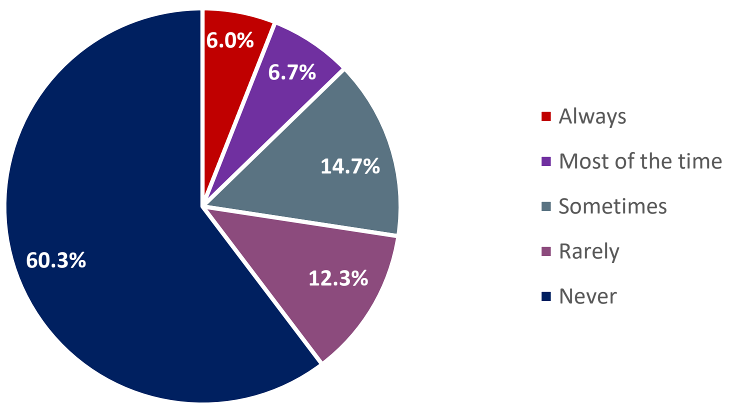
Figure 3. Do you check travel conditions before starting your journeys?



Base: 1,001

3.9.2 Figure 3 shows the percentage of respondents for whom information regarding travel conditions influences their mode of transport. Nearly two thirds (60.3%) of respondents said this information never influences their choice of mode. However, those who predominantly drive a car/van are more likely to say it does influence them than those who predominantly use another form of transport (43.5% compared to 34.4%, respectively).

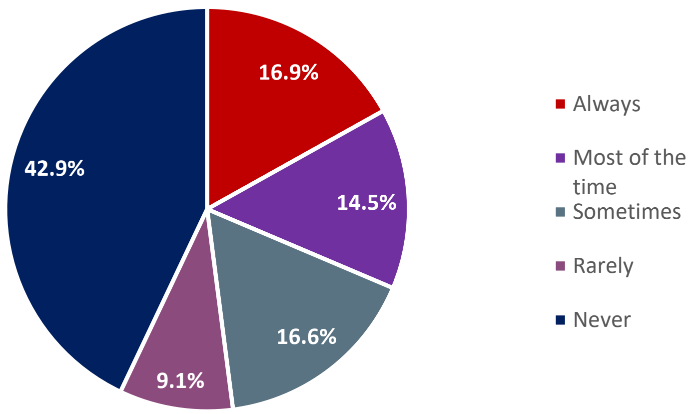
Figure 4. Does information about congestion or delays influence your choice of transport mode?



Base: 1,001

3.9.3 Figure 4 shows the percentage of respondents who check the weather forecast before starting their journeys, with 57.1% doing so, even if only rarely. Respondents who predominantly cycle, walk or run are much more likely than other respondents to check the weather (76.8% compared with 50.7%, respectively).

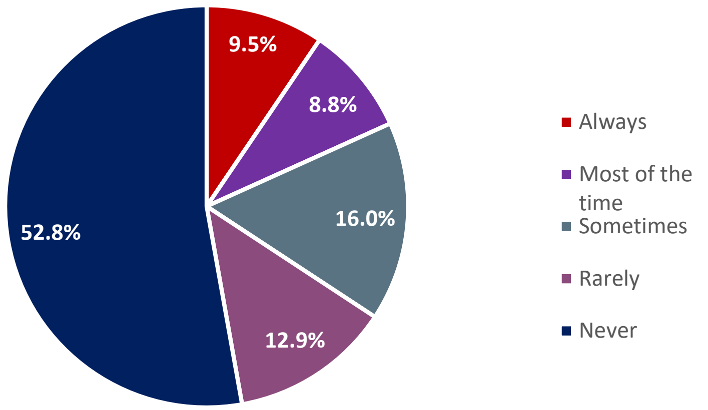
Figure 5. Do you check the weather forecast before starting your journeys?



Base: 1,001

3.9.4 The figure below shows the percentage of respondents for whom the weather conditions influence their choice of transport, with 47.2% saying they do, if only rarely. Again, cyclists and those who walk/run are more likely to be influenced by weather conditions than other respondents (61.5% compared with 42.5%, respectively).

Figure 6. Do weather conditions influence your choice of transport?



Base: 1,001

3.10 Alternative Modes

3.10.1 Respondents who indicated that they use a car/van to make journeys in and around Cambridge were subsequently asked if they could make these journeys using any other mode. Whilst nearly a third (31.9%) of these respondents stated that bus, minibus or coach services were available to them, two in five respondents (39.0%) said they had no other modes of transport they could use.

Table 22. Alternative Modes of Transport available to Car/Van users

Alternative Modes Available	Percentage
Other bus, minibus or coach services	31.9%
Bicycle	25.0%
Park & Ride bus services	11.7%
Taxi	10.8%
Walking/Running	6.8%
Train	6.4%
Motorcycle/Moped/Scooter	1.8%
Other	0.1%
None of the above	39.0%
Don't Know/ prefer not to say	0.6%
Base	**681**

3.10.2 Commuters were more likely than those travelling for other purposes to say they could make their car/van journeys by bicycle (34.8% compared to 27.7% of leisure travellers and 22.9% of those travelling for business/personal business); and, less likely to say they could do so by bus, minibus or coach services (26.1% compared to 35.3% of leisure travellers and 32.4% of those travelling for business/personal business).

3.10.3 Those aged 65 years and over were less likely than younger respondents to say cycling was an option (9.6% compared with 28.2%, respectively); and, more likely to say there were no other options available to them (46.6% compared with 38.0%).

3.10.4 People with disabilities were more likely than those without disabilities to say taxi was an alternative (21.2% compared with 9.9%); and, less likely to say that cycling was an option (10.1% compared with 26.8%).

3.10.5 Respondents living in Cambridge were more likely than those in South Cambridgeshire to say the following modes were possible alternatives: taxi (17.5% compared with 6.6%); cycling (37.4% compared with 17.4%); and walking/running (14.0% compared with 2.2%). Respondents living in South Cambridgeshire were more likely than those in Cambridge to say there were no alternatives available to them (43.6% compared with 32.4%).

3.10.6 A range of reasons were given by respondents as to why they do not use alternative modes of transport. Speed (28.3%), reliability (25.9%), and the price of using public transport (20.5%) are the three most cited reasons as to why alternative modes are not utilised.

Table 23. Why don't you travel by alternative modes?

Reason why alternative modes not used	**Percentage**
Speed of journey	28.3%
Reliability of journey	25.9%
Price of transport	20.5%
Distance to destination	18.4%
Complexity of journey (e.g. number of connections)	15.0%
Physical comfort	14.0%
Frequency of journey	12.2%
Distance to station/ stop	7.7%
Work vehicle/ drive for job	7.2%
Health reasons	5.5%
Personal safety	4.3%
Price of parking	3.0%
Ability to do other things while travelling (e.g. work/ read/ etc.)	2.2%
Availability of car parking	1.6%
More environmentally friendly/ sustainable	0.7%
Availability of cycle facilities	0.7%
Availability of 'Real Time Information'	0.6%
Availability of other forms of information	0.3%
Other	29.9%
Don't Know/ prefer not to say	4.9%
Base	**681**

3.10.7 Nearly a third (29.9%) of respondents gave 'other' reasons as to why they couldn't use alternative modes of transport. Of these 'other' reasons, the most common types of response related to:

- Lack of public transport;

- The need to take passengers or other items;
- Convenience; and
- Flexibility of travel.

> *"Bus doesn't run early enough."*
>
> *"Carrying things in the car that would be difficult on public transport."*
>
> *"Convenience of it being easier to use a car when weather is bad."*
>
> *"The car is the easiest option, particularly when travelling with the children."*
>
> *"Working hours are unpredictable."*

3.10.8 Health reasons were given as a reason to not use alternative modes more frequently by those aged 65 years and older (19.5% compared with 3.3% of younger respondents); those who were not working (15.4% compared to 2.7% of those who were working); and those with a disability (34.2% compared with 3.0% of those with no disability).

3.10.9 Speed of journey was given as a reason for not using alternative modes more frequently as socio-economic status moved from DE through to AB (18.6% of DE compared with 22.9% of C1C2 and 34.6% of grade AB); and respondents without a disability were also more likely than those without a disability to state this (31.3% compared with 14.3%, respectively).

3.10.10 Physical comfort was a more common reason for not using alternatives among those in socio-economic grade DE (26.6% compared with 13.0% of the other grades); and among those who were not working (22.8% compared with 12.2% of those who were working).

3.10.11 Price of transport was a more common reason for not using alternatives among residents of Cambridge (28.2%), compared to residents of South Cambridgeshire (17.5%).

3.10.12 Respondents were then asked to state which mode of transport they would use if driving was no longer an option for them. Almost a third (31.9%) of respondents would use a bus, minibus or coach service, and one in five (19.7%) would cycle instead.

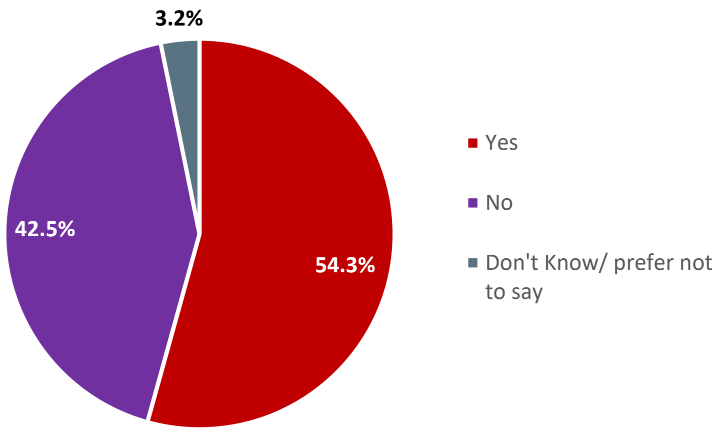
Table 24. If driving was no longer an option for you, which mode would you use?

Which mode would you use?	Percentage
Other bus, minibus or coach services	31.9%
Bicycle	19.7%
Taxi	13.0%
Train	9.6%
Park & Ride bus services	6.7%
Walking/Running	6.0%
Motorcycle/Moped/Scooter	2.7%
I wouldn't travel	12.5%
I have to drive as part of my job	4.5%
I would still drive, no matter what	3.9%
Other	7.1%
Don't Know/ prefer not to say	5.9%

Which mode would you use?	Percentage
Base	681

3.10.13 Respondents were also asked whether they would like to make more journeys in and around Cambridge without their own car/van. There was a mixed response, with just over half (54.3%) of respondents saying 'Yes', but more than two in five respondents (42.5%) saying 'No'.

Figure 7. Would you like to make more journeys without your own car/van?



Base: 681

3.10.14 The proportion of respondents who would like to make more journeys without their own car/van differs significantly by age and gender: Respondents aged 65 years and over were the least likely to want to change their mode of transport (41.0%), whereas respondents aged 25-49 were most receptive to doing so (62.3%); and females were more likely than males to say they wanted to (61.9% compared to 50.6%).

3.11 Potential initiatives to encourage or enable reduced car/van use

3.11.1 Respondents were presented with 32 potential initiatives, each aimed at encouraging a reduction in car/van use. Respondents were asked to rate each one in terms of the extent to which it might encourage this behaviour. Each initiative was then given a score based on the number of respondents who said the initiative was 'Very Likely' or 'Somewhat likely' to encourage them to use other modes of transport.

3.11.2 The five most popular initiatives were found to be:

- Introducing new public transport routes;
- Improving reliability of public transport services;
- Making public transport cheaper;
- Improving the frequency of services on public transport; and
- Introducing free parking at Park & Ride sites.

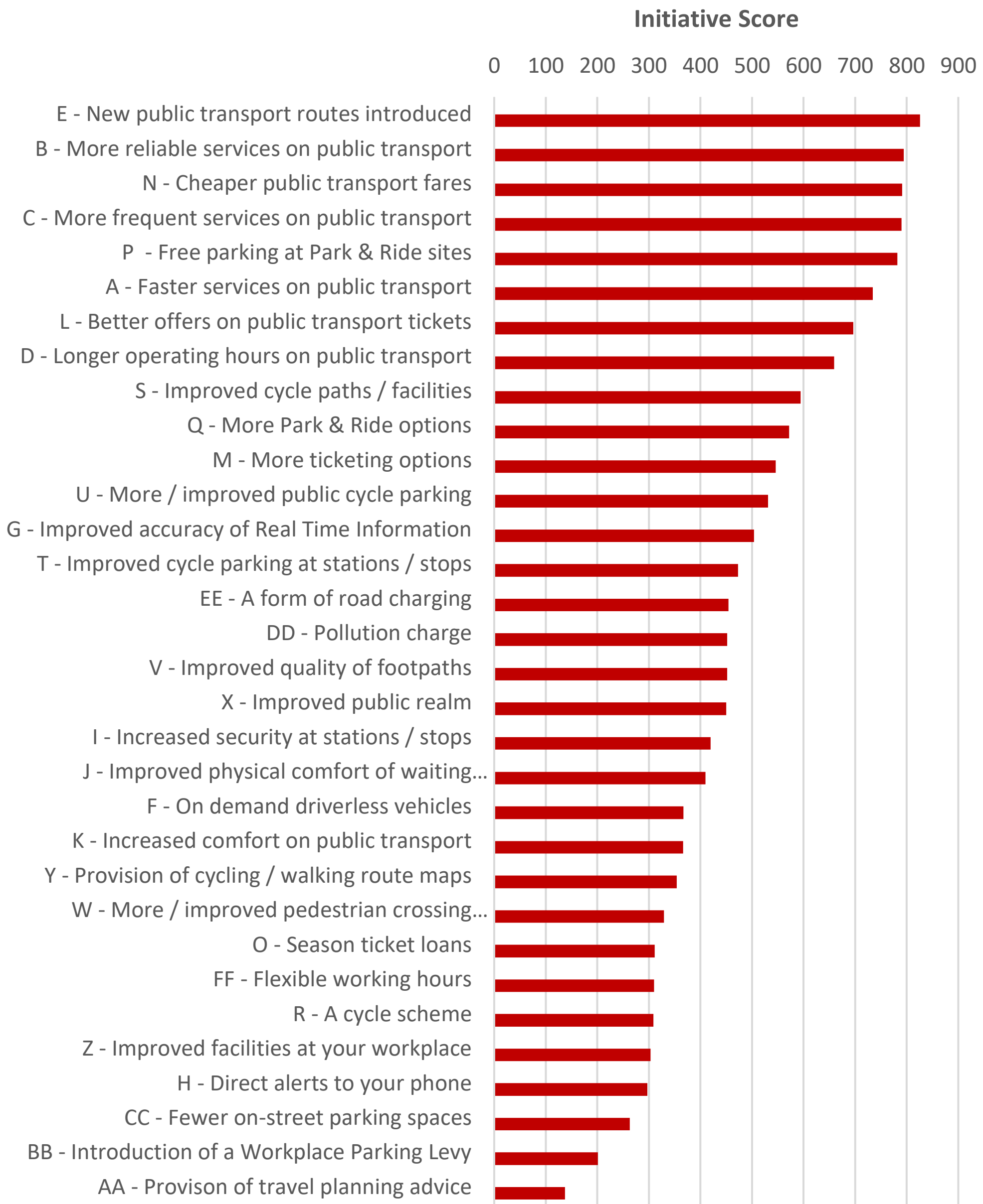
3.11.3 The five least popular initiatives were found to be:

- Provision of travel planning advice;

- Introducing a workplace parking levy;
- Reducing the number of on-street parking spaces;
- Providing direct alerts to your phone; and
- Improving workplace facilities.

3.11.4 The ranking of all initiatives is shown in Figure 7.

Figure 8. Ranking of the 32 Initiatives



3.11.5 The likelihood of an initiative encouraging a reduction in car/van use significantly differs by age. For instance, those aged 65+ are significantly less likely to change their mode than other age ranges, if the price of public transport was reduced (41.7% compared to 73.0% for younger respondents). Additionally, respondents aged 16-24 are significantly less likely to change their mode based on increased frequency of public transport services, relative to older respondents (55.6% compared with 72.2%, respectively).

3.11.6 There are also differences between genders with for some of the initiatives. Females are significantly more likely than males to change their mode based on cheaper public transport fares (73.4% compared with 61.8%) and increased frequency of services (74.6% compared with 63.0%).

3.11.7 If new public transport routes were introduced, then respondents who work would be more likely to change their mode than non-workers (72.5% compared to 67.6%, respectively); as would be the case if public transport fares were made cheaper (71.9% compared with 52.1%).

3.11.8 Respondents without disabilities are more likely than those with disabilities to change their mode if free parking is introduced at Park and Ride sites (67.7% compared with 51.1%, respectively). This initiative would also be valued by the residents of South Cambridgeshire more than Cambridge (72.9% compared with 55.8%, respectively).

3.11.9 In addition to the list of initiatives, respondents were asked if there was anything else that could encourage them out of their cars/vans. Whilst most suggestions were closely related to the initiatives, there were some novel ideas proposed.

3.11.10 A popular theme that emerged from this question was the appetite for the development of alternative forms of transport. These suggestions included the provision of additional rail services / stations, tram systems, and an underground network.

> *"Create a train station at Addenbrookes."*
>
> *"Reintroduce the railways services."*
>
> *"Something like a tram would be handy."*
>
> *"Underground network. Could be a good way forward. Going to keep growing. Right ground for tunnelling. Expensive, but a long-term investment."*

Some respondents suggested that new schemes were set up, or incentives were provided to encourage the use of public transport.

> *"Financial Incentive – tax relief for using public transport."*
>
> *"A car share scheme – both the rider and driver would gain financial benefit."*
>
> *"A taxi scheme that is subsidised would be good when I can't drive anymore."*

Although respondents were given the opportunity to select initiatives related to security earlier in the survey, some felt it was necessary to re-iterate the importance of personal safety.

> *"Better lighting. I think it's all about feeling safe."*
>
> *"Lighting needs to be improved. No police control, and no safety, especially for women."*

3.12 Profile of Respondents

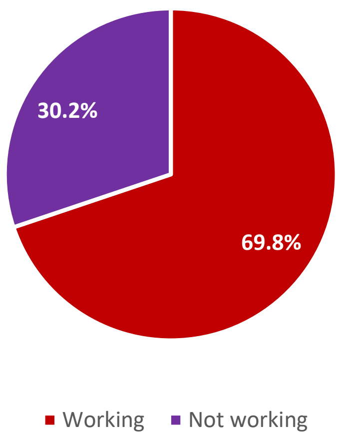
3.12.1 In total, 1,021 respondents completed the survey, of which 1,018 provided both their age and gender. Table 27 provides a breakdown of respondent age and gender.

Table 25. Age and Gender of Respondents

Age	Male	Female	Total
16 - 24	9.2%	8.5%	**17.7%**
25 - 49	22.3%	20.4%	**42.6%**
50 - 64	10.2%	10.2%	**20.4%**
65+	8.8%	10.4%	**19.2%**
Total	**50.5%**	**49.5%**	**1,018**

3.12.2 In terms of working status, over two-thirds (69.8%) were working either full-time or part-time. The remaining 30.2% were not working, including students and respondents who were retired.

Figure 9. Working status of respondents



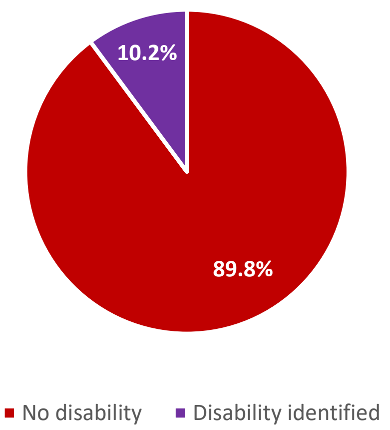
Base: 1,015

3.12.3 Of the 910 respondents who indicated their socio-economic grade (SEG), the sample breakdown was as follows:

- 55.3% were ‘AB’ - Higher & intermediate managerial, administrative, professional occupations;
- 35.6% were ‘C1’ or ‘C2’ - Supervisory, clerical & junior managerial, administrative, professional occupations or skilled manual occupations; and
- 9.2% were ‘DE’ - Semi-skilled & unskilled manual occupations, unemployed and lowest grade occupations.

3.12.4 Of the 1,007 respondents who answered the question regarding whether they have any disabilities, 10.2% of the sample reported having a disability. The majority of those who said they had a disability indicated that they had a mobility impairment.

Figure 10. Disability

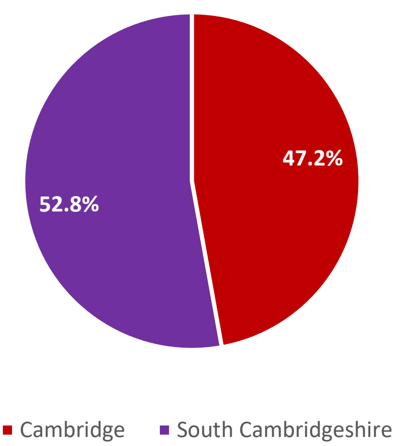


Base: 1,007

3.12.5 Of those with a disability, just over half (53.7%) were aged 65 years and over, and less than a quarter (22.7%) made commuting journeys in and around Cambridge.

3.12.6 With regards to the area in which respondents reside, just over half (52.8%) of the sample live in South Cambridgeshire.

Figure 11. Area of residence



Base: 1,021

4. CONCLUSIONS

4.1 What journeys are currently made in and around Cambridge?

4.1.1 More than three quarters of respondents travel in and around Cambridge at least twice a week, with the majority doing so five or more times a week.

4.1.2 Over two thirds of respondents make leisure journeys, and over half make commuting journeys and business/personal business journeys.

4.1.3 Over half of respondents usually travel by car/van, with the majority doing so alone without any passengers. Around a fifth of respondents usually travel by bicycle. Car/van drivers (travelling alone) were most likely to be commuters, aged 25-64, of AB socio-economic grade, and live in South Cambridgeshire. Bicycle users were also most likely to be commuters, but to be aged 16-24, of DE socio-economic grade, and to live in Cambridge.

4.1.4 There is a noticeable difference in the demographic profile of residents in Cambridge and South Cambridgeshire, resulting in some key differences in the way people travel. There is a higher proportion of residents aged 65 years and over in South Cambridgeshire, compared to Cambridge, resulting in less frequent journeys and less commuting journeys being made, but a higher proportion of car use. In addition, perhaps due to the demographic profile or the greater distance to the city centre, cycling, walking and running appear far less of an option for South Cambridgeshire residents.

4.1.5 It should also be noted that people with disabilities tend to make different journeys to those without disabilities: they tend to travel less frequently and are less likely to be commuting; and, while driving a car/van without passengers is still the most likely mode of transport, they are more likely than other respondents to travel as a passenger in a car/van and to travel by bus/minibus or coach service. A very small proportion of people with disabilities cycle. People with disabilities are also more likely than other respondents to consider taxis an option.

4.2 What factors influence current mode choice?

4.2.1 Respondents were asked to state the reasons why they used a particular mode of transport most often. The most frequently cited reasons were reliability of journey, speed of journey, and distance to destination. Availability of information and the ability to carry out other tasks during travel seem to have little bearing on mode choice.

4.2.2 The reasons for using different modes varied by the type of transport most often used. Those who usually drove a car/van were more likely to cite 'reliability of journey' than any other reason; cyclists were more likely to cite speed of journey; park and ride users' most common response was the price of transport, while users of other buses, minibuses or coach services were more likely to say reliability; and, health reasons were the most common reason for walking/running.

4.2.3 Regarding area and disability: Cambridge residents were more likely than residents of South Cambridgeshire to cite health reasons and sustainability as their reasons for mode choice; and, disabled respondents were more likely than those without a disability to cite health reasons and less likely to state speed of journey.

4.2.4 Less than a fifth of respondents 'always' check or check 'most of the time' the travel conditions before starting their journeys, and even fewer are influenced by this information. However, those who predominantly drive a car/van are more likely to check travel conditions and more likely to be influenced by this information than those who predominantly use another form of transport.

4.2.5 Similarly, less than a third of respondents 'always' check or check 'most of the time' the weather forecast before travelling, and even fewer are influenced by this information. Respondents who predominantly cycle, walk or run are much more likely than other respondents to check the weather and to be influenced by it.

4.3 What are the motivators and barriers to switching to more sustainable travel choices?

4.3.1 Car/van drivers were asked whether they would like to make more journeys in and around Cambridge without their own car/van. There was a mixed response, with just over half saying 'Yes', but more than two in five saying 'No'.

4.3.2 They were also asked, of the journeys they currently make by car/van, could they use a different mode of transport. Nearly a third stated that they could use bus, minibus or coach services and a quarter stated they could cycle, demonstrating some potential for mode shift. However, a fifth said they had no alternative.

4.3.3 Reasons for not using alternatives to car/van included the speed and reliability of the journey, the price of using public transport, the distance to destination and complexity of journey. Alternative modes need to compete with driving on these attributes if mode shift is to be encouraged.

4.3.4 It should be noted that the price of using public transport was a more common reason for not taking up alternative modes among residents in Cambridge, than in South Cambridgeshire.

4.3.5 Respondents were presented with 32 potential initiatives, each aimed at encouraging a reduction in car/van use. The five most popular initiatives were found to be:

- Introducing new public transport routes;
- Improving reliability of public transport services;
- Making public transport cheaper;
- Improving the frequency of services on public transport; and
- Introducing free parking at Park & Ride sites.

4.3.6 The five least popular initiatives were:

- Provision of travel planning advice;
- Introducing a workplace parking levy;
- Reducing the number of on-street parking spaces;
- Providing direct alerts to your phone; and
- Improving workplace facilities.

4.3.7 In general, public transport improvements (frequency, routes, fares/offers, speed, operating hours) ranked highest, whereas 'softer' initiatives such as travel planning and workplace initiatives (season ticket loans, cycle schemes) were least likely to encourage modal shift. Walking and cycling infrastructure improvements (cycle paths/footways) and charging mechanisms (road charging or pollution charging) ranked in the middle of the choice of initiatives.

4.3.8 Residents in South Cambridgeshire were more likely than those in Cambridge to change their mode if free parking were introduced at Park and Ride sites. Younger respondents were also more sensitive to fares.

Appendix A

Cambridgeshire Travel Survey

Methodology: CATI

Good [afternoon/evening]. My name is [interviewer name] and I am conducting a survey on behalf of the Greater Cambridge Partnership to better understand residents' travel behaviour and reasons for their travel choices. Please can you spare 10 minutes to answer some questions?

[If required] The findings from the survey will help the Greater Cambridge Partnership better understand your transport needs. If you complete this survey you can choose to be entered into a prize draw, with three winners each receiving £100 worth of high street shopping vouchers.

□1 Yes [Continue]
□2 No [Thank & close]

Thank you. Your answers will remain totally anonymous and will only be used for research purposes. We adhere to the Market Research Society code of conduct and all data will be held in accordance with the data protection act.

We first need to ask a few questions to ensure that the people we speak to are representative of all people living in the local area. Please can I take a few personal details…?

□1 Yes [Continue]
□2 No [Thank & close]

Screeners

S1. Which of the following age groups do you fall under? [Single response]

□1 Under 16 [Thank & close]
□2 16-24 years old
□3 25-49 years old
□4 50-64 years old
□5 65+ years old
□6 Prefer not to say [Do NOT read out]

S2. Please can you confirm, are you….? [Single response]

□1 Male
□2 Female
□3 Other/Prefer not to say [Do NOT read out]

S3. **Which of the following best describes your current situation?** [Single response]

☐1 Working full-time (30+ hours a week)
☐2 Working part-time (less than 30 hours a week)
☐3 Not working
☐4 Retired
☐5 Student
☐6 Other, please specify ____________________
☐7 Prefer not to say [Do NOT read out]

S4. **What is the occupation of the main income earner in your household?** If the main income earner is retired, please select the option that best describes what their occupation was before they retired. [Single response]

☐1 Higher managerial, administrative or professional
☐2 Intermediate managerial, administrative or professional
☐3 Supervisory or clerical and junior managerial, administrative or professional
☐4 Skilled manual worker
☐5 Semi or unskilled manual worker
☐6 Casual worker, pensioner (reliant on state pension only), or dependent on state welfare
☐7 Don't know/prefer not to say [Do NOT read out]

S5. [Insert District from database]

Current Travel Behaviour

I'd now like to ask you about your current travel behaviour in and around Cambridge. By 'in and around Cambridge' we mean travelling within the built-up area of the city and its outskirts.

Q1. **How often do you travel in and around Cambridge?** [Single response]

☐1 5 or more times a week
☐2 2-4 times a week
☐3 Once a week
☐4 Less than once a week, but at least once a month
☐5 Less than once a month
☐6 Never [Skip to 'Demographics' section]
☐7 Don't know/prefer not to say [Do NOT read out]

Q2. **For which of the following reasons do you make these journeys? (Please select all that apply)** [Multiple response]

☐1 Commuting to/from work
☐2 Commuting to/from education
☐3 School drop off/pick up
☐4 Employer's business
☐5 Personal business
☐6 Leisure activities
☐7 Other, please specify ____________________
☐8 Don't know/prefer not to say [Do NOT read out]

Q3. **At which of these times of day do you travel in and around Cambridge? (Please select all that apply)** [Multiple response]

☐1 Weekdays from 4am and before 7am
☐2 Weekdays from 7am and before 10 am
☐3 Weekdays from 10am and before 4pm
☐4 Weekdays from 4pm and before 7pm
☐5 Weekdays from 7pm and before 4am
☐6 Saturdays
☐7 Sundays
☐8 Don't know/prefer not to say [Do NOT read out]

	Q4a. Which of the following modes of transport do you use to make these journeys? (Please select all that apply) [Multiple response]	**Q4b. Which ONE of these modes of transport do you use most often to travel in and around Cambridge?** [Single response]	**Q4c.** [If Q2=1] **How do you usually travel to work? If you use more than one mode please select the mode you use for the longest part, by distance, of your usual journey to work.** [Single response]
[Only show for Q4c] Work mainly at or from home			☐1
Car/Van (as a driver, travelling alone)	☐2	☐2	☐2
Car/Van (as a driver, with passenger/s)	☐3	☐3	☐3
Car/Van (as a passenger)	☐4	☐4	☐4
Taxi	☐5	☐5	☐5
Train	☐6	☐6	☐6
Park & Ride bus services	☐7	☐7	☐7
Other bus, minibus or coach services	☐8	☐8	☐8
Motorcycle/Moped/Scooter	☐9	☐9	☐9
Bicycle	☐10	☐10	☐10
Walking/Running	☐11	☐11	☐11
Other, please specify	☐12	☐12	☐12
Don't know/prefer not to say [Do NOT read out]	☐13	☐13	☐13

Q4d. [If Q2=1 and Q4c ≠ 1] **What is the full postcode of your place of work?**

Work postcode ____________________
☐1 Don't know/prefer not to say [Do NOT read out]

Q5. [If Q4b ≠ 13] **Why do you travel in and around Cambridge most often by** [insert answer to Q4b]**?**
[Do NOT read out]
[Probe if necessary and code below]
[If respondent states 'convenience', probe for why it is convenient and code accordingly]
[Multiple response]

☐1 Speed of journey
☐2 Reliability of journey
☐3 Frequency of service
☐4 Distance to destination
☐5 Distance to station/stop
☐6 Availability of cycle facilities
☐7 Availability of car parking
☐8 Price of transport
☐9 Price of parking
☐10 Availability of 'Real Time Information'
☐11 Availability of other forms of information
☐12 Personal safety
☐13 Physical comfort
☐14 Ability to do other things while travelling (e.g. work/read/etc)
☐15 More environmentally friendly/sustainable
☐16 Health reasons
☐17 Complexity of journey (e.g. number of connections)
☐18 Work vehicle/ Drive for job
☐19 Other, please specify ____________________
☐20 Don't know/prefer not to say

Q6a. **Do you check travel conditions before starting your journeys?**

☐1 Always
☐2 Most of the time
☐3 Sometimes
☐4 Rarely
☐5 Never

Q6b. **Does information about traffic congestion or other transport delays influence your choice of transport mode?**

☐1 Always
☐2 Most of the time
☐3 Sometimes
☐4 Rarely
☐5 Never

Q6c. **Do you check the weather forecast before starting your journeys?**

☐1 Always
☐2 Most of the time
☐3 Sometimes
☐4 Rarely
☐5 Never

Q6d. Do weather conditions influence your choice of transport mode?

