

Report to: Greater Cambridge Partnership Executive Board

08 February 2018

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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 Executive Board to be endorsed. The Executive Board is asked to comment on the Study's initial findings.

2. Recommendations

The Executive Board is asked to:

- a) Endorse the recommendations set out in the study;
- b) Commend the multi-modal package of measures to the Cambridgeshire and Peterborough Combined Authority for approval and further development.

3. Officer comment on technical issues raised at Joint Assembly

- 3.1 The Joint Assembly Members discussed the balance between road and rail capacity and asked what more could be done to make use of rail before resorting to providing additional highway capacity.
- 3.2 It was explained that the recommendations from the study are clear that additional highway capacity is needed to cater for a significant proportion of strategic traffic. However, it is also clear that very significant public transport service enhancements and infrastructure, new pedestrian and cycle networks, and active parking restraint should be delivered alongside development in the study area and wider highways interventions. Increases in rail capacity are already being delivered, with trains between Kings Lynn and Cambridge increasing from four to eight cars and frequency on the same section increasing from hourly to half hourly in the next eighteen months. This will include for the first time stops at both Waterbeach and Cambridge North stations. The recommendations from the study help to maximise this extra capacity through relocating the existing station to better serve both the existing village and the new development. The relocation would also bring safety and capacity benefits for the rail network, and reduce congestion on village roads in the area of the current station.

- 3.3 The Assembly also raised a number of more detailed design questions relating to the alignment of a dualled A10 and also the location of a new Park and Ride site. The modelling did not test a specific alignment for the scheme, rather it just tested the principle of additional capacity, broadly on the alignment of the existing road. It is acknowledged that there are sections which would of necessity need to be offline, and costs for these will be developed in greater detail at the appropriate point in the design process.
- 3.4 It was explained that regarding the location of the Park and Ride site, again the modelling did not assume an exact location, but the function of the facility would be to intercept Cambridge-bound traffic as far north on the A10 as practical, enabling people to transfer to a segregated public transport corridor as seamlessly and quickly as possible. To do this, the site needs to be located as closely as possibly to the A10 however its exact location will be determined through the master planning process.
- 3.5. Questions were also raised regarding the next steps, particularly how the various options were to be developed going forward. There was a strong desire from the Joint Assembly that, whilst it was acknowledged that the Mayor and the Combined Authority would wish to pursue the road options (options 2-6), they felt GCP was in a good position to develop option 1, and could make that offer to the Combined Authority.

4. Key issues and considerations

Background

- 4.1. 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
- 4.2. The commission has delivered:
- An options study and Strategic Outline Business Case for the overall package of interventions on the Ely to Cambridge corridor. 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.
- 4.3. 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

- 4.4. 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.
- 4.5. 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.
- 4.6. 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 5.

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

- 4.7. 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.
- 4.8. 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.
- 4.9. 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.

- 4.10. 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.

5. Options

5.1. Options modelled for mitigation

As indicated in section 4.6, six mitigation packages were modelled. Table 1 sets out what these packages were.

- 5.2. 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 5.8.

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 combined 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

- 5.3. 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.
- 5.4. 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.

- 5.5. 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.
- 5.6. 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.
- 5.7. 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.
- 5.8. 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

- 5.9. 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.
- 5.10. 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.

- 5.11. 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.
- 5.12. 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.
- 5.13. The scheme assessment process requires assumptions to be made regarding the future years in which the costs will be incurred which for this study is assumed to be 2031. The software used in the assessment requires the use of a standard base year which at the present is 2010. This required the 2017 costs to be discounted to 2010. The Study costs are set out in Table 18 of the SOBC replicated below for clarity;

Table 2: Application of Package Cost Discounts (£000s)

