

**GREATER CAMBRIDGE PARTNERSHIP
JOINT ASSEMBLY**

2:00 pm

Thursday 18th November 2021

**Main Hall,
Storey's Field Centre,
Eddington Avenue,
Cambridge, CB3 1AA.**

*The meeting will be live streamed and can be accessed from the GCP
YouTube Channel - [Link](#)*

AGENDA

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| 1. Apologies for Absence | (-) |
| 2. Declaration of Interests | (-) |
| 3. Minutes | (3-26) |
| 4. Public Questions | (27) |
| 5. Petitions | (-) |
| 6. Residents Parking Scheme Delivery | (28-32) |
| 7. Further investment in the Greater Cambridge Active Travel network: Cycling Plus Consultation | (33-112) |
| 8. Foxton Travel Hub | (113-134) |
| 9. Electricity Grid Reinforcements: Update and Next Steps | (135-326) |
| 10. Quarterly Progress Report | (327-354) |
| 11. Date of Next Meeting | (-) |

- 2:00 p.m. Thursday 17th February 2021

MEMBERSHIP

The Joint Assembly comprises the following members:

Councillor Tim Bick (Chairperson)	-	Cambridge City Council
Councillor Rosy Moore (Vice-Chairperson)	-	Cambridge City Council
Councillor Simon Smith	-	Cambridge City Council
Councillor Alex Beckett	-	Cambridgeshire County Council
Councillor Brian Milnes	-	Cambridgeshire County Council
Councillor Neil Shailer	-	Cambridgeshire County Council
Councillor Ian Sollom	-	South Cambridgeshire District Council
Councillor Heather Williams	-	South Cambridgeshire District Council
Councillor Eileen Wilson	-	South Cambridgeshire District Council
Heather Richards	-	Business Representative
Christopher Walkinshaw	-	Business Representative
Claire Ruskin	-	Business Representative
Karen Kennedy	-	University Representative
Helen Valentine	-	University Representative
Vacancy	-	University Representative

IMPORTANT INFORMATION FOR THOSE WISHING TO OBSERVE PROCEEDINGS

Whilst the situation with COVID-19 is on-going, if you can observe the meeting remotely, rather than attend in person, you are encouraged to do so.

The GCP will be following the latest Government guidance in organising and holding its meetings. We ask you to maintain social distancing at all times and to wear a face covering unless you are exempt or when speaking at the meeting. Hand sanitiser will be available on entry to the venue. If you have any questions about the meeting arrangements please contact Democratic Services.

The meeting will be live streamed and can be accessed from the GCP YouTube Channel - [Link](#) . We support the principle of transparency and encourage filming, recording and taking photographs at meetings that are open to the public. We also welcome the use of social networking and micro-blogging websites (such as Twitter and Facebook) to communicate with people about what's happening, as it happens.

For more information about this meeting, please contact Nicholas Mills (Cambridgeshire County Council Democratic Services) on 01223 699763 or via e-mail at Nicholas.Mills@cambridgeshire.gov.uk.



Growing and sharing prosperity

Delivering our City Deal

Agenda Item No: 3

Greater Cambridge Partnership Joint Assembly

Minutes of the Greater Cambridge Partnership (GCP) Joint Assembly

Thursday 9th September 2021

2:00 p.m. – 5:05 p.m.

Present:

Members of the GCP Joint Assembly:

Cllr Tim Bick (Chairperson)	Cambridge City Council
Cllr Rosy Moore (Vice-Chairperson)	Cambridge City Council
Cllr Simon Smith	Cambridge City Council
Cllr Alex Beckett	Cambridgeshire County Council
Cllr Brian Milnes	Cambridgeshire County Council
Cllr Neil Shailer	Cambridgeshire County Council
Cllr Ian Sollom	South Cambridgeshire District Council
Cllr Heather Williams	South Cambridgeshire District Council
Cllr Eileen Wilson	South Cambridgeshire District Council
Heather Richards	Business Representative
Christopher Walkinshaw	Business Representative
Karen Kennedy	University Representative
Helen Valentine	University Representative

Attending at the discretion of the Chairperson

Claire Ruskin	Business Representative
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Officers:

Peter Blake	Transport Director (GCP)
Niamh Matthews	Assistant Director: Strategy and Programme (GCP)
Nick Mills	Democratic Services Officer (CCC)
Gemma Schroeder	Project Manager: Smart Cambridge (GCP)
Richard Preston	Senior Delivery Project Manager (City Access) (GCP)
Rachel Stopard	Chief Executive (GCP)
Isabel Wade	Assistant Director: Sustainable and Inclusive Growth (GCP)
Wilma Wilkie	Governance and Relationship Manager (GCP)

1. Apologies for Absence

Apologies for absence were received from Lucy Scott.

The Chairperson expressed thanks to former Joint Assembly member Andy Williams, noting that he had become a substitute member of the Executive Board. He advised the Joint Assembly that Claire Ruskin, a former member of the Executive Board, had been nominated as the new business representative to replace Andy Williams on the Joint Assembly. Although her appointment would not be official until ratified by the Executive Board at its forthcoming meeting, Claire Ruskin had been invited to attend today's Joint Assembly meeting in an unofficial capacity.

The Chairperson also informed the Joint Assembly that it had received a book entitled "Histon Road: A Community Remembers" from the Histon Road Area Residents' Association, which celebrated the memories of local people. It was noted that the book launch would be on 24th September at St Augustine's Community Centre in Cambridge, and would be accompanied by an exhibition of work by documentary photographer Faruk Kara.

2. Declarations of Interest

There were no declarations of interest.

3. Minutes

The minutes of the previous Joint Assembly meeting, held on 24th February 2021, were agreed as a correct record, subject to the correction of "Whittlesworth" to "Whittlesford" on the last bullet point of Agenda Item 10 (Quarterly Progress Report), and signed by the Chairperson.

4. Public Questions

The Chairperson informed the Joint Assembly that nine public questions had been accepted and that the questions would be taken at the start of the relevant agenda item, with details of the questions and a summary of the responses provided in Appendix A of the minutes. It was clarified that those submitting questions had been offered the option of attending the meeting in person or having their question read out by an officer.

It was noted that two questions related to agenda item 6 (Quarterly Progress Report), four questions related to agenda item 7 (Public Transport Improvements and City Access Strategy) and three questions related to agenda item 8 (Active Travel: Experimental Traffic Regulation Orders).

5. Petitions

The Chairperson notified the Joint Assembly that no petitions had been submitted.

6. Quarterly Progress Report

Two public questions were received from John Grant and Anna Williams (on behalf of Camcycle). The questions and a summary of the responses are provided at Appendix A of the minutes.

The Assistant Director of Strategy and Programme presented a report to the Joint Assembly which provided an update on progress across the GCP's whole programme. Further to the updates, the report detailed a proposal for the GCP to contribute £200k to the first stages of a traffic sensor network across Greater Cambridge, which would assist the development of a richer set of data that would demonstrate the impact of the GCP's work. While the project's timescale was still subject to discussion, it was proposed that the procurement process could commence by the autumn, allowing for the sensors to be in place by early spring and fully operational by the summer in 2022. Attention was also drawn to the update on Skills delivery in Section 11 of the report, which demonstrated that, despite challenges, there had been good progress towards the targets.

While discussing the report, the Joint Assembly:

- Clarified that consideration of the West of Cambridge Package had been deferred by the County Council's Planning Committee pending the submission of additional information that had been requested. It was anticipated that the planning application would be considered by the Committee in early 2022.
- Requested an update on Resident Parking Schemes (RPSs), noting that the GCP and County Council were both keen for progress to be made. The Transport Director confirmed that there were ongoing discussions with the County Council about developing an Integrated Parking Strategy, which included individual elements such as RPSs.
- Requested an update on land purchasing for the Greenways schemes. While acknowledging that the issue of land purchase was the greatest challenge for the schemes, the Transport Director assured members that a lot of work was being carried out to resolve the issues, and he anticipated being able to provide a more detailed update in early 2022.
- Welcomed that resources and events aimed at primary schools were being development for launch in the new academic year, noting the importance of primary schools for initiating aspirations in young people.
- Requested anonymised case studies in future reports that could demonstrate the wide variety of ages, levels and types of organisations taking on apprentices.

- Confirmed that a Smart Working Group was in the process of being organised.
- Suggested that the GCP could consider making a section of one of its projects solely for the use of autonomous vehicles, as there would be less impediments than on a public road, and it would support their development. The Assistant Director of Strategy and Programme informed members that the GCP was discussing such a proposal with the Genome Campus.
- Highlighted the importance of ensuring that changes to the strategic network were based on evidence.
- Welcomed that formal applications had been submitted to UK Power Networks (UKPN), and sought clarification on whether the response from UKPN had been either positive or negative. Noting that UKPN had acknowledged the problem raised by the GCP in its response, and that it was planning some consultation on changes that might impact the situation in Greater Cambridge, the Chief Executive reported that the GCP had requested a further meeting to discuss the matter in greater detail. She also noted that alongside the lobbying efforts, the GCP was continuing to intervene where it could, informing the Joint Assembly that an Outline Business Case would be presented later in the year.

7. Public Transport Improvements and City Access Strategy

Four public questions were received from David Trippett, Roger Turnbull, David Stoughton and Anna Williams (on behalf of Camcycle). The questions and a summary of the responses are provided at Appendix A of the minutes.

The Transport Director and Assistant Director for Sustainable and Inclusive Growth presented the report, which outlined proposals that would be presented to the Executive Board on 30th September 2021 to establish a comprehensive package of measures for the City Access Strategy to promote sustainable transport, improve air quality and reduce congestion and carbon emissions. This included the development of a final package of options for improving bus services, funding an expansion of the cycling-plus network, and managing road space in Cambridge. It also outlined plans to consult on a package including bus network improvements, proposals for prioritising road space for sustainable and active transport, and measures that would provide an ongoing funding source for the enhanced public transport network and more of the cycling-plus network across Greater Cambridge. Finally, it detailed plans to work with the Cambridgeshire and Peterborough Combined Authority (CPCA) and local bus operators to reduce emissions on the local public transport network by allocating £2.25m to support the Zero Emission Bus Regional Area (ZEBRA) bid to the Government for zero emissions vehicles across Greater Cambridge.

Emphasising the central role of the City Access Strategy in the GCP's overall programme, the Transport Director noted that car use in the region had now increased to higher levels than before the Covid-19 pandemic, further highlighting the need to improve the public transport offer and cycling infrastructure, while implementing measures to discourage car use. Members were informed that under the proposals laid out in the report, most market towns and villages would see a tripling and

extension of bus frequencies, along with more direct and express links to Cambridge. Bus routes would provide improved connections to travel hubs, such as train stations and cycling routes, and would include more direct services to main employment areas within the city centre, as well as more frequent, untimetabled services. Noting that changes to fares would be considered as part of the consultation, the Assistant Director for Sustainable and Inclusive Growth observed that a £1 flat fare, for example, could potentially lead to a further 1.6 million journeys per year.

While all the proposals and measures under consideration would make bus journeys more reliable, cheaper and therefore attractive, it was emphasised that there would be a significant cost of up to £40m per year, and while the GCP could fund a portion of that, an ongoing revenue source would be required. Noting that it would be difficult to reach unanimity on how this should be achieved, the Transport Director emphasised the importance of the consultation for involving the local community in the discussion to ensure all requirements and opinions were represented and considered. The Joint Assembly was informed that paragraph 2.1(a) of the report should have read “as outlined in the report”, rather than “in para 7.24 and 7.25”, while paragraph 6.10 should have referred to paragraphs 6.5-6.7 instead of 7.5-7.7.

While discussing the report, the Joint Assembly:

- Welcomed the development of the City Access Strategy as outlined in the report and the benefits that it would provide for residents and visitors to Cambridge.
- Highlighted the need to identify key strategic routes for movement around the city to ensure that traffic flowed as efficiently as possible, noting that there would be significantly more buses in the city if the employment growth continued according to the expected levels. Concerns were raised about this increase in numbers of buses and members sought clarification on where the bus routes would terminate, arguing that they could increase congestion. It was further asked for clarification on how bus users would be expected to complete their journeys if the buses did not reach the centre, and whether such clarification would be provided as part of the consultation.
- Supported the measures outlined in the report, while suggesting that supporters of proposals were generally less likely to indicate their support than objectors were to express their objections, although it was recognised that decisions were not solely based on the result of levels of support or opposition that were expressed during consultation.
- Observed that shopping preferences were evolving, with increasing online or click-and-collect purchases, which affected travel flow and public transport requirements. The Transport Director acknowledged the changes and recognised the GCP needed to respond accordingly and in an appropriately adaptable way.
- Argued that to reduce the number of cars in the city, greater attention should be given to rural areas, as it was easier to promote modal shift within urban areas than rural areas, given the increased number of connections required if using public transport, as well as the difficulty in walking or cycling for longer distances.

- Identified the multiple transport authorities in the area as one of the main causes of delay in developing the City Access Strategy and other projects, and queried whether the GCP could take a greater lead and encourage greater levels of joint working while streamlining processes.
- Considered whether City Access was the most appropriate name for the strategy, with members arguing that it suggested a focus on only improving the city itself and making it more accessible to people from outside the city, while it was noted that inaccurate references to a City Centre Access Strategy exacerbated such a perception. It was also observed that the strategy involved cross-city travel for local residents and that 'Access' was therefore an inappropriate term, while the Future Networks Map could include a more detailed section of the city to demonstrate this. The Assistant Director for Sustainable and Inclusive Growth noted that the GCP had not been able to find a more appropriate name than City Access Strategy but informed members that she would welcome alternative suggestions.
- Argued that the south-west area of the Future Network Map could include greater coverage, with the Ashwell and Morden train station in Odsey currently not serviced by buses, and other local routes and villages lacking in attractive public transport options. It was suggested that an increase in local bus connections to smaller train stations, along with a coordination of bus and train timetables, would lead to greater use of the services. Members also encouraged the inclusion of a greater number of villages on the map.
- Noted that it would be useful to be provided with information on where train journeys originated for people travelling into Cambridge.
- Argued that the cost of using public transport needed to be less than the cost of travelling by car into the city.
- Highlighted the need to re-establish bus services in rural villages following their suspension during the pandemic, noting that their continued suspension increased feelings of isolation and powerlessness in local communities, while also eroding levels of trust with bus operators and the GCP.
- Emphasised the importance of the Future Networks Map demonstrating interconnected travel options, such as cycling, bus and train networks.
- Observed that there was little consideration given for people who travelled out of Cambridge, noting that Park and Ride sites did not serve a function for residents wishing to travel out of the city.
- Expressed concern about the phasing of the project, noting that it would be ineffective to introduce improved buses to the network if they continued to suffer from congestion issues.
- Suggested that it would be helpful to clarify in the consultation that further routes and measures could be developed in the future.

- Observed that Cambridge did not share a culture of everybody using public transport in the same way that it existed in other cities, such as London, and suggested that encouraging families, through discounts or free travel for children, would help ingrain a culture shift. It was also argued that people were reticent to walk to or from a public transport service, and therefore that it would be useful to highlight the benefits of such active travel. The Assistant Director for Sustainable and Inclusive Growth acknowledged the need to encourage people to try buses and informed members that options such as target fares were being considered.
- Suggested that work on developing a clean air zone could be carried out alongside work on the City Access Strategy given that it would take a substantial period of time to implement and for the bus operators to prepare their fleets for compliance.
- Argued that automated taxis would be common in the future, significantly reducing the cost of journeys, and it was suggested that this eventuality needed to be considered as part of the strategy's development.
- Emphasised the need to be bold, fast and committed, arguing that it was unrealistic to expect every part of the strategy to work perfectly and without any negative side-effects. While members supported the need for further consultation, it was argued that an appropriate balance needed to be established for the various measures between cost, speed of implementation and public consultation. It was also argued that it needed to be made clear how the consultation would differ from previous consultations, to ensure that people felt listened to. Acknowledging the concerns, the Transport Director highlighted the importance of consultations for identifying the necessary measures and to establish a wide spectrum of opinions.
- Suggested that greater focus could be given during the consultation on how the measures would be beneficial to local residents, particularly regarding less obvious benefits such as lowering carbon emissions, improving public health and connecting communities, rather than simply the benefits of reducing congestion and making it easier for people traveling from outside the city. The Transport Director noted that the use of personas as part of the consultation for Choices for Better Journeys had been successful and popular, and that it was being explored how to do something similar with the City Access Strategy consultation.
- Emphasised the need to consult with parish councils while developing integrated transport strategies, given their knowledge of local communities and their needs. The Assistant Director for Sustainable and Inclusive Growth acknowledged the observation and informed the Joint Assembly that they would be involved.
- Highlighted the need to involve people in the consultation from outside the Greater Cambridge area, particularly in East Cambridgeshire, given that many of them would benefit from the Strategy. It was also recognised that the widest representation of input as possible should be sought in the consultation.
- Requested that the consultation consider the possibility of on-demand bus services. The Assistant Director for Sustainable and Inclusive Growth noted that the CPCA was carrying out such trials in Huntingdonshire and confirmed that they would be considered as part of the consultation.