☐1 Always
☐2 Most of the time
☐3 Sometimes
☐4 Rarely
☐5 Never

Q7. [If Q4a=2 or Q4a=3 or Q4a=4] **Of the journeys you make by car/van, could you make these journeys using any of the following modes of transport instead? (Please select all that apply)** [Multiple response]

☐1 Taxi
☐2 Train
☐3 Park & Ride bus services
☐4 Other bus, minibus or coach services
☐5 Motorcycle/Moped/Scooter
☐6 Bicycle
☐7 Walking/Running
☐8 Other, please specify ____________________
☐9 None of the above [Single response]
☐10 Don't know/prefer not to say [Do NOT read out]

Q8. [If Q4a=2 or Q4a=3 or Q4a=4] **And why [don't/can't] you travel by [this/these] alternative modes of transport?**
[Do NOT read out]
[Probe if necessary and code below]
[If respondent states 'convenience', probe for why it isn't convenient and code accordingly]
[Multiple response]

☐1 Speed of journey
☐2 Reliability of journey
☐3 Frequency of service
☐4 Distance to destination
☐5 Distance to station/stop
☐6 Availability of cycle facilities
☐7 Availability of car parking
☐8 Price of transport
☐9 Price of parking
☐10 Availability of 'Real Time Information'
☐11 Availability of other forms of information
☐12 Personal safety
☐13 Physical comfort
☐14 Ability to do other things while travelling (e.g. work/read/etc)
☐15 More environmentally friendly/sustainable
☐16 Health reasons
☐17 Complexity of journey (e.g. number of connections)
☐18 Work vehicle/ Drive for job
☐19 Other, please specify ____________________
☐20 Don't know/prefer not to say

Q9. [If Q4a=2 or Q4a=3 or Q4a=4] **If driving became more difficult for you, for whatever reason (for example due to congestion, the cost of maintaining your vehicle, health reasons, etc) which of the following modes of transport would you use instead? (Please select all that apply)** [Multiple response]

☐1 Taxi
☐2 Train
☐3 Park & Ride bus services
☐4 Other bus, minibus or coach services
☐5 Motorcycle/Moped/Scooter
☐6 Bicycle
☐7 Walking/Running
☐8 Other, please specify ____________________
☐9 I wouldn't travel [Do NOT read out] [Single response]
☐10 I have to drive as part of my job [Do NOT read out] [Single response]
☐11 I would still drive, no matter what [Do NOT read out] [Single response]
☐12 Don't know/prefer not to say [Do NOT read out] [Single response]

Q10. [If Q4a=2 or Q4a=3 or Q4a=4] **Would you like to make more journeys in and around Cambridge without your own car/van?**

☐1 Yes
☐2 No
☐3 Don't know/prefer not to say [Do NOT read out]

Q11. [If Q4a=2 or Q4a=3 or Q4a=4] **To what extent would each of the following potential initiatives encourage or enable you to reduce your use of your car/van, and use other modes of travel instead? Please note, there are 32 potential initiatives to quickly run through. (Please select all that apply)** [Randomise order] [Single response per row]

	Very likely	Somewhat likely	Not likely at all	Don't know/prefer not to say [Do NOT read out]
a) Faster services on public transport	☐1	☐2	☐3	☐4
b) More reliable services on public transport	☐1	☐2	☐3	☐4
c) More frequent services on public transport	☐1	☐2	☐3	☐4
d) Longer operating hours on public transport	☐1	☐2	☐3	☐4
e) New public transport routes introduced	☐1	☐2	☐3	☐4
f) On demand driverless vehicles (e.g. autonomous taxis/buses)	☐1	☐2	☐3	☐4
g) Improved accuracy of 'Real Time Information' displays and 'Real Time Information' displays at all stations/stops	☐1	☐2	☐3	☐4
h) Direct public transport alerts and/or direct weather alerts to your mobile phone	☐1	☐2	☐3	☐4
i) Increased security (e.g. lighting/CCTV) at stations/stops	☐1	☐2	☐3	☐4

j) Improved physical comfort of waiting facilities at stations/stops (e.g. provision of shelters/seating)	☐1	☐2	☐3	☐4
k) Increased physical comfort on public transport (e.g. comfort of seating/temperature)	☐1	☐2	☐3	☐4
l) Better offers on public transport tickets (e.g. discounts for specific types of people and/or times of travel)	☐1	☐2	☐3	☐4
m) More ticketing options for public transport (e.g. smart cards/ integrated ticketing/ online payments)	☐1	☐2	☐3	☐4
n) Cheaper fares for public transport	☐1	☐2	☐3	☐4
o) Season ticket loans for public transport	☐1	☐2	☐3	☐4
p) Free parking at Park & Ride sites	☐1	☐2	☐3	☐4
q) More Park & Ride options	☐1	☐2	☐3	☐4
r) A Cycle scheme (like a season ticket loan but to buy a bicycle)	☐1	☐2	☐3	☐4
s) More/Improved cycle paths and cycle crossing facilities	☐1	☐2	☐3	☐4
t) More/improved cycle parking at stations/stops	☐1	☐2	☐3	☐4
u) More/Improved public cycle parking (e.g. more locations/ better security)	☐1	☐2	☐3	☐4
v) Improved quality of footpaths	☐1	☐2	☐3	☐4
w) More/Improved pedestrian crossing facilities	☐1	☐2	☐3	☐4
x) Improved public realm (e.g. more trees/planters, better footways/ cycleway surfacing)	☐1	☐2	☐3	☐4
y) Provision of cycling/walking route maps and wayfinding information	☐1	☐2	☐3	☐4
z) More/Improved facilities at your workplace for cyclists/pedestrians (e.g. showers/ storage/ changing facilities)	☐1	☐2	☐3	☐4
aa) Provision of travel planning advice (from experts visiting your child's school/your workplace)	☐1	☐2	☐3	☐4
bb) Introduction of a Workplace Parking Levy (e.g. being charged to use parking spaces at your place of work)	☐1	☐2	☐3	☐4
cc) Fewer free on-street parking spaces	☐1	☐2	☐3	☐4
dd) Pollution charging (a charge for using more polluting vehicles)	☐1	☐2	☐3	☐4
ee) A form of road charging (depending on level of congestion)	☐1	☐2	☐3	☐4
ff) Flexible working hours	☐1	☐2	☐3	☐4

Q12. [If Q4a=2 or Q4a=3 or Q4a=4] **Is there anything else that could encourage or enable you to reduce your use of your own car/van, and use other modes of travel instead?** ____________________

Demographics

I'd like to take a few final details before we finish…

D1. **What is your full home postcode?**

Home postcode ____________________
□1 Don't know/prefer not to say [Do NOT read out]

D2. **Do you have any disabilities that affect the way you travel? (Please select all that apply)** [Multiple response]

□1 No [Single response]
□2 Yes - Visual impairment
□3 Yes - Mobility impairment
□4 Yes - Hearing impairment
□5 Yes - Mental health illness
□6 Yes - Learning difficulty
□7 Yes - Other, please specify ____________________
□8 Don't know/prefer not to say [Do NOT read out]

D3. **Would you be willing to participate in further research? If yes, we will need to take your contact details and will pass these on to the Greater Cambridge Partnership along with a subset of the data collected here today.**

□1 Yes
□2 No

D4. **Would you like to be entered into a prize draw for one of three chances to win £100 worth of high street shopping vouchers?**

□1 Yes
□2 No

D5. **Thank you very much for taking the time to talk to me today. Is there anything else that you would like to add before we finish?** ____________________

D6. **Finally, please may I take your contact details? We ask all participants for their contact details for our own back-checking purposes. However, we'll also need them if you indicated that you would like to be entered into the prize draw; that you would be willing to participate in further research; or, if you indicated that you do NOT want to participate in further research (so that we can ensure you don't get sent a similar survey, linked to this work, by the Greater Cambridge Partnership). Your contact details will be treated in confidence and used only for the purposes for which you have agreed.**

□1 Yes
□2 No

D6a. [If D6=1] **Record Respondent Details** ____________________
D6b. [If D6=1] **Respondent Name** ____________________
D6c. [If D6=1] **House Number/ Name** ____________________
D6d. [If D6=1] **Street Name** ____________________
D6e. [If D6=1] **Town** ____________________
D6f. [If D6=1] **County** ____________________
D6g. [If D6=1] **Best Contact Number** ____________________
D6h. [If D6=1] **Email** ____________________

If you find you have any queries after we've finished you can contact the Greater Cambridge Partnership by telephone on 01223 699906. [Other contact methods are also available – see https://www.greatercambridge.org.uk/contact-us/.]

Thank you very much for taking the time to talk to me today. I have no further questions.

Appendix B

Cambridgeshire Travel Survey - CATI Toplines [WEIGHTED]

Weighted on age, gender and area

ONS Population Estimates for mid-2016

(Q1) How often do you travel in around Cambridge?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q1) How often do you travel in around Cambridge?	5 or more times a week	583	57.1	57.1	57.1
	2-4 times a week	197	19.3	19.3	76.3
	Once a week	107	10.4	10.4	86.8
	Less than once a week, but at least once a month	76	7.4	7.4	94.2
	Less than once a month	38	3.7	3.7	97.9
	Never	20	1.9	1.9	99.8
	Don't Know/ prefer not to say	2	.2	.2	100.0
	Total	**1021**	100.0	100.0	

(Q2) For which of the following reasons do you make these journeys? (MR)

		Count	Column N %
(Q2) For which of the following reasons do you make these journeys? (MR)	Commuting to/from work	477	47.7%
	Commuting to/from education	65	6.4%
	School drop off/pick up	65	6.4%
	Employer's business	25	2.5%
	Personal business	470	46.9%
	Leisure activities	697	69.6%
	Other	11	1.0%
	Don't Know/ prefer not to say	3	.3%
	Base	**1001**	100.0%

(Q3) At which times of day do you travel around Cambridge? (MR)

		Count	Column N %
(Q3) At which times of day do you travel around Cambridge? (MR)	Weekdays from 4am and before 7am	79	7.9%
	Weekdays from 7am and before 10 am	581	58.1%
	Weekdays from 10am and before 4pm	537	53.7%
	Weekdays from 4pm and before 7pm	568	56.7%
	Weekdays from 7pm and before 4am	257	25.6%
	Saturdays	672	67.1%
	Sundays	625	62.4%
	Don't Know/ prefer not to say	6	.6%
	Base	**1001**	100.0%

(Q4a) Which modes of transport do you use to make these journeys? (MR)

		Count	Column N %
(Q4a) Which modes of transport do you use to make these journeys? (MR)	Car/Van (as a driver, travelling alone)	516	51.5%
	Car/Van (as a driver, with passenger/s)	382	38.1%
	Car/Van (as a passenger)	52	5.2%
	Taxi	60	6.0%
	Train	44	4.4%
	Park & Ride bus services	109	10.9%
	Other bus, minibus or coach services	273	27.3%
	Motorcycle/Moped/Scooter	23	2.3%
	Bicycle	357	35.7%
	Walking/Running	210	21.0%
	Other	1	.1%
	Don't Know/ prefer not to say	1	.1%
	Base	**1001**	100.0%

(Q4b) Which ONE of these modes do you use most often to travel around Cambridge?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q4b) Which ONE of these modes do you use most often to travel around Cambridge?	Car/Van (as a driver, travelling alone)	372	36.5	37.2	37.2
	Car/Van (as a driver, with passenger/s)	165	16.2	16.5	53.7
	Car/Van (as a passenger)	20	2.0	2.0	55.7
	Taxi	7	.7	.7	56.4
	Train	9	.9	.9	57.3
	Park & Ride bus services	38	3.7	3.8	61.1
	Other bus, minibus or coach services	115	11.3	11.5	72.6
	Motorcycle/Moped/Scooter	9	.9	.9	73.5
	Bicycle	193	18.9	19.3	92.8
	Walking/Running	58	5.7	5.8	98.7
	Other	1	.1	.1	98.7
	Don't Know/ prefer not to say	13	1.2	1.3	100.0
	Base	**1001**	98.1	100.0	
	System Missing Values	20	1.9		
	Total	1021	100.0		

(Q4c) How do you usually travel to work?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q4c) How do you usually travel to work?	Work mainly at or from home	13	1.3	2.7	2.7
	Car/Van (as a driver, travelling alone)	232	22.7	48.6	51.3
	Car/Van (as a driver, with passenger/s)	25	2.5	5.3	56.7
	Car/Van (as a passenger)	8	.8	1.7	58.3
	Taxi	5	.5	1.1	59.4
	Train	5	.4	1.0	60.4
	Park & Ride bus services	4	.4	.7	61.1
	Other bus, minibus or coach services	34	3.4	7.2	68.3
	Motorcycle/Moped/Scooter	4	.4	.9	69.2
	Bicycle	124	12.2	26.1	95.3
	Walking/Running	19	1.8	3.9	99.2
	Don't Know/ prefer not to say	4	.4	.8	100.0
	Base	**477**	46.7	100.0	
	System Missing Values	544	53.3		
	Total	1021	100.0		

(Q5) Why do you travel around Cambridge most often by..... (MR)

		Count	Column N %
(Q5) Why do you travel around Cambridge most often by..... (MR)	Speed of journey	382	38.2%
	Reliability of journey	406	40.6%
	Frequency of service	111	11.1%
	Distance to destination	221	22.0%
	Distance to station/ stop	61	6.1%
	Availability of cycle facilities	31	3.1%
	Availability of car parking	54	5.4%
	Price of transport	161	16.0%
	Price of parking	61	6.1%
	Availability of 'Real Time Information'	3	.3%
	Availability of other forms of information	0	0.0%
	Personal safety	49	4.9%
	Physical comfort	162	16.2%
	Ability to do other things while travelling (e.g. work/ read/ etc.)	12	1.2%
	More environmentally friendly/ sustainable	91	9.1%
	Health reasons	145	14.5%
	Complexity of journey (e.g. number of connections)	137	13.7%
	Work vehicle/ drive for job	62	6.2%
	Other	258	25.8%
	Don't Know/ prefer not to say	6	.6%
	Base	**1001**	100.0%

(Q6a) Do you check travel conditions before starting your journeys?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6a) Do you check travel conditions before starting your journeys?	Always	81	7.9	8.0	8.0
	Most of the time	110	10.7	10.9	19.0
	Sometimes	169	16.5	16.9	35.9
	Rarely	129	12.6	12.9	48.7
	Never	513	50.3	51.3	100.0
	Base	**1001**	98.1	100.0	
	System Missing Values	20	1.9		
	Total	1021	100.0		

(Q6b) Does information about congestion or delays influence your choice of transport mode?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6b) Does information about congestion or delays influence your choice of transport mode?	Always	60	5.9	6.0	6.0
	Most of the time	68	6.6	6.7	12.7
	Sometimes	147	14.4	14.7	27.4
	Rarely	123	12.0	12.3	39.7
	Never	604	59.2	60.3	100.0
	Base	**1001**	98.1	100.0	
	System Missing Values	20	1.9		
	Total	1021	100.0		

(Q6c) Do you check the weather forecast before starting your journeys?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6c) Do you check the weather forecast before starting your journeys?	Always	169	16.6	16.9	16.9
	Most of the time	145	14.2	14.5	31.4
	Sometimes	166	16.2	16.6	47.9
	Rarely	91	8.9	9.1	57.1
	Never	430	42.1	42.9	100.0
	Base	**1001**	98.1	100.0	
	System Missing Values	20	1.9		
	Total	1021	100.0		

(Q6d) Do you weather conditions influence your choice of transport?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6d) Do you weather conditions influence your choice of transport?	Always	95	9.3	9.5	9.5
	Most of the time	88	8.6	8.8	18.2
	Sometimes	160	15.7	16.0	34.3
	Rarely	129	12.7	12.9	47.2
	Never	529	51.8	52.8	100.0
	Base	**1001**	98.1	100.0	
	System Missing Values	20	1.9		
	Total	1021	100.0		

(Q7) Could you make these journeys using any of the following modes instead? (MR)

		Count	Column N %
(Q7) Could you make these journeys using any of the following modes instead? (MR)	Taxi	73	10.8%
	Train	43	6.4%
	Park & Ride bus services	80	11.7%
	Other bus, minibus or coach services	218	31.9%
	Motorcycle/Moped/Scooter	12	1.8%
	Bicycle	171	25.0%
	Walking/Running	46	6.8%
	Other	1	.1%
	None of the above	265	39.0%
	Don't Know/ prefer not to say	4	.6%
	Base	**681**	100.0%

(Q8) Why dont you travel by these alternative modes? (MR)

		Count	Column N %
(Q8) Why dont you travel by these alternative modes? (MR)	Speed of journey	193	28.3%
	Reliability of journey	177	25.9%
	Frequency of journey	83	12.2%
	Distance to destination	125	18.4%
	Distance to station/ stop	52	7.7%
	Availability of cycle facilities	5	.7%
	Availability of car parking	11	1.6%
	Price of transport	140	20.5%
	Price of parking	20	3.0%
	Availability of 'Real Time Information'	4	.6%
	Availability of other forms of information	2	.3%
	Personal safety	29	4.3%
	Physical comfort	95	14.0%
	Ability to do other things while travelling (e.g. work/ read/ etc.)	15	2.2%
	More environmentally friendly/ sustainable	5	.7%
	Health reasons	38	5.5%
	Complexity of journey (e.g. number of connections)	102	15.0%
	Work vehicle/ drive for job	49	7.2%
	Other	204	29.9%
	Don't Know/ prefer not to say	33	4.9%
	Base	**681**	100.0%

(Q9) If driving became more difficult for you, which of the following modes would you use? (MR)

		Count	Column N %
(Q9) If driving became more difficult for you, which of the following modes would you use? (MR)	Taxi	89	13.0%
	Train	65	9.6%
	Park & Ride bus services	46	6.7%
	Other bus, minibus or coach services	218	31.9%
	Motorcycle/Moped/Scooter	18	2.7%
	Bicycle	134	19.7%
	Walking/Running	41	6.0%
	Other	48	7.1%
	I wouldn't travel	85	12.5%
	I have to drive as part of my job	31	4.5%
	I would still drive, no matter what	26	3.9%
	Don't Know/ prefer not to say	40	5.9%
	Base	**681**	100.0%

(Q10) Would you like to make more journeys in and around Cambridge without your own car/van?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q10) Would you like to make more journeys in and around Cambridge without your own car/van?	Yes	370	36.2	54.3	54.3
	No	289	28.4	42.5	96.8
	Don't Know/ prefer not to say	22	2.1	3.2	100.0
	Base	**681**	66.7	100.0	
	System Missing Values	340	33.3		
	Total	1021	100.0		

(Q11) To what extent would each of the following initiatives encourage you to use other modes of transport?

		Count	Column N %
(Q11a) Faster services on public transport	Very likely	315	46.3%
	Somewhat likely	104	15.2%
	Not likely at all	231	34.0%
	Don't Know/prefer not to say	31	4.5%
	Base	**681**	100.0%
(Q11b) More reliable services on public transport	Very likely	346	50.8%
	Somewhat likely	102	14.9%
	Not likely at all	203	29.8%
	Don't Know/prefer not to say	30	4.4%
	Base	**681**	100.0%
(Q11c) More frequent services on public transport	Very likely	339	49.8%
	Somewhat likely	111	16.3%
	Not likely at all	206	30.2%
	Don't Know/prefer not to say	25	3.7%
	Base	**681**	100.0%
(Q11d) Longer operating hours on public transport	Very likely	281	41.3%
	Somewhat likely	96	14.1%
	Not likely at all	276	40.6%
	Don't Know/prefer not to say	27	4.0%
	Base	**681**	100.0%
(Q11e) New public transport routes introduced	Very likely	354	52.0%
	Somewhat likely	117	17.2%
	Not likely at all	189	27.7%
	Don't Know/prefer not to say	21	3.1%
	Base	**681**	100.0%
(Q11f) On demand driverless vehicles	Very likely	134	19.6%
	Somewhat likely	99	14.6%
	Not likely at all	383	56.2%
	Don't Know/prefer not to say	65	9.6%
	Base	**681**	100.0%
(Q11g) Improved accuracy of Real Time Information	Very likely	205	30.1%
	Somewhat likely	94	13.7%
	Not likely at all	318	46.7%
	Don't Know/prefer not to say	64	9.4%
	Base	**681**	100.0%
(Q11h) Direct public transport / weather alerts to your phone	Very likely	115	16.9%
	Somewhat likely	67	9.9%
	Not likely at all	452	66.3%
	Don't Know/prefer not to say	47	6.9%
	Base	**681**	100.0%
(Q11i) Increased security at stations / stops	Very likely	171	25.1%
	Somewhat likely	77	11.3%
	Not likely at all	376	55.3%
	Don't Know/prefer not to say	57	8.3%
	Base	**681**	100.0%
(Q11j) Improved physical comfort of waiting facilities	Very likely	164	24.1%
	Somewhat likely	81	11.9%
	Not likely at all	387	56.8%
	Don't Know/prefer not to say	49	7.2%
	Base	**681**	100.0%
(Q11k) Increased comfort on public transport	Very likely	136	19.9%
	Somewhat likely	95	14.0%
	Not likely at all	410	60.2%
	Don't Know/prefer not to say	40	5.9%
	Base	**681**	100.0%
(Q11l) Better offers on public transport tickets	Very likely	305	44.8%
	Somewhat likely	86	12.6%
	Not likely at all	259	38.1%
	Don't Know/prefer not to say	31	4.5%
	Base	**681**	100.0%
(Q11m) More ticketing options	Very likely	227	33.3%
	Somewhat likely	93	13.6%
	Not likely at all	332	48.8%
	Don't Know/prefer not to say	29	4.3%
	Base	**681**	100.0%

(Q11n) Cheaper public transport fares	Very likely	351	51.6%
	Somewhat likely	89	13.0%
	Not likely at all	213	31.3%
	Don't Know/prefer not to say	28	4.1%
	Base	**681**	100.0%
(Q11o) Season ticket loans	Very likely	131	19.2%
	Somewhat likely	50	7.3%
	Not likely at all	409	60.0%
	Don't Know/prefer not to say	92	13.5%
	Base	**681**	100.0%
(Q11p) Free parking at Park & Ride sites	Very likely	354	52.0%
	Somewhat likely	73	10.8%
	Not likely at all	217	31.8%
	Don't Know/prefer not to say	37	5.4%
	Base	**681**	100.0%
(Q11q) More Park & Ride options	Very likely	239	35.0%
	Somewhat likely	94	13.8%
	Not likely at all	305	44.8%
	Don't Know/prefer not to say	43	6.3%
	Base	**681**	100.0%
(Q11r) A cycle scheme	Very likely	124	18.2%
	Somewhat likely	60	8.8%
	Not likely at all	437	64.2%
	Don't Know/prefer not to say	59	8.7%
	Base	**681**	100.0%
(Q11s) Improved cycle paths / facilities	Very likely	257	37.8%
	Somewhat likely	79	11.6%
	Not likely at all	306	44.9%
	Don't Know/prefer not to say	39	5.8%
	Base	**681**	100.0%
(Q11t) Improved cycle parking at stations / stops	Very likely	205	30.1%
	Somewhat likely	63	9.3%
	Not likely at all	364	53.4%
	Don't Know/prefer not to say	49	7.2%
	Base	**681**	100.0%
(Q11u) More / improved public cycle parking	Very likely	231	34.0%
	Somewhat likely	68	10.0%
	Not likely at all	323	47.4%
	Don't Know/prefer not to say	59	8.6%
	Base	**681**	100.0%
(Q11v) Improved quality of footpaths	Very likely	191	28.0%
	Somewhat likely	70	10.3%
	Not likely at all	377	55.4%
	Don't Know/prefer not to say	43	6.3%
	Base	**681**	100.0%
(Q11w) More / improved pedestrian crossing facilities	Very likely	132	19.4%
	Somewhat likely	64	9.4%
	Not likely at all	430	63.1%
	Don't Know/prefer not to say	55	8.1%
	Base	**681**	100.0%
(Q11x) Improved public realm	Very likely	192	28.2%
	Somewhat likely	65	9.5%
	Not likely at all	342	50.2%
	Don't Know/prefer not to say	82	12.0%
	Base	**681**	100.0%
(Q11y) Provision of cycling / walking route maps	Very likely	146	21.4%
	Somewhat likely	62	9.2%
	Not likely at all	408	59.9%
	Don't Know/prefer not to say	65	9.5%
	Base	**681**	100.0%
(Q11z) Improved facilities at your workplace	Very likely	129	18.9%
	Somewhat likely	45	6.7%
	Not likely at all	432	63.4%
	Don't Know/prefer not to say	75	11.1%
	Base	**681**	100.0%

(Q11aa) Provison of travel planning advice	Very likely	50	7.3%
	Somewhat likely	37	5.4%
	Not likely at all	485	71.3%
	Don't Know/prefer not to say	109	16.0%
	Base	**681**	100.0%
(Q11bb) Introduction of a Workplace Parking Levy	Very likely	85	12.4%
	Somewhat likely	31	4.6%
	Not likely at all	488	71.7%
	Don't Know/prefer not to say	77	11.3%
	Base	**681**	100.0%
(Q11cc) Fewer on-street parking spaces	Very likely	104	15.3%
	Somewhat likely	55	8.1%
	Not likely at all	454	66.6%
	Don't Know/prefer not to say	68	10.0%
	Base	**681**	100.0%
(Q11dd) Pollution charge	Very likely	171	25.2%
	Somewhat likely	109	16.0%
	Not likely at all	356	52.2%
	Don't Know/prefer not to say	45	6.6%
	Base	**681**	100.0%
(Q11ee) A form of road charging	Very likely	180	26.5%
	Somewhat likely	93	13.7%
	Not likely at all	351	51.6%
	Don't Know/prefer not to say	56	8.2%
	Base	**681**	100.0%
(Q11ff) Flexible working hours	Very likely	131	19.2%
	Somewhat likely	49	7.2%
	Not likely at all	399	58.6%
	Don't Know/prefer not to say	103	15.1%
	Base	**681**	100.0%

Appendix C

Cambridgeshire Travel Survey - CATI Toplines [Unweighted]

(Q1) How often do you travel in and around Cambridge?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q1) How often do you travel in around Cambridge?	5 or more times a week	542	53.1	53.1	53.1
	2-4 times a week	212	20.8	20.8	73.8
	Once a week	114	11.2	11.2	85.0
	Less than once a week, but at least once a month	81	7.9	7.9	92.9
	Less than once a month	45	4.4	4.4	97.4
	Never	25	2.4	2.4	99.8
	Don't Know/ prefer not to say	2	.2	.2	100.0
	Total	**1021**	100.0	100.0	

(Q2) For which of the following reasons do you make these journeys? (MR)

		Count	Column N %
(Q2) For which of the following reasons do you make these journeys? (MR)	Commuting to/from work	438	44.0%
	Commuting to/from education	55	5.5%
	School drop off/pick up	61	6.1%
	Employer's business	17	1.7%
	Personal business	477	47.9%
	Leisure activities	703	70.6%
	Other	16	1.6%
	Don't Know/ prefer not to say	4	.4%
	Base	**996**	100.0%

(Q3) At which times of day do you travel around Cambridge? (MR)

		Count	Column N %
(Q3) At which times of day do you travel around Cambridge? (MR)	Weekdays from 4am and before 7am	67	6.7%
	Weekdays from 7am and before 10 am	549	55.1%
	Weekdays from 10am and before 4pm	564	56.6%
	Weekdays from 4pm and before 7pm	527	52.9%
	Weekdays from 7pm and before 4am	243	24.4%
	Saturdays	663	66.6%
	Sundays	611	61.3%
	Don't Know/ prefer not to say	7	.7%
	Base	**996**	100.0%

(Q4a) Which modes of transport do you use to make these journeys? (MR)

		Count	Column N %
(Q4a) Which modes of transport do you use to make these journeys? (MR)	Car/Van (as a driver, travelling alone)	513	51.5%
	Car/Van (as a driver, with passenger/s)	379	38.1%
	Car/Van (as a passenger)	57	5.7%
	Taxi	63	6.3%
	Train	46	4.6%
	Park & Ride bus services	123	12.3%
	Other bus, minibus or coach services	289	29.0%
	Motorcycle/Moped/Scooter	19	1.9%
	Bicycle	317	31.8%
	Walking/Running	194	19.5%
	Other	1	.1%
	Don't Know/ prefer not to say	1	.1%
	Base	**996**	100.0%

(Q4b) Which ONE of these modes do you use most often to travel around Cambridge?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q4b) Which ONE of these modes do you use most often to travel around Cambridge?	Car/Van (as a driver, travelling alone)	372	36.4	37.3	37.3
	Car/Van (as a driver, with passenger/s)	164	16.1	16.5	53.8
	Car/Van (as a passenger)	26	2.5	2.6	56.4
	Taxi	7	.7	.7	57.1
	Train	9	.9	.9	58.0
	Park & Ride bus services	44	4.3	4.4	62.4
	Other bus, minibus or coach services	125	12.2	12.6	75.0
	Motorcycle/Moped/Scooter	10	1.0	1.0	76.0
	Bicycle	170	16.7	17.1	93.1
	Walking/Running	57	5.6	5.7	98.8
	Other	1	.1	.1	98.9
	Don't Know/ prefer not to say	11	1.1	1.1	100.0
	Base	**996**	97.6	100.0	
	System Missing Values	25	2.4		
	Total	1021	100.0		

(Q4c) How do you usually travel to work?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q4c) How do you usually travel to work?	Work mainly at or from home	11	1.1	2.5	2.5
	Car/Van (as a driver, travelling alone)	221	21.6	50.5	53.0
	Car/Van (as a driver, with passenger/s)	23	2.3	5.3	58.2
	Car/Van (as a passenger)	6	.6	1.4	59.6
	Taxi	4	.4	.9	60.5
	Train	5	.5	1.1	61.6
	Park & Ride bus services	4	.4	.9	62.6
	Other bus, minibus or coach services	33	3.2	7.5	70.1
	Motorcycle/Moped/Scooter	4	.4	.9	71.0
	Bicycle	102	10.0	23.3	94.3
	Walking/Running	21	2.1	4.8	99.1
	Don't Know/ prefer not to say	4	.4	.9	100.0
	Base	**438**	42.9	100.0	
	System Missing Values	583	57.1		
	Total	1021	100.0		

(Q5) Why do you travel around Cambridge most often by..... (MR)

		Count	Column N %
(Q5) Why do you travel around Cambridge most often by..... (MR)	Speed of journey	378	38.0%
	Reliability of journey	405	40.7%
	Frequency of service	119	11.9%
	Distance to destination	218	21.9%
	Distance to station/ stop	67	6.7%
	Availability of cycle facilities	30	3.0%
	Availability of car parking	58	5.8%
	Price of transport	151	15.2%
	Price of parking	69	6.9%
	Availability of 'Real Time Information'	3	.3%
	Availability of other forms of information	0	0.0%
	Personal safety	50	5.0%
	Physical comfort	160	16.1%
	Ability to do other things while travelling (e.g. work/ read/ etc.)	11	1.1%
	More environmentally friendly/ sustainable	86	8.6%
	Health reasons	159	16.0%
	Complexity of journey (e.g. number of connections)	135	13.6%
	Work vehicle/ drive for job	49	4.9%
	Other	269	27.0%
	Don't Know/ prefer not to say	6	.6%
	Base	**996**	100.0%

(Q6a) Do you check travel conditions before starting your journeys?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6a) Do you check travel conditions before starting your journeys?	Always	83	8.1	8.3	8.3
	Most of the time	105	10.3	10.5	18.9
	Sometimes	165	16.2	16.6	35.4
	Rarely	139	13.6	14.0	49.4
	Never	504	49.4	50.6	100.0
	Base	**996**	97.6	100.0	
	System Missing Values	25	2.4		
	Total	1021	100.0		

(Q6b) Does information about congestion or delays influence your choice of transport mode?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6b) Does information about congestion or delays influence your choice of transport mode?	Always	56	5.5	5.6	5.6
	Most of the time	65	6.4	6.5	12.1
	Sometimes	148	14.5	14.9	27.0
	Rarely	124	12.1	12.4	39.5
	Never	603	59.1	60.5	100.0
	Base	**996**	97.6	100.0	
	System Missing Values	25	2.4		
	Total	1021	100.0		

(Q6c) Do you check the weather forecast before starting your journeys?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6c) Do you check the weather forecast before starting your journeys?	Always	165	16.2	16.6	16.6
	Most of the time	139	13.6	14.0	30.5
	Sometimes	164	16.1	16.5	47.0
	Rarely	98	9.6	9.8	56.8
	Never	430	42.1	43.2	100.0
	Base	**996**	97.6	100.0	
	System Missing Values	25	2.4		
	Total	1021	100.0		

(Q6d) Do you weather conditions influence your choice of transport?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q6d) Do you weather conditions influence your choice of transport?	Always	85	8.3	8.5	8.5
	Most of the time	78	7.6	7.8	16.4
	Sometimes	161	15.8	16.2	32.5
	Rarely	137	13.4	13.8	46.3
	Never	535	52.4	53.7	100.0
	Base	**996**	97.6	100.0	
	System Missing Values	25	2.4		
	Total	1021	100.0		

(Q7) Could you make these journeys using any of the following modes instead? (MR)

		Count	Column N %
(Q7) Could you make these journeys using any of the following modes instead? (MR)	Taxi	72	10.6%
	Train	43	6.3%
	Park & Ride bus services	82	12.0%
	Other bus, minibus or coach services	224	32.8%
	Motorcycle/Moped/Scooter	8	1.2%
	Bicycle	152	22.3%
	Walking/Running	40	5.9%
	Other	1	.1%
	None of the above	272	39.9%
	Don't Know/ prefer not to say	4	.6%
	Base	**682**	100.0%

(Q8) Why dont you travel by these alternative modes? (MR)

		Count	Column N %
(Q8) Why dont you travel by these alternative modes? (MR)	Speed of journey	198	29.0%
	Reliability of journey	178	26.1%
	Frequency of journey	85	12.5%
	Distance to destination	126	18.5%
	Distance to station/ stop	54	7.9%
	Availability of cycle facilities	6	.9%
	Availability of car parking	10	1.5%
	Price of transport	133	19.5%
	Price of parking	22	3.2%
	Availability of 'Real Time Information'	4	.6%
	Availability of other forms of information	2	.3%
	Personal safety	28	4.1%
	Physical comfort	92	13.5%
	Ability to do other things while travelling (e.g. work/ read/ etc.)	12	1.8%
	More environmentally friendly/ sustainable	6	.9%
	Health reasons	50	7.3%
	Complexity of journey (e.g. number of connections)	106	15.5%
	Work vehicle/ drive for job	39	5.7%
	Other	197	28.9%
	Don't Know/ prefer not to say	35	5.1%
	Base	**682**	100.0%

(Q9) If driving became more difficult for you, which of the following modes would you use? (MR)

		Count	Column N %
(Q9) If driving became more difficult for you, which of the following modes would you use? (MR)	Taxi	96	14.1%
	Train	62	9.1%
	Park & Ride bus services	53	7.8%
	Other bus, minibus or coach services	233	34.2%
	Motorcycle/Moped/Scooter	12	1.8%
	Bicycle	121	17.7%
	Walking/Running	43	6.3%
	Other	56	8.2%
	I wouldn't travel	88	12.9%
	I have to drive as part of my job	25	3.7%
	I would still drive, no matter what	27	4.0%
	Don't Know/ prefer not to say	40	5.9%
	Base	**682**	100.0%

(Q10) Would you like to make more journeys in and around Cambridge without your own car/van?