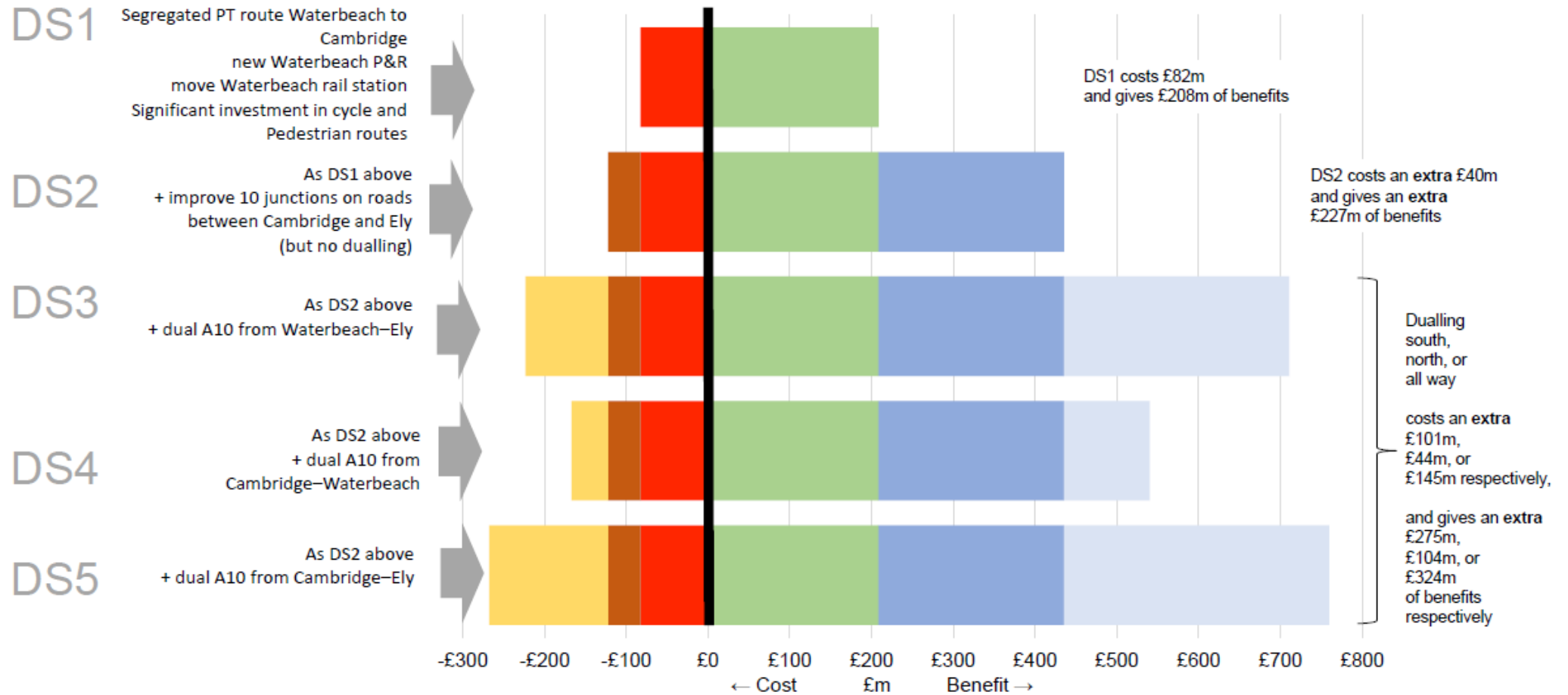
Cost Item	DS1 (Mode Shift)	DS2 (Junction Plus)	DS3 (North Dual)	DS4 (South Dual)	DS5 (Full Dual)
Package Estimate (2017 Prices)	151,700	224,500	414,900	306,400	508,600
Package Estimate (2010 Prices)	82,856	122,376,	222,947	166,856	267,482

- 5.14. The relative costs and benefits of the differing packages set out above can be seen in the graph below in figure 1.

Figure 1

Comparison of the **costs** and **benefits** of the five options

(shown as present values of £m)



- 5.15. The study also recognises that an offline alignment that potentially forms the southern part of an M11-to A47 link has some merit by providing an alternative route for a significant proportion of strategic traffic that uses the A10. The Combined Authorities M11 to 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.

6. Next steps and milestones

Progression of business case work

- 6.1. 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.
- 6.2. It is also suggested 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.
- 6.3. 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
- 6.4. 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.

7. Implications

7.1 Financial and other resources

The study recommends a significant package of transport infrastructure costing upwards of £500m. Should the Combined Authority request that the Greater Cambridge Partnership progress the development and delivery of one or more elements of the package, further discussion between the two organisations will need to take place to establish who funds the scheme/s.

7.2. Legal

All schemes taken forward will need to go through the appropriate statutory and legal processes as they are developed.

7.3. Staffing

Should the Combined Authority request that the Greater Cambridge Partnership progress the development of one or more elements of the package, given the scale of the schemes considerable demand could be placed on existing teams within the Partnership. Consideration will need to be given in due course to ensure they are resourced appropriately.

7.4. Risk management

A full project risk register forms part of the Project Plan.

7.5. Equality and diversity

The package of measures recommended in the study will help improve access to services, jobs and educational opportunities not only by car but also by public transport and active modes. A Community Impact Assessment will be carried out and reviewed as appropriate as each scheme develops.

7.6. Climate change and environmental

The study recommends significant early investment in active modes of transport such as cycling and walking between Ely, Waterbeach and Cambridge, as well as neighbouring villages. Furthermore, it also recommends early investment in public transport measures such as a segregated public transport corridor between Waterbeach and Cambridge, a new Park and Ride site and the relocation of Waterbeach Railway Station. The recommendations from the study therefore have positive implications for climate change by making available alternatives to the private car for making journeys. Environmental surveys will be undertaken on all schemes at the appropriate time to ensure that any adverse impacts are properly mitigated.

7.7. Consultation and communication

As the study has progressed, engagement with key stakeholders has been undertaken. Partner authorities have been part of both the Project Team and Project Board. The Boards of both the Greater Cambridge Partnership and the Cambridgeshire and Peterborough Combined Authority have been briefed and a local member briefing was undertaken on 8th January. As set out in paragraphs 6.2 and 6.4, a wider public consultation exercise is recommended in the summer of 2018 on the recommendations from the study. Whilst the Combined Authority will need to lead on this, given the breadth of the recommendations, the consultation will need to be extensive. A joined up approach will be desirable and the GCP will need to support this.

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