- Suggested that it would be helpful for the consultation to include comparisons of how the different measures would affect carbon emissions.
- Highlighted the importance of making it clear during consultations that such improvements to the bus network would only be sustainable with the implementation of an ongoing revenue source, and it was argued that the consultation should include discussions on the level of financial costs and penalties involved in the schemes.
- Noted that a high level of car journeys in the city were made by local people and therefore argued that the implementation of any measures such as a congestion charge would need to be accompanied by improvements to alternative options.
- Expressed concern about the impact of potential charging for vehicles accessing the city centre, particularly self-employed delivery drivers on low income, whose situation was already precarious following the impacts of the pandemic. It was emphasised that such affected stakeholders needed to be involved in the consultation.
- Expressed concern about allowing exemptions to charging for electric vehicles, as it would unfairly punish those who were unable to afford to upgrade their car.
- Highlighted the need to exempt some people from charging for reasons such as disability or inability to pay, although it was also argued that the climate crisis did not affect everybody equally and that one of the objectives was to reduce health inequalities and increase equality of access to public transport.
- Queried whether an equilibrium where enough people had been discouraged from using their vehicle and enough revenue was received from those who were prepared and able to pay a charge had been identified.
- Observed that replacing fuel-consuming vehicles with electric vehicles would not resolve the underlying congestion issues, and noted that while reducing carbon emissions they still produced pollution and led to accidents and road deaths.
- Acknowledged that developing a fair charging system was complex, but recognised that an ongoing revenue source would be required in order to ensure the Strategy was sustainable, and that this needed to be clearly explained throughout the consultation.

The Chairperson concluded that the Joint Assembly supported the direction set out in the report, with its main concerns revolving around ensuring the consultation was as inclusive, representative and informed as possible

8. Active Travel: Experimental Traffic Regulation Orders

Three public questions were received from Linny Purr, Kirsty Howarth (also on behalf of Nick Flynn, Robert Rawlinson and a number of local residents), and Anna Williams

(on behalf of Camcycle). The questions and a summary of the responses are provided at Appendix A of the minutes.

The Transport Director presented the report, which set out proposals for the future of six Experimental Traffic Regulation Orders (ETROs) that had been implemented by the County Council and funded by the GCP, and which would be presented to the Executive Board for recommendation to the County Council's Highways and Transport Committee. Following the GCP's initial support and funding for the ETROs and consultations, five of the schemes had been recommended for being made permanent, with a further proposal to rescind the sixth scheme. The Transport Director informed the Joint Assembly that if the Luard Road scheme, which had been recommended for rescindment, was be made permanent, it would be necessary to address concerns and make improvements to traffic signals on Long Road, which would mitigate the disbenefits that had been identified, although it was observed that such a change would require the GCP to agree to undertake the required improvements.

While discussing the report, the Joint Assembly:

- Welcomed the proposals to make the ETRO schemes permanent but expressed concern about the effects that the permanent measures would have on nearby roads as a result of the long-term displacement of traffic. It was suggested that the Executive Board could ask the County Council's Highways and Transport Committee to reconsider possible mitigation of such issues.
- Noted that the Luard Road scheme had received the highest level of strong support during the public consultation out of all the schemes, and sought clarification on the negative impacts that had been identified and which had led to the report recommending that the Luard Road scheme be rescinded. It was confirmed that the main issue had been regarding displacement of traffic to Long Road and the resulting negative effects, such as increased pollution in that area.
- Observed that Sedley Taylor Road had been used by vehicles as a rat run during the temporary closure on Luard Road, and expressed concern about the GCP therefore supporting the scheme being made permanent, as it was likely to lead to vehicles to continue to use Sedley Road in such a way. One member argued that traffic displacement would be an inevitable of any of the schemes.
- Suggested that, if the Luard Road scheme were recommended to be made permanent, the GCP could undertake long-term monitoring of the displacement effect on Long Road. The Transport Director acknowledged that such an approach would be reasonable.
- Confirmed that the supplementary information circulated to the Joint Assembly prior to the meeting had also been published on the meeting website alongside the agenda.

As a result of the discussion on whether to rescind the Luard Road scheme or make it permanent, along with the other five schemes, it was unanimously agreed to convey the following message to the Executive Board:

The Joint Assembly supports making permanent the Luard Road closure, but to mitigate impacts on other roads, requests work is undertaken on traffic signals in the area, and long-term monitoring is undertaken on the effects of displacement on Long Road.

9. Date of Next Meeting

The Joint Assembly noted that the next meeting was due be held on Thursday 18th November 2021.

Chairperson
18th November 2021

Greater Cambridge Partnership Joint Assembly – 9th September 2021
Public Questions Listed by Agenda Item

No		Question	Answer
6	John Grant	<p>Agenda Item 6 – Quarterly Progress Report</p> <p>The question refers to paragraph 13.2 on pp 52-53 of the Agenda Pack, and item 7 paragraphs 3.2 and 3.8 on pp 67-69.</p> <p>Following the success of the trial in west Cambridge, will GCP consider using Autonomous Vehicles in Waterbeach, to provide transport within the village and new town, including serving the railway station (whether or not it is relocated) and the various industrial and research sites?</p> <p>Will the team also consider the possibility of running the Vehicles at a higher speed (probably on dedicated tracks) to link into neighbouring settlements such as north Cambridge and Cottenham?</p>	<p>The trial at West Cambridge was successful, including highlighting the challenges that need to be solved before full autonomy can be considered a viable part of the public transport system.</p> <p>The GCP has an interest in various types of guidance systems including optical and autonomous technologies and continue to keep the development of these under review to ensure that we are in the best possible place to take advantage of them when the circumstances allow.</p>
12	Anna Williams on behalf of Camcycle	<p>Agenda Item 6 – Quarterly Progress Report</p> <p>Evidence published in July 2021 from the Cycle City Ambition Programme emphasises that there is significant potential to grow cycling in Cambridge: the sooner this is unlocked, the sooner benefits could be realised in terms of health, congestion, air quality and reduction of carbon emissions. Therefore Camcycle's questions on this agenda item seek to press for the rapid delivery of key active travel routes.</p> <p>1. There has been no specific agenda item on the much-needed Greenways at any meeting this year.</p>	<p>1. The focus this year has been on making progress on scheme design. Detailed designs for Comberton Greenway are nearing completion, and Haslingfield Greenway is well advanced.</p> <p>These are now providing the templates for subsequent Greenways. Greenways were all taken to the Executive Board last year and will be brought back to the Executive early next year once the design process is completed. Planned communications regarding the</p>

		<ul style="list-style-type: none"> ○ Can you provide detail on the progress on these schemes? ○ What are the 'early interventions' which have been allocated £1.75m for delivery this financial year? <p>2. We're pleased to see progress on the Chisholm Trail but seek reassurance that Phase 1 will open by the end of 2021.</p> <ul style="list-style-type: none"> ○ What are the 'significant time risks' mentioned in point 10.13? ○ When will the bridge over Coldham's Brook and the railway underpass be addressed and will either require closure of the Coldham's Common path? <p>3. We'd also like to know more details on progress on the Madingley Road project.</p> <ul style="list-style-type: none"> ○ What is the timeline for completion next year? ○ Will detailed designs be presented to the Executive Board in December? <p>4. The objectives of the Smart Signals project (13.7) are confusing.</p> <ul style="list-style-type: none"> ○ How are they prioritising those using sustainable transport (especially pedestrians or those wheeling cycles) when easing motor traffic congestion and reducing idling seems to be the main focus (item 7, 6.9)? ○ Are the GCP's traffic reduction targets built into junction designs? Junctions are a significant barrier to safe active travel routes and the reallocation of road space because 'traffic flow' at junctions consistently seems to be placed higher than space for people. 	<p>Greenways programme will take place in the near future.</p> <p>2. There is no specific risk to single out. Supply chain pressures on resources and materials remain, but our expectation is the project will be completed in 2021.</p> <p>The Coldhams Common element of the trail including the bridge/culvert and rail underpass sections, is scheduled for completion by November 2021 and it is not proposed at this time that the route will be closed during this period.</p> <p>3. The date set out in the Quarterly Progress Report for Madingley Road is the completion of design. This is in line with the current budget allocation.</p> <p>Design work is due to be completed in Autumn 2021. Engagement with stakeholders will then follow.</p> <p>4. (A) A key aim of the trial is to assess the capability of Artificial Intelligence to identify and prioritise each sustainable transport mode including pedestrians, cyclists and buses in particular by reducing their wait time at junctions. Part of the evaluation of the trial will look at the impact of giving greater priority to sustainable transport modes and the impact this has on overall junction performance/user experience to help inform future decisions.</p> <p>(B) The smart signals project is part of the GCP's integrated transport strategy to tackle congestion, air quality and the climate challenge, including a reduction in traffic.</p>
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3	David Trippett (Resident of Coldhams Lane and officer of Coldhams Lane Resident's Association)	<p>Agenda Item 7 - Public Transport Improvements and City Access Strategy</p> <p>At the previous meeting of the GCP, members firmly agreed that Eastern Access schemes needed to alleviate private motor traffic on the Northern trunk of Coldhams Lane, described as "one of the very worst congested roads in Cambridge" (Cllr Herbert). Extensive free parking at the Beehive Centre, demonstrably inadequate bus services, and the GCP's works to ameliorate traffic on Newmarket Rd were all cited as continuing drivers of congestion for Coldhams Lane. Residents continue to suffer from heavily congested traffic, and are very hopeful that the GCP will follow its words with actions. What proposals are being brought forward as a result of last meeting's discussion, and how will this integrate with the extended vision for a 'future bus network' recently published as part of its City Access paper?</p>	<p>The proposals being discussed today set out a bus network for the area as a whole, which would include improvements such as more frequent services, new local connections, lower overall traffic levels and lower fares.</p> <p>If approved by the Executive Board, a more detailed consultation on proposals will take place in the autumn as well as a consultation on the Cambridge Eastern Access scheme proposals.</p>
11	Roger Turnbull Apt Planning Ltd acting for a Stapleford resident working at Addenbrookes Hospital.	<p>Agenda Item 7 - Public Transport Improvements and City Access Strategy</p> <ol style="list-style-type: none"> 1. Page 66 of the Agenda gives greater priority to shorter-term bus improvements to promote sustainable transport and reduce carbon emissions. 2. In 2020, Systra Ltd produced the Cambridge Bus Network Report (page 73 of Agenda) to meet the GCP target to reduce traffic by 20% by 2031. It proposed 10 min. frequencies from rural villages to Cambridge Biomedical Campus (CBC) which aligned with City Deal objectives. 3. Paragraph 2.1.24 of the Systra Report said that the rural bus network was unattractive because it was "circuitous & infrequent." It proposed a new X7 service (4 buses p.hour) 	<p>The City Access report outlines the sort of improvements that need to be made to adequately reduce traffic and support the transition to zero carbon.</p> <p>The proposed consultation would, if approved by the Executive Board, seek views on detailed proposals for bus services which would then be followed by the development of a business case for specific proposals.</p>

		<p>routed via the A1301, cutting journey times from Great Shelford by c.15 mins, Fig 32 & para 4.3.10.</p> <p>4. My question is, will City Access programme:</p> <ul style="list-style-type: none"> - Meet GCP objectives to reduce traffic by 20%, & reduce carbon emissions, - Identify that the rural bus network is unattractive due to circuitous routes & infrequent services, - Increase bus frequencies from 20 mins to 10 mins on the A1301 corridor (instead of bypassing Sawston, Stapleford & Great Shelford, as proposed in the CSET Study), <p>Does the City Access proposals make the £100m+ cost of the CSET proposals Poor Value for Money, with an under-estimated impact on the Green Belt/landscape?</p> <ul style="list-style-type: none"> - With minimal modal shift (page 18 of the Outline Business Case Econ Case 2020), - Misleading travel benefits excluding 20-30 mins perceived walking/waiting times which are longer than cycling journey times, & by-passing the 14,000 pop. in Sawston, Stapleford & Great Shelford, (Shelford Rail Option report), - With a negative effect on existing bus services, losing 56% of their passengers (Table 4.3 & para 5.2.2 of Mott MacDonald Update May 2021). <p>Will the revised CSET Economic Case include the City Access measures in the GCP Do-Nothing case, against which the CSET proposals will be assessed?</p>	
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		I therefore repeat my Freedom of Information request for the release of 2020/21 CSET transport modelling results & evidence of revised travel benefits.	
2	David Stoughton Chair, Living Streets Cambridge	<p>Agenda Item 7 - Public Transport Improvements and City Access Strategy</p> <p>The City Access Strategy makes constant references to promoting walking but has few proposals that address the barriers pedestrians face. Reducing congestion and pollution and closing some streets to cars would greatly improve the environment and potentially encourage walking. However, our survey and outreach at Living Streets Cambridge records an increasing number of negative factors that deter walkers and especially the disabled, the partially sighted and the blind.</p> <p>Notable among the factors deterring pedestrians are:</p> <ul style="list-style-type: none"> o Significant growth in pavement parking since lockdown, possibly encouraged by increases in deliveries and collections, but there have been noticeable increases in entirely residential areas too, o The growing multiplicity of alternative modes of transport, including private eScooters, motorised skateboards and spinning wheels, which are either illegal or unregulated but whose users assume that taking them on footways is permitted despite the alarm this causes for many pedestrians, o Further increases in unnecessary cycling on pavements. <p>Living Streets welcomes alternative modes that support active travel where they are segregated from footways and sees an opportunity to greatly improve first and last mile travel for longer journeys and those involving public transport. Availability of eScooters at bus stops might, for instance, increase bus</p>	<p>The City Access proposals aim to support increased walking by reducing traffic, pollution, and refocusing the city away from the car to create more pleasant environments and open up opportunities to create more space for people walking.</p> <p>The GCP is not the appropriate body to regulate or enforce road traffic or highway legislation. We continue to work with partners to deliver improvements across the Greater Cambridge environment.</p>

		<p>occupancy.</p> <p>However, if walking is to increase significantly, these negative factors need to be addressed and, while control of them is split between different councils and agencies and may require legislation, collaborative action is essential.</p> <p>Will this assembly undertake to coordinate policies to segregate modes of travel and return the footways to the use of pedestrians as intended? Further, will it work with appropriate bodies to ensure that footways are properly regulated and abuses controlled?</p> <p>Finally, will the Greater Cambridge Partnership explore the potential benefits of integrating legal alternative modes such as licensed eScooters with public transport?</p>	
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13	Anna Williams on behalf of Camcycle	<p>Agenda Item 7 - Public Transport Improvements and City Access Strategy</p> <p>The City Access project is vitally important, but this report raises more questions than it answers. Given the risk of a car-based recovery from Covid and the county's limited carbon budget, the plans and timelines are unambitious. There is no holistic vision pulling together work from local authorities (e.g. Making Space for People, LCWIP) to deliver a sustainable transport network with integration between public transport and active travel.</p> <ol style="list-style-type: none"> 1. The new bus strategy will see up to 1,150 buses entering Cambridge per day (Systra) which requires space for their movements and will create additional conflict with people walking and cycling. <ul style="list-style-type: none"> o What will be done to mitigate this? o What's happened to the plan to extend the Core Traffic scheme with additional bus gates? 2. The paper states that measures to discourage car use must follow the implementation of alternatives; however both reliable bus journeys and safe cycle routes depend on traffic reduction. <ul style="list-style-type: none"> o The Steer report suggests 'an incremental approach...that ratchets up incentives and disincentives in tandem'. Is this being explored? 3. Point 6.9 talks about bringing forward a programme of roadspace reallocation to deliver 'a revised network hierarchy ... that prioritises sustainable modes of transport' building on Active Travel Fund schemes. <ul style="list-style-type: none"> o How does this fit into City Access? o Does the 'roadspace management scheme' scheduled for 	<p>Delivering a transformed transport network for Greater Cambridge that addresses the growth and climate challenges we face requires a vastly improved public transport network and lower car levels – this paper sets out a clear way forward on these two key issues.</p> <p>Taking your questions:</p> <ol style="list-style-type: none"> 1. The report explores the issues for the city environment of lower overall traffic levels, creating space for public transport, walking & cycling. Detailed bus routing and bus stop locations would also need to be considered as the proposed network is developed further following consultation. 2. Phasing is being explored to support the delivery of the proposals. 3. Cambridge's transport network is currently very constrained, and it would be difficult to deliver any large-scale road space reallocation without vehicle displacement impacts. The city access proposals for lower traffic levels would open up opportunities to take a bolder approach to the network. The draft road network hierarchy will therefore need to reflect the emerging city access proposals and is likely to be consulted on separately. 4. Choices for Better Journeys was a high level consultation undertaken prior to the pandemic, revised government policy on buses and active
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		<p>2023 at the earliest (6.25) just apply to charging elements?</p> <ul style="list-style-type: none"> ○ The February report suggested that the draft network hierarchy would be consulted on this year – is it due to be part of the City Access consultation? <p>4. It's unclear why two further consultations are needed following Choices for Better Journeys.</p> <ul style="list-style-type: none"> ○ What will they involve? ○ Will options be set in context of the GCP's traffic reduction targets and partners' climate commitments (3.3) so residents can make properly informed responses? 	<p>travel, and the emerging Local Transport Plan refresh.</p> <p>The proposed consultation this autumn would reflect this new context and move forward to discussing detailed bus service proposals as well as principles for reducing traffic levels. A second consultation could then follow on a detailed scheme.</p>
4	Linny Purr **	<p>Agenda Item 8 - Active Travel: Experimental Traffic Regulation Orders</p> <p>This question is an appeal to the GCP to carry out its science from a 'systems' perspective and see road closures as being about justice, not chiefly about transport.</p> <p>Closing a road to through traffic is a socially divisive act. This is a moral issue and it is immoral to use people as collateral damage.</p> <p>In the meeting notes, for each closure that is recommended, it states, "It is inevitable that some traffic would be displaced."</p> <p>This means that while some get to live in a cul-de-sac, 'green' and great with enhanced active travel, virtually no traffic past their doors and increased value of their homes, others, inevitably, are forced to take their traffic, congestion, emissions, and danger as well as their own.</p>	<p>The City Access proposals have been developed to progress these issues from a "holistic" perspective.</p>