		Frequency	Percent	Valid Percent	Cumulative Percent
(Q10) Would you like to make more journeys in and around Cambridge without your own car/van?	Yes	367	35.9	53.8	53.8
	No	293	28.7	43.0	96.8
	Don't Know/ prefer not to say	22	2.2	3.2	100.0
	Base	**682**	66.8	100.0	
	System Missing Values	339	33.2		
	Total	1021	100.0		

(Q11) To what extent would each of the following initiatives encourage you to use other modes of transport?

		Count	Column N %
(Q11a) Faster services on public transport	Very likely	310	45.5%
	Somewhat likely	105	15.4%
	Not likely at all	233	34.2%
	Don't Know/prefer not to say	34	5.0%
	Base	**682**	100.0%
(Q11b) More reliable services on public transport	Very likely	344	50.4%
	Somewhat likely	103	15.1%
	Not likely at all	206	30.2%
	Don't Know/prefer not to say	29	4.3%
	Base	**682**	100.0%
(Q11c) More frequent services on public transport	Very likely	348	51.0%
	Somewhat likely	110	16.1%
	Not likely at all	198	29.0%
	Don't Know/prefer not to say	26	3.8%
	Base	**682**	100.0%
(Q11d) Longer operating hours on public transport	Very likely	269	39.4%
	Somewhat likely	100	14.7%
	Not likely at all	284	41.6%
	Don't Know/prefer not to say	29	4.3%
	Base	**682**	100.0%
(Q11e) New public transport routes introduced	Very likely	347	50.9%
	Somewhat likely	121	17.7%
	Not likely at all	191	28.0%
	Don't Know/prefer not to say	23	3.4%
	Base	**682**	100.0%
(Q11f) On demand driverless vehicles	Very likely	120	17.6%
	Somewhat likely	101	14.8%
	Not likely at all	390	57.2%
	Don't Know/prefer not to say	71	10.4%
	Base	**682**	100.0%
(Q11g) Improved accuracy of Real Time Information	Very likely	199	29.2%
	Somewhat likely	93	13.6%
	Not likely at all	324	47.5%
	Don't Know/prefer not to say	66	9.7%
	Base	**682**	100.0%
(Q11h) Direct public transport / weather alerts to your phone	Very likely	110	16.1%
	Somewhat likely	67	9.8%
	Not likely at all	452	66.3%
	Don't Know/prefer not to say	53	7.8%
	Base	**682**	100.0%
(Q11i) Increased security at stations / stops	Very likely	169	24.8%
	Somewhat likely	80	11.7%
	Not likely at all	374	54.8%
	Don't Know/prefer not to say	59	8.7%
	Base	**682**	100.0%
(Q11j) Improved physical comfort of waiting facilities	Very likely	170	24.9%
	Somewhat likely	88	12.9%
	Not likely at all	376	55.1%
	Don't Know/prefer not to say	48	7.0%
	Base	**682**	100.0%
(Q11k) Increased comfort on public transport	Very likely	123	18.0%
	Somewhat likely	99	14.5%
	Not likely at all	418	61.3%
	Don't Know/prefer not to say	42	6.2%
	Base	**682**	100.0%
(Q11l) Better offers on public transport tickets	Very likely	297	43.5%
	Somewhat likely	86	12.6%
	Not likely at all	267	39.1%
	Don't Know/prefer not to say	32	4.7%
	Base	**682**	100.0%
(Q11m) More ticketing options	Very likely	219	32.1%
	Somewhat likely	88	12.9%
	Not likely at all	343	50.3%
	Don't Know/prefer not to say	32	4.7%
	Base	**682**	100.0%

(Q11n) Cheaper public transport fares	Very likely	350	51.3%
	Somewhat likely	83	12.2%
	Not likely at all	218	32.0%
	Don't Know/prefer not to say	31	4.5%
	Base	**682**	100.0%
(Q11o) Season ticket loans	Very likely	126	18.5%
	Somewhat likely	50	7.3%
	Not likely at all	410	60.1%
	Don't Know/prefer not to say	96	14.1%
	Base	**682**	100.0%
(Q11p) Free parking at Park & Ride sites	Very likely	365	53.5%
	Somewhat likely	72	10.6%
	Not likely at all	209	30.6%
	Don't Know/prefer not to say	36	5.3%
	Base	**682**	100.0%
(Q11q) More Park & Ride options	Very likely	245	35.9%
	Somewhat likely	97	14.2%
	Not likely at all	297	43.5%
	Don't Know/prefer not to say	43	6.3%
	Base	**682**	100.0%
(Q11r) A cycle scheme	Very likely	115	16.9%
	Somewhat likely	60	8.8%
	Not likely at all	445	65.2%
	Don't Know/prefer not to say	62	9.1%
	Base	**682**	100.0%
(Q11s) Improved cycle paths / facilities	Very likely	239	35.0%
	Somewhat likely	81	11.9%
	Not likely at all	317	46.5%
	Don't Know/prefer not to say	45	6.6%
	Base	**682**	100.0%
(Q11t) Improved cycle parking at stations / stops	Very likely	193	28.3%
	Somewhat likely	63	9.2%
	Not likely at all	372	54.5%
	Don't Know/prefer not to say	54	7.9%
	Base	**682**	100.0%
(Q11u) More / improved public cycle parking	Very likely	213	31.2%
	Somewhat likely	69	10.1%
	Not likely at all	337	49.4%
	Don't Know/prefer not to say	63	9.2%
	Base	**682**	100.0%
(Q11v) Improved quality of footpaths	Very likely	196	28.7%
	Somewhat likely	73	10.7%
	Not likely at all	367	53.8%
	Don't Know/prefer not to say	46	6.7%
	Base	**682**	100.0%
(Q11w) More / improved pedestrian crossing facilities	Very likely	135	19.8%
	Somewhat likely	63	9.2%
	Not likely at all	424	62.2%
	Don't Know/prefer not to say	60	8.8%
	Base	**682**	100.0%
(Q11x) Improved public realm	Very likely	193	28.3%
	Somewhat likely	66	9.7%
	Not likely at all	341	50.0%
	Don't Know/prefer not to say	82	12.0%
	Base	**682**	100.0%
(Q11y) Provision of cycling / walking route maps	Very likely	146	21.4%
	Somewhat likely	65	9.5%
	Not likely at all	402	58.9%
	Don't Know/prefer not to say	69	10.1%
	Base	**682**	100.0%
(Q11z) Improved facilities at your workplace	Very likely	115	16.9%
	Somewhat likely	43	6.3%
	Not likely at all	440	64.5%
	Don't Know/prefer not to say	84	12.3%
	Base	**682**	100.0%

(Q11aa) Provison of travel planning advice	Very likely	47	6.9%
	Somewhat likely	39	5.7%
	Not likely at all	480	70.4%
	Don't Know/prefer not to say	116	17.0%
	Base	**682**	100.0%
(Q11bb) Introduction of a Workplace Parking Levy	Very likely	69	10.1%
	Somewhat likely	30	4.4%
	Not likely at all	500	73.3%
	Don't Know/prefer not to say	83	12.2%
	Base	**682**	100.0%
(Q11cc) Fewer on-street parking spaces	Very likely	101	14.8%
	Somewhat likely	56	8.2%
	Not likely at all	458	67.2%
	Don't Know/prefer not to say	67	9.8%
	Base	**682**	100.0%
(Q11dd) Pollution charge	Very likely	168	24.6%
	Somewhat likely	111	16.3%
	Not likely at all	356	52.2%
	Don't Know/prefer not to say	47	6.9%
	Base	**682**	100.0%
(Q11ee) A form of road charging	Very likely	174	25.5%
	Somewhat likely	89	13.0%
	Not likely at all	361	52.9%
	Don't Know/prefer not to say	58	8.5%
	Base	**682**	100.0%
(Q11ff) Flexible working hours	Very likely	117	17.2%
	Somewhat likely	46	6.7%
	Not likely at all	411	60.3%
	Don't Know/prefer not to say	108	15.8%
	Base	**682**	100.0%

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Our Big Conversation Campaign Analysis

This paper provides an overview of Our Big Conversation, a multi-channel marketing communications campaign between September and November 20 2017.

Please be aware that the data provided below is indicative and some sources are estimated, as detailed figures were not available for all sources.

Analysis is provided for different marketing communication techniques, including events, print materials, media coverage, advertising, partners' channels, social media and website.

If you have any questions on Our Big Conversations or the data below, please don't hesitate to contact us on: contactus@greatercambridge.org.uk

Events

In total, there were 38 Our Big Conversation events for a wide range of stakeholders, including residents, employers, young people, commuters and councillors.

It is estimated that we spoke to around 3000 people directly during these events.

Type	Venue	Audience	Date	Estimated footfall	Public contact
City Council Staff Briefing	Guildhall Cambridge	Employers	25/09/2017	40	40
Community Drop-in	Cambridge Train Station	Commuters	26/09/2017	2500	200
Community Drop-in	Cambridge United	Residents	26/09/2017	3545	200
Community Drop-in	Grand arcade	Residents	27/09/2017	40,000	300
CUSU Freshers' Fair	Parker's Piece	Students	03/10/2017	15,000	300
CUSU Freshers' Fair	Parker's Piece	Students	04/10/2017	15,000	300
Community Drop-in	Meadows Community Centre	Residents	04-Oct	100	65
Business Briefing	Cambridge Doubletree	Businesses	04/10/2017	15	15
Community Drop-in	Babraham Road P&R	Commuters	05/10/2017	100	40
Community Drop-in	Addenbrooke's Concourse	Residents	05/10/2017	200	100
Community Drop-in	Meadows Community Centre	Residents	06/10/2017	25	5
Community Drop-in	Cambridge Market	Residents	07/10/2017	500	70
Sustainable travel event	Anglia Ruskin University	Students	09/10/2017	200	50
Young People's Participation Project	Meadows Community Centre	Young People	09/10/2017	2	2
Community Drop-in	Madingly Road P&R	Commuters	10/10/2017	100	40

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Type	Venue	Audience	Date	Estimated footfall	Public contact
Community Drop-in	The Hub, Cambourne	Residents	11/10/2017	20	2
Community Drop-in	Guildhall Cambridge	Residents	11/10/2017	20	7
Community Drop-in	Milton Road P&R	Commuters	12/10/2017	100	50
Business Briefing	Downing College	Businesses	12/10/2017	60	60
Community Drop-in	Sainsbury's, Coldham's Lane, Cambridge	Residents	14/10/2017	300	150
Community Drop-in	Babraham Research Campus	Employers	16/10/2017	100	50
Community Drop-in	Newmarket Road P&R	Commuters	19/10/2017	100	50
Business Briefing	Central Working, Cambridge Science Park	Businesses	20/10/2017	18	18
ChYPPs Family Lunch	Brown Field's Community Centre	Residents	24/10/2017	80	50
Community Drop-in	Trumpington Road P&R	Residents	24/10/2017	25	5
Community Drop-in	Tesco Milton	Residents	28/10/2017	200	80
Business Briefing	Hinxton Hall, Wellcome Genome Campus	Businesses	31/10/2017	10	10
Future Transport Children's Competition	Scout Hut, Impington Village College	Young People	09/11/2017	20	20
Community Drop-in	Gamlingay Ecohub	Residents	10/11/2017	200	50
CCC Staff Briefing	KV Room, Shire Hall	Businesses	15/11/2017	50	50
Workshop for South Cambridgeshire Parish and District Councillors	South Cambridgeshire Hall, Cambourne Business Park	Councillors	16/11/2017	40	40
Takeover Challenge	Guildhall Cambridge	Young People	17/11/2017	30	30
Community Drop-in	Foxton Village Hall	Residents	21/11/2017	30	20
Hack the City Wayfinding Challenge	Cambridge Station	Residents	25/11/2017	33	33
Briefing for CBC staff and employees	Hexagon, Frank Lee Centre, Addenbrooke's Hospital	Businesses	28/11/2017	30	30
Future of Transport in Cambridge	Post Doc centre, Eddington,	Residents/ Businesses	30/11/2017	250	250

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Type	Venue	Audience	Date	Estimated footfall	Public contact
	Cambridge				
Cambridgeshire and Peterborough Economic Growth Conference	Guildhall Cambridge	Businesses/developers	06/12/2017	150	50
Papworth Hospital Sustainable Travel Event	Papworth Village Hall	Businesses	07/12/2017	200	80
Total				79393	2912

Print materials

We distributed over 5000 leaflets and 800 feedback forms during the campaign period for Our Big Conversation. The collateral was used during events and also distributed by our partners.

To provide further information on the Greater Cambridge Partnership and our projects, an A4 leaflet was produced for the campaign for the following areas: city centre, east, north, south, west and cycling.

Feedback forms were also created to enable residents and businesses to provide constructive feedback at our events.

Media coverage

To promote Our Big Conversation, the Greater Cambridge Partnership's communication team worked closely with the local media, arranging press interviews and producing press releases.

In total, there were 15 articles on Our Big Conversation in the local media. All our press releases are available to view on our website: https://www.greatercambridge.org.uk/news/

Channel	Date	Author	Headline	Distribution	Readership/ Audience	URL
Cambridge Independent	30/08/2018	Ben Comber	We want a big conversation over £1billion spending plan	7,000	25,000	Link
That's Cambridge TV	25/09/2017	N/A	N/A	Unknown	Unknown	N/A
Heart FM (online)	25/09/2017	Bev Rimmer	Join In Cambridgeshire's Big Conversation!	Unknown	Unknown	Link
Cambridge News	25/09/2017	Jasmine Watkiss	Have your say on the future of Cambridge and South Cambridgeshire	18,586	54,661	Link
BBC Look East	27/09/2017	N/A	N/A	N/A	614,000	N/A
Cambridge Independent	27/09/2017	Ben Comber	Big Conversation Over Our Future	7,000	25,000	Link
Cambridge Independent	11/10/2017	Ben Comber	Big idea for city transport	7,000	25,000	Link

Channel	Date	Author	Headline	Distribution	Readership/ Audience	URL
Cambridge Independent	12/10/2017	N/A	Join the Twitter conversation	7,000	25,000	Link
Cambridge Independent	18/10/2017	Lynn Hieatt	Be part of the big transport conversation	7,000	25,000	Link
Cambridge Independent	18/10/2017	Ben Comber	District Councils Should Go Says, Lord Heseltine	7,000	25,000	Link
Cambridge Independent	18/10/2017	Peter Dawe	Why I'm boycotting future consultations	7,000	25,000	Link
Cambridge Independent	02/11/2017	Ben Comber	What improvements would you like to see on Cambridge roads?	7,000	25,000	Link
Cambridge Independent	15/11/2017	Roger Tomlinson	Like a vision from Blade Runner	7,000	25,000	Link
Cambridge Independent	22/11/2017	Community news	Histon	7,000	25,000	Link
Cambridge Independent	30/11/2017	Ben Comber	Get involved in the big conversation about the future of Greater Cambridge	7,000	25,000	Link

Advertising

To raise general awareness and to target specific stakeholders, advertising was used during Our Big Conversation. This included promoting a number of events using Facebook and adverts placed in the local media.

We also arranged a sponsorship deal with Cambridge United to help reach a wider audience. This included adverts placed in match day programmes and posts on their social media channels.

Date of advert	Length of advert	Channel	Type	Size	Page	Distribution	Reach
20/11/17	8 days	Facebook (own)	Event promotion	N/A	N/A	N/A	1288
26/10/17	4 days	Facebook (own)	Event promotion	N/A	N/A	N/A	2032
29/09/17	3 days	Facebook (own)	Event promotion	N/A	N/A	N/A	3375
28/09/17	N/A	Cambridge News	Awareness /event promotion	Half-page	18	18586	54661
28/09/17	N/A	Cambridge News	Social media	N/A	N/A	18586	54661
27/09/17	N/A	Cambridge Independent	Awareness/event promotion	Half-page	56	7000	N/A

Growing and sharing prosperity

Partners' Channels

Cambridge and South Cambridgeshire has a number of vibrant business, charitable and community networks. They helped us promote Our Big Conversation to their members, in the form of e-newsletters, blogs and articles.

Our local authority and business partners also promoted the campaign using their existing channels, including residents' magazines and e-newsletters.

It is estimated that through our partners' channels we reached over 500,000 people.

Channel	Date	Type	Headline	Page	Distribution /Readership	Reach	URL
LEP Business Briefing Email Campaign	Unknown	Email	N/A	N/A	5523	N/A	N/A
LEP Business Briefing Email Campaign	Unknown	Email	N/A	N/A	8439	N/A	N/A
LEP Business Briefing Email Campaign	Unknown	Email	N/A	N/A	7784	N/A	N/A
LEP Business Briefing Email Campaign	Unknown	Email	N/A	N/A	7670	N/A	N/A
Weekly CBC round-up	Nov-17	Enewsletter	N/A	N/A	500	N/A	N/A
Weekly CBC round-up	Dec-17	Enewsletter	N/A	N/A	500	N/A	N/A
CUH daily	Jan-18	Enewsletter	N/A	N/A	15000	N/A	N/A
South Cambridgeshire Parish Bulletin	01/11/2017	Enewsletter	Greater Cambridge Partnership Workshop Thu 16 Nov 6pm-8pm	N/A	600	N/A	Link
South Cambridgeshire Parish Bulletin	08/11/2017	Enewsletter	Greater Cambridge Partnership Workshop Thu 16 Nov 6pm-8pm at South Cambs Hall in Cambourne	N/A	600	N/A	Link
South Cambridgeshire Magazine	Autumn	Full page advert	How can we help you with your travel needs?	23	63,000	160,000	Link
Cambridge Matters	Dec-17	Article	Hundreds of views heard during GCP's Big	13	46,000	N/A	Link

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			Conversation				
Cambridge Matters	Sep-17	Article	Greater Cambridge Partnership - Join in with the Big Conversation	11	46,000	N/A	Link
South Cambridgeshire Magazine	22/11/2017	Article	It's Good to Talk: Hundreds take part in the Big Conversation	32	63,000	160,000	Link
Travel for Cambridgeshire	04/10/2017	Enewsletter	Quarterly Newsletter	N/A	1,280	N/A	N/A
TP+ commuter news	27/10/2017	Enewsletter	Greater Cambridge travel survey	N/A	Unknown	N/A	N/A
TP+ commuter news	28/09/2017	Enewsletter	Our 'Big Conversation' Is Now Launched	N/A	Unknown	N/A	Link
TP+ employee news	28/09/2017	Enewsletter	Our 'Big Conversation' Is Now Launched	N/A	Unknown	N/A	Link
FSB Business Bitesize	27/10/2017	Enewsletter	Greater Cambridge Partnership - Big Conversation	N/A	4,216	N/A	Link
A Dragon's Best Friend	15/09/2017	Blog	Some important decisions looming on the future of Cambridge	N/A	Unknown	N/A	N/A
Meldreth Matters	29/10/2017	Newsletter	Greater Cambridge Partnership	47	1700	N/A	Link
Cambridge MP Newsletter	28/09/2017	Newsletter	Greater Cambridge Partnership	N/A	Unknown	N/A	Link
Transition Cambridge	23/10/2017	Enewsletter	Big Conversation' with Greater Cambridge Partnership	N/A	Unknown	N/A	Link
Cambridge Network	28/11/2017	Article	Hack the City' challenge brings ideas for improving	N/A	10,000	N/A	Link

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			wayfinding in Cambridge				
Cambridge Network	16/11/2017	Article	Join the 'big conversation' about the future of Greater Cambridge this autumn	N/A	10,000	N/A	Link
Cambridge Network	16/11/2017	Article	Local children take over to have their say about life in Cambridge	N/A	10,000	N/A	Link
Cambridge Network	09/11/2017	Article	Sign up now for 'Hack the City' Wayfinding challenge	N/A	10,000	N/A	Link
Smarter Cambridge Transport	01/11/2017	Blog	A chance to say what you think	N/A	Unknown	N/A	Link

Social media

The Greater Cambridge Partnership uses social media to communicate to its stakeholders. It has three social media accounts on Twitter, Facebook and Linked In.

During the campaign, we used the hashtag #OurBigConversation. On Twitter alone, the hashtag was used in 124 tweets, generating 158 retweets and 101 likes.

The table below provides a summary of social media from GCP channels and does not take into account social media generated by partners or other users.

Channel	Total number of posts	Reach	Impressions	Reactions	Engagement	Views
Facebook	31	11418	20335	117		
Twitter	56		112665		2449	
Linked In	12		1087			
YouTube	2					432
Total	101		137085			

Greater Cambridge Partnership Website

The GCP (greatercambridge.org.uk) launched a new website in July 2017. The campaign used the new website to provide general information, regular news updates and promote events.

In total, there were 37 pages on the GCP website, generating a total of 2384 unique page views.

URL	Unique page views	Average time on page	Entrances

GREATER CAMBRIDGE PARTNERSHIP

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https://www.greatercambridge.org.uk/about-city-deal/the-big-conversation/	1187	03:25	883
https://www.greatercambridge.org.uk/about-city-deal/ourbigconversation-travel-survey/	46	1:38	9
https://www.greatercambridge.org.uk/news/we-launch-our-big-conversation/	155	2:06	40
https://www.greatercambridge.org.uk/big-conversation-business-briefing/	20	0.47	2
https://www.greatercambridge.org.uk/big-conversation-at-tesco-milton/	15	37	1
https://www.greatercambridge.org.uk/big-conversation-at-cambridge-market/	14	22	3
https://www.greatercambridge.org.uk/big-conversation-at-addenbrooke-s-concourse/	12	01:40	2
https://www.greatercambridge.org.uk/our-big-conversation-takeover-challenge/	11	00:50	1
https://www.greatercambridge.org.uk/big-conversation-business-briefing-frank-lee-centre/	42	02:56	17
https://www.greatercambridge.org.uk/news/lord-heseltine-joins-our-big-conversation/	39	01:10	13
https://www.greatercambridge.org.uk/news/big-conversation-at-aru-freshers-fair/	3	03:42	1
https://www.greatercambridge.org.uk/big-conversation-cambridge-train-station/	12	00:24	2
https://www.greatercambridge.org.uk/big-conversation-business-briefing-downing-college/	22	01:56	4
https://www.greatercambridge.org.uk/big-conversation-at-madingley-road-p&r/	13	00:38	4
https://www.greatercambridge.org.uk/big-conversation-at-sainsbury-s-coldham-common/	13	00:24	1
https://www.greatercambridge.org.uk/big-conversation-at-milton-road-p&r/	9	01:05	2
https://www.greatercambridge.org.uk/big-conversation-at-the-hub-cambourne/	7	00:38	1
https://www.greatercambridge.org.uk/big-conversation-pop-up-at-cusu-fresher-s-fair/	8	03:33	1
https://www.greatercambridge.org.uk/big-conversation-pop-up-at-meadows-community-centre/	3	00:32	1
https://www.greatercambridge.org.uk/big-conversation-at-babraham-road-p&r/	6	00:22	1
https://www.greatercambridge.org.uk/big-conversation-at-cusu-fresher-s-fair/	4	00:13	0
https://www.greatercambridge.org.uk/big-conversation-business-briefing-central-working/	14	03:07	2
https://www.greatercambridge.org.uk/the-big-conversation-pop-up-the-grand-arcade/	25	01:54	5
https://www.greatercambridge.org.uk/big-conversation-at-babraham-research-campus/	13	00:14	4
https://www.greatercambridge.org.uk/big-conversation-at-newmarket-road-p&r/	5	01:51	2
https://www.greatercambridge.org.uk/big-conversation-at-trumpington-p&r/	19	01:04	0

https://www.greatercambridge.org.uk/big-conversation-business-briefing-hinxton-hall/	17	04:36	2
https://www.greatercambridge.org.uk/big-conversation-at-gamlingay-eco-hub/	2	07:09	0
https://www.greatercambridge.org.uk/big-conversation-at-foxton-village-hall/	7	00:38	2
https://www.greatercambridge.org.uk/news/hundreds-of-views-heard-during-first-two-weeks-of-gcp-s-big-conversation/	51	02:28	6
https://www.greatercambridge.org.uk/news/hovercraft-a-double-decker-punt-children-s-vision-for-future-transport/	31	02:29	8
https://www.greatercambridge.org.uk/big-conversation-cambridge-utd-v-forest-green-rovers/	10	00:48	1
https://www.greatercambridge.org.uk/news/help-to-shape-the-future-of-transport-in-greater-cambridge/	268	02:03	193
https://www.greatercambridge.org.uk/hack-the-city-wayfinding-challenge/	36	01:23	14
https://www.greatercambridge.org.uk/news/sign-up-now-for-hack-the-city-wayfinding-challenge-saturday-25-november-cambridge/	28	00:31	1
https://www.greatercambridge.org.uk/news/there-s-still-time-to-take-part-in-travel-survey/	209	02:28	135
https://www.greatercambridge.org.uk/news/hack-the-city-challenge-brings-ideas-for-improving-wayfinding-in-cambridge/	8	00:31	1

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Growing and sharing prosperity
Delivering our City Deal

Report to: Greater Cambridge Partnership Joint Assembly 18 January 2018

Lead officer: Chris Tunstall – GCP Director of Transport

Rural Travel Hubs

1. Purpose

1.1. To present a feasibility report on the development of Rural Travel Hubs in South Cambridgeshire.

1.2. To seek approval to proceed to phase two of the project. Phase two will involve the preparation of full business cases for the pilot sites, a detailed analysis of planning considerations, refined costings of construction and an outline of the evaluation methods to review the success of the pilots.

1.3. This supports the Greater Cambridge Partnership's transport vision of 'creating better and greener transport networks, connecting people to homes, jobs, study and opportunity'.

2. Background

2.1. In July 2016, all South Cambridgeshire Parish Councils were written to asking them if they could identify any locations for Rural Travel Hubs (RTHs). A number of responses were received which broadly identified six villages (Foxton, Meldreth, Oakington, Shepreth, Swavesey and Whittlesford).

2.2. In March 2017, the Greater Cambridge Partnership (GCP) Executive Board approved £100k to progress a feasibility study into the potential of RTHs.

2.3. In May 2017, a project team led by GCP officers developed a Project Initiation Document and Project Brief. The main objective of the RTHs project is 'making it easier to travel in, out and around Cambridge and South Cambridgeshire by public transport, cycle or on foot, and reduce and maintain lower traffic levels to ease congestion'.

2.4. Skanska were appointed as the consultants to undertake most of the feasibility study under a framework contract already held with the County Council. The feasibility work commenced in June 2017.

2.5. The key objectives for Skanska and the Rural Travel Hubs feasibility study were:

a. To provide a community-led understanding of what a Rural Travel Hub is and their purpose
b. Identification of rural communities' travel connections to Cambridge City
c. Develop an outline specification and criteria for Rural Travel Hubs based on community views
d. Identify areas within South Cambridgeshire that may benefit from the provision of a Rural Travel Hub
e. Provide a recommendation to establish at least two sites that could be used as a pilot study for Rural Travel Hubs
f. Consider the high-level planning issues that would be relevant to any planning application.

2.6. The feasibility report appended to this report details the work undertaken to clarify the term "Rural Travel Hub", the engagement with local communities and stakeholders, transport modelling, criteria used to assess sites and high level planning considerations of pilot sites.

3. Key issues and considerations

3.1. Section 11 of the feasibility report details the site prioritisation methodology and nine criteria used to rank the sites. Taking all factors into consideration, Oakington (adjacent the Cambridge Guided Busway), and Whittlesford are identified as the top two sites. A further eight sites are listed in order of their criteria based score.

3.2. The Oakington site is owned by Cambridgeshire County Council. It is anticipated that this would enable quicker land acquisition discussions and therefore a faster delivery of the pilot. It is also in the green belt; therefore work will need to be done to demonstrate the very special circumstances which justify a Green Belt location such as more evidence to demonstrate the benefits of the sites and local transport needs.

3.3. The Whittlesford site is in the countryside outside the village framework; therefore consideration will need to be given to safeguard the rural character. During the course of this research it has been agreed that a master planning exercise will take place for Whittlesford station and its surrounding area, including the three adjacent science hubs. This will involve taking a holistic look at the issues and opportunities whilst involving all the stakeholders, landowners, neighbourhood plan group and Parish Council to develop a plan for the whole area. The master planning exercise will take into consideration the Cambridgeshire rail corridor study and any ongoing need for the rural hub.

3.4. Given that there could be delays, for planning or master planning reasons, in bringing forward either of the top two sites. It may be prudent to consider a third pilot at Sawston (a very close third ranked hub) to safeguard against this. The proposed location at Sawston will need to be considered in light of the ongoing projects including delivering improvements to the South Eastern Corridor (A1307), which also has the potential for the development of a park and ride at Linton, and aspirations of the Parish. This can all be taken into consideration if it is agreed this site moves into phase two.

3.5. An initial costing for each of the sites has been included in the feasibility report. It should be noted that whilst these costings may be high they could well be reduced depending on specification and exact designs. More detailed costings would be developed in phase two of the project if approved by the Executive Board in February.

3.6. The report has undertaken initial assessment of the benefits and disbenefits of Rural Travel Hubs in 'Section 6' of the feasibility report. This will inform the development of the business cases going forward. At this stage it is anticipated that further work to refine current designs to facilitate the preparation of business cases can be met within current budget allocation. The budget will be monitored carefully going forward. Any likelihood of overspend will be reported back to the Board.

4. Options and emerging recommendations

4.1. Taking into consideration the results of the feasibility report, parish consultation, local knowledge and planning considerations, it is the officers' view that Rural travel Hubs be explored further at Oakington, Whittlesford (as part of the Transport Master Planning exercise) and Sawston by developing full business cases for each site.

4.2. The GCP Joint Assembly is asked to comment on the officers' recommendations to help with the development of the Executive Board Report.

5. Next steps and milestones

5.1. The GCP Executive Board in February 2018 will be recommended to approve Oakington, Whittlesford (as part of the Transport Master Planning exercise) and Sawston as the three pilot sites, to progress to phase two of this project.

5.2. Phase two will include the preparation of full business cases for Oakington and Sawston sites, developed with the local communities, Parish Councils and local Members to ensure proposals meet local needs. They will address planning considerations such as green belt, design, access and conservation, refine the costs and outline the monitoring and evaluation methods that will be used to review the success of the pilots.

5.3. Following local engagement the business cases will be updated accordingly and presented to the Assembly and Board in late 2018 when the Board will be asked to approve further funding for the development of the sites.

List of appendices

Appendix 1	Rural Travel Hubs Feasibility Study Report November 2017
Appendices within appendix 1	Please refer to the documents section on the following web page https://www.greatercambridge.org.uk/transport/transport-projects/rural-travel-hubs/

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SKANSKA

Rural Travel Hubs

Feasibility Study Report

November 2017

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Rural Travel Hubs

Feasibility Study Report

Cambridgeshire County Council

November 2017

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Executive Summary

Cambridge and South Cambridgeshire continue to grow both geographically and economically. With the predicted level of growth it is deemed unsustainable for the car to continue as a primary transport mode into Cambridge city. The demand for a frequent and reliable transport system is increasing, especially from the rural locations surrounding the city. The rural communities in South Cambridgeshire represent a proportion of society that should be able to take full advantage of the transport networks available, whether they are bus, walking or cycling networks, and not have to rely on car journeys to access the city.

Skanska has been commissioned by The Greater Cambridge Partnership and South Cambridgeshire District Council to prepare a feasibility study into the potential for Rural Travel Hubs to be developed within South Cambridgeshire.

The Rural Travel Hub concept seeks to increase bus and cycle patronage into Cambridge from the outlying rural areas in order to reduce the number of car journeys into the city.

Through a consultation and engagement process the term 'Rural Travel Hub' has been defined as:

> ***'a transport facility that serves as an interchange, close to existing transport corridors (that are served by a reliable and relatively frequent public transport service), where residents in rural areas can walk, cycle or drive to and continue their onward journey using a sustainable mode of travel'.***

The consultation and engagement process also assisted with the identification of services, infrastructure and facilities that could be provided at the hub location.

There are no existing designated Rural Travel Hubs in the South Cambridgeshire District. However, an existing transport facility at Swavesey has been reviewed as part of the feasibility study. The Swavesey Guided Busway Stop has evolved into something akin to a Rural Travel Hub, and perhaps best represents what a hub may look like and consequently was used as a case study.

A detailed review of national, regional and local transport policy applicable to rural travel and the Rural Travel Hub concept was undertaken. This review concluded that the development of infrastructure similar to that of Rural Travel Hubs, should be supported at all levels.

A district-wide review resulted in the identification of 10 parishes that could be considered for a Rural Travel Hub in South Cambridgeshire.

The report has considered the baseline situation in South Cambridgeshire in terms of typical movements of people and the mode of transport that they currently use. This has shown that, as may be expected, a number of people living in the vicinity of the potential hub sites work in Cambridge, and as a result of this are making journeys into Cambridge on a regular basis.

The feasibility study concluded that the operation of Rural Travel Hubs in South Cambridgeshire is potentially viable and that they are likely to be supported by local communities, serving to encourage more use of sustainable travel for journeys into Cambridge from outlying parishes.

An appraisal process was undertaken which reviewed each of the 10 parishes against identified factors, considering the opportunities and constraints at each. Adopting this approach a priority list was established to aid the identification of the two parishes that could progressed as pilot sites as detailed below:

a) Oakington Guided Busway Stop

b) Whittlesford Railway Station

Subject to the approval of the Greater Cambridge Partnership's Assembly and Board the two identified pilot sites should be taken forward to preliminary design, local consultation and planning permission/consent, and (subject to approval) construction.

It is recommended that the two pilot sites are monitored to establish usage patterns. The results of this monitoring process would then dictate whether further Rural Travel Hubs should be provided throughout South Cambridgeshire.

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1.0 Introduction

1.1 Background

Cambridge is a city that has experienced huge growth since the 1960s in technology, innovation and life sciences to become the UK's leading city in these areas. This growth has made Cambridge an ideal place for foreign investment into the UK economy. This growth is now contributing to a shortage of housing and a transport network that grows more congested each year.

The Greater Cambridge Partnership (GCP) is a partnership between Central Government, Council leaders, businesses and the University of Cambridge, which aims to secure hundreds of millions of pounds in the years leading up to 2031. Part of the investment plan of the GCP is focussed on transport. The importance of transport has been recognised as a key factor in the continued success of the Cambridge Phenomenon and economic success in this area.

The GCP's vision is "Working together to grow and share prosperity and improve quality of life, now and in the future" and its transport ambition is "Creating better and greener transport networks, connecting people to homes, jobs, study and opportunity".

As Cambridge continues to grow both geographically and economically the need to access the city on frequent and reliable transport is increasing, especially from the rural locations surrounding Cambridge. There is a need for the people living in these rural locations to have increased access to the existing and planned transport services into the city centre. The rural communities in South Cambridgeshire represent a proportion of society that should be able to take full advantage of the public transport networks available, whether they are bus, walking or cycling networks, and not have to rely on car journeys to access the city.

"In South Cambridgeshire, the level of car traffic generated by travel to work trips grew by 9.8%, but the proportion of employed residents of the district who drove to work dropped from 62.7% to 60.2%. For stability in car trips to be seen in the period 2031 with the population growth envisaged in the Local Plans, this proportion would need to fall to around 47%" (Transport Strategy for Cambridge and South Cambridgeshire, 2014).

This project has been funded after a decision made by the GCP Executive Board to progress a feasibility study of Rural Travel Hubs in South Cambridgeshire. In response to a letter sent to all South Cambridgeshire District Council (SCDC) Parishes in 2016 from the SCDC Portfolio Holder for the GCP, six parishes of South Cambridgeshire have put forward their interest in being involved with this project.

Swavesey is an example of an existing project that has seen the development of a 'travel hub' aiming to increase bus and cycle patronage, whilst reducing the number of people travelling into Cambridge by car. Details from the Swavesey project will be used within the study to determine the benefits and physical aspects of a Rural Travel Hub.

The project will feed into the wider objectives of the Transport Strategy for Cambridge and South Cambridgeshire (2014) to:

- Enhance accessibility to, from and within Cambridge and South Cambridgeshire
- Ensure good transport links between new and existing communities
- Prioritise sustainable alternatives to the private car and reduce the impacts of congestion on sustainable modes of transport;
- Ensure the strategy encourages healthy and active travel, supporting improved well-being.

The Rural Travel Hubs project will need to inter-relate with other local transport projects and their aims. These include the following:

City Access – Greater Cambridge Partnership

City Access is a package of eight measures to tackle congestion within Cambridge by the creation of a transport system that meets the needs of our growing, vibrant city. It plans to achieve a reduction in peak-time traffic levels in Cambridge by 10-15% by 2031.

It aims to help more people get into, out of and around the city by sustainable means, offer better alternatives to travel by car and boost economic growth and quality of life.

The City Access package of eight measures are:

- pedestrian and cycling infrastructure provision
- Improved public space and air quality
- better bus services and expanded use of Park and Ride
- travel planning
- smart technology
- traffic management
- workplace parking levy
- on-street parking management (including Controlled Parking Zones)

Greenways – Greater Cambridge Partnership

The Greenways project aims to establish a high-quality network of 12 separate routes into Cambridge from surrounding towns and villages, from approximately five to ten miles away. They will primarily be commuter cycle paths, but with additional benefits for pedestrians, horse riders and leisure.

A ‘Greenway’ will be an attractive route segregated from traffic or on quiet roads. The aim is to increase levels of cycling and walking, to reduce congestion as the city grows and to improve the health of the population. Parts of each route exist already, but some may need significant improvement or have missing links.

Cambourne to Cambridge Better Bus Journeys – Greater Cambridge Partnership

The Cambourne to Cambridge scheme aims to deliver improved, faster and more reliable bus services, together with high quality cycling and walking facilities and a new Park & Ride site, for people travelling into Cambridge from towns and villages to the west.

The project will provide improved public transport links - connecting people to places of employment, study and key services - and help existing and new communities along the A428 grow sustainably in the coming years.

Between now and 2031, 8,800 new homes and 15,000 new jobs are planned between Cambridge and St Neots along this route as part of the Local Plans, with 3,500 more houses to the east of St Neots due by 2036.

By providing new travel choices, and as an alternative to the car, the Cambourne to Cambridge scheme will help manage growing congestion on the A428 and ensure people have good access to opportunities in the Cambridge area.

The scheme is ear-marked for completion within the next five to 10 years.

Cambridge South East Travel Study – Greater Cambridge Partnership

The Cambridge South East Travel Study aims to provide better bus, walking and cycling options for commuters that currently travel along the A1307, linking communities and employment sites between Haverhill and Cambridge.

The preferred options include:

- improved public transport corridors along the A1307 in Linton as well as improved non-motorised user routes between Babraham and Cambridge
- a public transport corridor from Babraham Road Park & Ride to the Cambridge Biomedical Campus
- new Park & Ride site near the A11
- high-quality cycle routes

- safe walking routes
- road safety improvements between Horseheath and Linton

Western Orbital – Greater Cambridge Partnership

A Western Orbital would provide a fast and reliable bus link near to or on the M11 between major housing sites and the big employment areas avoiding the busy city centre. These employment sites include: Cambridge Biomedical Campus and the West Cambridge site as well as the North West Cambridge site.

The Western Orbital could turn a section of the M11 into a three-lane 'smart motorway', which could ensure better bus journeys between Cambourne and Addenbrooke's, which could take under half an hour on a traffic-free route.

A10 Royston to Cambridge Foot & Cycleway – Greater Cambridge Partnership

The A10 Foot and Cycleway is a shared vision of local residents, councillors, campaigners and project officers alike.

The aim is to ultimately see a high quality, consistent foot and cycle link extend from Cambridge all the way through to Royston, aligning with the A10 route.

The Greater Cambridge Partnership has overseen the creation of a local link within this vision that links Frog End to Melbourn via a foot and cycleway.

Following the resolutions of the Executive Board on Wednesday 22nd November, it has been asked that Cambridgeshire and Hertfordshire County Councils undertake a joint study for the completion of the final stretch of the A10 Royston to Cambridge pedestrian and cycle route, to feed into the GCP's future investment strategy prioritisation process.

1.2 Purpose

The population of South Cambridgeshire in 2001 was approximately 130,000 which grew to just under 150,000 in 2011 and is estimated to reach over 180,000 by 2031.

The number of dwellings in South Cambridgeshire in 2001 was 53,600 growing to 61,700 in 2011. Significant growth is predicted with the number of dwellings expected to reach 80,600 by 2031 representing a 35% increase in the number of dwellings since 2001.

With this level of growth in South Cambridgeshire it is unsustainable for the car to continue as a primary transport mode into Cambridge City. The residents of South Cambridgeshire should have easy access to the transport networks available into the city with some communities residing within a few miles but being served poorly by the existing public transport, cycling and walking networks.

The purpose of this study is to take a community-led approach to determine what a Rural Travel Hub is and determine possible locations that would maximise the benefits seen by rural communities in South Cambridgeshire. The study will establish the needs of local communities when determining these locations.

The study will ensure that any recommended Rural Travel Hubs will provide rural communities with improved access to jobs and services in and around Cambridge whilst considering the impacts of localised motor traffic resulting from use of the hubs.

The study will provide criteria to establish feasibility and prioritisation of Rural Travel Hubs within South Cambridgeshire that would benefit from further funding and establish a case for project development. The study will be used to inform a report that will go to the Executive Board for a recommendation to progress the project to implementation.

1.3 Study Objectives

The following objectives for this feasibility study will help to achieve the aim of the City Access Project, and therefore the Greater Cambridge Partnership, of '*making it easier to travel in, out and around Cambridge and*

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South Cambridgeshire by public transport, cycle or on foot, and reduce and maintain lower traffic levels to ease congestion'.

a) To provide a community-led understanding of what a Rural Travel Hub is and their purpose.
b) Identification of rural communities' travel connections to Cambridge.
c) Develop an outline specification and criteria for Rural Travel Hubs based on community views.
d) Identify locations within South Cambridgeshire that may benefit from the provision of a Rural Travel Hub by undertaking a district-wide review.
e) Provide a recommendation to establish at least two sites that could be used as a pilot study for Rural Travel Hubs (RTH).
f) Consider the high-level planning issues that would be relevant to any planning application.

1.4 Study Outcomes

The principal outcomes of the study include:

- A clearer understanding of the community view of benefits and dis-benefits of Rural Travel Hubs.
- A number of options with high level costs of the possible locations and layouts of Rural Travel Hubs that will suit the different geographical locations of South Cambridgeshire.
- Understand localised impacts of motor traffic on rural areas resulting from Rural Travel Hub usage.
- Recommendations of suitable areas within South Cambridgeshire that would benefit from further investigation of Rural Travel Hubs.

1.5 Methodology

This feasibility study will be undertaken in the following stages:

a) Undertake a detailed review of pertinent policies and guidance related to Rural Travel Hubs (to include sustainable travel, active travel and public transport), assessing the relevance of Rural Travel Hubs and their compliance with governmental and societal aspirations and targets.

b) Carry out a baseline review of the transportation and socio-economic characteristics of the South Cambridgeshire District Council Area using 2011 Census data.

c) Undertake a case-study of the informal travel hub that has developed at the Swavesey guided busway stop, including user counts and a questionnaire survey.

d) Hold a community engagement event to obtain local feedback on the Rural Travel Hub concept, establish a definition of what 'Rural Travel Hubs' are and their objective.

e) Determine the benefits and dis-benefits of Rural Travel Hubs.

f) Identify rural communities that would most benefit from a Rural Travel Hub through review of existing public transport provision.

g) Undertake a detailed appraisal of all 10 potential hub sites. This includes the 6 sites identified following a 2016 consultation as detailed in section 3.0, considering:

   - Proximity to existing public transport network (bus and/or rail).
   - Proximity to designated cycle routes, other major Non-Motorised User (NMU) routes and any planned schemes (including Greenways).
   - Proximity to intended users.
   - Review of Public Transport Service levels (e.g. frequency of buses/trains).
   - Access to and from the sites (for both car drivers and NMUs).
   - Future development in the locality which could increase demand.
   - Planned infrastructure improvements nearby.

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- Availability and suitability of land.
- Review local census data to better understand the local demographic and travel patterns.
- The need for public transport improvements to service the sites, including increased frequency & capacity.
- The attractiveness of the site and NMU routes to it.

h) Propose appropriate facilities for each site including:

  - Car parking.
  - Access for both vehicles and NMUs (including availability of suitable NMU routes to the hubs).
  - Cycle parking/security (including cycle lockers).
  - Bus stop provision.
  - Drop-off provision.
  - Bus shelters.
  - Public information and Real Time Information.
  - Lighting (possibly low level in rural locations).

i) Calculate high level construction cost estimates for each site (excluding land costs).

j) Undertake site visits, preliminary measurements and site photographs as required.

k) Score sites and rank in priority order to identify the two sites most suitable for pilot schemes. Scoring will consider:

  - Population served.
  - Frequency of bus and rail services.
  - Cost of travel.
  - Car journeys saved.
  - Proximity to a suitable cycleway.
  - Land availability and suitability.
  - Site access.
  - Proximity to an existing Park & Ride site.
  - Cost per space.

l) Prepare conceptual layouts for each site showing access arrangements for both car user and NMUs.

m) Conclusion

n) Recommendations

1.6 Study Outputs

A feasibility report on the definition of Rural Travel Hubs, defining the opportunities and risks they could provide within South Cambridgeshire with recommendations of sites for a pilot scheme.

The report considers the potential options for travel hub provision including presenting a selection of types, facilities and locations which might be suitable, and outlining the benefits and potential issues associated with each. Consideration will also be given to the overall scheme benefits and factors such as budgetary constraints.

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2.0 Policy & Guidance Review

This section provides an overview of the various national and local transport policies pertinent to the concept of a Rural Travel Hub. The policies and guidance reviewed within this study include transport plans and strategy produced by Central Government as well as the more regional/local policies adopted by Cambridge, Cambridgeshire and South Cambridgeshire District Council.

2.1 National Policy & Guidance regarding Transport

2.1.1 National Planning Policy Framework – 2012 (Department for Communities and Local Government)

The National Planning Policy Framework (NPPF) 2012 outlines the requirement for local authorities to promote sustainable development, including sustainable transport (Section 4). The Rural Travel Hub concept would contribute toward the following objectives:

> *"…Transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. Smarter use of technologies can reduce the need to travel. 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…"*
>
> *"…Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport…"*
>
> *"…Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people. Therefore, developments should be located and designed where practical to…"*
>
> - *"…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…"*
> - *"…consider the needs of people with disabilities by all modes of transport…"*

2.1.2 Transport Investment Strategy (DfT July 2017)

One of the Governments core objectives is to "*create a more reliable, less congested and better connected transport network for the users who rely on it"* with the Investment Strategy commenting that *"our intensively used networks are ageing and face increasing demands, creating delays and undermining reliability. In places they don't provide the connections people and business need" (Paragraph 3.1)*.

Paragraphs 3.10, 3.11 and 3.12 of the Strategy, under the heading of "expanding existing capacity to ease congestion", explain the importance of tackling congestion:

> *"…3.10 In many cases we need to invest to upgrade and enhance the existing network, making it better able to cope with demand by adding capacity to reduce congestion and crowding. This not only makes journeys more comfortable and reliable, but can make possible new trips that were previously impractical due to frequent or unpredictable delays.*
>
> *3.11 On the road network, congestion creates delays and bottlenecks on heavily-used routes. And because the network is congested, incidents have a much greater impact, meaning longer recovery times and lower reliability. Managing congestion needs to be environmentally sustainable, and solutions are not limited to adding extra miles of tarmac, but can also include making road layouts more efficient, or investing in the way the network is managed.*

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3.12 Upgrades which tackle congestion typically have high returns. Schemes in our Road Investment Strategy, which included new sections of smart motorway, junction improvements, widening and bypasses show high rates of return, with £1 spent leading to an average return of at least £4.5..."

Paragraphs 3.14 to 3.18, under the heading of 'enhancing connectivity by adding new capability' explain the importance of connectivity within the transport system:

"…3.14 The connectivity of our transport system – the ease with which places and people are linked together – is a fundamental component of the positive economic contribution it can make. In many cases, we need to invest to add new capability to the network, which transforms travel in a particular corridor or provides opportunities for the travelling public to make journeys in a new way. This may involve creating entirely new routes, investing to better integrate different parts of the network, or delivering step-changes in capacity by bolstering existing routes with stretches of new infrastructure.

3.15 These schemes can create new links between communities and workplaces to deepen local labour markets, connect housing developments to the network or provide new routes on city and commuter networks.

3.16 They can also include improving access to our ports and airports, integrating the network through hubs, and making possible new and improved journeys between economic centres.

3.17 They can range in scale, from small projects which might improve cycle access to a new housing development, through to a new station providing rail access to a whole community, and right up to mega-projects like Crossrail and HS2. These larger connectivity-enhancing schemes can have much more significant wider economic impacts than smaller schemes and help unlock economic benefits on a much larger scale. To unlock growth in productivity, industrial capability and employment, global competitiveness and housing we will need to continue to invest in new or transformed connections.

3.18 These three investment priorities – addressing the condition, capacity and connectivity of the network – represent the core ways we can create a more reliable, less congested and better connected network that supports growth and housing..."

Paragraph 3.21, under the heading of 'adapting the network to safeguard our environment, safety and health' states:

"…3.21 Our investment can also deliver positive outcomes for health and the environment. Providing new cycleways and road networks that accommodate the needs of cyclists and walkers can encourage people to shift from cars to more sustainable and healthy forms of travel, particularly for short local trips that make up the bulk of personal trips..."

2.1.3 Cycling and Walking Investment Strategy (DfT 2017)

It is the Governments ambition to make "cycling and walking the natural choices for shorter journeys, or part of a longer journey". The document sets out the following objectives:

Government objectives by 2020 (according to Paragraph 1.14) are to:

- *"…increase cycling activity, where cycling activity is measured as the estimated total number of cycle stages made*
- *increase walking activity, where walking activity is measured as the total number of walking stages per person*
- *reduce the rate of cyclists killed or seriously injured on England's roads, measured as the number of fatalities and serious injuries per billion miles cycled*
- *increase the percentage of children aged 5 to 10 that usually walk to school…"*

Further to this, the Government have set the following aims and target, respectively, to 2025 (Paragraph 1.15):

- *"…aim to double cycling, where cycling activity is measured as the estimated total number of cycle stages made each year, from 0.8 billion stages in 2013 to 1.6 billion stages in 2025, and will work towards developing the evidence base over the next year.*
- *…aim to increase walking activity, where walking activity is measured as the total number of walking stages per person per year, to 300 stages per person per year in 2025, and will work towards developing the evidence base over the next year…*

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- *…increase the percentage of children aged 5 to 10 that usually walk to school from 49% in 2014 to 55% in 2025..."*

Paragraph 3.39, under the heading 'Bus Services Bill', states that:

> *"…The Bus Services Bill will give authorities the option to take more control of their local services, through implementing Quality Partnerships, new 'Enhanced Partnerships', or through adopting a franchising approach. These approaches will provide authorities with the ability to better integrate bus services with wider public transport networks, and with sustainable travel options such as cycling and walking facilities. Ensuring a seamless transition from public transport to and from walking and cycling routes and networks is key to increasing the number of walking and cycling stages to bus stops and other transport interchanges…"*

2.2 Local Policy & Guidance

2.2.1 CCC Local Transport Plan (LTP3) – 2014

The third Local Transport Plan (LTP3) is a statutory document which sets out Cambridgeshire County Council's transport objectives, policies and strategy for the county. LTP3 was updated in 2014 to reflect new data and changing context with regard to funding and development plans, to cover the period to 2031. The objectives and policy direction remain unchanged since first being adopted in 2011.

The overarching strategy as outlined in Section 4 states that Cambridgeshire County Council will:

> *"widen choice by encouraging more sustainable and environmentally friendly forms of transport including walking, cycling and public transport and will make it easier for people to interchange between different modes of transport".*

The LTP3 sets out objectives relating to journey time reliability, reduction of private car journeys, making sustainable transport more attractive, improving accessibility and minimising environmental impact.

2.2.2 Transport Strategy for Cambridge & South Cambridgeshire

The Transport Strategy for Cambridge and South Cambridgeshire (TSCSC) was adopted by Cambridgeshire County Council on 4 March 2014 and ensures that local councils plan together for sustainable growth and continued economic prosperity in the area.

Eight objectives have been set for this strategy, as detailed below:

- *"To ensure that the transport network supports the economy and acts as a catalyst for sustainable growth*
- *To enhance accessibility to, from and within Cambridge and South Cambridgeshire (and beyond the strategy area)*
- *To ensure good transport links between new and existing communities, and the jobs and services people wish to access*
- *To prioritise sustainable alternatives to the private car in the strategy area, and reduce the impacts of congestion on sustainable modes of transport.*
- *To meet air quality objectives and carbon reduction targets, and preserve the natural environment.*
- *To ensure that changes to the transport network respect and conserve the distinctive character of the area and people's quality of life.*
- *To ensure the strategy encourages healthy and active travel, supporting improved well-being.*
- *To manage the transport network effectively and efficiently".*

2.2.3 Transport Investment Plan 2016

The Transport Investment Plan (TIP) sets out the transport infrastructure, services and initiatives that are required to support the growth of Cambridgeshire. The schemes included in the TIP are those that the County

Council has identified for potential delivery to support growth. These range from strategic schemes identified through the County Council's transport strategies, to those required to facilitate the delivery of Local Plan development sites for which Section 106 contributions will be sought, through to detailed local interventions. The TIP is used to identify and prioritise projects to be added to the Transport Delivery Plan (TDP). The TDP is the County Council's implementation plan for the delivery of transport and highway schemes to address existing transport problems while at the same time catering for the transport needs of new communities and enhancing the environment.

2.2.4 Greater Cambridge Partnership

The Greater Cambridge Partnership has an overarching objective to make *"it easier to travel in, out and around Cambridge and South Cambridgeshire by public transport, cycle or on foot, and reduce and maintain lower traffic levels to ease congestion".*

2.3 Local & National Transport Policy Summary

In summary the Rural Travel Hub concept could potentially contribute towards achieving the following local and national transport policy objectives:

- Enhancing connectivity/accessibility to, from and within Cambridge and South Cambridgeshire.
- Providing viable sustainable travel options for those living in rural areas.
- Easing congestion in Cambridge by encouraging more sustainable travel into the city.
- Reducing air pollution and carbon emissions by promoting more sustainable travel.
- Encouraging healthy and active travel, supporting improved wellbeing
- To generate economic opportunities – better connections between rural communities and Cambridge will increase the employment and educational opportunities available.

2.4 Policy & Guidance regarding Planning

This section provides an overview of the various national and local planning policies pertinent to the suitability of the proposed locations and layout and design of the Rural Travel Hubs. The policies and guidance reviewed within this study include national, regional and local policies adopted by Cambridgeshire County Council, Cambridge City Council, and South Cambridgeshire District Council.

2.4.1 National Planning Policy Framework – 2012 (Department for Communities and Local Government)

The NPPF 2012 outlines the requirement for local authorities to promote sustainable development, The Rural Travel Hub concept should contribute towards the following planning objectives:

> *"At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking.*
>
> *For decision-taking this means:*

- *Approving development proposals that accord with the development plan without delay; and*
- *Where the development plan is absent, silent or relevant policies are out-of-date, granting permission unless:*
  - *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole; or*
  - *specific policies in this Framework indicate development should be restricted.*

The NPPF also identifies the fundamental aim of the Green Belt policy is to prevent urban sprawl by keeping land permanently open; the essential characteristics of Green Belts are their openness and their permanence. As such, the Green Belt serves five purposes:

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- To check the unrestricted sprawl of large built-up areas;
- To prevent neighbouring towns merging into one another;
- To assist in safeguarding the countryside from encroachment;
- To preserve the setting and special character of historic towns; and
- To assist in urban regeneration, by encouraging the recycling of derelict and other urban land.

When considering any planning application, local planning authorities should ensure that substantial weight is given to any harm to the Green Belt. 'Very special circumstances' will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm, is clearly outweighed by other considerations.

Certain other forms of development are also not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict with the purposes of including land in Green Belt. These include

- Local transport infrastructure which can demonstrate a requirement for a Green Belt location. South Cambridgeshire Development Plan

When considering the location and design of the Rural Travel Hubs a further planning assessment will need to be undertaken to determine whether the proposed sites would be acceptable in accordance with Local Development Framework or Local Plan policies. This would involve assessing the Rural Travel Hubs impact on the wider area, such as those impacting the Countryside, Green Belt, Heritage Assets, Conservation or Biodiversity and so on.

3.0 Consultation & Engagement

Local input was sought in order to establish views on rural travel and the identification of facilities that will enhance the experience for those living in rural areas.

In the summer of 2016, all Parish Councils in South Cambridgeshire were contacted for initial feedback on the Rural Travel Hub concept. Of the 96 parishes contacted, six were initially identified as potentially feasible and therefore required further investigation. These sites were Shepreth, Meldreth, Whittlesford, Oakington, Foxton and Swavesey. In addition to these sites, and following a district wide review, four further locations have been identified for consideration. These locations are Cambourne, Linton, Sawston and Comberton. Initial liaison has been undertaken with Parish Councils who expressed an interest, as outlined in 3.1.

Separately local stakeholders, specialist interest groups and all Parish Councils were invited to a wider engagement event to discuss concept and record community views. The results of the event are outlined in Section 3.2.

3.1 Initial Parish Liaison

Many of the Parishes identified for consideration as hub sites have been consulted directly.

3.1.1 Oakington

The Parish Council are supportive of a small scheme that would enable the Citi6 to turn around at the guided busway, enabling more people from the village to access those routes. They felt there needed to be a solution to the current on street parking and this may include parking restrictions. They would like to see provision of a small drop off/pick up area and improved access for pedestrians and cyclists to the bus hub, as the current narrow kerbside footpath is very dangerous. With new homes planned for Cottenham the guided bus stop in Oakington will be very popular with commuters. The Parish Council were keen to stress that any proposal should not increase the traffic through their village

3.1.2 Linton

Linton Parish Council was not one of the initial six sites suggested through the parish consultation in 2016. Linton is not a hub site that has been prioritised for investigation as a potential pilot, given the ongoing work to improve the A1307 and the projects looking at this. However, if priorities change the Parish Council will be consulted and their views recorded

3.1.3 Shepreth

The Parish Council proposed three sites as potential hubs as part of the initial consultation on this project. On speaking with them, they are keen that any proposals for these sites would have to demonstrate that traffic would not be increased through the village. Local landowners wanted to see more details of any proposals before they could comment. The Parish Council also wanted assurances regarding the management and maintenance of any proposed hub.

3.1.4 Swavesey

The Parish Council agree that the car park alongside the guided bus had served local residents well and had developed into an informal hub. They liked that it was not a widely advertised busway car park and therefore was able to primarily serve local residents. There are few issues with on street parking in the vicinity of the hub. They would like to see the surface replaced with a more hard wearing permeable material. They commented that if the local bus service which links with the guided bus was able to run more frequently and reach all parts of the village, it would help more residents to access better services. They stressed that better cycle storage facilities were required to prevent bike thefts and were keen to explore the potential for the parish to manage their use for local residents. Any proposals to increase the hub at Swavesey would have to address the Parish Council's concerns about increased traffic through the village, which at peak times is a very real issue especially given the amount of on street parking through the village.

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3.1.5 Foxton

The Parish Council are keen to resolve the parking issues on Station Road, which regularly cause problems with residents living there and traffic passing through the village. They would not support a large scheme as they do not believe it would be appropriate for Foxton. Any proposal would have to avoid the long term plans of Network Rail, which indicate moving the current crossing resulting in the A10 being routed over or under the railway line.

3.1.6 Meldreth

The Parish Council are keen to make improvements to the station access and reduce the amount of on-street parking which regularly impacts on residents. The roads and pavements are very narrow and there are limited options to improve this. There is a path from Melbourn to Meldreth that is regularly used to access the station, but there is no lift to enable wheelchair or pushchair access to the Cambridge bound platform. Improved cycling opportunities from the surrounding villages would help, but this would require investment. A planning application is being considered for land adjacent the station to build 27 properties and resident parking.

3.1.7 Whittlesford

The Parish Council are very supportive of any plan to improve the station area and reduce on-street parking in the village and are keen to be considered a pilot for this project. They have set up a neighbourhood plan group to look at the redevelopment of the station. The station draws a lot of people from a large geographical area and the passenger numbers cannot be compared to that of the smaller stations on the Kings Cross line. Access to the station is an issue, with nowhere for buses to turn around and increased pressure on the 500 space car park. There is currently no access to the Cambridge bound platform for wheelchair or pushchairs as no lift is in place. One resident suggested that if there were better cycleways into Cambridge from Whittlesford (particularly from Whittlesford to Great Shelford) then more people may take to their cycles. It was clear from the discussion that a plan for the whole station area needs to be produced which incorporates the hub concept and addresses a number of the other issues.

3.1.8 Sawston

The Parish Council are supportive of the idea to improve transport links, reduce congestion and link villages to train, bus or cycle ways but asked that the project team look more widely at all the proposals locally to improve transport, including the A1307 proposals, options for Spicers station, greenways and Cambridge South before drawing any conclusions. In particular they would like to see improvements to the cycleway/footpath from Sawston to Whittlesford station, along with an agreed maintenance and management plan for any new paths to ensure they are fit for purpose over the long term. They were also keen to stress the importance of addressing access issues for the elderly, disabled and families

3.1.9 Comberton

Comberton Parish Council was not one of the initial six sites suggested through the parish consultation in 2016. Comberton is not a hub site that has been prioritised for investigation as a potential pilot. However, if this changes the Parish Council will be consulted and their views recorded.