		<p>Road closures also harm the local economy; commuters who live beyond cycling distance; the elderly and disabled, and all those with mobility problems; all users of the road for necessary journeys; and locals forced to take lengthy detours round the barrier. The environment will suffer as alternative journeys are much longer.</p> <p>When all the rhetoric round, 'It's for COVID, cycling, speeding, lorries, climate-crisis, 'trial only'', is done, you are still left with the policy being either fair or unfair.</p> <p>National evidence (Ealing et al) proved that road closures and cycle lanes are not all you need to change travelling behaviour. Traffic evaporation was a false claim. Other equitable solutions and incentives are available.</p> <p>Please govern by consent from a holistic perspective and manage interdependency. Put justice and the environment, at the heart of transport policies.</p> <p>If not, children in the 'side roads' will be forced to live in 'High Traffic Neighbourhoods'. One question will be, "Who is it who will go and explain to these children why their lungs are not as important as the ones that you gave a 'Low Traffic Neighbourhood' to?</p> <p>** Representing the vast majority of residents in Havenfield Retirement Flats, Arbury Road, for whom she is the spokesperson (04.09.20 Survey of 57 occupied flats - 44 opposed to modal filter, 5 supported, 1 abstention).</p>	
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	<p>Nick Flynn and Robert Rawlinson *</p>	<p>Agenda Item 8 - Active Travel: Experimental Traffic Regulation Orders</p> <p>1. Given the officers report states no negative evidence to support the proposal to rescind the experimental order, and there is clear evidence the objectives have been met, as well as the proven popularity of the scheme with residents and non-residents, what is the justification for re-opening the road?</p> <p>On 'whether it should be retained', the Luard/Sedley Taylor scheme scored more highly in responses from non-residents than it did from residents - 61% of all respondents feeling that the restriction should be retained and made permanent, more than for the schemes in Newtown, Nightingale Avenue or Storey's Way.</p> <p>2. What would be the council's reason for re-opening the road when this would make the roads less safe for cyclists and pedestrians? Both the council and central government have stated objectives to encourage people out of their cars and to use other more environmentally friendly modes of transport. The GCP report states it was used by over 700 cyclists per day.</p> <p>The report states consultation responses show it has been 'successful in improving walking and cycling and making the area safer'. Also, there is clear evidence previously provided to the Council on the frequency of accidents before the closure of the road.</p> <p>According to the GCP's own report, there were 2 serious and 6 slight injuries on Luard Road or Sedley Taylor Road including their junctions with Hills Road or Long Road</p>	<p>Journey time data has indicated an increase in eastbound delays on Long Road following the closure of Luard Road at a time when overall traffic levels fell.</p> <p>Given the effect that longer delays on Long Road could have on air quality, this aspect of the trial closure needs to be considered and weighed against the environmental benefits achieved by reducing traffic on the closed route.</p> <p>Whilst journey times on Long Road have fluctuated during the trial, there is a concern they could increase again as traffic levels return to pre-pandemic levels.</p> <p>The information provided in the report on road collisions is based on data provided by the Police in accordance with national requirements.</p>
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		<p>from 2017 to the start of the trial period in 2020. No collisions were recorded during the ETRO trial period.</p> <p>3. Notwithstanding the intended impact of the road closure to displace traffic on to Long Road, away from Luard/Sedley Taylor roads that have become a classic residential 'rat-run', what evidence is there to show a net increase in traffic and/or pollution levels that could be used as a justification to remove the road closure?</p> <p>The officers' report states 'there is no data to support that the displacement has been any worse than for any road closure sites', there is NO proposal to rescind any of those 5 ETRO schemes. In addition, the officers' report states that there is 'no air quality data' to support or disagree that any traffic displacement has negatively affected pollution levels.</p> <p>4. Given the justification for rescinding the order is an alleged increase in complaints to the signals team regarding the Hills Road/Long Road junction, where is the evidence on changes in journey times and what consideration has been given to the impact of the reopening of the nearby Fendon Road roundabout in July 2020? This change, shortly before the Luard Road Experimental Traffic Order came into effect, would also have been expected to increase traffic volumes on Long Road independently of the Luard Road scheme.</p> <p><i>Note: the above represents a combination of questions submitted by Nick Flynn and Robert Rawlinson * to avoid duplication.</i></p>	
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		<p><i>* Mr Rawlinson's questions were put forward by the following list of residents on Luard Road and Sedley Taylor Road and presented as a single request for the convenience of the Joint Assembly:</i></p> <p><i>Chris Parkins, Susan Hegarty, Doreen Hodgson, Braden Howarth, Jim Metcalf, Heather Warwick, David Clary, Heather Clary, Peter Hewkin, Rory Powe, Don Broom, Sally Broom, Vivien Perutz, Michelle Pearl, Emma Duncan, Anne Lyon, Richard Lyon, Robert Rawlinson, Callinan and Pete Fox.</i></p>	
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14	Anna Williams on behalf of Camcycle	<p>Agenda Item 8 - Active Travel: Experimental Traffic Regulation Orders</p> <p>Camcycle welcomes this report; it's good to see detailed data on traffic flows, journey time, speed, collisions and air quality, in addition to consultation responses.</p> <p>As the report says, these schemes included the long-term goal to create a better environment for active travel and support the government's target of half of urban journeys being walked or cycled by 2030. Key metrics are:</p> <ul style="list-style-type: none"> • The number of people who used these routes as a pedestrian or cyclist • The improvement in actual and perceived safety (the main barrier to active travel) • A reduction in motor traffic which may create a route suitable for all ages and abilities without the need for protected infrastructure. <p>The report shows that all schemes were successful, with routes rebalancing transport in favour of walking and cycling. Over 80% of those travelling in Carlyle Road, Silver Street and Luard Road are doing so actively, and daily levels of cycling in Carlyle Road are approaching those on popular routes such as the Riverside bridge. According to LTN 1/20, the level of motor traffic on Bateman Street now makes it an appropriate route for all types of cyclist, whereas the 4000+ vehicle movements before (2018) created a barrier to many.</p> <p>Camcycle would like to see all these schemes retained and improved. It is completely unacceptable that Luard Road has been recommended for removal when it has achieved its aims.</p>	<p>Journey time data has indicated an increase in eastbound delays on Long Road following the closure of Luard Road at a time when overall traffic levels fell.</p> <p>Given the effect that longer delays on Long Road could have on air quality, this aspect of the trial closure needs to be considered and weighed against the environmental benefits achieved by reducing traffic on the closed route.</p> <p>Whilst journey times on Long Road have fluctuated during the trial, there is a concern they could increase again as traffic levels return to pre-pandemic levels.</p>
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		<ol style="list-style-type: none"> 1. There are high levels of cycling on this route. 2. A majority (61%) support the retention of the filter. 3. 63% of respondents say the road is safer. 4. Collisions (and, anecdotally, non-reported 'near misses') have been reduced. <p>How can the GCP claim one of its transport aims is to 'prioritise greener and active travel' when here it is placing motor traffic flow and driver convenience above safer walking and cycling?</p>	
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Greater Cambridge Partnership Joint Assembly
Public Questions Protocol

Following the end of temporary legislation allowing for public meetings to be conducted entirely virtually, we are now required to hold meeting in a face to face setting. It will not be possible to participate in the meeting virtually. While it is now possible for public speakers to attend a meeting and speak in person, at the same time we need to ensure there is a Covid safe environment for everyone in the meeting. We therefore urge you to consider allowing your question to be read out on your behalf and to observe proceedings remotely.

At the discretion of the Chairperson, members of the public may ask questions at meetings of the Joint Assembly. This standard protocol is to be observed by public speakers:

- Notice of the question should be sent to the Greater Cambridge Partnership Public Questions inbox [public.questions@greatercambridge.org.uk] no later than 10 a.m. three working days before the meeting.
- Questions should be limited to a maximum of 300 words.
- Questioners will not be permitted to raise the competence or performance of a member, officer or representative of any partner on the Joint Assembly, nor any matter involving exempt information (normally considered as 'confidential').
- Questioners cannot make any abusive or defamatory comments.
- If any clarification of what the questioner has said is required, the Chairperson will have the discretion to allow other Joint Assembly members to ask questions.
- The questioner will not be permitted to participate in any subsequent discussion and will not be entitled to vote.
- The Chairperson will decide when and what time will be set aside for questions depending on the amount of business on the agenda for the meeting.
- Individual questioners will be permitted to speak for a maximum of three minutes.
- In the event of questions considered by the Chairperson as duplicating one another, it may be necessary for a spokesperson to be nominated to put forward the question on behalf of other questioners. If a spokesperson cannot be nominated or agreed, the questioner of the first such question received will be entitled to put forward their question.
- Questions should relate to items that are on the agenda for discussion at the meeting in question. The Chairperson will have the discretion to allow questions to be asked on other issues.

**The deadline for receipt of public questions for this meeting is
10:00 a.m. on Monday 15th November 2021**

Residents Parking Scheme Delivery

Report to: Greater Cambridge Partnership Joint Assembly

Date 18th November 2021

Lead Officer: Peter Blake – Director of Transport, GCP

1. Purpose

- 1.1 Following a period where delivery of new residents' parking schemes in Cambridge was paused, the County Council's Highways and Transport Committee agreed on 4th November to restart this programme and requested the GCP to initiate delivery of new residents' parking schemes, given the link with the City Access Project.
- 1.2 The Joint Assembly is invited to consider the proposals for the GCP to restart delivery of residents' parking schemes to be presented to the Executive Board, including:
 - (a) The indicative map of potential residents' parking schemes, and progress to date in delivering these;
 - (b) The proposal to proceed to informal consultation, through local members, on all the unimplemented indicative residents' parking schemes, as a first step towards prioritising schemes for delivery;
 - (c) In Romsey West, where informal consultation has already indicated support for residents' parking, proceeding to work with members and residents to develop proposals; and
 - (d) Plans for the development of the Integrated Parking Strategy to consider delivery of residents' parking schemes in the medium term as well as the future evolution of existing schemes.

2. Issues for Discussion

Background

- 2.1 In 2017 the Greater Cambridge Partnership (GCP) committed £1.1m to fund the introduction of residents' parking schemes across the City of Cambridge. Fourteen schemes were considered, with eight being installed following support through informal consultation and public consultation.

- 2.2 In March 2020, the delivery of new residents' parking schemes was paused for a period of one-year. The pause was extended in March 2021, in the context of the Integrated Parking Strategy being developed by the GCP with the County and City Councils, which would provide an opportunity to reflect on the future role of residents' parking schemes as part of a wider plan to manage parking.
- 2.3 The development of an Integrated Parking Strategy is a significant undertaking. Recognising the transport challenges faced by the Greater Cambridge area, on 4 November 2021 the County Council's Highways and Transport Committee agreed that continuing to develop and deliver residents' parking schemes in parallel would offer the greatest benefit to local communities, signalling intent to tackle the congestion, air quality and climate challenges across the area. The Committee therefore agreed to restart the programme and requested that the GCP initiate delivery of new residents' parking schemes.

Current Residents' Parking Schemes

- 2.4 Currently, much of the on-street parking in Cambridge is uncontrolled. Although residents' parking schemes cover the central part of the city, there are still many areas where schemes have yet to be considered. The map at Appendix 1 provides an indication of potential future residents' parking scheme areas. The following areas were implemented by the County Council using GCP funding: Morley, Accordia, Staffordshire, Ascham, Victoria, Coleridge West, Newnham & Benson North. The following areas were also considered but deferred following feedback through informal and public consultation: York, Stretton, Stourbridge, Chesterton West, Chesterton East and Chesterton South.

3. Options and Emerging Recommendations

Restarting Scheme Delivery

- 3.1 The County Council followed a staged process for implementing residents' parking schemes, beginning with informal consultation through local members. It is suggested the GCP restarts informal consultation for all the outstanding areas identified on the map at Appendix 1. This would form a first step in prioritising schemes for delivery, by understanding the opportunities and challenges of scheme delivery across the city as well as local appetite for schemes. The informal consultation would include previously deferred scheme areas, given the time that has elapsed since they were last considered and the evolution of the city access project as well as local and national policies concerning transport, air pollution and the environment.
- 3.2 The exception to this would be in Romsey West, where informal consultation has already indicated support for residents' parking. In Romsey West, it is suggested that the GCP proceeds to work with members and residents to develop proposals.

Integrated Parking Strategy

- 3.3 Working closely with the County and City Councils, the GCP is developing an Integrated Parking Strategy which aims to support uptake of public and active transport, cut congestion and air pollution and reduce carbon emissions. It will

consider how on and off street parking could be more effectively managed to reduce congestion on the network and promote the use of sustainable modes of transport.

- 3.4 The Integrated Parking Strategy provides an opportunity to reflect on the future role of residents' parking schemes as part of a wider plan to better manage parking in the city. This includes considering how 'Liveable Neighbourhoods' approaches could work in Cambridge, whereby parking is considered in the round alongside issues such as electric charging provision, cycle parking, car club spaces, pocket parks and other community and environmental uses. It will consider options for evolving existing residents' parking schemes, around a quarter of which are oversubscribed and many others at or near capacity, creating issues around access. Options such as greater use of technology to manage parking and improve scheme administration will also be explored.

4. Alignment with City Deal Objectives

- 4.1 Better management of car parking capacity in Cambridge city will support the delivery of City Deal objectives to reduce congestion and pollution, increase use of sustainable modes of transport and tackle climate challenges. Delivery of further residents' parking schemes will support the aims of the city access project, which seeks to realise a series of benefits, including:
- Securing the continued economic success of the area through improved access and connectivity;
 - Significant improvements to air quality and enhancements to active travel, supporting a healthier population;
 - Reducing carbon emissions in line with the partners' zero carbon commitments;
 - Helping to address social inequalities where poor provision of transport is a contributing factor; and
 - Wellbeing and productivity benefits from improving people's journeys to and from employment.

5. Citizen's Assembly

- 5.1 The Citizens' Assembly set out a vision for the future of transport in Greater Cambridge. The proposals in this paper link with the city access project which aims to deliver the Citizens' Assembly's vision.

6. Financial Implications

- 6.1 Funding is available within this year's City Access budget for the initial work proposed in this report. Further funding will be required in subsequent years to facilitate the development and delivery of the Integrated Parking Strategy, including residents' parking schemes, and this will be considered as part of the GCP budget setting process for next financial year.