3.1.10 Cambourne

The Parish Council are very keen for a travel hub having been on the list before for such a proposal. They would prefer a hub to be in the vicinity of the High Street, given its location in the centre, near car parking and the routes of current buses. Cycle storage at the Parish Council office could also be extended and car parking already exists at the PC office and at Morrison’s/other shops.

There are good cycle links within. There are a number of bus routes coming through the village and scope to make a fast link through to Cambridge, linking with other GCP projects such as the Cambourne to Cambridge Better Buses. A few DRT (Demand Responsive rTansport) schemes also operate into Morrison’s and could be extended to take in other villages and link to a bus hub in Cambourne.

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3.2 Stakeholder Event

A stakeholder engagement event was held on the evening of Wednesday 6th September 2017 at the South Cambridgeshire District Council office in Cambourne, with 47 attendees present. The evening's agenda comprised the following:

- Welcome, Concept and Background – Cllr Burkitt
- Procurement and Governance – The Project Team
- Feasibility Study – Skanska
    a) Introduction to the Feasibility Study
    b) Key objectives of the Rural Travel Hubs concept
    c) Study methodology
    d) Travel patterns in South Cambridgeshire
    e) The Swavesey Model
    f) Site criteria (size, spaces, access, location, availability of land etc.)
    g) Potential facilities at Rural Travel Hub locations.
    h) Purpose of the workshop – Why we need your help.
- Engagement and Next Steps – The Project Team
- Workshop – Interactive group discussions on the issues affecting rural travel and an evaluation of the Rural Travel Hub concept.
- Scoring Exercise – To establish the level of support for the Rural Travel Hub concept.

3.2.1 Workshop Summary

Attendees were invited to participate in a group discussion, considering the following questions:

a) What are the factors that influence public transport usage in rural areas?

b) What are the factors that influence cycle usage in rural areas?

c) What services and facilities would you like to be provided at Rural Travel Hubs?

d) Identify the strengths and weaknesses of the Rural Travel Hub concept.

A record of the discussions can be found in Appendix C. The feedback received has been considered when developing the definition and determining the requirements of Rural Travel Hubs.

3.2.2 Scoring Exercise

A scorecard was developed for the event as a means of gauging the level of support for the Rural Travel Hub concept. All attendees were asked to complete the scorecard at the end of the evening. A copy of a blank scorecard can be found in Appendix D1.

The scorecard asked two questions (as detailed below) and asked attendees to provide a score of between 1 and 5, with 1 being 'would not support' and 5 being 'fully support'. A comments box was also provided to allow attendees to include a justification for their answer.

a) Do you support the Rural Travel Hub concept?

b) Would you support a Rural Travel Hub in your Parish?

Not all of the attendees completed a scorecard. 28 scorecards were collected at the end of the evening.

The results of the scorecard exercise are shown on Charts A & B.

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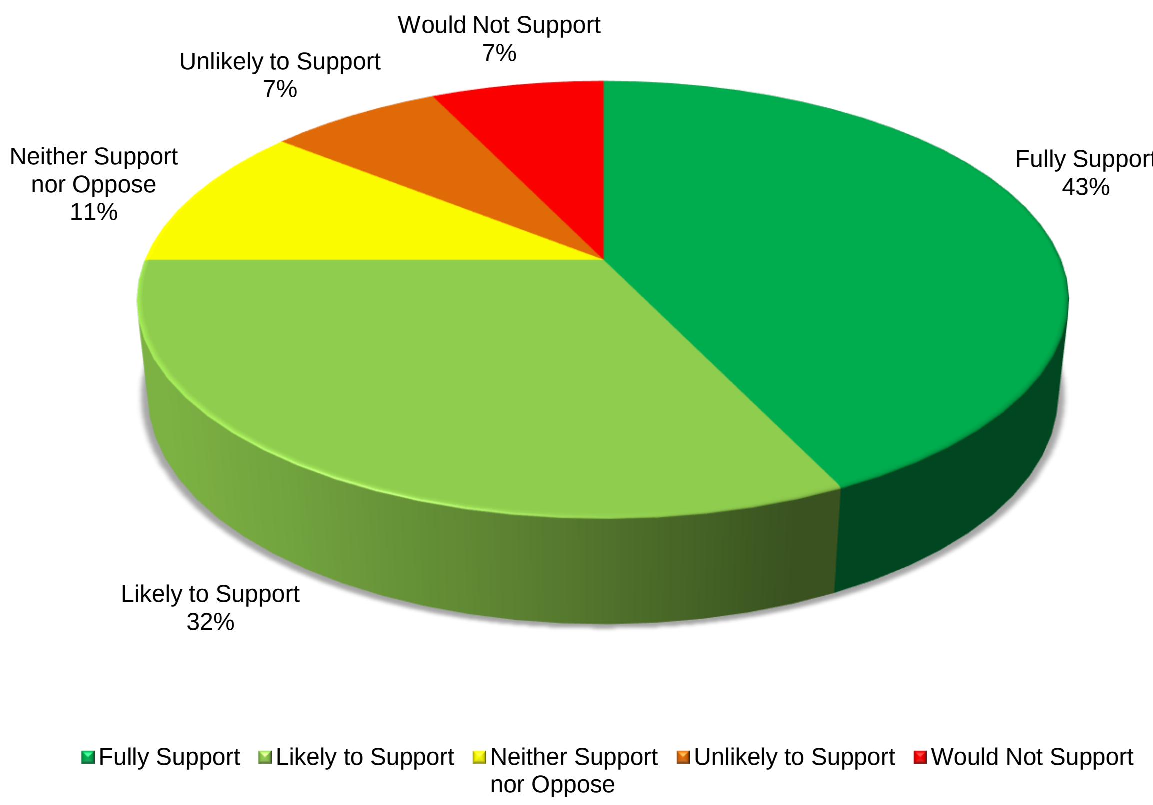
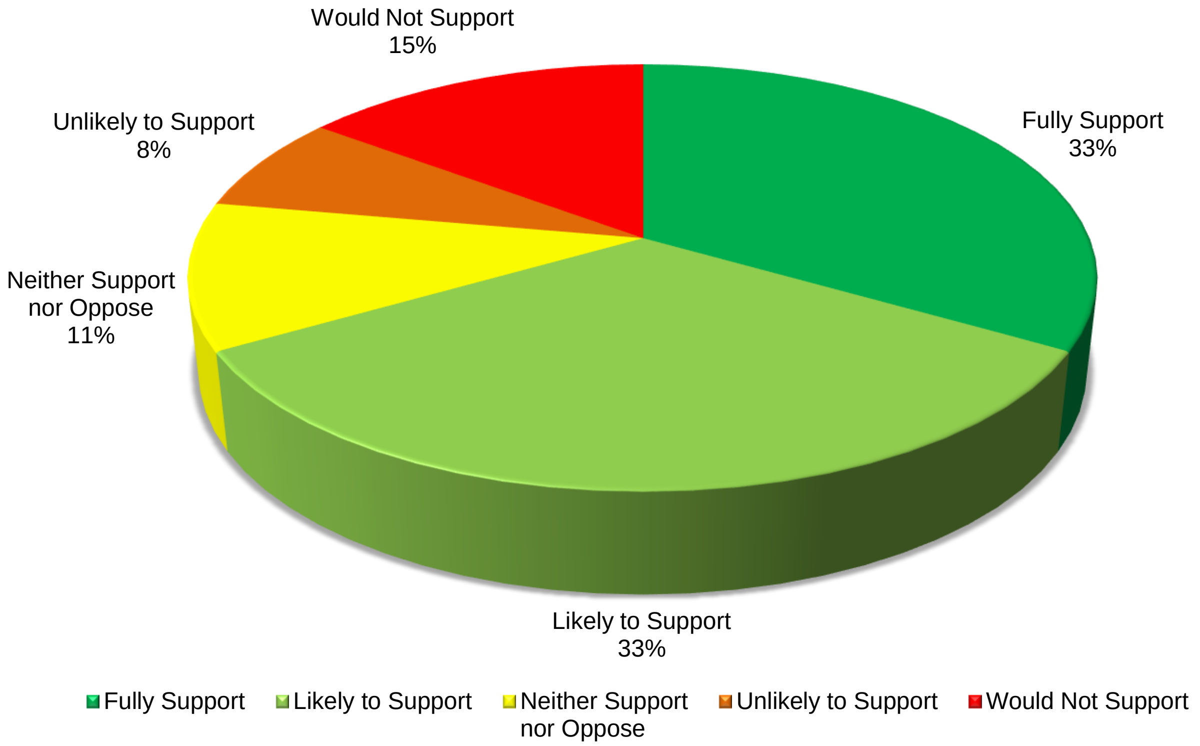


Chart B: Would you support a Rural Travel Hub in your Parish?



The results indicate a high level of support with 75% of respondents supportive of the Rural Travel Hub concept compared to 14% who were not supportive.

Similarly 66% would support a Rural Travel Hub in their own parish compared to 23% who not supportive.

A summary of the scorecard results and associated comments can be found in Appendix D2.

3.3 South Cambridgeshire District Council Planning Liaison

South Cambridgeshire District Council Planning Department undertook a high-level review and commentary of the potential hub locations, highlighting potential planning constraints and requirements. A summary of their informal feedback has been included for each site within the detailed site reviews in Section 9. Further consultations would have to be undertaken due to constraints on various sites, should they be taken forward. The planning constraints have also been used to inform the scores relating land availability and access in the site Prioritisation Matrix detailed in Section 11.

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4.0 Rural Travel Hub Definition

4.1 What is a Rural Travel Hub?

Through the consultation and engagement process the following definition of a 'Rural Travel Hub' has been developed. The term 'Rural Travel Hub' is defined as a **'transport facility that serves as an interchange, close to existing transport corridors (that are served by a reliable and relatively frequent public transport service), where residents in rural areas can walk, cycle or drive to and continue their onward journey using a sustainable mode of travel'.**

4.2 How do Rural Travel Hubs Operate?

The Rural Travel Hub is essentially a form of integrated transport enabling users to walk, cycle or park their vehicles at a designated facility and access Cambridge via a sustainable mode of transport, thus relieving congestion on the arterial routes into and within the city centre.

Whilst a key objective of the Rural Transport Hub concept is to reduce the number of private car journeys into Cambridge, it was clear during the consultation and engagement process that there is a strong desire for more general public transport service improvements in rural areas, for example better interconnectivity between neighbouring towns and villages. The hub facilities will enable users to travel to locations other than Cambridge where located on transport routes. They would also be able to be used as stops for Demand Responsive Transport services and Community Transport.

The Rural Travel Hub differs subtly from other forms of integrated transport facilities such as Park & Ride. Traditionally, a Park & Ride facility predominantly targets private motorised users, encouraging them to park their vehicles at the designated facility before continuing their onward travel by means of the public transport network. Such sites are usually situated on the outskirts of cities; the objective being to minimise the volume of private vehicles in inner city areas.

Rural Travel Hubs could be seen as a form of hybrid facility. Whilst generally small scale car parking facilities will be provided at each hub location for motorists, there will be a bias towards encouraging active travel to and from the sites by making them attractive to cyclists and pedestrian users once at the hub.

Each hub will be bespoke. It is not a case of 'one size fits all', but rather that the Rural Travel Hub will be designed to suit the community it serves taking into consideration its location, the available transport links and planning constraints This report highlights conceptual site layouts in Appendix B. In further stages of this project more detailed design options for each site will be provided to suit the requirements of the specific location.

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5.0 Case Study

Whilst there are no existing designated Rural Travel Hubs in the South Cambridgeshire District, an existing transport facility at Swavesey has been reviewed as part of the Feasibility Study. The Swavesey Guided Busway Stop has evolved into something akin to a Rural Travel Hub, and perhaps best represents what a hub may look like.

5.1 Swavesey Guided Busway Stop

The Cambridgeshire Guided Busway was officially opened in August 2011 and connects Cambridge, Huntingdon and St. Ives, with much of the route following a disused railway line. The Busway comprises guided tracks in both directions, with an adjacent shared use footway/cycleway, affording access for pedestrians and cyclists.

Originally the Swavesey Busway Stop consisted of bus shelters for passengers and 20 covered cycle stands. Increasing cycle usage led to an additional 35 uncovered cycle stands being provided. A compound, approximately 70m from the busway, used during construction was converted to a designated drop-off area and small car park, with space for up to 15 vehicles (including 1 disabled bay). Subsequently, again following increasing demand, the car park was extended to its current size and able to accommodate approximately 40 vehicles (see images below).

Image 5.1: Swavesey Busway car park.

Image 5.2: Swavesey Busway cycle storage.

5.1.1 Facilities

The facilities at the hub include:

- A car park for a maximum of 40 vehicles, with one designated disabled bay. The car park is located on Station Road approximately 70m to the north of the Busway. There is a separate 'IN' and 'OUT' vehicular access arrangement with 2.1m height barriers to restrict usage to cars only. The car park also features a designated drop-off area, which is signed from Station Road. A footway provides pedestrian access between the car park and Busway. Station Road is street-lit, which therefore illuminates the vehicular accesses and footway link to the busway stop. The car park is not street lit. The car park surface is unbound gravel, with the exception of the disabled bay and drop-off area which have a bound bituminous surface (see image 5.1).
- Cycle parking alongside the St. Ives bound track of the Busway. There are 55 'Sheffield' cycle stands in total, 20 covered and 35 uncovered. (see image 5.2)
- A pair of bus stops on Station Road, located approximately 90m to the north of the Busway. These provide a link to the Busway for local bus services, including the Citi 5 service which generally runs at 2-hourly intervals.
- CCTV at the Busway stop and cycle park, but not at the separate car park.
- Real Time Information signs at the Busway stops.

- Shelters at the Busway stops, including passenger information signs.
- Emergency help button at the Busway stops.
- Ticket machines at the Busway stops.
- Shared use footway/cycleway along the western side of Station Road/Over Road that provides a pedestrian/cycle link between the village of Over to the north (a distance of approximately 1.3 miles) and Swavesey to the south (a distance of approximately 3/4 mile).
- Bicycle tyre pump.

5.1.2 Survey

Two surveys were undertaken at the Swavesey Busway stop, one during the school summer holidays in August and the other during school term-time throughout September. These were undertaken to establish usage patterns, gauge the opinion of users on the quality of the transport infrastructure provided and additional facilities desired. Undertaking two surveys allowed comparisons to be made between usage during term-time and school holidays. The August survey also enabled indicative usage patterns to be established prior to the Consultation Event of 6th September. The results of the surveys are summarised below:

Survey 1 – School Summer Holiday (August)

Date of Survey:	Thursday 10th August 2017
Time of Survey:	06:00 – 13:00
Sample set:	87
Car park traffic count:	every 15 mins (06:00 – 13:00)

Notable findings:

- 87 people surveyed (representing majority of those using the inbound service – users travelling outbound (to St Ives) were not included in the survey). Not all inbound users were captured owing to multiple users arriving simultaneously and the frequency of service.
- Majority of users from villages of Swavesey or Over; others from further afield at Fen Drayton & Fenstanton (although these represented the minority). No users were surveyed from outside these 4 areas.
- Popular destinations; Cambridge ‘city centre’, Railway Station, Milton Science Park & Addenbrooke’s Hospital.
- Vast majority walked, cycled or used car park facility to access Swavesey Busway Stop (only one user travelled to the facility via bus)
- No vehicles present in car park at 05:30am (inference is no overnight parking issue at time of survey)
- Some users were unaware the car park was for the general use for those using the Busway (i.e. under the impression it was a drop-off point only?)
- One instance of vandalism to a vehicle parked in the car park was noted among respondents.
- Max number of vehicles in car park at any one point during survey = 32 (ponding water accounted for ~2-3 spaces)
- Reports of cycle theft – users cited concerns over cycle security and noted this as the main reason for not using the cycle storage facility.
- Cycle storage capacity for 110 cycles on 55 Sheffield cycle stands (20 covered, 35 uncovered): 14 bikes present at start of survey, 11 damaged/unusable, max. net gain of +19 bikes during survey (30 spaces occupied).
- Feedback from users generally positive

- Comments on condition of surfacing & lack of drainage in car park
- Issues with automated ticket machines (often unreliable/out of order)
- Monthly pass discount is negligible/unattractive (users purchasing 'long-term' passes felt they should get more of a discount and this would act as an incentive).
- The 'free parking' was deemed a positive by those using the car park – making Swavesey an attractive option. Several respondents asked if there was a plan to start charging.

Survey 2 – School Term-time (September)

Date of Survey:	*Wednesday 27th September 2017*
Time of Survey:	*06:00 – 13:00*
Sample set:	*102*
Car park traffic count:	*every 15 mins (06:00 – 13:00)*

Notable findings:

- 102 people surveyed (representing majority of those using the inbound service – users travelling outbound (to St Ives) were not included in the survey, but were counted). Not all inbound users captured owing to multiple users arriving simultaneously and the frequency of service.
- Majority of users are from the villages of Swavesey or Over; others were from further afield (although these represented the minority).
- Popular destinations were; Cambridge 'city centre', Railway Station, Milton Science Park & Addenbrooke's Hospital.
- One vehicle was present in the car park at 06:00am (inference is that there is no 'general' overnight parking issue at time of survey).
- Some users were unaware the car park was for the general use of those using the Busway (i.e. under the impression it was a drop-off point only).
- The maximum number of vehicles in the car park at any one point during survey was 42 (2 vehicles parked on grass verge within extents of car parking area). The maximum capacity of designated parking area is assessed to be 40.
- Reports of cycle theft – users cited concerns over cycle security and noted this as the main reason for not using the cycle storage facility.
- Cycle storage capacity for 110 cycles on 55 Sheffield cycle stands (20 covered, 35 uncovered): 16 bikes present at start of survey (9 within covered section, 7 uncovered). The maximum number of cycles recorded during survey was 65.
- Feedback from users on the transport facilities provided was generally positive.
- Comments were made on the poor condition of car park surface & lack of drainage leading to ponding in the car park.
- Users commented on disparity of the Busway fares (those traveling 1 stop had to pay full fares rather than "pro-rata" approach used in other transport system such as the London Tube zonal system).
- Issues experienced with the automated ticket machines (often unreliable/out of order).

5.1.2.1 Usage

A summary of the key findings from the surveys is presented below:

How often do you use the Swavesey Transport Facilities?

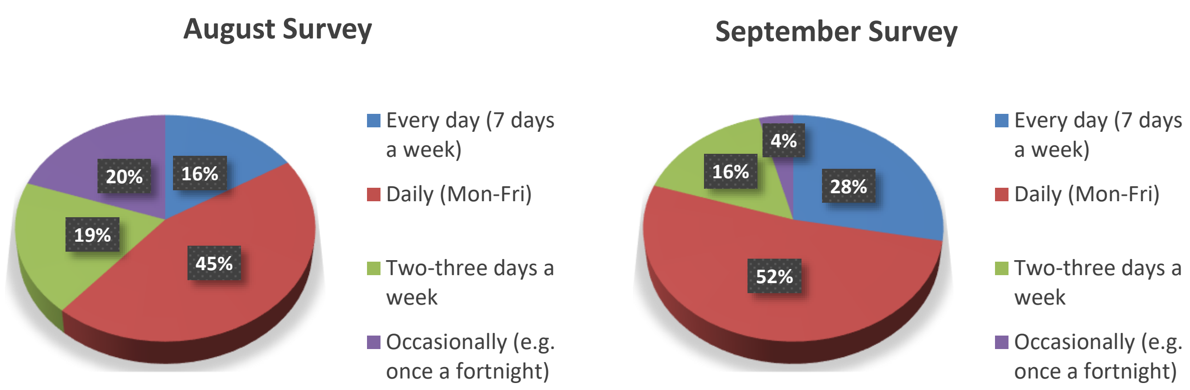

Chart 5.1 – Frequency of use (Bus Stop)

Chart 5.1 indicates that the majority of users travel on a daily basis during the week. The number of 'occasional' users is increased during the school holiday period (August), whereas there is an increased number of daily users (both 7-days and Monday-Friday) during the term-time (September) survey. This is likely to be due to the increased number of students and commuters.

Do you use the Swavesey car park to access the Guided Busway stop?

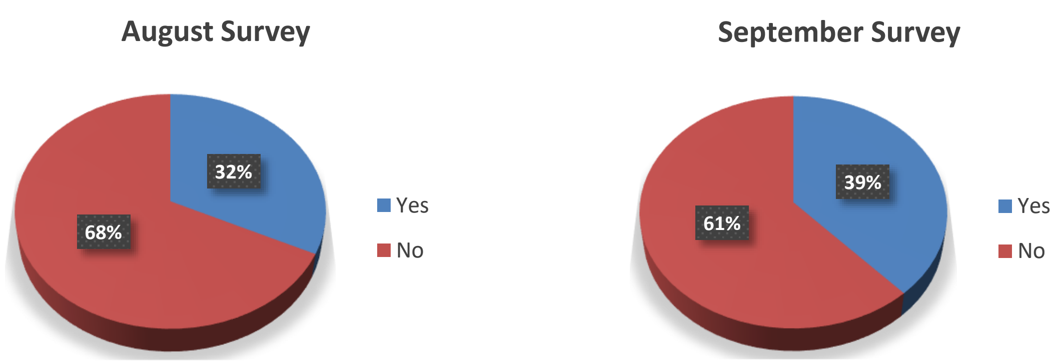

Chart 5.2 – Car park usage

Chart 5.2 shows that marginally over one-third of those surveyed use the nearby parking facility to either park their vehicle or be dropped off at the designated set-down area (broadly similar results observed for both August and September surveys). During the September survey it was observed the vast majority of car park users (91%) were travelling on the inbound service to Cambridge.

One vehicle was present in the car park at the start of the September survey (06.00am) indicating that, on the day of the survey, overnight parking did not appear to be an issue. The car parked overnight left the car park at 08.30am and was driven by a user who alighted from the outbound service (to St Ives). No vehicles were observed in the car park at the start of the August survey.

During the September survey, the car park reached its capacity at 09.45am, a further 2 vehicles mounted the kerb within the extents of the car park and parked on the grass verge, making the total number of vehicles

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within the car park 42 (including 1no. occupied disabled space). Beyond this multiple cars accessed the car park, but left due to a lack of suitable spaces. One user parked their car on the south-east verge opposite St Andrews Church, before making their way to the Busway stop. Another user was observed parking on the west side of and to the north of the busway. A number of users were dropped off in the bell-mouth of the MG Owners Club access road, rather than at the designated drop-off facility. During the August survey, the car park never reached full capacity within the survey period.

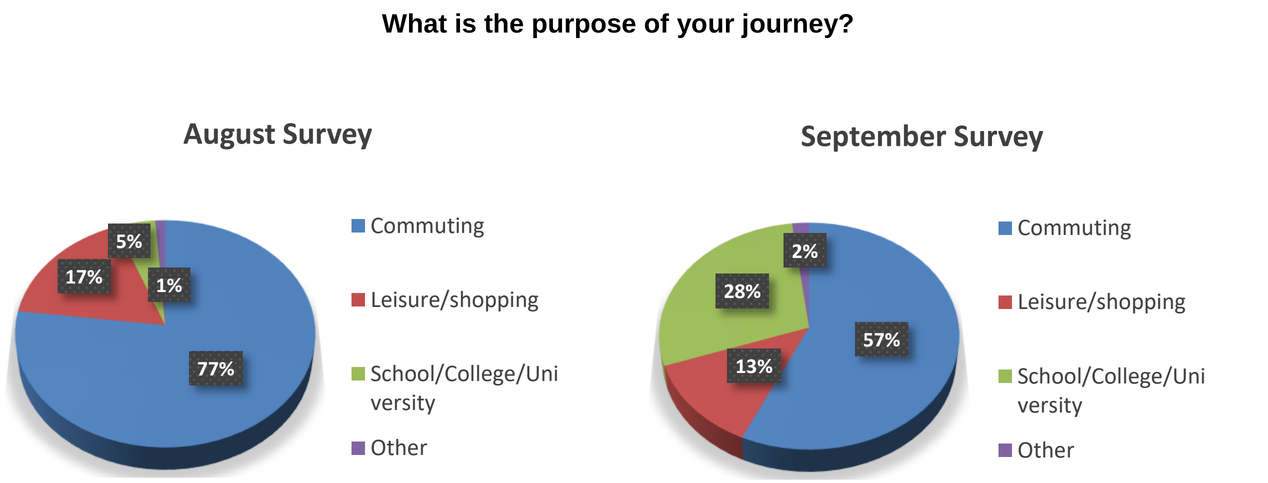

Chart 5.3 – Purpose of journey

Chart 5.3 shows that over half of those surveyed use the Swavesey Busway Stop for commuting to work (57%) during the September survey (compared with 77% recorded during August), with the majority of commuters arriving before 08.30am. A further 28% of users were travelling to educational establishments during term time (compared with 5% during the holiday period). Those accessing the facility for leisure remained broadly constant over the two surveys and tended to arrive later in the morning and many used concessionary passes that were valid after 09.30am.

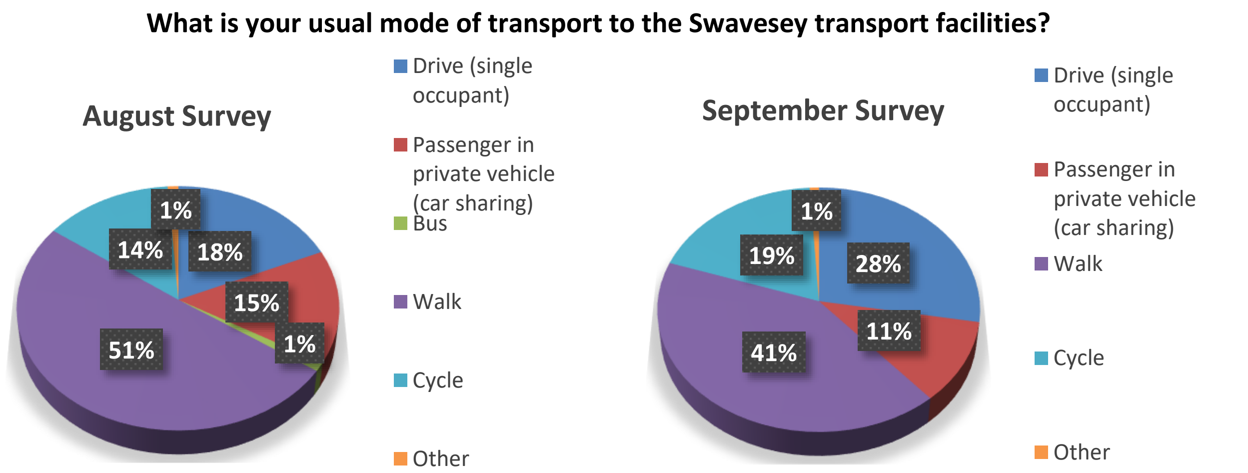

Chart 5.4 – Mode of transport to the hub

Chart 5.4 indicates the most popular method of travel to the hub is on foot during both surveys (51% of users walking in August compared with 41% during September). During term-time (September survey) just over one quarter (28%) used the car parking facility, with 11% of users being dropped-off (accounting for the 39% car park / drop-off point usage noted in Chart 5.2). There was a slight increase in the number users accessing the site by cycle in September, 19%, compared to 14% during in August. In September more single occupant vehicles were recorded using the car park, 28% compared to 18% in August.

Where was the start of your journey?

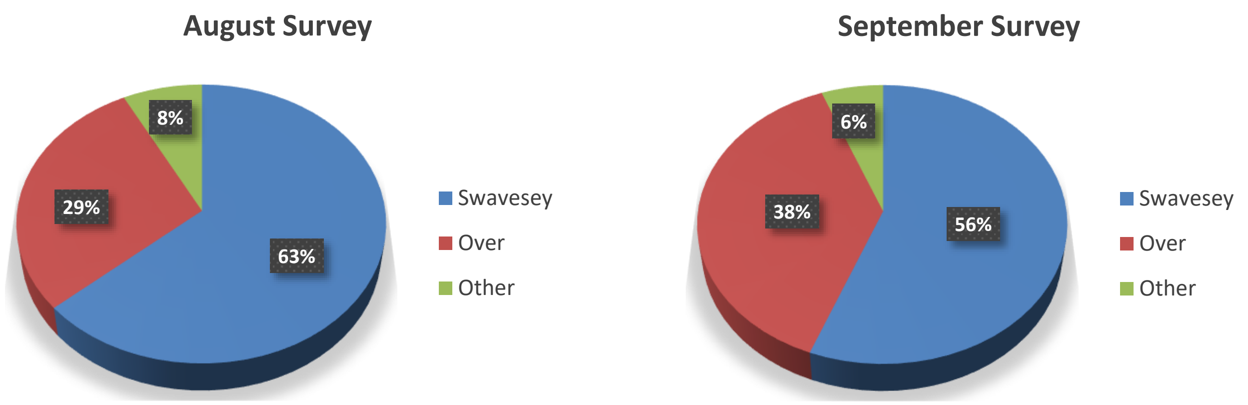

Chart 5.5 – Journey origin

Chart 5.5 shows the vast majority of users were local residents of Swavesey and Over (92% August, 94% September). The number of users walking and cycling to the facility (shown in Chart 5.4) also suggests a predominantly local use. The combined population of Swavesey & Over is 5,325 (2011 census) which gives an indication of the population that a similar sized hub could potentially serve.

Overall how would you rate the Swavesey transport facilities?

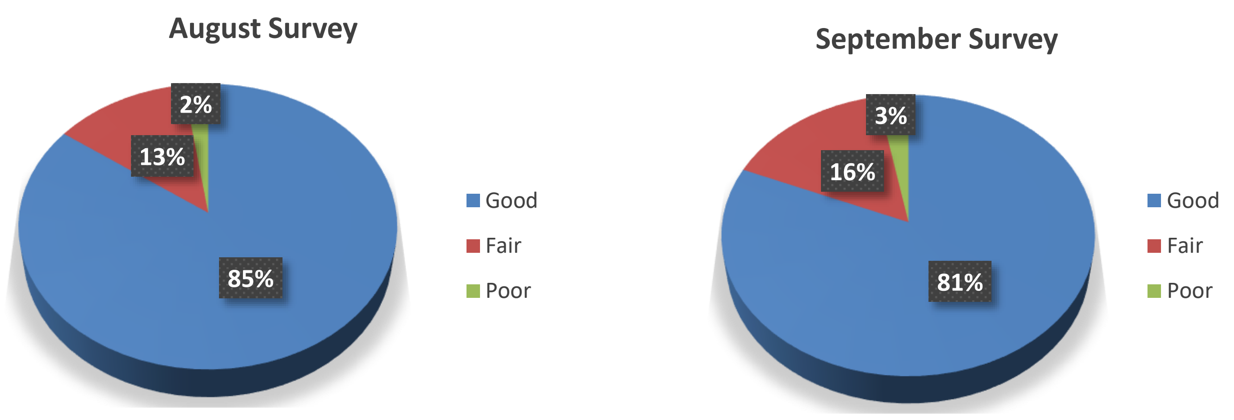

Chart 5.6 – User opinion

Chart 5.6 shows the vast majority of respondents rate the facility as being ‘Good’ (on a ‘Good, Fair, Poor’ scale) demonstrating a generally positive view of the facility among those who use it, with results being consistent in both surveys.

6.0 Benefits & Dis-benefits of Rural Travel Hubs

As with any proposed infrastructure development, the notion of designated Travel Hubs to enhance connectivity between rural outer-lying parishes and Cambridge has a number of benefits. However, conversely there are also a number of potential dis-benefits that should be considered. These are discussed within the subsequent sections:

6.1 Benefits

The benefits associated with the installation of a Rural Travel Hub facility are presented below:

6.1.1 Congestion Reduction

One of the main objectives and indeed benefits of a Rural Travel Hub is the reduction of private vehicular traffic in and around Cambridge. The provision of a Rural Travel Hub Facility will enable commuters to travel into Cambridge using public transport and/or cycleways, thereby reducing the total number of private vehicles and easing congestion in and around the city. The success of the two pilot sites will need a measure to determine the hubs' ability to reduce traffic and provide the residents of rural South Cambridgeshire with access to provisions for sustainable travel into Cambridge.

6.1.2 Environmental Benefits

A reduction in the volume of traffic in Cambridge will have a positive impact in terms of air pollution and reducing the overall carbon emissions in these more central areas. Additionally, there would also be an opportunity to promote more sustainable travel if facilities such as charging points for electric vehicles were provided at the Hubs.

6.1.3 Public Health Benefits

In addition to the reduction in private/single occupancy vehicles and congestion, the provision of strategically located Rural Travel Hubs can have a positive benefit on public health. Such hubs could enable people to either walk or cycle to a designated point from which they could use public transport to reach the city centre.

6.1.4 Public Perception

The implementation of Rural Travel Hubs may act to heighten awareness of the public transport systems in and around Cambridge. The connectivity between more rural communities and the mainstream transport corridors can offer a degree of inclusion for areas previously isolated from the public transport network.

6.1.5 Economic

By connecting the rural communities of South Cambridgeshire to Cambridge, the employment and educational opportunities available to those living in rural areas will be improved.

The hub offers an opportunity for car users to park their vehicles and then access the city centre using existing bus or train services and/or cycleways as well as other sustainable travel modes. In addition to reducing congestion, by leaving vehicles at the Rural Travel Hub, there can be a financial benefit to motorists when considering additional fuel and parking charges within Cambridge (as it is intended that car parking at the hub sites will be free). This would be a factor in making the Rural Travel Hub a more attractive and appealing option to some commuters.

6.1.6 Outreach Activities

Rural Travel Hubs may provide inclusion to areas which may otherwise appear isolated. Hubs could be a focal point not only for a community's transportation needs, but also be pivotal in terms of outreach activities. For example, the facility may offer suitable location and amenities for cycle proficiency training, neighbourhood policing, mobile library, mobile health screening, blood donation, recycling point, Community Playbus and act as a convenient meeting point for cyclists and ramblers.

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6.1.7 Transport Connections

Rural Travel Hubs could provide a vital link in the improved connectivity of communities of South Cambridgeshire with the wider County infrastructure network. Examples could include Demand Responsive Travel, Community Transport and the potential development of shuttle buses to and from the Hubs. The addition of such services in rural settings can open the door for wider accessibility to the district's other transport links which make the county and city of Cambridge a more inclusive area to live and work.

6.2 Dis-benefits

The potential dis-benefits associated with the installation of a Rural Travel Hub facility are presented below:

6.2.1 Environmental Intrusion

The location of the Rural Travel Hub is a critical consideration. They should ideally be located in an accessible area to the rural parishes they serve in order to provide connectivity to the city and other transport links within the county. However, many areas in South Cambridgeshire are likely to be considered 'Green Belt' or the open countryside and therefore potential development may be met with local opposition from the communities it is intended to serve. Consideration therefore should focus on 'Brownfield' (previously developed) sites in the first instance. The location of the Rural Travel Hub must both fit the needs of the local community but not be visually intrusive. They will also need to address planning policy requirements including Green Belt.

6.2.2 Local Traffic Congestion

A key objective of the Rural Travel Hub concept is to ease congestion in Cambridge by encouraging the use of more sustainable travel. The installation of such a hub may potentially result in a localised increase in traffic movements at the proposed sites. Whilst the level of localised congestion in the vicinity of the Hubs is anticipated to be relatively low due to their modest size, there is potential that the travelling public from outside the immediate locality may converge on the new sites. However, as established in the Swavesey case study, it is envisaged that the facilities will be mainly used by local residents, who would otherwise be travelling by private vehicle to their destination, such that any net gain in traffic volumes is likely to be minimal.

6.2.3 Maintenance

There will be a requirement to maintain the Rural Travel Hub throughout its design life. The cost associated with this ongoing maintenance regime will depend largely on the size of the hub and what facilities and amenities are provided. The design of the Rural Travel Hubs will be done in a way as to minimise the maintenance of the sites as much as possible. There is likely to be some level of maintenance required however, and this will be detailed in further stages of the project.

6.2.4 Effectiveness

The effectiveness of Rural Travel Hubs in reducing vehicle congestion in Cambridge is dependent on the number of people using them. Due to their relatively small size, it could be argued that their impact could be negligible in achieving this objective.

Where the hub sites are located close to existing chargeable parking facilities (e.g. Whittlesford Railway Station) there is the potential for the hub car parks to quickly reach capacity, with car users electing to use the free facility.

It cannot be assumed all hub users will be heading into Cambridge. It is likely the hub sites will also be used by commuters heading to other destinations. This will inhibit the effectiveness of the sites in terms of reducing the number of car journeys into Cambridge.

6.2.5 Improper / Anti-social Use

Whilst a Rural Travel Hub could represent a suitable focal point for community activities (e.g. suitable meeting place for cyclists and ramblers as identified in Section 6.1.6), it could also attract less desirable anti-social behaviour or improper use. This may be a source of opposition to the implementation of such hubs.

6.2.6 Capacity of the existing Public Transport Network

Potential users may not use hubs that are located alongside busy public transport corridors that operate at capacity at peak times because they might not be able to find a seat or even board the service. Additional services to enhance capacity may be required at certain locations to encourage use of the hubs.

6.3 Overall Benefit to Dis-benefits (outline BCR)

When looked at as a whole, the potential expected benefits of providing Travel Hubs in Rural South Cambridgeshire outweigh the dis-benefits as it is considered that the dis-benefits can be suitably mitigated against.

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7.0 Baseline Transport & Socio-economic Impact Review

This section summarises general demographics, transport behaviours and socio-economic characteristics for the South Cambridgeshire District, based on the data captured during the 2011 Census for England & Wales. Data is also presented for the wider Cambridgeshire area, the East of England region and the overall statistics for England & Wales as a whole, enabling direct comparison between district, county, geographic region & national level.

7.1 Demographics and Socio-Economic Characteristics

7.1.1 General Demographics

South Cambridgeshire District has a total population of 148,755 according to the 2011 England and Wales Census. In the context of Cambridgeshire as a whole this represents just under one quarter (23.9%) of the total population (621,210). South Cambridgeshire District comprises of 34 electoral wards. It completely surrounds the city of Cambridge, which is administered separately from the district by Cambridge City Council.

The table below, Table 7.1.1, shows typical demographic indicators for each designation.

Census Output Area	Population (2011)	Households	Average persons per household	Median Age	Mean Age
South Cambridgeshire District	148,755	59,960	2.4	41.0	40.1
Cambridgeshire	621,210	251,241	2.4	39.0	39.5
East of England	5,846,965	2,423,035	2.4	40.0	40.2
England & Wales	56,075,912	23,366,044	2.4	39.4	39.7

Table 7.1.1 – General demographic indicators

Source: 2011 Census Data (England & Wales) – Tables KS101EW, KS105EW, KS403EW & KS102EW

From Table 7.1.1 it can be seen that the South Cambridgeshire District exhibits the same average number of persons per household as Cambridgeshire, East of England and indeed England & Wales as a whole. The median age of South Cambridgeshire residents is higher than that for Cambridgeshire, East of England and England & Wales. Similarly, the mean age of those living in South Cambridgeshire is higher than the corresponding mean age for Cambridgeshire and England & Wales as a whole, but is marginally lower than that for the East region.

7.1.2 Employment

The following Table 7.1.2 summarises economic activity within the South Cambridgeshire District and compares this directly with data for the wider county of Cambridge, the East of England and England & Wales as a whole.

Census Output Area	Economically Active - Working (Aged 16-74)	Employed		Self Employed	Unemployed	Full Time Student
		Part Time	Full Time	FT & PT		
South Cambridgeshire District	74,393	12,877	47,627	16%	3.95%	2.56%
Cambridgeshire	315,206	61,668	196,182	14%	5.14%	3.90%
East of England	2,650,835	592,403	1,524,201	16%	7.13%	3.83%
England & Wales	26,414,207	5,634,988	15,733,446	15%	8.09%	4.06%

Table 7.1.2 – General demographic indicators

Source: 2011 Census Data (England & Wales) – Tables WP601EW & DC6107EW

South Cambridgeshire has a higher rate of employment than both the East of England region (79.85%) and England & Wales average (80.90%) with 81.33% of all economically active residents of South Cambridgeshire in some form of employment. The rate of employment is marginally less than that for Cambridgeshire (81.80%). Unemployment levels are relatively low in South Cambridgeshire at 3.95% which compares favourably to Cambridgeshire (5.14%), East of England (7.13%) and overall England & Wales figures of 8.09%.

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7.2 Existing Travel Behaviour

7.2.1 Method of Travel to Work

The 2011 census data was interrogated to establish peoples' method of travel to work. The table below compares residents' primary mode of transport to their place of work.

Census Output Area	METHOD OF TRAVEL TO WORK / STUDY - TOTAL (%)												
	All categories: Method of travel to work	Work mainly at or from home	Underground, metro, light rail, tram	Train	Bus, minibus or coach	Taxi	Motorcycle, scooter or moped	Driving a car or van	Passenger in a car or van	Bicycle	On foot	Other method	Not in employment (not travelling)
South Cambs District	107,779	5.7%	0.1%	2.7%	3.2%	0.1%	0.7%	46.9%	2.9%	5.8%	4.9%	0.4%	26.6%
Cambridgeshire	461,380	4.5%	0.1%	2.6%	2.4%	0.2%	0.5%	41.4%	3.1%	6.6%	6.6%	0.4%	31.5%
East of England	4,245,544	3.8%	0.8%	4.8%	2.5%	0.3%	0.5%	41.4%	3.4%	2.4%	6.8%	0.4%	32.9%
England & Wales	41,126,540	3.5%	2.5%	3.3%	4.7%	0.3%	0.5%	37.1%	3.3%	1.9%	6.9%	0.4%	35.5%

Table 7.2.1 – Primary method of travel to work (Age 16-74)

Source: 2011 Census Data (England & Wales) – Table QS701EW

Table 7.2.1 shows that the number of residents travelling to work by car/van in South Cambridgeshire (46.9%) is higher than that for Cambridgeshire as a whole and the East region (both 41.4%) and significantly higher than the total percentage for England & Wales (37.1%). The number of people travelling to work by bicycle in South Cambridgeshire (5.8%), whilst lower than Cambridgeshire as a whole (6.6%), is significantly higher than the corresponding proportions for the East of England (2.4%) and England & Wales (1.9%).

7.2.2 Motorised vehicle movements on key radials

The Traffic Monitoring Report is a collation of data taken from various locations throughout Cambridgeshire and is summarised in a single report produced once a year. Appendix J shows data taken from some of the radial cordon sites surrounding Cambridge. These cordon site are Babraham Road, Shelford Road, Hauxton Road, Barton Rd, Madingley Rd, Huntingdon Road, Girton Road, Histon Road, Busway North and Milton Road. This data is able to provide information on traffic flows for a 12hr period between 7am-7pm.

As Appendix J shows, there is potential for Rural Travel Hubs to remove some of the traffic on these radials. It is important to note that the Rural Travel Hub concept is intended to provide those living in rural communities the ability to access sustainable modes of travel into Cambridge and is not solely focussed on reducing commuter numbers.

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7.2.3 Car ownership

The following Table 7.2.2 shows the proportion of households with access to a car or van

Census Output Area	Percentage of Households with Access to a Car or Van
South Cambridgeshire District	89.0%
Cambridgeshire	82.6%
East of England	81.5%
England & Wales	74.4%

Table 7.2.2 – Percentage of households with access to a car or van

Source: 2011 Census Data (England & Wales) – Table KS404EW

The proportion of households with access to a car or van in South Cambridgeshire (89.0%) is significantly higher than that for the Cambridgeshire area as a whole (82.6%), the East of England (81.5%) and the overall figure for England & Wales (74.4%).

7.2.4 Distance travelled to place of work

Table 7.2.3 shows the average distances travelled to work for residents of the South Cambridgeshire District, Cambridgeshire, East of England and England & Wales

	DISTANCE TRAVELLED TO WORK - TOTAL (%)										
Census Output Area	Less than 2km	2km to less than 5km	5km to less than 10km	10km to less than 20km	20km to less than 30km	30km to less than 40km	40km to less than 60km	60km and over	Work mainly at or from home	Other	Average distance (km)
South Cambs District	9.5%	11.9%	20.5%	21.7%	5.7%	2.3%	2.7%	5.4%	13.2%	7.1%	17.4
Cambridgeshire	16.3%	14.6%	13.2%	16.6%	8.5%	3.2%	2.6%	5.8%	11.8%	7.4%	18.1
East of England	16.5%	15.4%	12.7%	14.8%	8.4%	4.5%	4.4%	3.7%	10.7%	8.9%	17.3
England & Wales	16.6%	18.3%	17.3%	15.3%	5.8%	2.6%	2.3%	3.1%	10.3%	8.4%	15.3

Table 7.2.3 – Distance travelled to work

Source: 2011 Census Data (England & Wales) – Table QS702EW

The majority (54.1%) of South Cambridgeshire residents travel between 2km and 20km to their place of work. This is higher than the overall figure for Cambridgeshire (44.4%), the East of England (42.9%) and England & Wales (50.9%). The average distance travelled to work for those in South Cambridgeshire (17.4km) is marginally less than that for Cambridgeshire as a whole (18.1km), broadly similar to East of England average (17.3km), but more than the average for England & Wales (15.3km).

7.2.5 Location of Place of Work

Based on the 2011 census data, and using the *DataShine Commute* online tool, it is possible to determine origin-destination information for those commuting to work. In terms of the Rural Travel Hub project the number of persons travelling into Cambridge is of particular interest. As such those who work from home, work within the same Super Output Area (SOA), have no fixed place of work or work outside of the UK have been excluded from the summary. For each hub location a percentage has been derived which indicates the number of people whose work is based outside the hub SOA and travel into Cambridge from the given location. This information is presented in Table 7.2.4 below.

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Hub Location	Nearest Super Output Area (SOA)	Percentage Travelling to Cambridge SOA	Selected Other
Oakington	SC 003 Swavesey, Longstanton, Cottenham	47%	Milton SOA (6%)
Linton	SC 016 Linton	41%	Duxford SOA (10%)
Shepreth	SC 018 Fowlmere and Foxton, Melbourn, Meldreth	30%	London SOA (5%)
Swavesey	SC 003 Swavesey, Longstanton, Cottenham	47%	Milton SOA (6%)
Foxton	SC 018 Fowlmere and Foxton, Melbourn, Meldreth	30%	London SOA (5%)
Meldreth	SC 018 Fowlmere and Foxton, Melbourn, Meldreth	30%	London SOA (5%)
Whittlesford	SC 017 Duxford, The Abingtons, Whittlesford	45%	London SOA (6%)
Sawston	SC 015 Sawston	47%	Duxford SOA (19%)
Comberton	SC010 Caldecote, Comberton, Hardwick, Haslingfield and The Eversheds	54%	Milton SOA (6%)
Cambourne	SC 020 Bourn	45%	Milton SOA (6%)

Table 7.2.4 – Work Destination from Hub Location

Source: 2011 Census Data (England & Wales)

In all cases, Cambridge represented the most popular single destination from each of the hub locations. This shows that, as may be expected, a significant number of people living in the vicinity of the potential hub sites work in Cambridge, and as a result of this make journeys into Cambridge on a regular basis.

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8.0 Services, Infrastructure & Facility Requirements

The services, infrastructure and facilities provided at each hub site will differ, with each hub being bespoke and individually designed and tailored to the community it serves and the available transport links. Below are some examples of the sort of facilities & amenities that could be offered.

8.1 Cycling

Cycling represents a transport mode which could be used both to and from a hub location. For example, users could travel to the hub on their cycles and then continue their onward journey by another transport mode, say, bus or rail – leaving their cycle at the hub. Alternatively, as in the case of a designated ‘park & cycle’ scheme, users may travel to the hub facility by car, bus etc. before continuing their onward travel by cycle.

8.1.1 Cycle Storage Facilities

Where cycles are left or stored at hub sites, there is obviously the requirement for designated and secure storage facilities. Such facilities will act to encourage cyclists to use the hub and provide confidence that their cycles will be adequately protected from theft and/or vandalism.

8.1.2 Secure Cycle Lockers

Cycle lockers provides a storage solution that offer enhanced security compared with traditional cycle storage facilities, such as cycle stands. Use of the fully enclosed and lockable unit is generally chargeable on a monthly basis for a small sum and offers robust protection for cycles. The units come in a variety of sizes to accommodate single or double occupancy. Where secure cycle lockers are provided, due consideration will need to be given to the costs associated with the administration, management and maintenance of the units. It is envisaged that these costs would be covered by the revenue generated from the secure cycle lockers.

8.1.3 Covered Cycle Stands

Covered cycle stands provide protection for cycles against inclement weather. Some users may be reluctant to use their cycle if only uncovered storage provision is made.

8.2 Pedestrian/Cycle Links

Non-motorised user links between transport modes require consideration – i.e. how pedestrians and cyclists move between the hub and the desired transport mode. Footways/Cycleways should be provided which link to existing non-motorised user routes to provide continuous connectivity. Where hub sites are located close to the proposed Greenway routes there may be the opportunity for access improvements to be delivered as part of Greenways project.

Pedestrian routes to and from car parks with bays for disabled people should be free from steps, bollards and steep slopes which many disabled people find difficult to negotiate.

8.3 Car Parking

Car parking facilities are required for those users travelling to hub site by private vehicle. Facilities could also be incorporated to cater for users to be dropped off at the hub site.

8.3.1 Size

The size of the car park will be determined by the level of envisaged use and will be established through community engagement. Whilst the number of spaces is not set, it is anticipated that these will be ‘modest’ in size and aimed predominantly for local use by those residents travelling from nearby parishes.

Due to the predicted population growth within South Cambridgeshire it may be appropriate to acquire additional land to facilitate future expansion of the hub. Hubs would only be extended where there is sufficient demand and following local consultation. Planning considerations would also need to be taken into account.

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8.3.2 Access

Suitable vehicular access to the car park should be afforded from the existing highway. This could comprise an 'In/Out' arrangement or a more conventional junction. A number of considerations are required, including; visibility splay, designated lanes and swept-path analysis for larger vehicle movements. Access must also be provided for non-motorised users and pedestrian traffic in the form of footways to connect the car parks to the existing pedestrian routes and/or other facilities (bus stop / rail station). Some minor improvement works may be required to the existing highway to accommodate the accessibility arrangement.

8.3.3 Height Barriers

Access control measures can be achieved by the implementation of vehicle height barriers. Such barriers would permit car & motorcycle access only and prohibit access for larger/commercial vehicles.

8.3.4 Disabled Parking Provision

Suitable parking spaces for disabled users must be provided. In accordance with the *Department for Transport's Traffic Advisory Leaflet 5/95 – Parking for Disabled People (1995)* it is recommended that, for car parks with a capacity up to 200 bays,3 bays or 6% of the total capacity (whichever is greater) should comprise of disabled bays. The location of the disabled bays needs to be considered. They should be ideally placed as close as possible to the main facility to be accessed (i.e. bus stop / rail station).

8.3.5 Signing

The parking facility should be suitably signed, although some parishes may prefer this to be understated in order not to attract large volumes of users from outside the immediate locality.

8.3.6 Drop-off/Pick-up Points

In addition to those leaving their private vehicles at the car park, provision should be allowed for a designated drop-off / set down area.

8.3.7 Landscaping

Due to the predominantly rural nature of the proposed hub locations it is important that aesthetics are considered at design stage. The car park should be visually attractive, not obtrusive and so a site-specific and sympathetic design approach is required. Natural screening from trees and shrubs could be incorporated to help the facility blend in to the surroundings. If so, it would be advisable that the species are native and correspond with the advice provided in South Cambridgeshire District Council's Landscape in New Developments SPD Adopted March 2010.

8.3.8 Charging

It is intended that car and cycle parking at the hub sites will be free of charge, although there will be a charge for cycle lockers.

8.3.9 Maintenance

It may be beneficial to provide litter bins at hub sites, however, this would likely incur cost and require a strategy for maintaining the collections. Therefore the requirement for litter bins needs to be discussed and agreed locally. Similarly the provision of grit bins could be considered and require similar consultation and agreement.

General maintenance responsibility for the hub site will need to be locally considered and agreed.

8.4 Public Transport

The hubs will be located close to existing public transport infrastructure or designated cycling routes. In some instances minor improvements may be required as detailed below.

8.4.1 Shelters

Shelters will be required with seated areas, allowing users to shelter from inclement weather and provide a degree of comfort.

8.4.2 Bus Stops

In some areas bus stops may require relocation, designated pull-in areas or even additional stops to be included within the given routes. As a result of any relocated/additional bus stops it may be necessary to revise bus timetable(s) to capture the new or relocated stop.

8.4.3 Real Time Information

Real time passenger information boards can be installed at bus stops to provide users with current information on service and assist with planning their journeys.

8.4.4 Ticketing

Automated ticket machines can be provided at hub facilities to enable users to purchase advanced tickets where the most probable mode of transport used would require one.

8.5 Lighting

New or additional road and footway lighting can have a major impact upon the character and appearance of an area. In rural locations high levels of night-time illumination are visually and environmentally undesirable, as is the impact of numerous lights and lighting columns. However, this has to be balanced against the advantages in terms of highway safety and personal security.

Low-level lighting may be preferable in car park areas to reduce the environmental impact. Part-night lighting and/or motion sensitive lighting could also be considered as a means of reducing the environmental impact.

Lighting schemes should be designed to limit obtrusive light using directional luminaires and light controlling attachments.

8.6 Technology (Smart Cambridge)

The Smart Cambridge initiative seeks to make travel easier, reduce congestion and explore intelligent mobility. The Rural Travel Hub facilities could assist with the promotion of this Smart Cambridge concept by providing better travel & transport information (e.g. real time displays) and making payment options easier for users (e.g. integrated ticketing machines).

8.7 Security

Security at the Hub locations is critical and the hub should be a safe and secure location for users and to park their cycles and cars. In addition to secure cycle lockers consideration should be given to closed-circuit television surveillance cameras to act as a deterrent. Furthermore, the location and layout of the Rural Travel Hubs needs to be considered to ensure it is not isolated or poorly overlooked preventing natural surveillance.

8.8 Materials

The rural nature of the hubs means it is important they are designed sympathetically, in keeping with their surroundings and using materials obtained from sustainable sources. Materials selection in terms of street furniture (e.g. shelters, litter bins, cycle stands, bollards etc.), paved surfaces and fencing, as well as landscaping, will be key in meeting this objective.

General considerations should include:

- Use of local materials wherever possible.
- Use of environmentally sustainable materials from a known source.
- Use of recycled materials from a known source.

- The weathering characteristics and life expectancy of the material.
- Ease of future maintenance and reinstatement.
- Availability of replacement materials.
- Keeping the number of signs to a minimum.

All materials, particularly with regard to paved surface specification, must provide a satisfactory level of safety, for example using textured paved surfaces to avoid slippery surfaces.

Sustainability issues must be properly addressed. This includes the whole life cost of the materials, the source, the distance they have to be transported and the method of delivery. Potential for re-use on site, recycling and methods of disposal have to be considered.

The flexibility around materials selection means that where a number of materials options are available, local consultation can be undertaken to aid selection of the most acceptable material.

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9.0 Potential Hub Locations

Ten hub locations have been identified and reviewed as part of the feasibility study. The location map shown in Appendix H shows the location of all the potential hub sites.

9.1 Oakington Guided Busway Stop

The parish of Oakington is located to the north-west of Cambridge, approximately 5 miles from the city centre with a direct footpath .

9.1.1 Location & Site Description

The proposed location of the Oakington Rural Travel Hub is adjacent to the Cambridgeshire guided busway route which runs generally north to south, bisecting the parishes of Oakington & Westwick (see Figure 9.1). A small parcel of agricultural land has been identified to the west of the guided busway, immediately south-west of the busways junction with Station Road. The site is accessible from Station Road which is a two-way single carriageway road, subject to a 30mph speed limit and is street-lit. A footway on the northern side of Station Road provides pedestrian access to the site from Oakington and Westwick. See Appendix A1 for existing site photographs.

Figure 9.1: Oakington Location Plan

9.1.2 Demographics

A Rural Travel Hub at Oakington would predominantly serve the parishes of Oakington & Westwick, Girton and Cottenham which had a combined population of 12,251 at the time of the 2011 Census.

9.1.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Oakington Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 8.4 miles and take approximately 25 minutes.

9.1.3.1 Guided Busway

The Oakington Busway Stop is served by Routes A (St. Ives to Cambridge), B (Peterborough to Cambridge), C (St. Ives to Cambridge) & N (Longstanton to Cambridge) which afford access to Cambridge, with services departing every 12 minutes. Routes A, C & N are 5.8 miles via the guided route with a typical journey time of 22 minutes. Route B is marginally more direct at 5.6 miles but takes fractionally longer (25 minutes) due to the nature of route taken. The cost of a return ticket from Oakington Busway Stop to the city centre is £4.30. However, Busway services can be busy at peak times, with limited capacity.

9.1.3.2 Bus (Citi 6 Service)

Oakington village is also served by the Citi 6 service (Cambridge to Oakington) which affords access to the city centre with a typical journey time of 27 minutes following a route that is 6 miles long with services departing every 30 minutes. The cost of a return ticket from Oakington village to the city centre is also £4.30.

9.1.3.3 Cycle

A designated cycle facility runs adjacent to the guided busway, which will form the future St. Ives Greenway. The most direct cycle route to the city centre is via a combination of the cycle track and the use of local roads and represents a journey distance of 5.1 miles and is anticipated to take 28 minutes. Cycle improvements are being considered between Oakington Village and the busway as part of the proposed St. Ives Greenway Project.

9.1.4 Facilities

The existing and proposed facilities are presented below:

9.1.4.1 Existing

The existing facilities at the Oakington Busway Stop include:

- Bus shelters.
- Real Time Information.
- 15 no. covered cycle stands.
- CCTV.
- Emergency help points.
- Service information signs.
- Street lighting at Busway Stop and on Station Road.

9.1.4.2 Proposed

The facilities proposed for the Rural Travel Hub at Oakington comprise:

- A car park with 41 spaces including 3 designated disabled bays to ensure the facility is accessible for all users. This will be similar to the facility at Swavesey.
- Additional secure cycle parking including cycle lockers. These could be located on the guided busway, dependent on planning and space constraints.
- Drop-off/pick-up facility.
- Street lighting within the car park – requirements/specification to be agreed locally.
- Bus turn around/stop to allow the Citi 6 service to be extended up to the busway stop, including a shelter and raised 'bus boarder' kerbs. Local services including Demand Responsive Transport, Community Transport and future shuttle buses would also be able to utilise this facility.
- Widening of the existing footway between Oakington Village and the busway to improve pedestrian safety and accessibility.

9.1.5 Availability of Land & Planning Considerations

The small parcel of agricultural land that lines the western side of the Busway offers a potential location for the Rural Travel Hub car park. Initial Land Registry enquiries indicate the Title Absolute on the Proprietorship Register is listed as Cambridgeshire County Council.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is within Flood Zone 3, meaning that there is a high probability of flooding. A flood risk assessment must be carried out prior to any development.

- The proposed site is outside of the village framework and therefore falls within the countryside.
    - The site located on land classified as **Green Belt.** Strong justification for this site will be required in order for this site to be considered. NPPF Paragraph 90 - Certain other forms of development are also not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict with the purposes of including land in Green Belt. These include *local transport infrastructure which can demonstrate a requirement for a Green Belt location*
- *Sufficient information will need to identify why a Green Belt location has been chosen, and whether impact on openness and green belt purposes have been considered. Unless these tests are met, the development would be considered inappropriate development, and very special circumstances would need to be demonstrated.*
- A Conservation Area is located to the eastern edge of the guided busway, but the proposed site is not within it.
- *Westwick Hall is a grade II listed building in close proximity to the site, heritage impact upon the setting of the listed building will need to be considered and assessed. The SCDC Historic Buildings Officer recommends that careful consideration is given to the design of a Rural Travel Hub at this site to mitigate any significant harm to the Listed Building or Conservation Area.*
- The layout and access of the proposed rural hub would need to be developed further, due to the potential for conflict between buses turning & vehicles / NMUs accessing site and the lack of safe access for pedestrian and cyclists. The proximity of the proposed vehicular access to the Guided Busway was also raised as a concern. This is something that could be addressed through a pre-application and preliminary design stage.

9.1.6 Access & Conceptual Layout

Conceptual layouts for the proposed hub site can be found in Appendix B1. Two options have been developed. Option A includes a car park, bus turn around and cycle storage facility. A second option (Option B), excluding the bus turn around has also been developed which may be more economically viable and less visually intrusive, due to less extensive construction being required.

Vehicular access to the hub site would be constructed at the location of the existing maintenance hard standing on Station Road with a separate in/out arrangement. Minor vegetation clearance will be required to ensure adequate visibility splays are provided at the new access. It is encouraged that any new vegetation is replaced by native species.

It is advised that minimal tarmac be introduced to the front of the site, as identified on the conceptual drawing to mitigate any impact upon the rural character of the area.

The existing signal controlled pedestrian crossing on Station Road to the west of the busway facilitates pedestrian movements to the proposed hub site and the existing busway stops. However, the narrow footway (approximately 1m wide) linking Oakington village to the Busway requires widening to improve access to the site, particularly for wheel chair users and those pushing prams. Consideration will need to be given to a ditch that runs adjacent to the existing footway. Potential widening will require suitable piping or local diversion.

Cycle improvements are being considered between Oakington Village and the busway as part of the proposed St. Ives Greenway Project. This would improve cycle access to the busway cycle route and may encourage increased cycle usage.

Consideration will need to be given to the layout and location of various transport modes within the site. For example, cyclists should not have to ride across motorised access or through the site to access the cycle lockers. Nor should they have to ride across pedestrian access to the bus stops. This would ensure cyclists and pedestrian safety.

9.1.7 Oakington Site Summary

There is currently no parking facility at the Oakington guided busway stop. Providing a car park would follow the Swavesey model, allowing access to those in the locality who are unable to walk or cycle to the stop. The small size of the proposed car park means the impact on traffic levels locally would be minimal. The car park may also result in a reduction in the number of motorists who currently park on-street in the village to access the busway as they will have a designated facility, improving the flow of traffic through the village.

The guided busway offers frequent services into Cambridge with bus journey times being comparable to journeys made by car. The reasonable cost of a return ticket (£4.30) is an advantage, particularly if users who would otherwise drive have to pay city centre parking charges. The busway services can be busy at peak times, with limited capacity. Oakington is one of the last stops before reaching Cambridge and users may be deterred if they cannot find a seat or even board the service. Additional services will need to be considered.

The close proximity of the site to Cambridge means, as found at Swavesey, the majority of users are likely to travel to and from Cambridge, with those living on the western side of the village most likely to use the proposed car park facility.

The provision of secure cycle lockers will encourage more people to cycle to or from the busway stop, who as at observed at Swavesey, may be currently deterred by cycle theft and vandalism.

The provision of a bus turn around would improve connectivity between the Citi 6 service and the guided busway services. This improved arrangement could be utilised for Demand Responsive Transport, Community Transport and facilitate the development of future shuttle buses between villages. However, the high cost associated with this improvement means further investigation and consultation is required to ascertain whether the potential benefits justifies the increased cost.

Widening the footway between Oakington Village and the busway stop would improve pedestrian safety and accessibility when walking to the site, particularly for wheelchair users and those pushing prams. Such improvements are also being considered within the scope of the proposed St. Ives Greenway project.

In regards to planning there are also numerous constraints adjacent to or on the site, such as the Green Belt, Listed Building and Conservation Area. As such, the Rural Travel Hub would need to give particular consideration to these matters.

Cambridgeshire County Council are the proprietor of the land identified for the hub site. This is likely to assist with land acquisition and aid delivery.

9.2 Linton

The parish of Linton is located to the south-east of Cambridge, approximately 10.5 miles from the city centre (direct path).

9.2.1 Location & Site Description

The proposed location of the Linton Rural Travel Hub is on Bartlow Road, to the east of Linton village centre, adjacent to the existing Bus Route No. 13 bus stops located close to The Ridgeway (see Figure 9.2). Bartlow Road is a single two-way carriageway, subject to a 30mph speed limit and is street-lit. A footway runs along the southern side of the road providing pedestrian access to the site from the village centre and the A1307. A small parcel of land has been identified to the west of Bartlow Roads junction with the A1307. See Appendix A2 for existing site photographs.

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Figure 9.2: Linton Location Plan

9.2.2 Demographics

A Rural Travel Hub at Linton would predominantly serve the parishes of Linton, Hadstock, Bartlow & Horseheath and Balsham which have a combined population of 6,558 at the time of the 2011 Census.

9.2.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Linton Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 11.7 miles and take roughly 33 minutes.