Have the resource implications been cleared by Finance? Yes
Name of Financial Officer: Sarah Heywood

7. Next Steps and Milestones

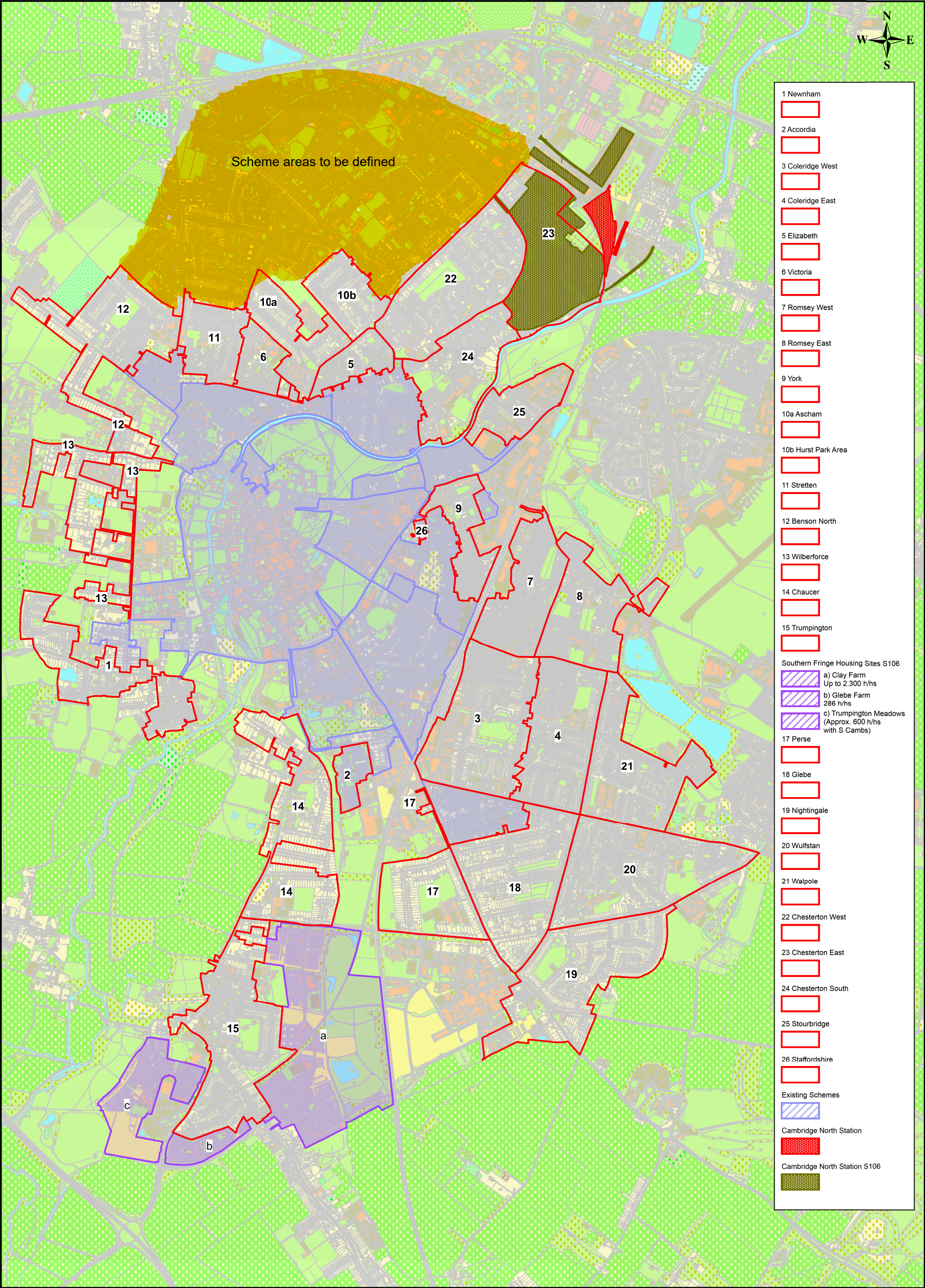
- 7.1 Informal consultation on the indicative future residents' parking schemes would commence in 2022, with a paper brought later that year prioritising schemes and setting out a full implementation plan. Work with residents' and members to develop proposals for Romsey West would begin in early 2022.
- 7.2 The Integrated Parking Strategy is being developed alongside the wider city access proposals discussed by the Joint Assembly and agreed by the Executive Board in September 2021. The Strategy will be brought to the Joint Assembly and Executive Board in June 2022 in line with the roadmap agreed for the city access project.

List of Appendices

Appendix 1	Indicative map of potential residents' parking schemes
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Background Papers

Source Documents	Location
Highways and Transport Committee paper: Greater Cambridge Partnership's City Access Strategy and Wider Collaboration with Cambridgeshire County Council (November 2021)	Document.ashx (cmis.uk.com)
Highways and Transport Committee paper: Residents' Parking Delivery Review (March 2021)	Document.ashx (cmis.uk.com)



Further Investment in the Greater Cambridge Active Travel Network: *Cycling Plus* Consultation

Report to: Greater Cambridge Partnership Joint Assembly

Date 18th November 2021

Lead Officer: Isobel Wade – Assistant Director, Sustainable and Inclusive Growth, GCP

1. Purpose

- 1.1 In March 2021, the Executive Board considered an analysis of the current active travel¹ network to identify gaps and missing links and consider how these could be addressed. The Board agreed to consult on a prioritised package of further improvements to encourage cycling, within an indicative envelope of £20m. The *Cycling Plus* consultation ran from 5th July to 16th August 2021 and sought feedback on people's priorities for further investment in active travel. This report presents the results of the consultation and suggested next steps.
- 1.2 The Joint Assembly is invited to consider the proposals to be presented to the Executive Board to further develop and invest in a comprehensive active travel network for Greater Cambridge. In particular, to consider:
- (a) The results of the *Cycling Plus* consultation – see report at Appendix 1;
 - (b) Proceeding to prepare preliminary designs and strategic outline business cases for:
 - i. Active travel improvements for the A1134 North-South (Perne Road, Mowbray Road and Fendon Road), including considering how a scheme could improve provision for cyclists at the Addenbrooke's roundabout;
 - ii. Active travel improvements for Hills Road from Hills Road Sixth Form College to the junction with Regent Street/Gonville Place/Lensfield Road; and
 - (c) Continuing to develop the active travel network for Greater Cambridge in the context of the *Cycling Plus* consultation feedback, the emerging city access proposals discussed by the Joint Assembly and Executive Board in September

¹ Active travel is defined in the Cambridgeshire and Peterborough Local Transport Plan as “physically active modes such as cycling, walking, or horse riding. It also includes walking or cycling as part of a longer journey”

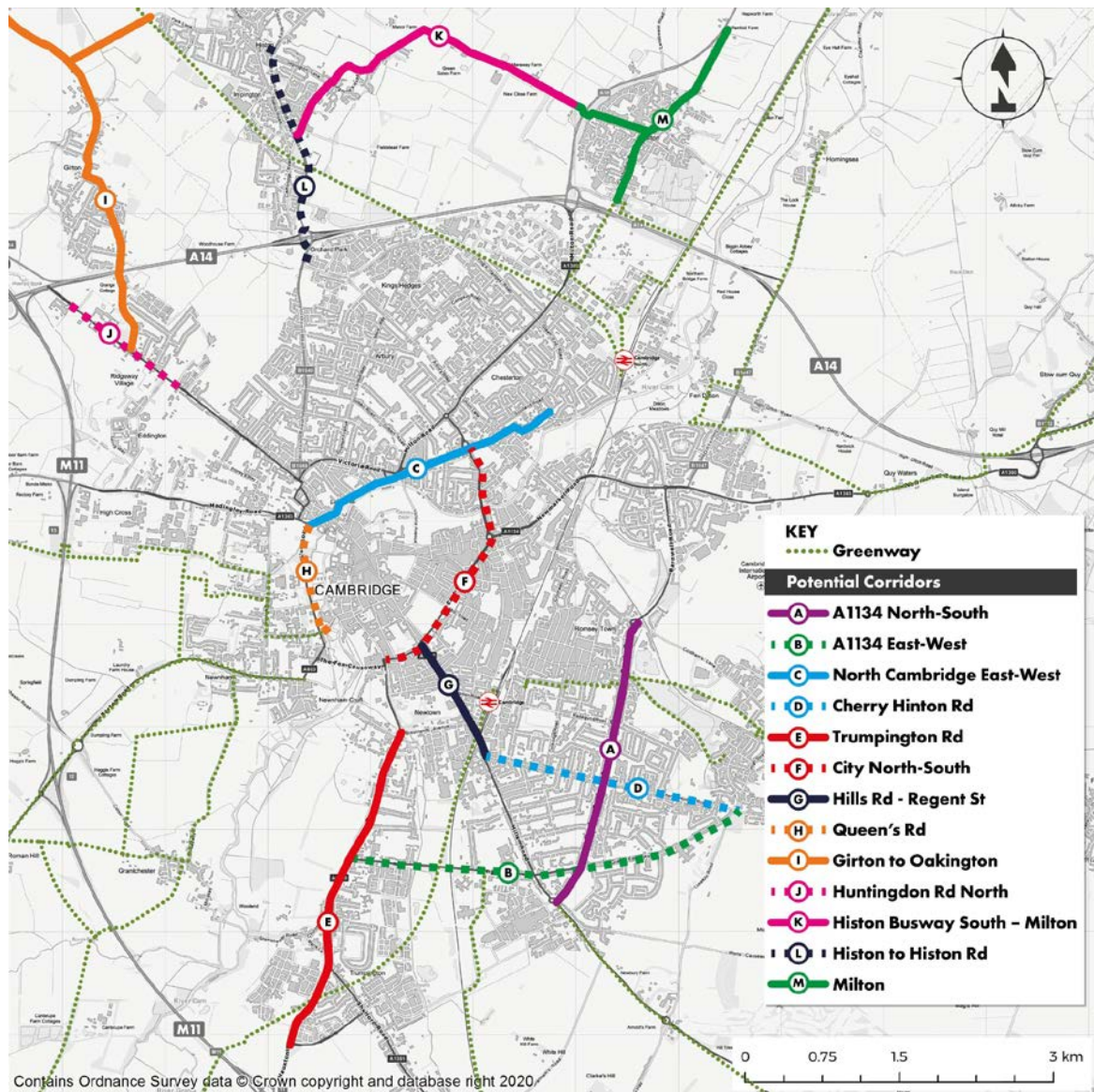
2021 and the potential identification of a revenue source for additional investment in the network.

2. Issues for Discussion

- 2.1 The Greater Cambridge Partnership is already committed to a transformational investment in active travel of over £130m. This includes the Chisholm Trail, upgrades to cross-city cycling routes, 12 new greenways linking villages with the city, and new walking and cycling routes as part of the four corridor schemes. Partners including the County Council and Cambridgeshire and Peterborough Combined Authority are also investing in active travel improvements.
- 2.2 In March 2021, the Executive Board considered an analysis of the current active travel network to identify further gaps and missing links and consider how these could be addressed.² The analysis built on the draft Local Cycling and Walking Infrastructure Plans to consider how the GCP could consolidate its existing investment in the active travel network through a prioritised package of schemes. An indicative envelope of £20m was used based on the Future Investment Strategy agreed by the Executive Board in December 2020.
- 2.3 The analysis identified 13 corridors that could benefit from significant improvements for people cycling and walking. These are shown at figure 1. An initial prioritisation of these schemes was undertaken to understand how they would contribute to enhancing the active travel network, potential costings and delivery opportunities and challenges.

² https://greatercambs.filecamp.com/s/GCP_FIS_Active_Travel_Study/fo

Figure 1: Corridors identified for potential investment



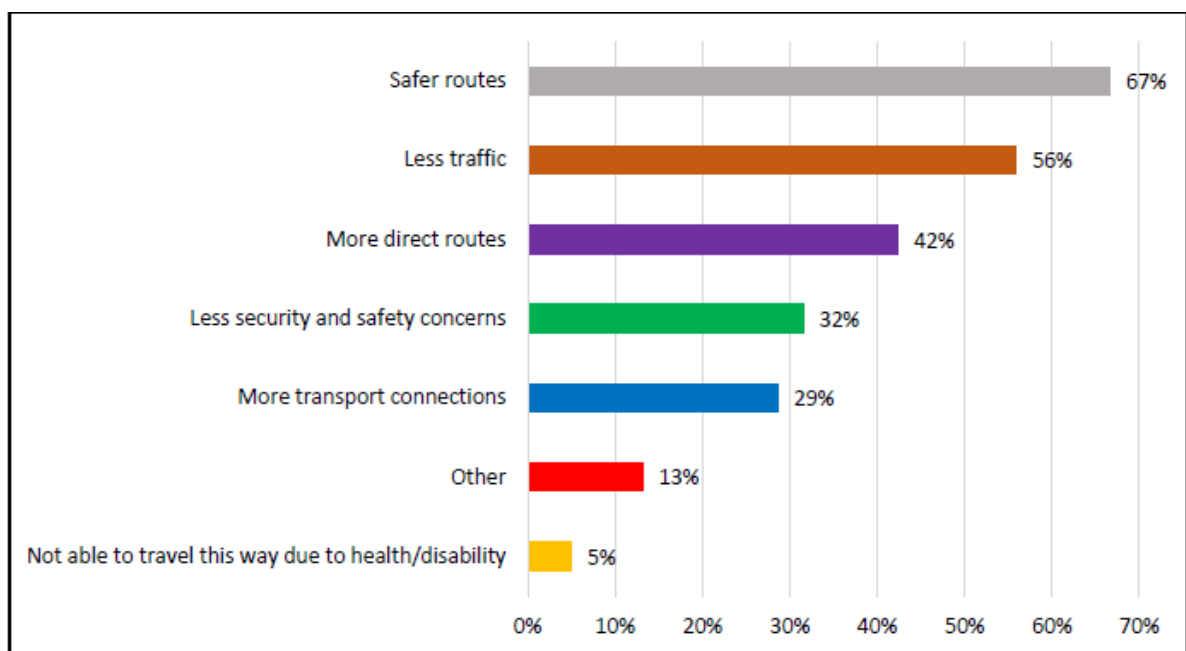
3. Consultation and Engagement

- 3.1 A consultation, *Cycling Plus*, took place between 5 July and 16 August 2021 which sought views from the public and stakeholders on current use of active travel, barriers to use of active travel and priorities for future investment by the GCP.
- 3.2 The report of the consultation is at Appendix 1. There were 1009 responses to the consultation survey as well as 72 written responses from groups and individuals. 60% of respondents to the survey were located in Cambridge, 29% in South Cambridgeshire, with the remainder coming from nearby districts.
- 3.3 The first section of the consultation asked people about their current use of active travel modes. Key findings include:
 - The majority of respondents indicated that 'leisure' (84%), 'social' (81%), 'exercise' (74%), and 'commuting to work' (70%) are the sort of journeys they make using active travel modes

- Over half of the respondents walk on a 'daily' basis (54%). Over a quarter of the respondents walk '2-3 times a week' (28%)
- Almost half of the respondents cycle 'daily' (48%), and almost a third '2-3 times per week' (30%)
- Majority of the respondents 'never' ride horses (98%), scoot (89%), or use 'other' modes of active travel (80%)
- Respondents travelled using active modes most frequently in their local area, with significant proportions also making active journeys at least weekly to the city centre (67%), across the city (59%), and to their local high streets (81%). Active journeys between villages and between the city and villages were made less frequently by respondents, but with a majority still indicating they made these journeys at least monthly.