9.2.3.1 Bus

The Bartlow Road bus stops are served by Stagecoach Route 13, 13A & B (Cambridge to Haverhill) which afford access to Addenbrooke's Hospital and the city centre. These follow the A1307 along a route that is 11.4 miles long towards the city centre, with a journey typical time of 38-40 minutes. Services generally run every 30 minutes, with services increasing in frequency during morning peak times. The cost of a return Dayrider Plus ticket (purchased on-board) to the city centre is £6.70. Service improvements are likely to be delivered as part of the A1307 Three Campuses to Cambridge Project, speeding up journey times and making services more reliable.

9.2.3.2 Cycle

The most direct cycle route to the city centre is via the A1307, being approximately 11.2 miles in distance and is anticipated to take 58 minutes. There are no designated off-carriageway cycle facilities on the section of the A1307 between Linton and the Babraham Research Campus. Beyond the Babraham Research Campus a shared footway/cycleway follows the northern side of the A1307, affording cyclists access to Addenbrooke's Hospital and the city centre. It is likely that improved cycle infrastructure from Linton will be provided as part of the Greenways project and/or the A1307 Three Campuses to Cambridge Project.

9.2.4 Facilities

The existing and proposed facilities are presented below:

9.2.4.1 Existing

The only existing facilities close to the proposed hub site are the bus stops on Bartlow Road. These are marked with flag signs but no other facilities are provided for example hard standings, bus shelters or raised 'bus boarder' kerbs. Pedestrian access from the village and the A1307 to the bus stops is provided by a footway on the southern side of Bartlow Road.

9.2.4.2 Proposed

The facilities proposed for the Rural Travel Hub at Linton comprise:

- Car park with 41 spaces including 3 designated disabled bays.
- Drop-off/pick-up facility.
- Low level lighting within the car park – requirements/specification to be agreed locally.
- Bus stop improvements on Bartlow Road, including shelters, raised 'bus boarder' kerbs, hard-standings and Real Time Information signs.
- An uncontrolled pedestrian crossing on Bartlow Road to enable bus users to cross between the inbound and outbound bus stops.
- Secure cycle parking including cycle lockers.

9.2.5 Availability of Land & Planning Considerations

The small envelope of land identified appears to follow a previous alignment of Bartlow Road. Following initial Land Registry enquiries, no titles were found and further investigation is required. It may be that this area of land is considered to be Highway as located on an old alignment of Bartlow Road and appears to have been used previously as an area to store chippings for surface dressing operations.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within Flood Zone 1 classified area, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.
- The proposed site is outside of the village framework and therefore falls within the countryside.
- Due to its isolated location it may become an area for anti-social behaviour.
- The location of the proposed bus stops and pedestrian crossing on Bartlow Road may need to be revised/reviewed. This is something that could be addressed through a pre-application and at preliminary design stage.
- A key issue for this site is the relationship with developments recently permitted by the Council. North and South of Bartlow Road S/1963/15 was permitted in September 2017 for 55 dwellings. Developments were designed to include a landscape buffer between the sites and the A1307.

9.2.6 Access & Conceptual Layout

A conceptual layout showing the proposed hub car park, drop-off area and cycle storage facility is shown in Appendix B2.

Access to the proposed hub site will be directly off Bartlow Road. The access point would be constructed at the location of the existing field access/junction where the old alignment joins the new alignment of Bartlow Road. A separate in/out arrangement is proposed to allow an internal drop off area to be provided. Some vegetation clearance will be required to ensure visibility splays are adequate.

An uncontrolled pedestrian crossing will be required on Bartlow Road to enable bus users to cross between the inbound and outbound bus stops. The limits of the 30mph zones may need to be altered to accommodate the crossing and access at the proposed located.

9.2.7 Linton Site Summary

Providing a car park at the Linton Rural Travel Hub would allow access to Route 13 bus services for those in the locality who do not live directly on the bus route. The small size of the proposed car park (maximum 41 spaces) means the impact on traffic levels locally would be minimal. Many of the potential users are likely to travel from the parishes to the east of Linton, therefore the hub's location to the east of the village means it is unlikely to generate a significant increase in traffic in the village.

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Route 13 buses offer frequent services into Cambridge with bus journey times being approximately 5-8 minutes longer compared to journeys made by car. However, the relatively high cost of the return ticket (£8.00) may deter some potential users, unless ticketing costs can be reduced or subsidised in some way.

For keen cyclists parking and cycling to Cambridge may be attractive, with the provision of secure cycle lockers providing peace of mind if leaving their cycle on-site overnight. The high speed sections of the A1307 where no off-carriageway cycle currently exist may deter less confident cyclists. Cycle infrastructure improvements as part of the Greenways and/or A1307 projects are therefore important in the success of this site as a Park & Cycle facility.

Improvements to the existing bus stops on Bartlow Road will make them more accessible to users.

If it is confirmed that the land identified is considered Highway, this is likely to reduce costs associated with land acquisition.

A hub at this site could be delivered as part of the A1307 Three Campuses to Cambridge Project which aims to provide better bus, walking and cycling options for commuters along the A1307, linking communities and employment sites between Haverhill and Cambridge.

9.3 Shepreth Railway Station

The parish of Shepreth is located to the south-west of Cambridge, approximately 7.5 miles from the city centre (direct path).

9.3.1 Location & Site Description

The proposed location of the Shepreth Rural Travel Hub is at Shepreth railway station, located to the north of the village centre (see Figure 9.3). An area of land has been identified approximately 150 metres to the north of the railway station and is accessible from Barrington Road. Barrington Road is a single two-way carriageway, subject to a 30mph speed limit and is street-lit. See Appendix A3 for existing site photographs.

Figure 9.3: Shepreth Location Plan

9.3.2 Demographics

A Rural Travel Hub at Shepreth would predominantly serve the parishes of Shepreth, Barrington, Fowlmere and Orwell which have a combined population of 4,002 at the time of the 2011 Census.

9.3.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Shepreth Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 9.2 miles and take roughly 30 minutes.

9.3.3.1 Train

Shepreth railway station affords access to the city centre via the Great Northern Route (London Kings Cross to Kings Lynn), with a typical journey time of 33 minutes, including a 13 minute train ride to Cambridge Station and a 20 minute walk to the city centre. Rail services generally run hourly, although more frequent services are provided during the morning peak period. The cost of return travel is £5.00.

9.3.3.2 Bus

The city centre can be accessed by bus via Route 26 and the Trumpington Park & Ride from the bus stops. However, there are no buses starting from the village centre, with users having to walk 0.7 miles to the A10 to reach the nearest bus stop. The bus journey time is typically 60 minutes with an hourly service provided. The cost of a return Dayrider Plus ticket (purchased on-board covering both services) to the city centre is £6.70.

9.3.3.3 Cycle

The recently constructed off-carriageway cycle facilities alongside the A10 provide cycle access to the city centre. The A10 cycle route will form part of the Melbourn Greenway, therefore further improvements for cyclists are likely to follow. The route is approximately 8.8 miles in distance and is anticipated to take 42 minutes.

9.3.4 Facilities

The existing and proposed facilities are presented below:

9.3.4.1 Existing

The existing facilities at Shepreth railway station include:

- A small car park with 12 spaces (including 1 disabled bay).
- 24 cycle stands (15 uncovered and 9 covered).
- Shelters on the platforms for train users.
- Real Time Information on the train platforms.
- Bus stops on Barrington Road, outside the railway station.

9.3.4.2 Proposed

The facilities proposed for the Rural Travel Hub at Shepreth comprise:

- A car park with 51 spaces including 3 designated disabled bays.
- Drop-off/pick-up facility.
- Street lighting within the car park – requirements/specification to be agreed locally.
- Bus stops outside the main station building that could be used by Demand Responsive Travel, Community Transport and local shuttle buses.
- Secure cycle parking including additional covered cycle stands and cycle lockers at the main station building.
- Widening of the existing footway between the Railway Station and the proposed car park (a distance of approximately 150 metres) to ensure pedestrian safety and accessibility.

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9.3.5 Availability of Land & Planning Considerations

The area of land identified to the north of the Railway Station is an industrial site (believed to be the site of the old Rhee Valley Cement Works) and now appears to be used as a hard-standing area for material storage. Initial Land Registry enquiries appear to show that this land is owned privately and that development may be subject to restrictive covenants. Further investigation is required.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.
- The proposed site is outside of the village framework, and therefore falls within the countryside
- The planning history for the site is detailed below, demonstrating its use for industrial purposes:
    - S/0070/91/F - Use as coach park with ancillary storage – Approved
    - S/2430/89/F – Use for Class B2 (General Industrial)– Approved
    - S/0775/83/F - Change of use to coal stacking ground and store - Approved
- The use of a brownfield site is likely to make a proposal at this site more favourable than other greenfield locations in the vicinity.
- Tree Preservation Orders - several Elms forming a shelter belt are located in the vicinity of the site.
- SSSI Impact Risk Zone Area radius of SSSI L Moor, Shepreth,

9.3.6 Access & Conceptual Layout

A conceptual layout showing the proposed hub car park and drop-off area facility is shown in Appendix B3.

Access to the proposed hub site will be directly off Barrington Road. A separate in/out arrangement is proposed to allow an internal drop off area to be provided. Some vegetation clearance will be required to ensure visibility splays are adequate.

The existing footway between the Railway Station and the proposed car park would need to be widened for a distance of approximately 150m to ensure pedestrian safety and accessibility.

9.3.7 Shepreth Site Summary

A Rural Travel Hub at Shepreth Railway Station would provide increased parking provision, allowing more residents of the village and neighbouring parish's access to rail services into Cambridge.

The small size of the proposed car park means the impact on traffic levels locally would be minimal. Many of the potential users are likely to travel from the parishes to the north of Shepreth (i.e. Barrington and Orwell), therefore the hubs location to the north of the village means it is unlikely to generate a significant increase in traffic in the village centre.

The railway offers frequent services into Cambridge with journey times being comparable to journeys made by car. The railway also offers reasonably priced travel which is likely to be attractive to users.

Improvements to the cycle parking, including secure cycle lockers at the main station building will encourage more people to cycle to the station.

Travelling to Cambridge from Shepreth via bus is not a viable option due to the lack of services to/from the village centre. However, the provision of bus stops outside the station would mean the site could be serviced more easily by future Demand Responsive Transport, Community Transport and local shuttle buses to improve connectivity with Shepreth and surrounding parishes.

It cannot be assumed that all hub users will be heading into Cambridge. It is likely that the hub site will also be used by commuters heading to other destinations by train, including London. This will inhibit the effectiveness of the site in terms of reducing the number of car journeys into Cambridge.

Further investigation of the land identified for the hub car park is required to determine if it is suitable for development.

9.4 Swavesey Guided Busway Stop

The parish of Swavesey is located to the north-west of Cambridge, approximately 9 miles from the city centre (direct path).

9.4.1 Location & Site Description

The proposed location of the Swavesey Rural Travel Hub is adjacent to the Cambridgeshire guided busway route which runs west to east, bisecting the parishes of Swavesey and Over (see Figure 9.4). A small parcel of agricultural land has been identified to the south of the guided busway. The site is accessible from Station Road which is a two-way single carriageway road, subject to a 30mph speed limit and is street-lit. A shared use footway/cycleway on the western side of Station Road provides pedestrian/cycle access to the site from Swavesey and Over. See Appendix A4 for existing site photographs.

Figure 9.4: Swavesey Location Plan

9.4.2 Demographics

A Rural Travel Hub at Swavesey would predominantly serve the parishes of Swavesey and Over which have a combined population of 5,325 at the time of the 2011 Census.

9.4.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Swavesey Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 11.9 miles and take roughly 28 minutes.

9.4.3.1 Guided Busway

The Swavesey Busway Stop is served by Routes A (St. Ives to Cambridge), B (Peterborough to Cambridge) and C (St. Ives to Cambridge) which afford access to the city centre, with services departing every 12 minutes. The journey time is typically 28 minutes. The cost of a return ticket from the Swavesey Busway Stop to the city centre is £6.70. However, busway services can be busy at peak times, with limited capacity.

9.4.3.2 Bus (Citi 5)

Bus stops located on Station Road to the north of the Busway serve Citi 5 services (Cambridge to Fenstanton) which afford access to the city centre with a typical journey time of 60 minutes following a route that is approximately 14 miles long with services departing every 2 hours. The cost of a return Dayrider Plus ticket (purchased on-board) to the city centre is £6.70.

9.4.3.3 Cycle

A designated cycle facility runs adjacent to the guided busway, which will form the future St. Ives Greenway. The most direct cycle route to the city centre is via a combination of the cycle track and the use of local roads and represents a journey distance of 9.8 miles and is anticipated to take 50 minutes. Cycle access to the site from Swavesey and Over may be improved as part of the St. Ives Greenway Project.

9.4.4 Facilities

The existing and proposed facilities are presented below:

9.4.4.1 Existing

The existing facilities at the Swavesey Busway stop include:

- A car park with approximately 40 spaces (including 1 disabled bay).
- Drop-off/pick-up facility.
- 55 cycle stands (35 uncovered and 20 covered).
- Shelters at both inbound and outbound Busway stops.
- Real Time Information at both inbound and outbound Busway stops.
- Bus stops on Station Road, close to the existing Busway car park.
- CCTV at the Busway stops.
- Emergency Help points at the Busway stops.
- Busway ticketing machine.

9.4.4.2 Proposed

The proposed improvements to the existing facilities at Swavesey comprise:

- An additional car park to the south of the busway, with 35 spaces including 3 designated disabled bays. As detailed in Section 5.0, the existing car park is at capacity, with bus users parking on-street in the village when the car park is full.
- Low level lighting within the car park – requirements/specification to be agreed locally.
- Additional secure cycle parking including cycle lockers. As detailed in Section 5.0, the fear of cycle theft and/or vandalism may deter some users from cycling to/from the site.
- Drainage improvements and lighting at the existing car park located to the north of the Busway.

9.4.5 Availability of Land & Planning Considerations

A parcel of agricultural land is located to the south of the Busway, bounding its southern perimeter. This site would provide direct access to the Busway for car park users, with vehicular access being provided off Station Road. Following initial Land Registry enquiries, no titles were found therefore further investigation is required.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within a Flood Zone 3, meaning that there is a high probability of flooding. A flood risk assessment must be carried out prior to any development.
- The proposed site is outside of the village framework, and therefore located in the countryside
- A Conservation Area is located immediately west of the proposed site (which lies east of Station Road), The proposed location would be in close proximity to Church and Manor House, both Grade 1 Listed Buildings, and also located adjacent to Priory Earthworks Scheduled Monument.

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- The area proposed forms the entrance to the village, and these fields provide an open and rural setting. It is also located close to the grade 1 listed church and grade 1 manor house, with clear views between the church and this site, with potential for significant harm to the setting of heritage assets.

9.4.6 Access & Conceptual Layout

A conceptual layout showing the proposed additional car park and cycle storage facility is shown in Appendix B4.

Vehicular access to the hub site would be provided directly off Station Road with a simple T-junction arrangement. Station Road is subject to a 30mph speed limit and is street-lit. Vegetation clearance will be required to ensure adequate visibility splays are provided at the new access.

The shared use footway/cycleway along the western side of Station Road/Over Road provides off-carriageway cycle access for those heading to the site from both Swavesey and Over. The signal controlled pedestrian crossings on Station Road facilitate pedestrian movements to the busway stops.

9.4.7 Swavesey Site Summary

A scheme at Swavesey would look to improve and provide additional hub facilities (as detailed in Section 5.0), including increased car parking provision and improved/more secure cycle parking, allowing more residents of Swavesey and Over to access to the Guided Busway services into Cambridge.

Whilst the number of car park spaces at Swavesey would effectively double with the new car park, the local usage of the existing car park (as detailed in Section 5.0) means there is unlikely to be a significant increase in traffic within the locality, as these local users would otherwise be driving to alternative transport facilities (e.g. the Longstanton Park & Ride) or directly to their destination. The additional car park may also result in a reduction the number of motorists who currently park on-street in the village (when the car park is full) to access the busway as there will be more spaces available.

The guided busway offers frequent services into Cambridge with bus journey times being comparable to journeys made by car. However, the busway services can be busy at peak times, with limited capacity. Potential users may be deterred if they cannot find a seat or even board the service, therefore additional services will need to be considered.

The provision of secure cycle lockers will encourage more people to cycle to the busway stop, who as at observed at Swavesey, are currently deterred due to incidents of cycle theft and vandalism (as detailed in Section 5.0). The cycle lockers will also encourage people to park at the facility and cycle to Cambridge. Cycle access improvements from Swavesey and Over may also be delivered as part of the St. Ives Greenway Project.

The site is subject to a number of planning constraints which could make delivery of site in this location challenging in planning terms.

Following initial Land Registry enquiries, no titles were found therefore further investigation is required.

9.5 Foxton Railway Station

The parish of Foxton is located to the south-west of Cambridge, approximately 6.5 miles from the city centre (direct path).

9.5.1 Location & Site Description

The proposed location of the Foxton Rural Travel Hub is at Foxton railway station, which is located to the northwest of the village centre (see Figure 9.5). An area of land has been identified approximately 50 metres to the north the railway station and is accessible from the A10 Cambridge Road. The A10 is a single two-way carriageway, subject to a 50mph speed limit and is street-lit. See Appendix A5 for existing site photographs.

Figure 9.5: Foxton Location Plan

9.5.2 Demographics

A Rural Travel Hub at Foxton would predominantly serve the parishes of Foxton, Barrington, Fowlmere and Thriplow, which have a combined population of 4,595 at the time of the 2011 Census.

9.5.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Foxton Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 7.6 miles and take approximately 22 minutes.

9.5.3.1 Train

Foxton railway station affords access to the city centre via the Great Northern Route (London Kings Cross to Kings Lynn), with a typical journey time of 30 minutes, including a 10 minute train ride to Cambridge Station and a 20 minute walk to the city centre. Rail services generally run hourly, although more frequent services are provided during the morning peak period. The cost of return travel is £5.00.

9.5.3.2 Bus

The city centre can be accessed by bus via the hourly Stagecoach Route 26 service to the Trumpington Park & Ride site, with users having to change to access the city centre via the Park & Ride service. The total journey time is typically 43 minutes. The cost of a return Dayrider Plus ticket (purchased on-board covering both services) to the city centre is £6.70.

9.5.3.3 Cycle

A shared use off-road cycleway runs alongside the A10 providing a traffic free route towards the city centre, with the shortest cycle route to the city centre being 7.4 miles. It is anticipated that this journey would take approximately 36 minutes. The A10 will form part of the Melbourn Greenway, therefore further cycle improvements are likely in the future as part of the Greenways project.

9.5.4 Facilities

The existing and proposed facilities are presented below:

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9.5.4.1 Existing

The existing facilities at Foxton railway station include:

- 4 uncovered cycle stands, with pedestrian guard railings also being used for cycle storage due to a lack of capacity.
- Real Time Information at both inbound and outbound train platforms.
- Bus stop lay-bys for (Route 26 services) on either side of the A10, approximately 50 metres north of the railway station.

9.5.4.2 Proposed

The proposed hub facilities at Foxton railway station comprise:

- A car park to the north of the railway station, with 35 spaces including 3 designated disabled bays.
- Street lighting within the car park – requirements/specification to be agreed locally.
- Bus stop improvements (including shelters, raised kerbs and Real Time Information) at the bus stops on the A10 to improve connectivity between the rail station and local services including the No. 26 service as well as Demand Responsive Transport and Community Transport services.
- Area for secure cycle parking. These would be located on the small triangle of land immediately north of the railway station.

9.5.5 Availability of Land & Planning Considerations

A parcel of land is located to the north of the railway station and is currently owned privately, being used commercially as a hand car wash. The site has been particularly chosen because it is located on the eastern side of the A10 and would therefore not affect or be affected by any future schemes to remove the level crossing and replace with a bridge. Such a scheme would utilise the vacant land on the western side of the A10.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.

9.5.6 Access & Conceptual Layout

A conceptual layout showing the proposed car park and cycle storage facility is shown in Appendix B5.

Vehicular access to the hub site would be provided directly off the A10 with a simple T-junction arrangement.

The shared use footway/cycleway along the eastern side of the A10 provides off-carriageway cycle access for pedestrians and cyclists heading to the site from both from the north and south.

The relatively small size of the car park means any increase in local traffic is likely to be negligible. The car park would allow a reduction the number of motorists who currently park on-street in the village on Station Road as there will be a designated car park available.

The conceptual layout identifies a cycle store which would appear quite open in the wider area. To ensure the development remains in keeping with the street scene, it is advised that landscaping should be implemented to the front of the cycle stores.

9.5.7 Foxton Site Summary

A scheme at this location would improve and expand upon the current transport facilities at the railway station. The provision of a car park and improved/more secure cycle parking will allow more residents of the village and neighbouring parishes to access the rail services.

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The small size of the proposed car park (maximum 35 spaces) means the impact on local traffic levels would be minimal, particularly as the hub is located on the A10 away from the village centre.

The railway offers frequent services into Cambridge with train journey times being comparable to journeys made by car. The reasonable cost of a return ticket (£5.00) is an advantage, particularly if users who would otherwise drive have to pay city centre parking charges.

It cannot be assumed that all hub users will be heading into Cambridge. It is likely that the hub site will also be used by commuters heading to other destinations by train, including London. This will inhibit the effectiveness of the sites in terms of reducing the number of car journeys into Cambridge.

Improvements to the cycle parking, including secure cycle lockers, will encourage more people to cycle to the station. The ongoing cycle improvements along the A10 together with planned improvements as part of the Melbourn Greenway Project will further encourage cycle usage.

Travelling to Cambridge from Foxton via bus is not a viable option due to the lack of direct services into Cambridge, longer journey times and higher travel costs. The provision of improved bus stops outside the station would mean the site can be serviced by future Demand Responsive Transport, Community Transport and local shuttle buses. This will improve connectivity with surrounding parishes.

9.6 Meldreth

The parish of Meldreth is located to the south-west of Cambridge, approximately 9 miles from the city centre (direct path).

9.6.1 Location & Site Description

Meldreth railway station is located at the southern end of the village and is accessible from the High Street (see Figure 9.6). An area of land has been identified adjacent to the existing station car park and is accessible from the existing car park access. See Appendix A6 for existing site photographs.

Figure 9.6: Meldreth Location Plan

9.6.2 Demographics

A Rural Travel Hub at Meldreth would predominantly serve the parishes of Meldreth, Melbourn, Fowlmere and Bassingbourn, which have a combined population of 11,261 at the time of the 2011 Census.

9.6.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Meldreth Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 10.7 miles and take approximately 28 minutes.

9.6.3.1 Train

Meldreth railway station affords access to the city centre via the Great Northern Route (London Kings Cross to Kings Lynn), with a typical journey time of 36 minutes (similar to the travel time by car), including a 16 minute train ride to Cambridge Station and a 20 minute walk to the city centre. Rail services are generally every 30 minutes. The cost of return train travel is £5.00, plus a £1.50 daily charge for car park users.

9.6.3.2 Bus

The bus stops on the High Street outside the station are only serviced by a local service (Route 128 Shepreth to Royston) which runs at infrequent intervals. The city centre can be accessed by bus via the Route 26 Melbourn to Trumpington Park & Ride service, with onward travel to city centre via the Park & Ride services. Bus users from Meldreth are required to walk 0.8 miles to Melbourn in order to access the Route 26 services. The total journey time is typically 1 hour 13 minutes. The cost of a return Dayrider Plus ticket (purchased on-board covering both services) to the city centre is £6.70.

9.6.3.3 Cycle

Cyclists from Meldreth are able to use shared use footway/cycleway that starts in Melbourn, running alongside Cambridge Road and then up the A10, providing a traffic free route towards the city centre. The shortest cycle route to the city centre is 10.6 miles and would take approximately 50 minutes. Future cycle improvements are likely as part of the Melbourn Greenways project.

9.6.4 Facilities

The existing and proposed facilities are presented below:

9.6.4.1 Existing

The existing transport facilities at the Meldreth station include:

- Car park for 46 vehicles (including 2 disabled bays), chargeable at a daily rate of £1.50.
- 6 uncovered cycle stands.
- Real Time Information at both inbound and outbound train platforms.
- Bus stops for Route 128 on the High Street near the access to the station car park.

9.6.4.2 Proposed

The proposed improvements to the existing transport facilities at Meldreth comprise:

- Additional car parking area next to the existing station car park, with 34 spaces including 3 designated disabled bays.
- Additional secure cycle parking including covered cycle stands and cycle lockers. These would be best located near to the station building within the footprint of the existing car park. Further investigation with the operators of the car park is required.
- Pedestrian route from the new area of parking and existing station car park.
- Street lighting within the car park – requirements/specification to be agreed locally.
- Investigate how to improve connectivity between the rail station and local bus services to improve accessibility to the station for those who do not drive. This could include Demand Responsive Transport, Community Transport and/or the provision of local shuttle bus services.

9.6.5 Availability of Land & Planning Considerations

A parcel of privately owned land is located to the south of the railway station and appears to have been previously used commercially, although the site is currently vacant. This site would be accessed off the existing station car park access.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The ste is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.
- Site lies within the development framework and is on a brownfield site.
- The planning application for the site (Former GoCold Building, Station Yard, High Street, MELDRETH, SG8 6JR). The status of this application is noted as "Out for Consultation"; details below:
  - S/1502/17/FL – Demolition of existing factory building and office, and construction of 27No. dwellings with associated landscaping.

9.6.6 Access & Conceptual Layout

A conceptual layout showing the proposed car park and cycle storage facility is shown in Appendix B6.

Direct access would be provided off the existing car park entrance, using the existing vehicular access off of the High Street. A simple T-junction is likely to be acceptable due to the low number of vehicles using the car park and low speeds. A designated pedestrian route would need to be provided for car park users to safely access the station.

The small scale of the proposed car park means the impact of additional traffic on the local network is likely to be minimal. The additional parking would allow a reduction in the number of motorists who park on-street in the village as there will be a designated car park available.

9.6.7 Meldreth Site Summary

A scheme at this location would look to improve and expand upon the current transport facilities at Meldreth Station, including additional car parking provision and improved/secure cycle parking, allowing more residents of the village and neighbouring parishes access to rail services.

The small size of the proposed additional car park means the impact on local traffic levels would be minimal.

The railway offers frequent services into Cambridge with train journey times being comparable to journeys made by car. The reasonable cost of a return ticket (£5.00) is also an advantage, particularly if users who would otherwise drive have to pay city centre parking charges.

The proposed hub car park is located close to existing chargeable parking facilities at Meldreth Railway Station. There is the potential for the proposed hub car park to quickly reach capacity, with car users electing to use the free facility.

It cannot be assumed that all hub users will be heading into Cambridge. It is likely that the hub site will also be used by commuters heading to other destinations by train, including London. This will inhibit the effectiveness of the sites in terms of reducing the number of car journeys into Cambridge.

Improvements to the cycle parking, including secure cycle lockers, will encourage more people to cycle to the station.

Travelling to Cambridge from Shepreth via bus is not a viable option due to the lack of direct services into Cambridge, longer journey times and higher travel costs. The provision of improved bus stops outside the station would mean the site can be serviced more easily by future Demand Responsive Transport, Community Transport and local shuttle buses, improving connectivity with surrounding parishes.

9.7 Whittlesford

The parish of Whittlesford is located to the south of Cambridge, approximately 7.5 miles from the city centre (direct path).

9.7.1 Location & Site Description

The proposed location of the Whittlesford Rural Travel Hub is near Whittlesford railway station (see Figure 9.7). An area of land has been identified on the southern side of Royston Road, approximately 650m west of the railway station.

There are currently proposals for transport improvements and additional parking on a large scale to be provided closer to the station. It is considered that a holistic approach needs to be taken. Consultation with all stakeholders is recommended to identify the additional parking requirements. Other transport improvements will need to be included in the consultation process such as bus turn around points to enable buses to serve the station directly.

The area of land identified to the west of the station could be used as a temporary parking area to provide an immediate increase in parking capacity whilst the longer term proposals are developed. The temporary car park would be located approximately 650m from the station. However, many station users currently park along Royston Road (for free) in the location of the proposed car temporary car park. See Appendix A7 for site photographs.

Figure 9.7: Whittlesford Location Plan

9.7.2 Demographics

A Rural Travel Hub at Whittlesford would predominantly serve the parishes of Whittlesford, Duxford, Pampisford, Sawston and Thriplow which have a combined population of 12,588 at the time of the 2011 Census.

9.7.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Whittlesford Rural Travel Hub to the city centre (for the purposes of this study defined as the intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 10 miles and take approximately 24 minutes.

9.7.3.1 Train

Whittlesford railway station affords access to the city centre via the West Anglia Main Line (London Liverpool Street to Cambridge), with a typical journey time of 27 minutes, including a 7 minute train ride to Cambridge Station and a 20 minute walk to the city centre. Rail services run every 15 minutes. The cost of return train travel is £6.00, plus a £7.60 daily charge for car park users.

9.7.3.2 Bus

The bus stops on Duxford Road (approximately 490m to the west of the railway station) provide an hourly service to the city centre via the Citi 7 service, with a journey typical time of 60 minutes. The cost of a return Dayrider Plus ticket (purchased on-board) to the city centre is £6.70.

The bus stop on Station Road East provides additional services towards the city centre via Route 7A at intervals between 1 hr 15 mins to 2 hours. It should be noted that bus users are required to change service at the Babraham Road Park & Ride Site for onward travel to the city centre.

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9.7.3.3 Cycle

The most direct cycle route to the city centre is via a combination of local roads and the off carriageway section of NCN 11 from Great Shelford to Addenbrooke's. This represents a journey distance of 9.4 miles and is anticipated to take 50 minutes.

9.7.4 Facilities

The existing and proposed facilities are presented below:

9.7.4.1 Existing

The existing facilities at Whittlesford Railway Station include:

- 377 parking spaces (split between two car parks either side of the station) with the peak daily parking charge of £7.60. The car park is street-lit.
- 10 no. covered and 15 no. uncovered cycle stands to the western side of the station. Cycle parking is judged to be at capacity, with bicycles being locked to railings to the eastern side of the station, where there are no stands.
- CCTV
- Onward travel information signs.
- Shelters/waiting rooms on the train platforms for passengers.
- Real Time Information on both inbound and outbound train platforms.

9.7.4.2 Proposed

The facilities proposed for the Rural Travel Hub at Whittlesford comprise:

- New car park with 208 additional spaces including 12 designated disabled spaces.
- Street lighting within the car park – requirements/specification to be agreed locally.
- Additional secure cycle parking including covered cycle stands and cycle lockers. These would be best located near to the station building within the footprint of the existing car park. Further investigation with the operators of the car park is required.

9.7.5 Availability of Land & Planning Considerations

The parcel of land identified is currently used for agriculture. Initial Land Registry enquiries appear to show that this land is owned privately and that development may be subject to restrictive covenants. Further investigation is required.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.
- CCC & Highways England Depots may become vacant circa 2020, with the possibility of these sites being developed. Separately Abellio Greater Anglia **may** have submitted a pre-application for increasing the capacity of the existing chargeable parking facility at Whittlesford Rail Station. Additionally, there may be proposals for a transport hub facility as part of the AgriTech development, which also includes improvements to cycle facilities and a small bus interchange.
- The proposed location is located outside of the development framework and therefore falls within the countryside.
- The location is rural in character and therefore proposed lighting will need to ensure it does not cause adverse harm to biodiversity within the area, or neighbouring properties.
- Consideration will need to be given to the impact upon residential properties nearby.

9.7.6 Access & Conceptual Layout

A conceptual layout showing the proposed car park is shown in Appendix B7.

Access to the car park would be directly off Royston Road with a simple T-junction being proposed. Some vegetation clearance will be required to ensure visibility splays are adequate. Royston Road is a single two-way carriageway, subject to a 30 mph speed limit and is street-lit.

Pedestrian access to the station will be provided by the existing footway on Royston Road that leads to the station.

The conceptual layout identifies few cycle stores, however those currently available at the station are at capacity. As such, consideration should be given to increasing more cycle facilities on the Rural Travel Hub.

9.7.7 Whittlesford Site Summary

An additional temporary car park at Whittlesford would provide an immediate increase in parking capacity, allowing more residents of the village and neighbouring parishes access to rail services.

The impact on traffic levels locally would be minimal as the car park is located close to the A505, with only a local increase in traffic likely on Royston Road.

The railway offers frequent services into Cambridge with journey times being comparable to journeys made by car. The railway also offers reasonably priced travel (£6.00) which is likely to be attractive to users.

The proposed hub car park is located close to existing chargeable parking facilities at Whittlesford Railway Station. There is the potential for the proposed hub car park to quickly reach capacity, with car users electing to use the free facility.