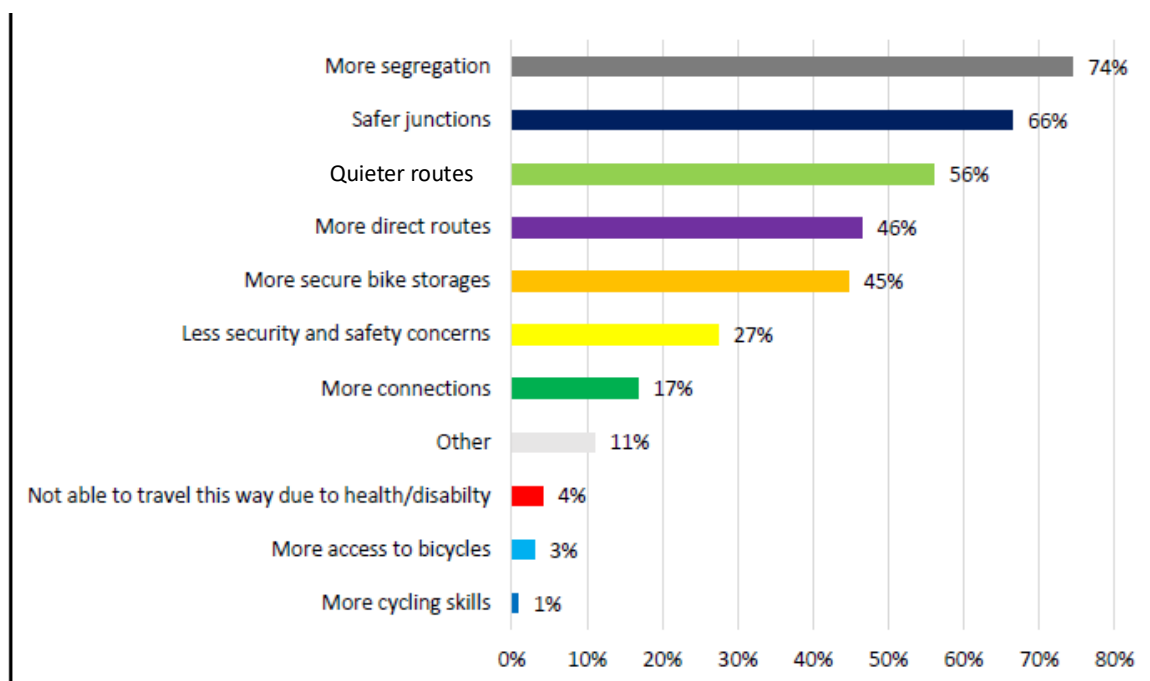
3.4 Respondents were asked about the conditions that would encourage them to walk or use a mobility aid for more journeys they currently make by car. Figure 2 summarises the responses.

Figure 2: Conditions supporting people to walk or use mobility aids



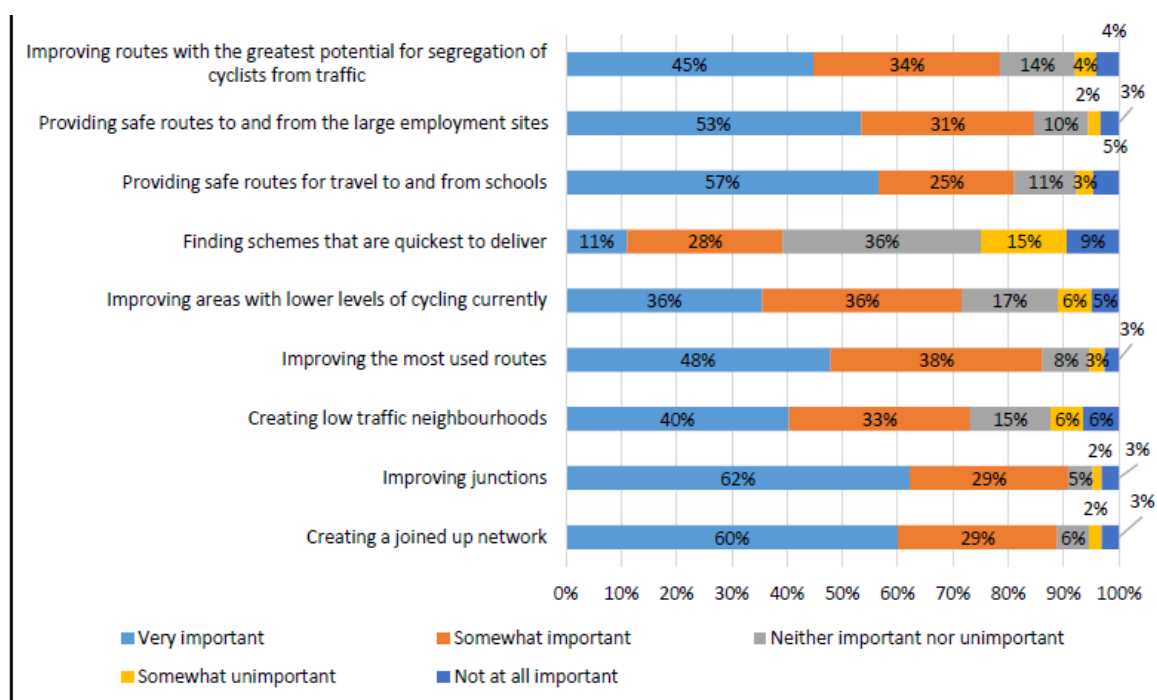
3.5 Respondents were asked about the conditions that would encourage them to cycle for more journeys they currently make by car. Figure 3 summarises the responses.

Figure 3: Conditions supporting people to cycle more



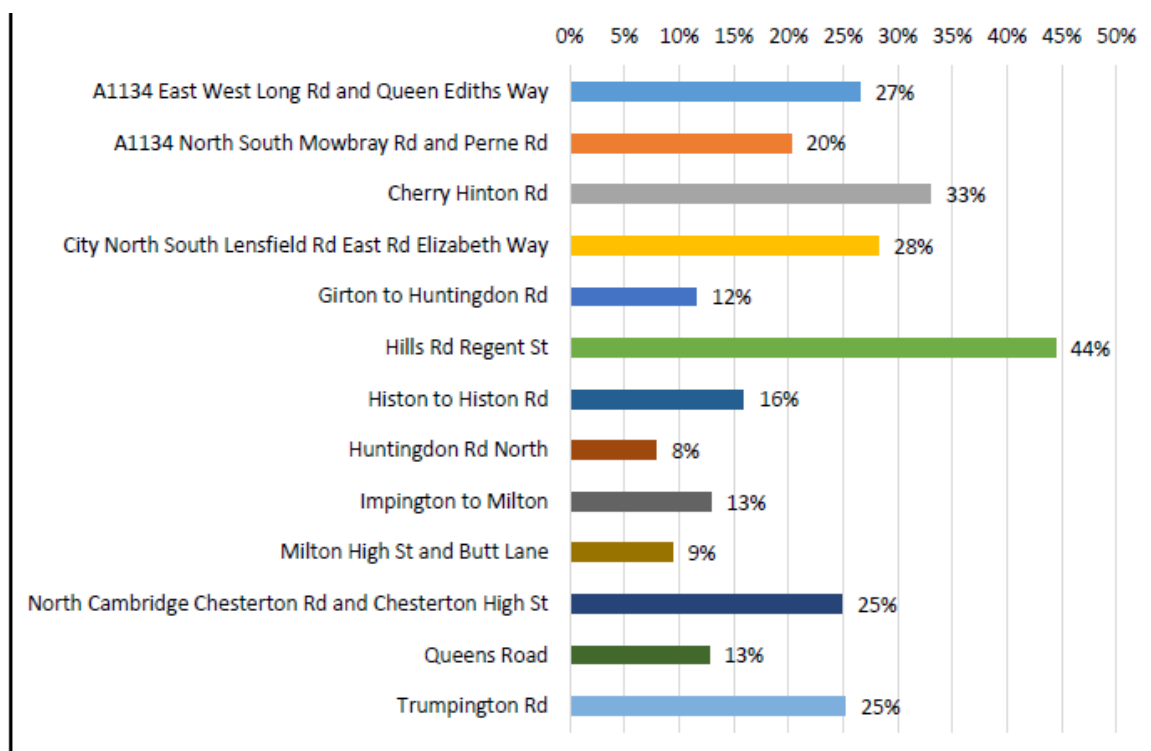
3.6 Respondents were asked how important nine different priorities for active travel investment were to them. The majority of respondents felt that eight of the nine priorities were either 'very important' or 'somewhat important', as shown in figure 4.

Figure 4: Importance of priorities for investment in active travel



3.7 Respondents were asked which of the 13 proposed corridors they would be most likely to use for active travel if they were improved, and could select up to three options. Figure 5 sets out the responses.

Figure 5: Most selected active travel corridors



- 3.8 Respondents were asked for comments on whether any other routes should be considered for investment, for comments on how the proposals could impact on people or groups with protected characteristics under the Equality Act 2010, and for general comments. These are outlined in detail in the consultation report. As well as specific location suggestions, key themes included the need to improve safety, the need to reduce overall levels of motorised traffic, the importance of connections to education and employment, the impact of active travel schemes on people with disabilities, and the importance of creating segregated facilities and of maintenance.

4. Options and Emerging Recommendations

- 4.1 The responses to the consultation suggest that there is public support for further investment in the Greater Cambridge active travel network. Creating a joined up network of safe and attractive active travel routes has been identified as a key priority for the city access strategy. Continuing to develop and deliver the Cycling Plus network in the light of consultation feedback and wider policy developments is therefore a key part of creating an attractive and cohesive sustainable transport network. The full cost of the network is substantial and additional funding sources will need to be identified. The Executive Board previously agreed a £20m indicative envelope for further active travel improvements, and it is suggested that this allocation is utilised to advance one or more schemes for preliminary design alongside continuing the develop Greater Cambridge's active travel network.
- 4.2 Taking the responses to the consultation, an Addendum to the original active travel analysis (Appendix 2) has been produced which seeks to reprioritise the thirteen corridors that were identified for investment as well as to identify potential next steps in further developing the Cycling Plus network should additional funding sources be identified, for example through the city access project.

Identifying Priority Schemes for Investment

- 4.3 The revised prioritisation incorporates the extent to which the scheme addressed priorities for investment identified by respondents to the consultation, as well the level of support the scheme received in the consultation. The full scoring assessment for each corridor and an explanation of the criteria and approach is set out in Appendix 2. The results of the revised prioritisation are set out in table 1 below.

Table 1: Revised prioritisation matrix

Scheme	Rank	Cost*	Pros	Cons
A1134 (North-South) (Mowbray Road & Perne Road)	1	£11.5m	<ul style="list-style-type: none"> Connects with Dutch Roundabout High cycling potential Relatively good deliverability Supports emerging LCWIP Contributes to a coherent network Strongly supports public priorities for investment 	<ul style="list-style-type: none"> Relatively high-cost scheme Good but not highest VfM
Hills Road - Regent Street	2	£10.5m	<ul style="list-style-type: none"> High cycling potential Relatively good deliverability Supports emerging LCWIP Contributes to a coherent network High level of support from public consultation 	<ul style="list-style-type: none"> Relatively high-cost scheme Cyclists required to use bus lane in sections
A1134 (East-West) (Long Road & Queen Edith's Way)	3	£8.5m	<ul style="list-style-type: none"> Connects with Dutch Roundabout Supports emerging LCWIP Relatively high value for money Contributes to a coherent network 	<ul style="list-style-type: none"> May encounter deliverability issues Low level of segregation achievable in sections
North Cambridge (Chesterton Road & Chesterton High Street)	3	£6.0m	<ul style="list-style-type: none"> Relatively low-cost scheme Relatively high value for money Supports emerging LCWIP Contributes to a coherent network 	<ul style="list-style-type: none"> Low level of segregation achievable in sections Deliverability issues including Mitcham's Corner Gyration
Milton	4	£4.5m	<ul style="list-style-type: none"> Supports emerging LCWIP Helps facilitate trips from Park & Ride 	<ul style="list-style-type: none"> High cost / low VfM Low level of segregation achievable in sections
Cherry Hinton Road	4	£8.0m	<ul style="list-style-type: none"> Relatively low-cost scheme Contributes to a coherent network High level of support from public consultation 	<ul style="list-style-type: none"> May encounter deliverability issues Not identified in emerging LCWIP
Queens Road	5	£5.5m	<ul style="list-style-type: none"> No bus stops impacted Relatively low-cost scheme Supports emerging LCWIP Contributes to a coherent network 	<ul style="list-style-type: none"> Relatively low cycling potential Few connections to key trip attractors May encounter deliverability issues Potential impact on coach parking
City (North-South) (Lensfield Road, East Road & Elizabeth Road)	6	£13.0m	<ul style="list-style-type: none"> High cycling potential Contributes to coherent network Close to several key trip attractors Strongly supports public priorities for investment 	<ul style="list-style-type: none"> High cost / low VfM Would be difficult to deliver due to physically constrained sections
Huntingdon Road North	6	£1.8m	<ul style="list-style-type: none"> Connects with multiple schools Builds on existing infrastructure and route Relatively low-cost scheme Supports emerging LCWIP 	<ul style="list-style-type: none"> May encounter deliverability issues
Trumpington Road	7	£18.5m	<ul style="list-style-type: none"> High cycling potential Supports emerging LCWIP Contributes to coherent network Strongly supports public priorities for investment 	<ul style="list-style-type: none"> High cost / low VfM Would be difficult to deliver due to high number of junctions
Impington - Milton	7	£1.5m	<ul style="list-style-type: none"> Relatively low-cost scheme Helps facilitate sustainable trips to P&R Supports emerging LCWIP 	<ul style="list-style-type: none"> Low level of segregation achievable in sections
Histon - Histon Road	8	£2.9m	<ul style="list-style-type: none"> Extends the planned Histon Road scheme into Histon Relatively low-cost scheme Supports emerging LCWIP 	<ul style="list-style-type: none"> May encounter deliverability issues Low value for money
Girton - Huntingdon Road	9	£2.4m	<ul style="list-style-type: none"> Relatively low-cost scheme Supports emerging LCWIP 	<ul style="list-style-type: none"> Low level of segregation achievable in sections May encounter deliverability issues Few connections to key trip attractors

- 4.4 As set out above, the Executive Board previously agreed a £20m indicative envelope for further active travel improvements. The original analysis of the network included indicative costs for upgrading each corridor, as set out in table 1. However, more detailed work will be required to better establish the funding requirement through preliminary design work, and to develop the case for investment through the preparation of a Strategic Outline Business Case in line with Department for Transport processes. It is therefore suggested that the two highest scoring schemes are taken forward for preliminary design:
- Active travel improvements for the A1134 North-South (Perne Road, Mowbray Road and Fendon Road), including considering how a scheme could improve provision for cyclists at the Addenbrooke's roundabout, given the priority placed by consultation respondents on improving junctions;
 - Active travel improvements for Hills Road from Hills Road Sixth Form College to the junction with Regent Street/Gonville Place/Lensfield Road.
- 4.5 The GCP and the County Council are undertaking a review of the Cambridge road network hierarchy, which will be consulted on in 2022. The review aims to better reflect current and future transport priorities and support the uptake of sustainable modes of transport. The two routes above are both important parts of Cambridge's road network and so it will be important that preliminary design work is undertaken in the context of the review.

Developing the Active Travel Network Further

- 4.6 The consultation responses and Active Travel Study Addendum demonstrate a case for investing further in the Cycling Plus routes and the active travel network more generally. In the consultation, suggestions were also received for wider improvements to the network, as well as demonstrating a desire for lower traffic levels, quieter streets and increased segregation of different modes.
- 4.7 Creating a joined up network of safe and attractive active travel routes has been identified as a key priority for the city access strategy. Lower traffic levels and additional funding would enable more of the Cycling Plus network to be delivered. In September, the Executive Board considered a paper on the city access project and agreed to develop a final package of options for improving bus services, funding an expansion of the Cycling Plus network and managing road space in Cambridge. They agreed a roadmap for this work commencing with a public consultation. The Making Connections consultation launched on 8 November and seeks feedback on proposals for improving the bus network, making space for walking and cycling, and options for raising money to pay for these improvements.
- 4.8 It is therefore also suggested that the GCP works with partners to continue to develop the Cycling Plus network, taking account of the consultation feedback and suggestions as well as reflecting the development of the city access strategy, the Active Travel Strategy for Cambridgeshire and final LCWIPs being developed by the County Council, the road network hierarchy review and the refresh of the Local Transport Plan.

5. Alignment with City Deal Objectives

- 5.1 Delivering improvements to the Greater Cambridge active travel network will support the City Deal objectives of enhancing connectivity, improving access to opportunities and increasing use of sustainable modes of transport. Increasing use of active travel modes also supports improvements to air quality, health and our environment. The two schemes proposed for investment link strongly with key employment growth sites including the Cambridge Biomedical Campus.

6. Citizens' Assembly

- 6.1 Delivering further improvements to the active travel network supports the GCP's response to the Citizens' Assembly recommendations. In particular, the proposals in this paper supports the delivery of the Citizens' Assembly's vision, in particular the following elements:
- Be environmental and zero carbon
 - Be people centred – prioritising pedestrians and cyclists
 - Enable interconnection
 - Have interconnected cycle infrastructure
 - Provide safe layouts for different users
- 6.2 Further development of and delivery of the Cycling Plus network is proposed as part of the city access proposals, which seek to address the Citizens' Assembly's recommendations more broadly.