It cannot be assumed that all hub users will be heading into Cambridge. It is likely that the hub site will also be used by commuters heading to other destinations by train, including London. This will inhibit the effectiveness of the sites in terms of reducing the number of car journeys into Cambridge.

Improvements to the cycle parking, including secure cycle lockers at the main station building, will encourage more people to cycle to the station. Liaison is required over the extent and positioning of the cycle parking.

There are a number current development proposals for this location, including extension of the existing car park, cycle improvements and a small transport hub facility. Whilst none have been formally approved, if progressed each of these could potentially have implications on the travel infrastructure in the vicinity of Whittlesford Station. Consequently, there needs to be a holistic approach looking at the wider context in order to ensure improved connectivity between rail and bus services.

There is ‘Master Planning Exercise’ which is a piece of work in its very early stages that is intended to look at Whittlesford as a whole with a strategic approach considering projects of GCP, County Council and private organisations.

9.8 Sawston

The parish of Sawston is located to the south-east of Cambridge, approximately 6 miles from the city centre (direct path).

9.8.1 Location & Site Description

The proposed location of the Sawston Rural Travel Hub is to the north of Sawston, close to the junction of the A1301 and Cambridge Road (see Figure 9.8), with the site being accessible from Cambridge Road. A small parcel of land has been identified on what is currently a large field used for agriculture. See Appendix A8 for existing site photographs.

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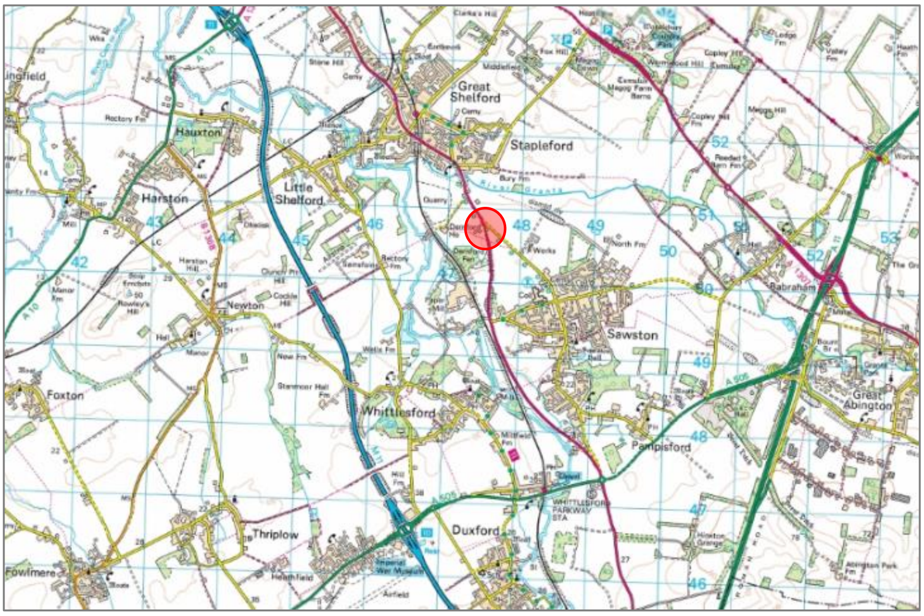

Figure 9.8: Sawston Location Plan

9.8.2 Demographics

A Rural Travel Hub at Sawston would predominantly serve the parishes of Sawston, Whittlesford, Pampisford, Duxford, Hinxton and Newton which have a combined population of 11,846 at the time of the 2011 Census.

9.8.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Sawston Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 8.4 miles and take approximately 29 minutes.

9.8.3.1 Train

Hub users could park and cycle to Great Shelford railway station, with a 7 minute cycle ride to the station from the car park and then a 7 minute train ride into Cambridge. From Cambridge rail station it is then a 20 minute walk to the city centre. The total journey time is approximately 34 minutes. An hourly train service is provided to the city at a cost of £3.90 for return travel.

9.8.3.2 Bus

The Citi 7 bus passes by the proposed hub site on Cambridge Road. A service runs every 20 minutes, with a journey to the city centre taking 40 minutes. The cost of a return Dayrider Plus ticket (purchased on-board) to the city centre is £6.70. Additional bus stops would be required at the hub site as the nearest bus stops are in Sawston village adjacent to Spicers Sports Field. These serve Route 7A (Babraham Road Park & Ride – Whittlesford), 132 (Cambridge to Saffron Walden) and the Citi 7 (Cambridge to Saffron Walden).

9.8.3.3 Cycle

Hub users could park and cycle from the hub site into the city centre, following the route of NCN 11. The 8.1 mile long journey takes an estimated 41 minutes. A shared use footway/cycleway follows the A1301 from the proposed hub location toward Great Shelford, where cyclists then can continue along the route of NCN 11 towards Cambridge.

9.8.4 Facilities

The existing and proposed facilities are presented below:

9.8.4.1 Existing

There are currently no transport facilities at the hub site, but the site is on a section of NCN 11 which has good off-carriageway cycle facilities with Toucan crossings at the junction of the A1301 and Cambridge Road which assist cyclists in accessing the Cambridge bound cycleway.

Citi 7 bus services also pass the site. These provide a regular bus service into Cambridge at 20 minute intervals.

9.8.4.2 Proposed

The proposed hub facilities at Sawston comprise:

- Car park for 50 cars including 3 disabled bays. It is suggested that additional land is set aside for future expansion depending on the demand at the site.
- New bus stops with shelters, raised 'bus boarder' kerbs and Real Time Information so that the site can be serviced by the Citi 7 service, allowing users to park and ride into Cambridge.
- Secure cycle parking including cycle lockers to facilitate the site being used for parking and cycling.
- Low level lighting within the car park – requirements/specification to be agreed locally. The junction of the A1301/Cambridge Road is already lit therefore a power supply would be readily available.
- Drop-off/pick-up facility.

9.8.5 Availability of Land & Planning Considerations

The parcel of land identified is currently used for agriculture and owned by Cambridgeshire County Council, being designated as a 'Rural Asset'. As Cambridgeshire County Council are the proprietor of the land identified for the hub site this is likely to assist with land acquisition and aid delivery.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.
- The site located on land classified as **Green Belt.** Strong justification for this site will be required in order for this site to be considered. NPPF Paragraph 90 - Certain other forms of development are also not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict with the purposes of including land in Green Belt. These include *local transport infrastructure which can demonstrate a requirement for a Green Belt location.*
- *Sufficient information will need to identify why a Green Belt location has been chosen, and whether impact on openness and green belt purposes have been considered. Unless these tests are met, the development would be considered inappropriate development, and very special circumstances would need to be demonstrated.*
- The location of the Rural Hub would be hard to mitigate, as there are vast views across agricultural fields. It may mitigate adverse impacts if the site were designed to use the land adjoining the road junction, where there is more existing landscaping and existing lighting.
- Proximity to SSSI site at Dernford Fen, Sawston,

9.8.6 Access & Conceptual Layout

A conceptual layout showing the proposed car park is shown in Appendix B8.

The site would be accessed off the western side of Cambridge Road, with a new vehicular access being required into the site. Cambridge Road is a two-way single carriageway road and subject to the national speed limit (60 mph). It is lit at its junction with the A1301.

Pedestrian and cycle access would tie-in at the existing shared use cycleway that runs along the western side of Cambridge Road.

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9.8.7 Sawston Site Summary

A Rural Travel Hub at Sawston would allow access to the Citi 7 bus services for those who do not live directly on the route.

The site could also be used as a 'Park & Cycle' facility, allowing users to take advantage of the facilities provided along National Cycle Network (NCN) Route 11 in order to access Cambridge directly or Great Shelford railway station for onward travel. Cycle parking, including secure cycle lockers, should be provided to encourage this.

The site has been positioned away from the village centre to reduce adverse impact of additional car journeys into the village. However, it could be moved closer to the village if there is a local desire.

Cambridgeshire County Council is the proprietor of the land identified. This is likely to reduce costs associated with land acquisition.

9.9 Comberton

The parish of Comberton is located west of Cambridge, approximately 4 miles from the city centre (direct path).

9.9.1 Location & Site Description

The proposed location of the Comberton Rural Travel Hub is at the eastern side of the village, on a parcel of land to the southeast of the B1046 Barton Road/Long Road mini roundabout (see Figure 9.9). The land is currently used for agriculture, with tall hedgerows bounding the northern and eastern perimeter of the site. See Appendix A9 for existing site photographs.

Figure 9.9: Comberton Location Plan

9.9.2 Demographics

A Rural Travel Hub at Comberton would predominantly serve the parishes of Comberton, Little Eversden, Great Eversden and Bourn, which have a combined population of 4,202 at the time of the 2011 Census.

9.9.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Comberton Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 6 miles and take approximately 20 minutes via the B1046 and A603.

9.9.3.1 Bus

Route 18 (Cambridge to Longstowe) follows the B1046 Barton Road past the proposed hub site. This provides an hourly service in the city centre, with the journey taking approximately 26 minutes. A return ticket costs £4.30.

9.9.3.2 Cycle

Cyclists could choose two routes to access the city centre by:

(a) Following the B1046 and then the route of the future Barton Greenway alongside the A603 which equates to a distance of approximately 5.2 miles and would take approximately 25 minutes. There is an existing shared use footway/cycleway along most of this route.

(b) Following the route of the future Comberton Greenway presents a slightly longer journey, a distance of approximately 5.7 miles with a journey time of approximately 28 minutes. The Comberton Greenway is not yet constructed and there are no cycle facilities on Long Road, heading north away from the village. This is a high speed (60mph) section of single carriageway which may deter less confident cyclists.

9.9.4 Facilities

The existing and proposed facilities are presented below:

9.9.4.1 Existing

There are currently no transport facilities at the location of the proposed hub site.

9.9.4.2 Proposed

The proposed improvements to the transport facilities at Comberton comprise:

- Car park for 50 cars with 3 designated disabled bays.
- Secure cycle parking including cycle lockers.
- New bus stops on the B1046 with raised 'bus boarder' kerbs, shelters and Real Time Information Signs so that the site can be directly serviced by the Route 18 bus.
- Low level lighting within the car park – requirements/specification to be agreed locally The B1046 is lit therefore a power supply would be readily available.
- Drop-off/pick-up facility.

9.9.5 Availability of Land & Planning Considerations

The land identified for the hub site is currently used for agriculture. Initial Land Registry enquiries appear to show that this land is owned privately and that development may be subject to restrictive covenants. Further investigation is required.

Potential Planning Constraints (Summary of comments from SCDC Planners)

- The site is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains. However, it is noted that Barton Road, within the confines of the carriageway is classified as Flood Zone 3. Land and property in flood zone 3 have a high probability of flooding. A flood risk assessment must be carried out.
- The site located on land classified as **Green Belt.** Strong justification for this site will be required in order for this site to be considered. NPPF Paragraph 90 - Certain other forms of development are also not inappropriate in Green Belt provided they preserve the openness of the Green Belt and do not conflict with the purposes of including land in Green Belt. Theseinclude: *local transport infrastructure which can demonstrate a requirement for a Green Belt location.*

- *Sufficient information will need to identify why a Green Belt location has been chosen, and whether impact on openness and green belt purposes have been considered. Unless these tests are met, the development would be considered inappropriate development, and very special circumstances would need to be demonstrated.*
- The Rural Travel Hub should be screened heavily with landscaping to mitigate the impact upon the character and appearance of the wider area.

9.9.6 Access & Conceptual Layout

A conceptual layout showing the proposed car park is shown in Appendix B9.

The vehicular access would be on the road that forms the southern arm of the B1046 Barton Road/Long Road mini roundabout, with a simple T-junction being proposed. A separate pedestrian access into the car park would be provided at the northwest corner of the field.

Pedestrian access will also be required on the northern side of the site to provide access to the new bus stops on Barton Road. An uncontrolled pedestrian refuge crossing on Barton Road is required to assist pedestrians crossing between the inbound and outbound bus stops. Barton Road at this location is a two-way single carriageway, street-lit and subject to a 30/40 mph speed limit.

9.9.7 Comberton Site Summary

The site would include the provision of a car park and secure cycle parking, allowing residents of neighbouring parishes where cycle access is currently poor to access the future Greenway routes in order to head into the city centre.

A Rural Travel Hub at this location could operate as a ‘Park & Cycle’ facility and would be ideally located at the start of the future Comberton Greenway. The existing shared use footway/cycleway along the B1046 provides cycle access towards the city centre via Barton. The only concern would be the distance to Cambridge may still deter cyclists to use this site, and it may benefit from being closer.

The site has been positioned away from the village centre to reduce adverse impact of additional car journeys into the village.

Bus and cycle journey times are comparable with car journey times. Bus fares are reasonably priced (£4.30). This is likely to attract usage of the site. However, bus services, which depart every 60 minutes, may not be frequent enough to attract local ‘park and ride’ usage. Additional bus services need to be considered at peak times.

The proposal would have to identify clearly why green belt land is required.

9.10 Cambourne

The parish of Cambourne is located to the west of Cambridge, approximately 8 miles from the city centre (direct path).

9.10.1 Location & Site Description

The proposed location of the Cambourne Rural Travel Hub is on the small parcel of land to the east of Broadway, situated between St. Neots Road and the A428 (see Figure 9.10). The land is currently used for agriculture, with tall hedgerows bounding the site perimeter. See Appendix A10 for existing site photographs.

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Figure 9.10: Cambourne Location Plan

9.10.2 Demographics

A Rural Travel Hub at Cambourne would predominantly serve the parishes of Cambourne, Elsworth & Conington, Knapwell, Boxworth, Papworth Everard, Caxton and Bourn which have a combined population of 13,697 at the time of the 2011 Census.

9.10.3 Travel Options to the City Centre

The sections below describe the travel options from the proposed location of the Cambourne Rural Travel Hub to the city centre (for the purposes of this study defined as intersection of Sidney Street, Hobson Street and St. Andrews Street). By way of comparison the corresponding journey made by car would be approximately 9.3 miles and take approximately 30 minutes, via St. Neots Road and the A1303 Madingley Road.

9.10.3.1 Bus

The Citi 4 service (Cambridge to Cambourne) follows St. Neots Road past the proposed hub site. This provides a service every 20 minutes into the city centre, with the journey along the 7.6 mile route taking approximately 26 minutes. The cost of a return Dayrider Plus ticket (purchased on-board covering both services) to the city centre is £6.70.

9.10.3.2 Cycle

Following St. Neots Road and then Madingley Road presents a cycle route of approximately 7.5 miles in length, with a journey time of approximately 36 minutes. There are currently no off-carriageway cycle facilities along the high speed (60mph) single carriageway sections. This may deter less confident cyclists.

9.10.4 Facilities

The existing and proposed facilities are presented below:

9.10.4.1 Existing

A pair of bus stops located on St. Neots Road to the west of the proposed hub site. These serve the Citi 4 service. The Cambridge bound stop has a bus shelter and bus layby, whereas the Cambourne bound bus stop is unmarked (i.e. no sign, shelter or layby).

A footway follows the southern side of St. Neots Road providing pedestrian access to/from the site.

9.10.4.2 Proposed

The proposed transport facilities at Cambourne comprise:

- Car park for 41 cars including 3 disabled spaces (with additional land being set aside for future expansion depending on the demand at the site).
- Secure cycle parking including cycle lockers.
- Uncontrolled pedestrian refuge crossing on St. Neots Road to enable bus users to cross between the bus stops.
- Real Time Information at Cambridge bound bus stop lay-by.
- Low level lighting within the car park – requirements/specification to be agreed locally The B1046 is lit therefore a power supply would be readily available.
- Drop-off/pick-up facility.

9.10.5 Availability of Land & Planning Considerations

The land identified as a potential hub site is currently used for agriculture and is under private ownership. The site has been selected because it is outside the proposed route of the Cambourne to Cambridge Busway and will therefore not be affected by this scheme in the future.

Potential Planning Constraints (Summary of comments from SCDC Planners)

The site is located within a Flood Zone 1, meaning that there is a low probability of flooding. There is no requirement for a flood risk assessment for a development in flood zone 1 where it is smaller than one hectare; is not affected by sources of flooding other than rivers and the sea, for example surface water drains.

The proposed site is outside of the village framework, and therefore located in the countryside

9.10.6 Access & Conceptual Layout

A conceptual layout showing the proposed car park is shown in Appendix B10.

There are no private properties within the immediate vicinity of the site therefore the impact of additional traffic accessing the site will be minimal.

The existing access to the area of land identified will be used as the main vehicular access. A ghost island right turn lane is provided on St. Neots Road which assists vehicular movements into the site, which utilises a standard T-junction arrangement.

Pedestrian access to/from the site is via the existing footway on the southern side of St. Neots Road.

An uncontrolled pedestrian refuge crossing is required to assist pedestrians crossing between the inbound and outbound bus stops. St. Neots Road at this location is a two-way single carriageway, street-lit and subject to the national speed limit (60mph).

9.10.7 Cambourne Site Summary

A Rural Travel Hub at this location would provide a park & cycle facility to the northeast of Cambourne on St. Neots Road.

Long distance cycle commuters regularly use St. Neots Road to head into Cambridge. The numbers of cyclists are likely to increase with the proposed cycle improvements on St. Neots Road being delivered as part of the Cambourne West development. Improvements will include a shared use footway/cycleway along St. Neots Road between Cambourne and the Madingley Mulch Roundabout, with cyclists then re-joining the carriageway and following the on-carriageway cycle lanes towards the city centre. Until these proposals are delivered, less confident cyclists may be deterred from using the facility.

There are no private properties within the immediate vicinity of the site therefore the impact of additional traffic accessing the site will be minimal.

Bus and cycle journey times are comparable with car journey times. Bus services are frequent. However, fares are relatively expensive (£6.70). This may deter those wishing to park & ride.

The proposed location may not be beneficial if/when the Cambourne to Cambridge Busway is implemented. Therefore the rural hub may only be a temporary solution.

The Parish Council are keen for a travel hub. They would like a hub to be in the vicinity of the High Street, given its location in the centre, near car parking and the routes of current buses. However, there are good cycle links into the centre of Cambourne and there are a number of bus routes passing through the village (including fast services for Cambridge). DRT (Demand Responsive Transport) schemes also operate into Morrison's car park. It is not felt that a hub in the centre of Cambourne would be a high priority given the nature of the existing facilities.

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10.0 Preliminary Costings

Preliminary construction cost estimates have been produced for each of the 10 sites assessed (see Appendix G).

10.1 Summary of Costs

Typical construction costs have been used to calculate high level cost estimates for each site.

Due to uncertainty over how the land at each site would be acquired, costs associated with land acquisition have not been included.

Site	Cost Estimate (£)
Oakington - Option A (with bus turn around)	£368,107
Oakington - Option B (without bus turn around)	£217,664
Linton	£300,528
Shepreth	£226,590
Swavesey	£224,125
Foxton	£232,176
Meldreth	£144,933
Whittlesford	£599,933
Sawston	£377,253
Comberton	£355,875
Cambourne	£273,914

Table 10.1 – High-level Cost Estimates

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11.0 Site Appraisal

In this section a strategy to produce an effective system for prioritising the proposed sites is presented. Key factors are identified which enables each site to be assigned a score resulting in an overall ranked order.

11.1 Site Prioritisation Methodology

A Site Appraisal Ranking (SAR) has been developed to facilitate the prioritisation of the proposed sites. The *equation below has been used to calculate the individual site score and includes various factors for the different* individual components considered. The coefficients and importance for each factor have been agreed following a review by the Project Team. The equation thus yields an overall weighted score for each site:

$$Total\ Score = 2R_{pop} + 3R_{br} + 3R_{c} + 3R_{cjs} + 3R_{cy} + 2R_{la} + 2R_{acc} + R_{pr} + R_{cps}$$

A matrix has been set-up using the 9 factors identified in the prioritisation criteria, namely;

- Population (R_{pop}) – the total population of the surrounding parishes that the hub location is likely to serve. This indicates the approximate number of people who would feasibly benefit from the hub.
- Frequency of bus/rail (R_{br}) – the frequency of public transport services (bus/rail) serving the hub location. The frequency of service is deemed a key factor in the attractiveness of a particular site.
- Cost of travel (R_{c}) – the cost of return travel using public transport (bus/rail) from the hub location. Cost of travel is likely to have an impact on the amount of people using a hub at a given location.
- Car journey saving (R_{cjs}) – measured as the number of car parking spaces provided at the hub. This is one of the key objectives of the Rural Travel Hub concept.
- Proximity to safe cycle route (R_{cy}) – distance to the nearest off-carriageway cycle route that provides safe access to Cambridge.
- Land availability (R_{la}) – considers high level planning issues such as proximity to Green Belts, Conservation Areas, flood risk etc. Land availability constraints may dictate the suitability of a site.
- Access (R_{acc}) – considers the availability and suitability of highway access.
- Proximity to P&R (R_{pr}) – distance to the nearest Cambridge Park & Ride facility. Close proximity to an existing major transport hub (such as a park & ride) may compromise the effectiveness of the Rural Travel Hub.
- Cost per space (R_{pr}) – the cost per space is a measure of the minimum monetary cost per car journey saving. This is governed by the facilities provided and the potential number of people using the hub. This represents a basic 'cost-benefit' summary for the given site.

The above nine factors are considered on an individual basis for the 10 potential hub sites detailed in Section 9, before being combined for each site to yield an overall score. Prior to assigning scores, it is necessary to apply a weighting coefficient to each of these factors, as some are more influential than others in terms of determining the suitability of a given site. Consequently, the above list of principal factors is further split into three sub-categories, presented in order of importance. This represents a hierarchical categorisation which places a greater emphasis on certain factors relative to others. Details of this hierarchy are given below:

Sub-category 1 (Higher Priority):

- Car journey saving (R_{cjs})
- Proximity to safe cycle route (R_{cy})
- Frequency of bus/rail (R_{br})
- Cost of travel (R_{c})

Sub-category 2 (Medium Priority):

- Population (R_{pop})
- Land availability (R_{la})
- Access (R_{acc})

Sub-category 3 (Lower Priority):

- Proximity to P&R (R_{pr})
- Cost per space (R_{pr})

Sub-category 1 comprises four of the nine principal factors which are considered to be highest priority. Among the primary drivers for the Rural Travel Hub concept is the reduction of car journeys into Cambridge and the promotion of more sustainable modes of transport (e.g. cycling). Therefore, it follows that car journey saving and proximity to a safe cycling route should feature within the highest priority factors. Additionally, the frequency of sustainable transport modes from that location and the associated cost are critical in assessing suitability of the hub location. The weighting coefficient associated with car journey saving, proximity to safe cycle route, frequency of bus/rail and cost of travel has been set to 3.

Sub-category 2 factors are those that are not the highest priority, but nonetheless are still considered sufficiently important to warrant an elevated weighting factor (i.e. medium priority). These include, population served, land availability and access. The population served is obviously key in terms of providing the maximum number of people to an accessible facility. Land availability and access are also deemed medium priority as there may be implications in terms of planning consent and existing infrastructure which may affect the feasibility of a given location. The weighting coefficient associated with population, land availability and access has been set to 2.

Sub-category 3 factors are those considered lower priority in terms of identifying suitable sites for the Rural Travel Hub facility, but still affect the prioritisation. These include proximity to existing Park & Ride sites and the cost of the facility on cost per space basis.

The above scoring framework has been developed by considering the primary factors that are deemed most important for identifying the most suitable locations for a Rural Travel Hub in the South Cambridgeshire District.

Based on the above methodology, the contribution for each element/factor to the overall SAR score is shown in Chart 11.1:

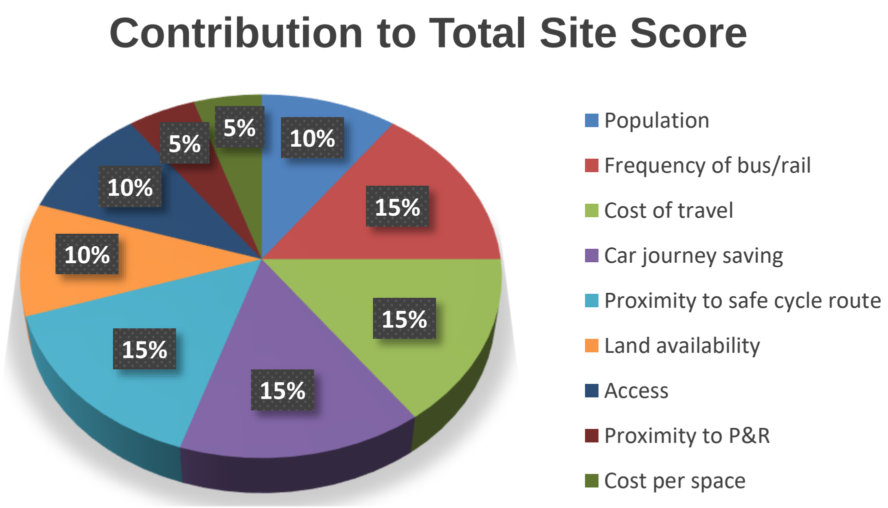

Chart 11.1 – Contribution of each element to total site score.

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Having established this scoring mechanism, a matrix was set up enabling direct comparison between the 10 proposed sites from which an overall ranked order could be determined. The formula produces a score for each hub site between 20 (min) and 100 (max) – the results of which are shown below in Table 11.1. A full version of the prioritisation matrix, including individual site scores for each factor, is given in Appendix F1. Appendix F2 provides details of the scoring criteria, including the bandings for each factor. Appendix F3 comprises the site details that formed the basis of the score for each factor.

11.2 Site Prioritisation List

Individual scores for each site were determined and then the sites were ranked in order of descending score, the final order is shown in Table 11.1:

Parish	Location of RTH	Overall Score
Oakington B	Guided Busway Stop (without bus turn around)	**80**
Oakington A	Guided Busway Stop (with bus turn around)	**76**
Whittlesford	Whittlesford Railway Station	**68**
Sawston	A1307 j/w Cambridge Road	**67**
Swavesey	Guided Busway Stop	**63**
Meldreth	Meldreth Railway Station	**62**
Cambourne	St. Neots Road near its junction with Broadway	**62**
Comberton	B1046 Comberton Road	**61**
Shepreth	Shepreth Railway Station	**60**
Foxton	Foxton Railway Station	**59**
Linton	Bartlow Road	**53**

Table 11.1 – Prioritised list of potential Rural Travel Hub sites.

Table 11.1 indicates a ranked order of the potential hub sites based on the prioritisation criteria outlined in Section 11.1. Appendix F gives a breakdown of the site prioritisation matrix and gives a rationale of the overall scores for each of the 11 locations featured in table 11.1. Appendix F2 provides details of the scoring criteria, including the bandings for each factor. Appendix F3 comprises the site details that formed the basis of the score for each factor.

The scores indicate that the Oakington B (without the bus turn around) appears most suitable hub site overall. This is due to its close proximity to the guided busway, which offers frequent services at relatively low cost. The cycleway which runs adjacent the busway provides a safe and convenient cycle route into Cambridge, allowing users to park and cycle. The site is easily accessible from Oakington village. A hub facility here would broadly follow the Swavesey model which has proven to be successful.

Oakington Option A, including a bus turn around would offer additional connectivity compared to Option B, but the high cost associated with the construction of a bus turning circle means this option does not score as well Option B.

The site at Whittlesford Railway Station would serve a large population in an area where there is high demand for interconnectivity between transport modes. The land availability and potential for access at this location mean that a substantially larger facility could be considered, potentially saving a significant number of car journeys.

It is recommended that Oakington Guided Busway Hub (Option B) and Whittlesford Railway Station hub warrant further evaluation as the two potential pilot sites. However, All ten sites considered have their merits and would be suitable for consideration should the Rural Travel Hub concept be expanded to include more locations.

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12.0 Conclusion

Through the consultation and engagement process the following definition of a 'Rural Travel Hub' has been developed. The term 'Rural Travel Hub' is defined as:

> ***'a transport facility that serves as an interchange, close to existing transport corridors (that are served by a reliable and relatively frequent public transport service), where residents in rural areas can walk, cycle or drive to and continue their onward journey using a sustainable mode of travel'.***

Whilst the above definition outlines what the concept of a Rural Travel Hub is, the facilities provided at each site are likely to be different. Each hub site will be individually tailored to suit the community it serves, in terms of its location and the available transport links, with facilities being focussed on the predominant forms of transport to and from the site. It is not a case of 'one size fits all'.

The study included a detailed review of national, regional and local policy applicable to rural travel and the Rural Travel Hub concept. This has concluded that the concept and development of this type of infrastructure is supported at all levels.

Analysis of the Census data showed that car ownership and the number of residents travelling to work by car/van in South Cambridgeshire is higher than the Eastern region and significantly higher than that for England & Wales as a whole. Similarly, the number of people travelling to work by bicycle in South Cambridgeshire is significantly higher than the corresponding figure for both the East of England and England & Wales. It was also established that, as may be expected, a significant number of people living in the vicinity of the potential hub sites work in Cambridge, and as a result of this are making relatively short journeys into Cambridge on a regular basis. Improvements to public transport and greater provision for cyclists is likely to increase the potential for modal shift towards more sustainable forms of transport.
Whilst there are no existing designated Rural Travel Hubs in the South Cambridgeshire District, an existing transport facility at Swavesey has been reviewed as part of the Feasibility Study. The Swavesey Guided Busway Stop has evolved into something akin to a Rural Travel Hub, and perhaps best represents what a hub may look like. The usage survey at Swavesey was undertaken to understand how the hubs might work in practice. The findings have been used to inform the study and make suggestions of the type of services and infrastructure that could be included at hub sites.

As established in the Swavesey case study, it is envisaged that the proposed hub facilities will be mainly used by local residents, who would otherwise be travelling by private vehicle to their destination, such that any net gain in local traffic volumes is likely to be minimal.

A widespread consultation exercise across South Cambridgeshire has been conducted with potential stakeholders, community representatives and partners who will be involved in the development of the Rural Travel Hubs. This has been encouraging and revealed a high level of support for the concept of Rural Travel Hubs and their implementation. Consultees have actively engaged in the process and made useful and proactive suggestions for services and infrastructure. However, a number of general concerns were made by stakeholders during the engagement activities about the perceived frequency, capacity and connectivity of public transport in rural areas. Some of the issues may partly be addressed by the implementation of Rural Travel Hubs. Further detailed investigation and consideration is recommended particularly where there is strong local desire for better interconnectivity between outlying parishes, rather than improved links into Cambridge.

A district-wide review resulted in the identification of 10 sites that could be considered for a Rural Travel Hub in South Cambridgeshire. An appraisal process was then undertaken which reviewed each of the sites against the identified factors, considering the opportunities and constraints at each site. Adopting this approach a priority list was established to aid the identification of the two pilot sites.

The report has drawn on community views, a policy review and the review of the existing facilities at Swavesey to identify potential services, facilities and infrastructure that each hub site could contain. It has also identified the potential benefits and dis-benefits of Rural Travel Hubs.

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High level cost estimates have been produced for the development Rural Travel Hub facilities at each site identified. These are designed to assist with the future allocation of budgets.

The feasibility study has found that the operation of Rural Travel Hubs in South Cambridgeshire is viable and that they are likely to be supported by the local community, serving to encourage more use of sustainable travel for journeys into Cambridge from outlying parishes.

13.0 Recommendations

Based on the site prioritisation process outlined in Section 11 it is recommended that the following sites are progressed as pilot sites:

a) Oakington Guided Busway Stop

b) Whittlesford Railway Station

The two proposed pilot sites, along with Swavesey, could then be monitored to establish usage patterns. The results of this monitoring process would then dictate whether further Rural Travel Hubs should be provided throughout South Cambridgeshire.

Subject to the approval of the Greater Cambridge Partnership's Assembly and Board the two identified pilot Rural Travel Hub sites should be taken forward to preliminary design, local consultation and planning permission/consent, and (subject to approval) construction.

Due to the relatively high costs it may be prudent for the construction at the pilot sites to initially be more temporary in nature. Following the monitoring period, if deemed successful, a permanent design solution could be developed

Appendix A – Site Photographs

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Appendix B – Conceptual Layouts

Appendix C – Workshop Summary

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Appendix D – Scoring Exercise Analysis

Appendix E – Swavesey Survey (Blank)

Appendix F – Prioritisation Matrix

Appendix G – Cost Estimates

Appendix H – Sites Location Plan

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Appendix I – National and Local Planning Policies to consider

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Appendix J – Traffic Flows

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