7. Financial Implications

- 7.1 The Executive Board has previously agreed an indicative allocation of £20m to deliver additional active travel schemes as part of the Cycling Plus network. Subject to the Executive Board's views of the proposals outlined in this paper, the two schemes would be brought back for Joint Assembly and Executive Board consideration once preliminary design work has been undertaken and strategic outline business cases prepared. At that point, budgets for the schemes will be provided and agreement sought to proceed.
- 7.2 The further delivery of the Cycling Plus network is desirable but is contingent on identification of additional funding. As set out above, the city access proposals seek to identify an ongoing funding source as well as create lower traffic levels which would enable the delivery of the full active travel network.
- 7.3 The Executive Board has deliberately agreed to over-programme by £123m compared to estimated available funding and either additional funding will need to be identified to fund all approved schemes or existing schemes prioritised to within available resources

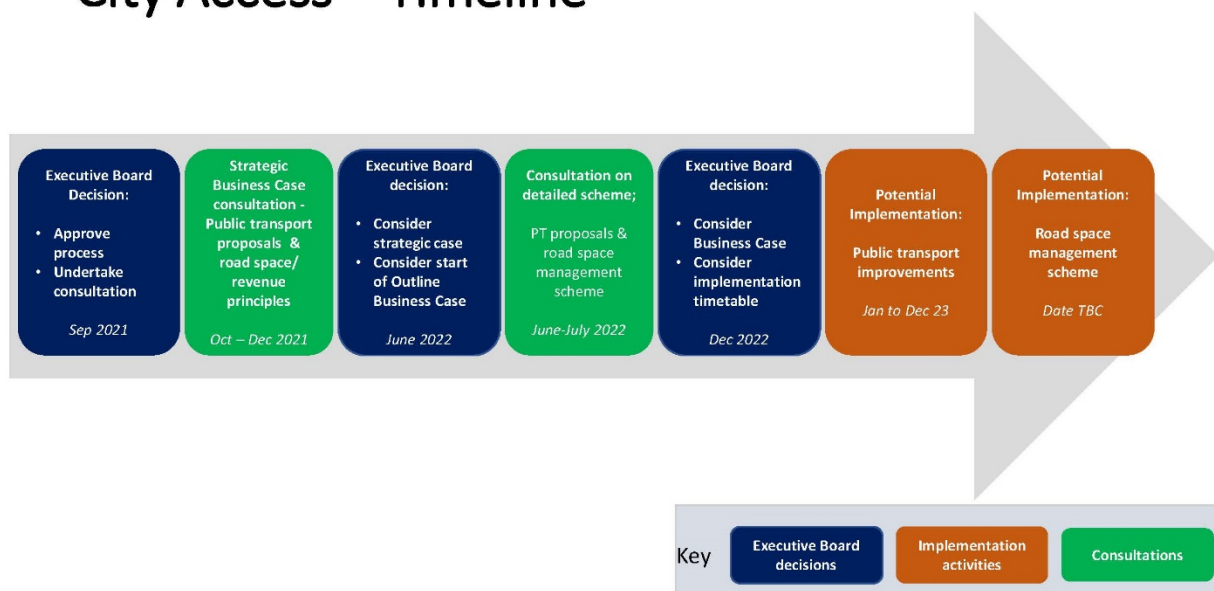
Have the resource implications been cleared by Finance? Yes
Name of Financial Officer: Sarah Heywood

8. Next Steps and Milestones

- 8.1 Subject to the Executive Board's approval, the A1134 North-South and Hills Road active travel schemes would proceed to preliminary design and preparation of a strategic outline business case, for consideration by the Joint Assembly and Executive Board in mid 2022. The development of the wider Cycling Plus network will continue in line with the agreed roadmap for the city access project shown in figure 6 below.

Figure 6: City Access Timeline

City Access – Timeline



List of Appendices

Appendix 1	Cycling Plus Consultation: Summary Report of Consultation Findings
Appendix 2	Future Investment Strategy: Active Travel Investment Study Addendum

Background Papers

Source Documents	Location
Future Investment Strategy: Active Travel Investment Study	https://greatercambs.filecamp.com/s/GCP_FIS_Active_Travel_Study/fo

Produced by the Cambridgeshire Research Group



Cycling Plus Consultation: Summary Report of Consultation Findings

V1

September 2021

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Executive Summary

Between 05 July and 16 August 2021 the Greater Cambridge Partnership (GCP) held a consultation on active travel around Cambridge. Coverage included whether and how often people use active travel to get into and around Cambridge, and what the barriers are that might discourage people from using active travel methods. It also covered people's priorities for active travel investment, including the 13 possible corridors identified in the Active Travel Opportunities report, alongside any other possible routes. The key findings of this piece of work are:

- Analysis of the geographical spread (see figure 6) and the breadth of responses for different groups shows that the Greater Cambridge Partnership has delivered an effective and robust consultation.
- The majority of respondents felt that 8 of the 9 priorities were either 'very important' or 'somewhat important'
 - 'Improving junctions'
 - 'Creating a joined-up network'
 - 'Improving the most used routes'
 - 'Providing safe routes to and from the large employment sites'
 - 'Providing safe routes for travel to and from schools'
 - 'Improving routes with the greatest potential for segregation of cyclists from traffic'
 - 'Creating low traffic neighbourhoods'
 - 'Improving areas with lower levels of cycling currently'
- Just under a fifth of respondents indicated 'finding schemes that are quickest to deliver' are 'very important' or 'somewhat important'
- Of the 13 travel corridors:
 - 'Hills Rd Regent St' was selected by over two fifths of respondents
 - 'Cherry Hinton Rd' was selected by a third of respondents
 - 'City North South Lensfield Rd East Rd Elizabeth Way' was selected by over a quarter of respondents
 - 'A1134 East West Long Rd and Queen Ediths Way' was selected by over a quarter of respondents
 - 'North Cambridge Chesterton Rd and Chesterton High St' was selected by a quarter of respondents
 - 'Trumpington Rd' was selected by a quarter of respondents
- A great deal of detailed comments were received. From these it was clear that;
 - There were concerns about a lack of ongoing maintenance of active travel routes and that this was causing safety issues; concerns about the use of shared use paths which were felt to result in conflict between active travel modes; the need for more active travel routes around rural locations and to/from education/employment sites

- Responses were also received on behalf of a number of different groups or organisations. All of the responses from these groups have been made available to board members in full and will be published alongside the results of the public consultation survey.

Methodology Summary

The consultation adopted a multi-channel approach to promote and seek feedback. It was held primarily online via ConsultCambs and GCP social media channels and was supported by advertising in print media and press coverage. Hard copies of consultation materials were available on request.

Quantitative data was recorded through a formal consultation questionnaire (online) with 1,009 complete responses in total recorded. A significant amount of qualitative feedback was also gathered via the questionnaire and through social media/emails.

This report summarises the core 1009 online and 72 written responses to the consultation survey.

Key findings

Current active travel usage

Quantitative

- 988 respondents answered the question on the type of journey they make using active travel modes.
 - The majority of respondents indicated that 'leisure' (84%), 'social' (81%), 'exercise' (74%), and 'commuting to work' (70%) as the sort of journeys they make using active travel modes
- 965 respondents answered the question on how often they walk, 978 on how often they cycle, 710 on how often they scoot, 703 on how often they ride a horse, and 614 on 'other' modes of active travel.
 - Over half of the respondents walk on a 'daily' basis (54%). Over a quarter of the respondents walk '2-3 times a week' (28%)
 - Almost half of the respondents cycle 'daily' (48%), and almost a third '2-3 times per week' (30%)
 - Majority of the respondents 'never' ride horses (98%), scoot (89%), or use 'other' modes of active travel (80%)
- 973 respondents answered the question on how often they travel within their local area.
 - The majority of respondents travel within their local area 'daily' (71%), and a further 20% travel within their local area '2-3 times per week'
- 948 respondents answered the question on how often they travel to the city centre.

- Over a quarter of the respondents indicated they travel to the city centre 'weekly' (28%), a quarter '2-3 times a week' (25%) and just over a fifth monthly (21%)
- 905 respondents answered the question on how often they travel across the city.
 - One quarter of respondents indicated they travel across the city 'monthly' (25%), just under a quarter 'weekly' (23%) and just over a fifth '2-3 times a week' (22%)
- 896 respondents answered the question on how often they travel to their local high street/town centre.
 - More than a third of the respondents indicated they travel to their local high street/town centre '2-3 times a week' (35%), just under a quarter 'weekly' (24%), and over a fifth 'daily' (22%)
- 878 respondents answered the question on how often they travel between villages.
 - Just under two fifths of respondents indicated they 'never' travel between villages (39%) while a quarter indicated 'monthly' (25%) travel between villages
 - Almost a third travel between villages either '2-3 times a week' (14%) or 'weekly' (16%)
- 897 respondents answered the question on how often they travel between the city and surrounding villages.
 - Almost a third of respondents indicated that they travel between the city and surrounding villages either '2-3 times a week' (13%) or 'weekly' (19%)
 - Under a third of the respondents indicated they 'never' travel between the city and surrounding villages (30%) and under a third indicated they travel between the city and surrounding villages 'monthly' (30%)
- 549 respondents answered the question on how often they travel to other places.
 - The majority of respondents indicated they 'never' travel to any other places (64%)
- 894 respondents answered the question on conditions that would support them walking or using a mobility aid instead of making the journey by car.
 - The majority of respondents indicated that 'safer routes' (67%) and 'less motorised traffic' (56%) would help them walk or use a mobility aid instead of a car
- 967 respondents answered the question on the conditions that would help them cycle more.
 - The majority of respondents indicated that 'more segregation' (74%), 'safer junctions' (66%), and 'quieter routes' (56%) would help them cycle more

Individual elements of the proposed scheme

Quantitative

- 993 respondents answered the question on how important 9 different priorities for investment in active travel was for them.
 - The majority of respondents felt that 8 of the 9 priorities were either 'very important' or 'somewhat important'
 - 'Improving junctions' (91%)
 - 'Creating a joined-up network' (89%)
 - 'Improving the most used routes' (86%)
 - 'Providing safe routes to and from the large employment sites' (84%)
 - 'Providing safe routes for travel to and from schools' (82%)
 - 'Improving routes with the greatest potential for segregation of cyclists from traffic' (79%)
 - 'Creating low traffic neighbourhoods' (73%)
 - 'Improving areas with lower levels of cycling currently' (72%)
 - Just under two-fifths of respondents indicated 'finding schemes that are quickest to deliver' are 'very important' (11%) or 'somewhat important' (28%)
 - Over a third of the respondents indicated this priority is 'neither important nor unimportant' (36%)
 - Just under a quarter of respondents indicated this priority is 'somewhat unimportant' (15%) or 'not at all important' (9%)
- 898 respondents answered the question on which corridors would be most likely used for active travel if they were improved. The respondents could select up to three corridors.
 - 'Hills Rd Regent St' was selected by over two fifths of respondents (44%)
 - 'Cherry Hinton Rd' was selected by a third of respondents (33%)
 - 'City North South Lensfield Rd East Rd Elizabeth Way' was selected by over a quarter of respondents (28%)
 - 'A1134 East West Long Rd and Queen Ediths Way' was selected by over a quarter of respondents (27%)
 - 'North Cambridge Chesterton Rd and Chesterton High St' was selected by a quarter of respondents (25%)
 - 'Trumpington Rd' was selected by a quarter of respondents (25%)

Qualitative

- Question 8 asked respondents whether there were any other routes they felt were particularly important to consider now or in the future. 556 respondents answered this question. The main themes were:
 - Concerns about the general safety of active travel routes due to volumes of motorised traffic, lack of maintenance, conflict on shared use paths, and crossing points over major roads

- Active travel routes that needed connecting to Cambridge, particularly education/employment sites and rural villages/towns
- The need for more active travel routes to education and employment sites
- The need for active travel improvements to Mill Road
- Concerns about a lack of ongoing maintenance of roads/cycle paths/footpaths
- The need for active travel improvements to Newmarket Road
- The need for active travel routes connecting rural locations to each other and Cambridge
- The need for improvements to active travel routes around and connecting to Addenbrookes
- The need for cycle and footpaths to be widened
- The need for active travel improvements to Coldhams Lane
- The need for active travel improvements to Arbury Road
- The need for active travel improvements to and around the Cambridge railway station
- The need for active travel improvements to and around Waterbeach
- The need for active travel improvements to Hills Road
- The need for active travel improvements to and around Cottenham
- The need for active travel improvements to the guided busway routes

Other

Qualitative

- 207 respondents left comments about whether they felt the proposals would either positively or negatively affect or impact on any person/s or group/s that fall under the Equality Act 2010. The main themes were:
 - Discussion about the impacts and benefits the proposals could have on those with disabilities including: concerns about shared use paths, the need for wider foot and cycle paths, general safety improvements to active travel routes, concerns about the negative impact of Low Traffic Neighbourhoods and modal filters on those needing a car, the need for public transport improvements, and concerns about the potential loss of disabled parking spaces
 - Discussion about the impacts of reduced access for motorised traffic and whether this would negatively impact on those needing a personal vehicle (due to disability, age, income, or pregnancy) or be beneficial due to lower overall levels of motorised traffic
 - Discussion about the impacts and benefits of the proposals on younger/older travellers (similar to those discussed for those with disabilities)
 - General comments that the proposals would have a positive impact
 - That the proposals would have no impact
 - That improvements to personal safety (lighting/CCTV/visibility) were needed for the benefit of female travellers

- 319 respondents left comments on the question asking if they had any further comments on the project or the proposed options. The main themes were:
 - Concerns about the safety of active travel routes due to a lack of ongoing maintenance, the need for improvements to junctions/crossings, a lack of safe routes to/from rural locations, the need for clear segregation from motorised traffic, the need for enforcement of negative/illegal motorist behaviour, the use of shared spaces for active travellers, the increased usage of electric/motorised scooters/bikes, the need for funding cycling proficiency and training
 - Discussions about the need for reducing motorised traffic and concerns potential reductions in personal vehicle access would negatively impact those who couldn't walk or cycle
 - Concerns about the lack of ongoing maintenance to roads/footpaths/cycle paths
 - The need for segregated routes, both from motorised traffic and differing forms of active travel modes
 - Concerns about a lack of active travel routes, particularly to rural locations, the need for more/all of the option proposals, the need to connect up existing active travel routes, the need for new communities to have active travel routes built in, and the need for county wide active travel infrastructure
 - Concerns about the impacts on younger/older travellers and those with disabilities, including: the need for routes connecting to education sites in rural areas, the need for ongoing maintenance, the need for wider cycle/footpaths, the need for public transport improvements for those unable to walk/cycle

Introduction

Background

Between 5 July and 16 August 2021 the Greater Cambridge Partnership (GCP) held a public consultation on whether and how often people use active travel to get into and around Cambridge.

The consultation asked what the barriers are that might discourage people from using active travel methods as well as their priorities for active travel investment and the 13 possible corridors identified in the Active Travel Opportunities report. We also asked people to tell us about other possible routes.

The GCP Executive Board agreed to consult on 13 possible corridors identified in the Active Travel Opportunities report which was published in March 2021 as part of our Future Investment Strategy. The 13 corridors carry a significant amount of cycle traffic and could benefit from improvements as part of creating a joined up active travel network.

The GCP identified an indicative budget of £20million which could be used to fund schemes on two of three of the corridors.

Consultation and Analysis Methodology

Background

The consultation strategy for this stage of the Cycling Plus proposals was designed by the Greater Cambridge Partnership communications team with input from the County Council's Research Team. During the design process reference was made to the County Council's Consultation Guidelines, in particular taking into account the following points:

- The consultation is taking place at a time when proposals are at a formative stage (with a clear link between this consultation round and the previous consultation);
- Sufficient information and reasoning is provided to permit an intelligent response from the public to the proposals;
- Adequate time given for consideration and response given the significance of the decision being taken;
- Plans in place for a full analysis of the results and for these to be presented at a senior level to enable the consultation to be conscientiously taken into account in finalising any proposals.

Consultation Strategy

Identification of the Audience

The consultation was open for anyone to contribute to. The key target audience was individuals or organisations that are interested because they might be impacted by the proposals – either because they might use the routes or live near to them. This included, but was not limited to, members of the public, elected representatives, businesses and campaign groups.

Design of Consultation Materials

It was identified that the audience for the consultation required a great deal of detailed information upon which to base their responses. So whilst the key consultation questions were relatively straightforward (people were asked what sort of journeys they make using active travel modes, how often they use active travel modes, how often they used active travel modes to make specific journeys, what things would support them to walk/use mobility aids rather than a car, what would help them cycle more, how important 9 different priorities were to them, and which three of the 13 corridors would they most likely use for active travel) a six-page information document was produced and supplemented with additional information and was available online and in hard copy on request.

This information document explained the Greater Cambridge Partnership's strategy and the timescales to which it was working and discussed the reasons for the Cycling Plus consultation. This was supplemented online with maps showing the proposed routes for investment.

Design of Consultation Questions

The consultation questions themselves were designed to be neutral and clear to understand, and were structured to enable people to comment on all the key areas of decision making. This was done in order to help people to understand and comment on the Greater Cambridge Partnership's strategy and the local implications of this.

For the first half of the consultation survey there was a focus on questions relating to the options for the Cycling Plus scheme. Questions then moved on to capture the detail of why respondents were choosing particular options. The second half of the survey focused on multiple choice questions relating to respondents' personal details, allowing measurement of the impact of the Cycling Plus scheme on various groups.

The main tool for gathering comments was an online survey. It was recognised that online engagement, whilst in theory available to all residents, could potentially exclude those without easy access to the internet. Therefore paper copies of the information document and survey were available on request. A telephone number for the Contact Centre was included in the materials and online so that people could speak to someone to give their responses if they preferred. Other forms of response e.g. detailed written submissions were also received and have been incorporated into the analysis of the feedback.

The survey included the opportunity for 'free text' responses and the analysis approach taken has enabled an understanding of sentiment as well as the detailed points expressed.

Diversity and Protected Characteristics

A complete set of questions designed to monitor equality status (sexuality) were not included within the direct questions on the survey. This was because previous feedback from the public has suggested that these questions are overly intrusive given the context of providing comments on the strategic aspects of a new transport route.

Previous consultation has highlighted the importance of taking into account accessibility at the detailed scheme design stage.

It was decided therefore to only collect information on matters pertinent to travel, that is to say age, employment status, ethnicity, sex/gender, and disability (although not the nature of disability). A free text option provided opportunity for respondents to feedback on any issues they felt may impact on protected groups.

Analysis

The strategy for analysis of the consultation was as follows:

- An initial quality assurance review of the data was conducted and a review with the engagement team carried out to identify any issues or changes that occurred during the consultation process.
- A set of frequencies were then produced and checks made against the total number of respondents for each question and the consultation overall. A sense check of the data was made at this point with issues such as checking for duplicate entries, data entry errors and other quality assurance activities taking place.
 - **Duplicate Entries.** Measures were in place to avoid analysing duplicated entries. The online survey software collects the timestamp of entries so patterns of deliberate duplicate entries can be spotted and countered.
 - **Partial Entries.** The system records all partial entries as well as those that went through to completion (respondent hit submit). These are reviewed separately and in a limited number of cases - where a substantial response has been made (as opposed to someone just clicking through) - these are added to the final set for analysis.
 - Within the analysis a search for any unusual patterns within the responses was carried out, such as duplicate or 'cut and paste' views being expressed on proposals.
- Closed questions (tick box answers) are then analysed using quantitative methods, and these are presented in the final report through charts, tables and descriptions of key numerical information.
- Data was also cross-tabulated where appropriate, for example, to explore how respondents in particular areas or with different statuses answered questions. Characteristics data was used to provide a general over-view of the 'reach' of the consultation in terms of input from people of different socio-economic status and background.
- Free text questions were analysed using qualitative methods, namely through thematic analysis. Key themes are identified using specialist software and then responses tagged with these themes (multiple tags can be given to the same response). At this stage, totals of tagged themes are created and sample quotes chosen for the final report that typify particular tagged themes. Comment themes are listed in order of the number of comments received, from most to least. In the reporting of themes 'most' represents where over 50% of respondents' comments were applicable, 'some' represents 25%-49%, and 'few' represents less than 25% of comments.

- Finally, the final report is produced to provide an objective view of the results of the consultation.

Quality Assurance

Data Integrity

- A visual check of the raw data shows no unusual patterns. There were no large blocks of identical answers submitted at a similar time.
- Date / time stamp of submissions showed no unusual patterns.
- Text analysis showed no submissions of duplicate text.

Survey Findings

Respondent Profile

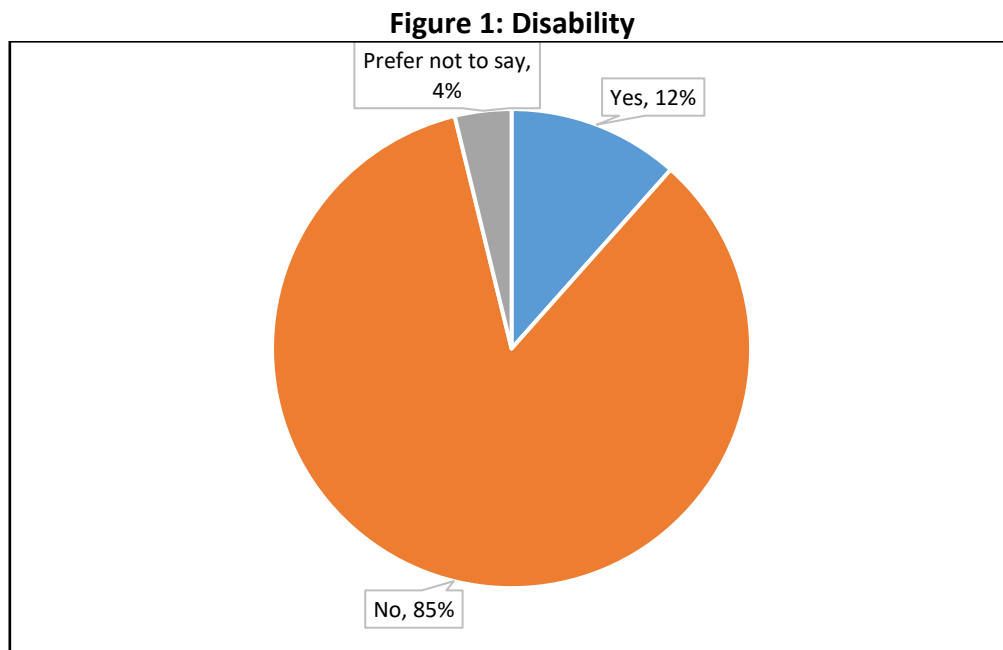
In total, 1000 individuals and 9 stakeholders responded to the consultation survey. These stakeholders were:

- Living Streets Cambridge
- A10 Corridor Cycling Campaign
- Milton Cycling Campaign, (working with Camcycle)
- County Councillor Histon & Impington
- District Councillor for Waterbeach and Milton (Paul Bearpark)
- Willingham Parish Councillor
- Cambridge City Councillor
- Parish Councillor
- District Councillor

Disability that influences travel decisions

968 respondents answered the question on whether they had a disability that influences travel decisions.

- **12% of respondents indicated they had a disability that influences travel decisions**



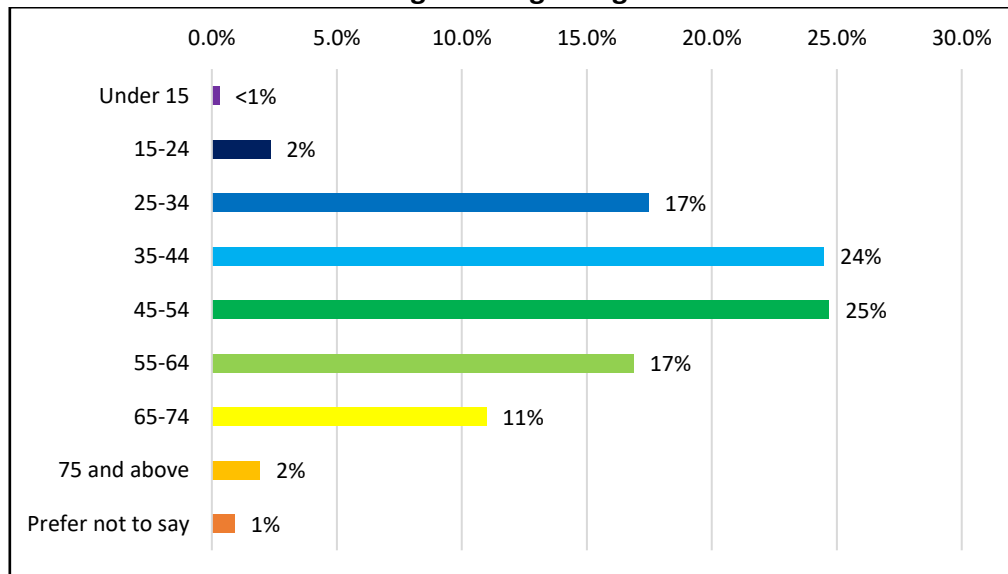
**N.B. Figures in the graph may not add up to 100% due to rounding*

Age range

984 respondents answered the question on their age range.

All ages from '25-34' to '65-74' years were well represented when compared to the general Cambridgeshire population, whilst the age group from '15-24' years (accounting for just 2% of responses) was under-represented compared to the general Cambridgeshire population.

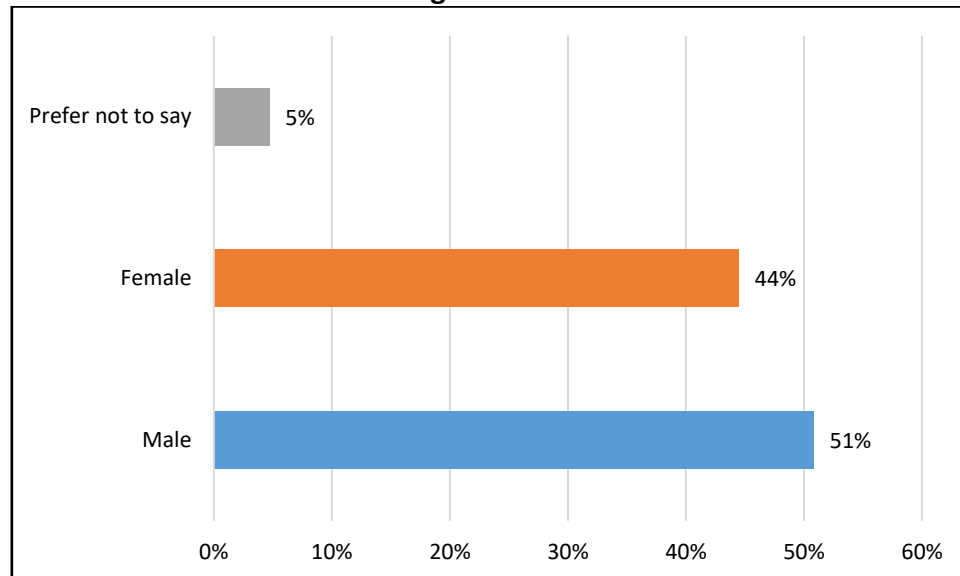
Figure 2: Age range



Sex and gender

976 respondents answered the question on their sex and 911 answered the question on their gender.

Figure 3: Sex



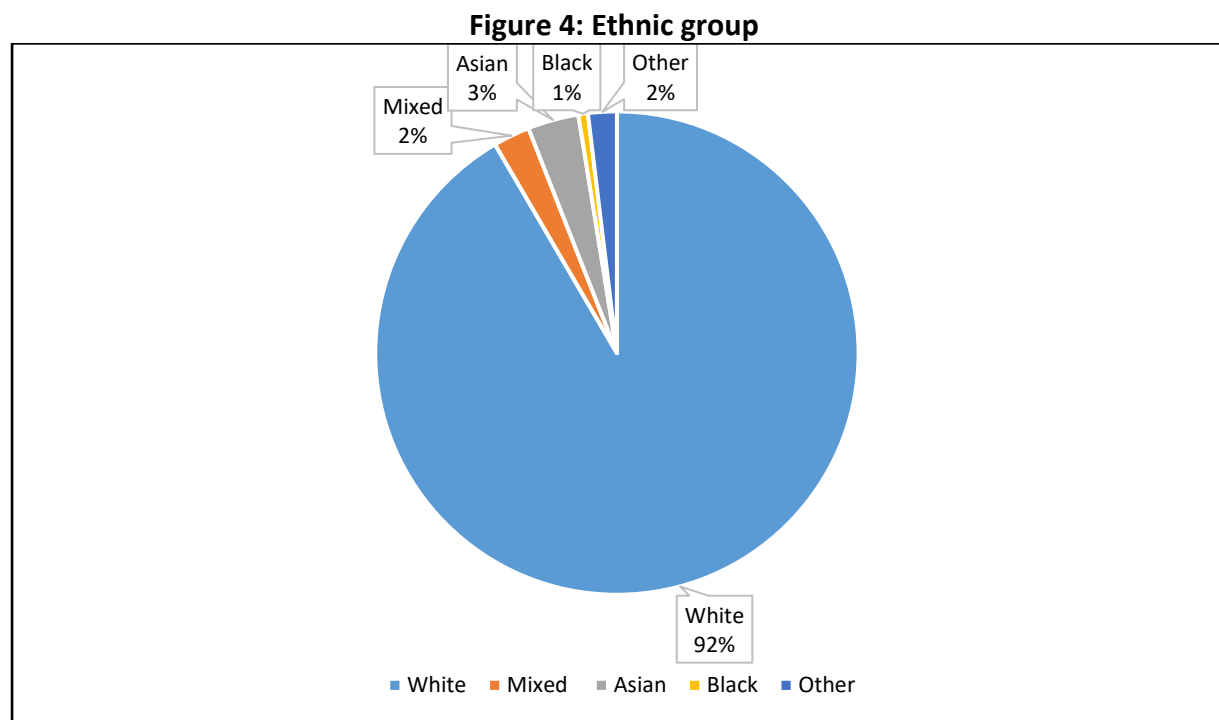
The majority of the respondents defined their gender same as at birth (93%), 1% of respondents defined their gender as different from their sex registered at birth and 6% 'preferred not say'. Respondents could leave comments to define their gender if it differed from their sex registered at birth. The comments included:

- Non-binary
- Indication that they do not believe in gender constructs
- Indication that they were not happy with the question

Ethnic group

939 respondents answered the question on their ethnicity.

- The majority of respondents were 'White' (92%).



**N.B. Figures in the graph may not add up to 100% due to rounding*

Ethnic groups were defined as following:

- Asian or Asian British includes Indian, Pakistani, Bangladeshi, Chinese or any other Asian background.
- Black, Black British, Caribbean or African includes Black British, Caribbean, African or any other Black background.
- Mixed or Multiple ethnic groups includes White and Black Caribbean, White and Black African, White and Asian or any other Mixed or Multiple background.
- Other ethnic group includes Arab or any other ethnic group.
- White includes British, Northern Irish, Irish, Gypsy, Irish Traveller, Roma or any other White background.

Location

924 respondents answered the question on their location.

- **The majority of respondents were located in Cambridge (60%).**
 - Under a third of respondents were located in South Cambridgeshire (29%)

Figure 5: Respondent location by district

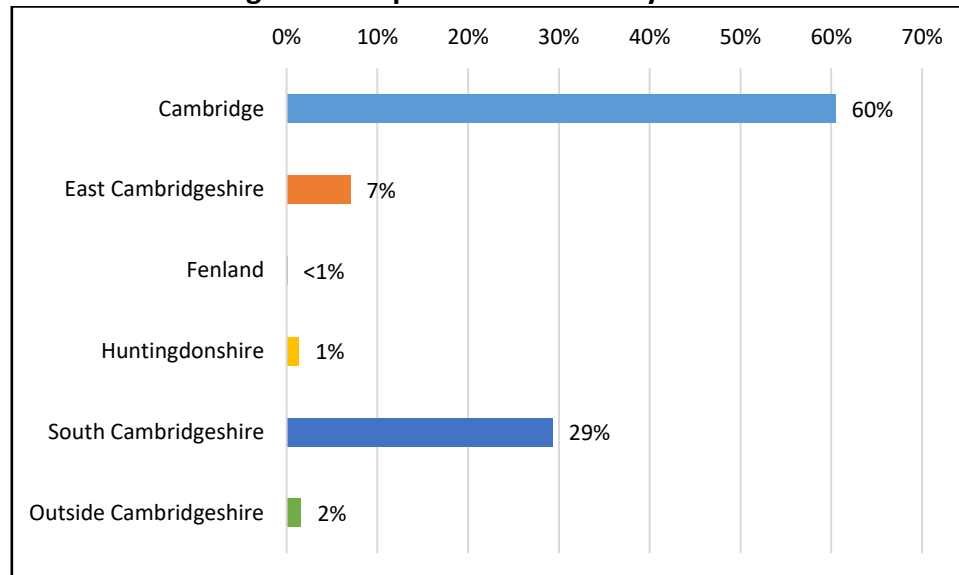
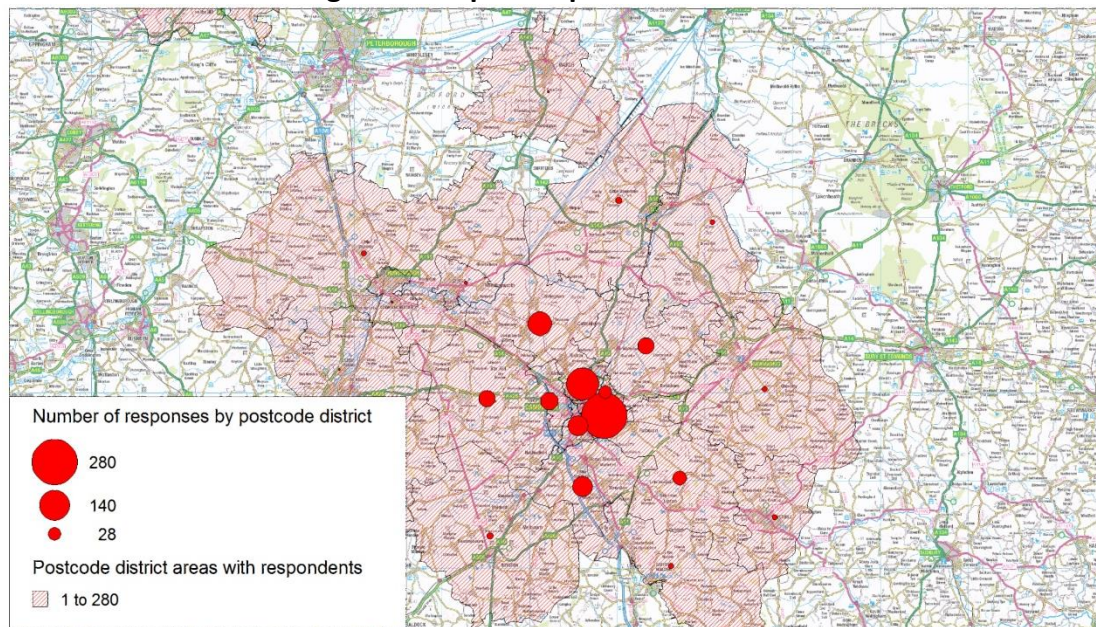


Figure 6: Map of respondent locations

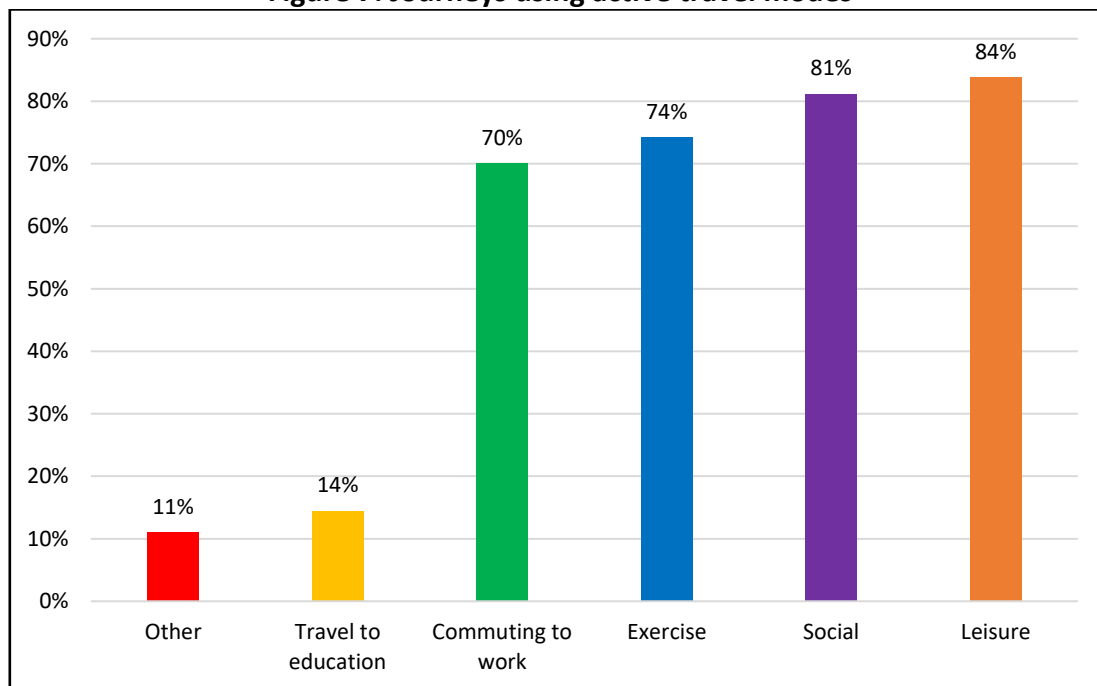


Question 1: What sort of journeys do you make using active travel modes?

988 respondents answered the question on the type of journey they make using active travel modes. The respondents could select more than one answer.

- The majority of respondents indicated that 'leisure' (84%), 'social' (81%), 'exercise' (74%), and 'commuting to work' (70%) are the sort of journeys they make using active travel modes

Figure 7: Journeys using active travel modes



**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

The category 'other' includes: shopping, care for children or adults, health appointments, dog walking, site-seeing, attending religious places, recycling, and other personal events/hobbies. 5 of the respondents indicated they are unable make active travel journeys due to being disabled.

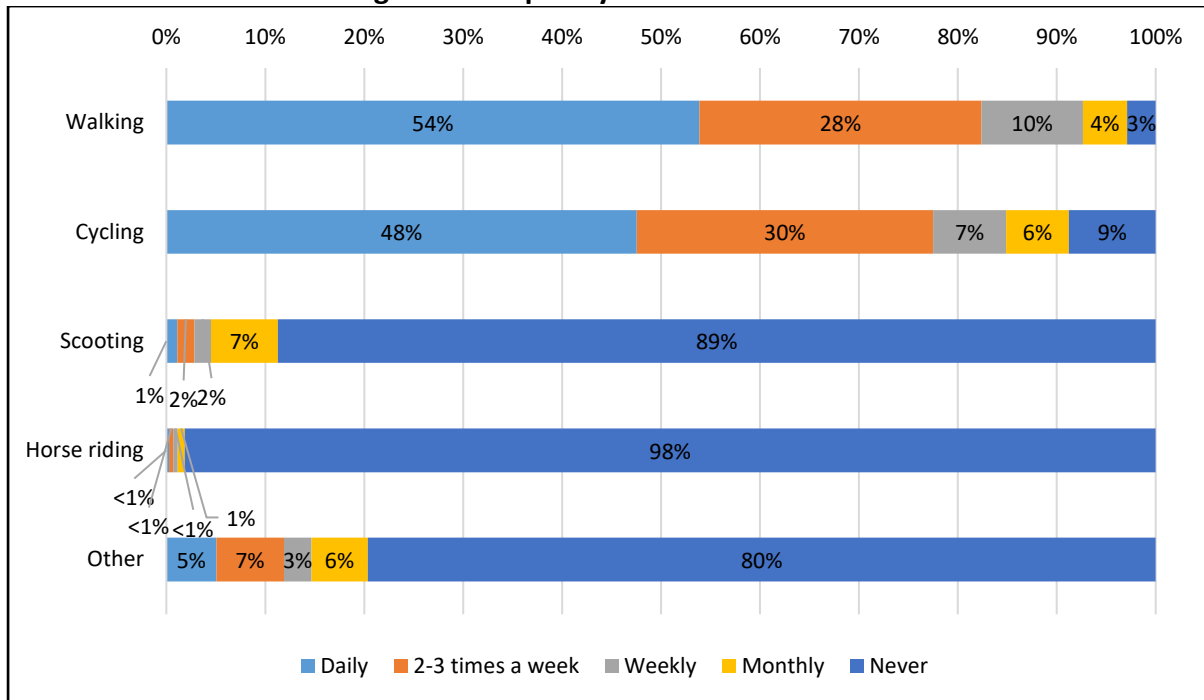
Question 2: How often do you use the following active modes to make journeys?

965 respondents answered the question on how often they walk, 978 on how often they cycle, 710 on how often they scoot, 703 on how often they ride a horse, and 614 on 'other' modes of active travel.

- Over half of the respondents walk on a 'daily' basis (54%). Over a quarter of the respondents walk '2-3 times a week' (28%).
- Almost half of the respondents cycle 'daily' (48%), and almost a third '2-3 times per week' (30%).

- Majority of the respondents 'never' ride horses (98%), scoot (89%), or use 'other' modes of active travel (80%).

Figure 8: Frequency of activities modes



**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

Differences in response

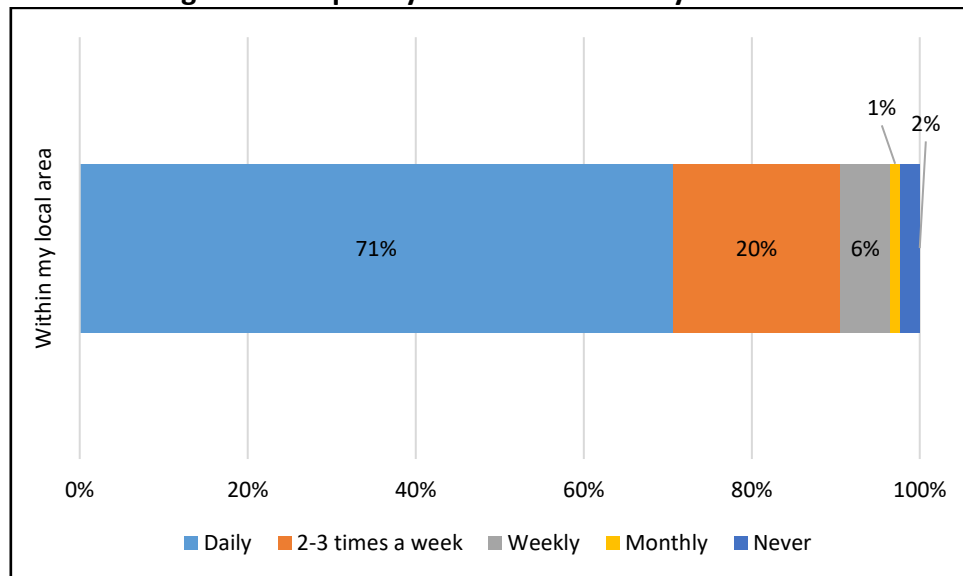
Respondents who indicated they had a disability that influences travel decisions were more likely to indicate they 'never' walk (11%) or cycle (30%).

Question 3: How often do you make the following journeys using active modes?

973 respondents answered the question on how often they travel within their local area.

- The majority of respondents travel within their local area 'daily' (71%), and a further 20% travel within their local area '2-3 times per week'.

Figure 9: Frequency of travel 'within my local area'

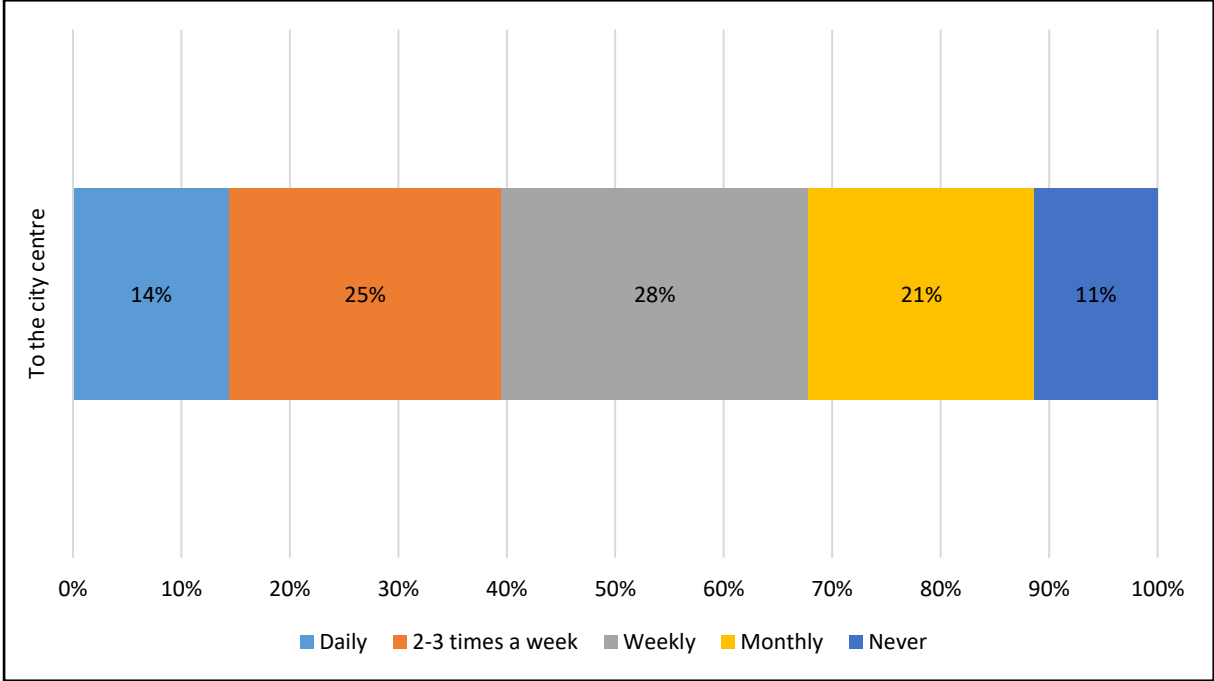


*N.B. Figures in the graph may not exactly match the text in the report due to rounding

948 respondents answered the question on how often they travel to the city centre.

- Over a quarter of the respondents indicated they travel to the city centre ‘weekly’ (28%), a quarter ‘2-3 times a week’ (25%) and just over a fifth monthly (21%).

Figure 10: Frequency of travel ‘to the city centre’

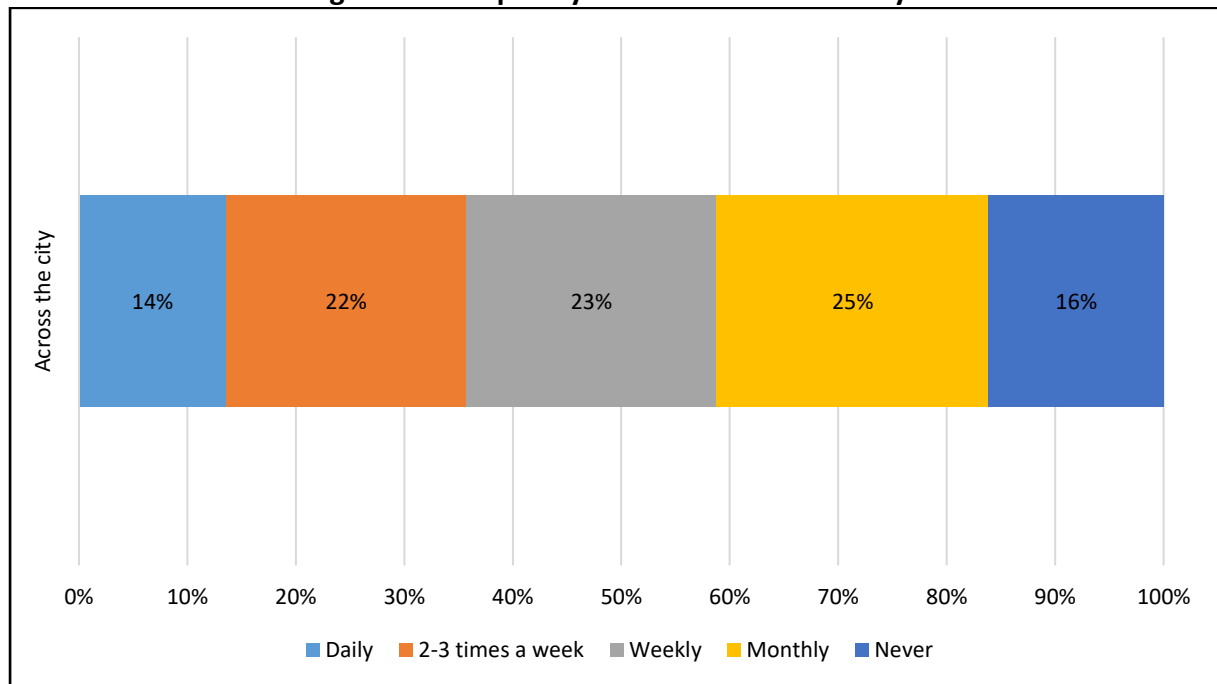


**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

905 respondents answered the question on how often they travel across the city.

- One quarter of respondents indicated they travel across the city 'monthly' (25%), just under a quarter 'weekly' (23%) and just over a fifth '2-3 times a week' (22%).

Figure 11: Frequency of travel 'across the city'

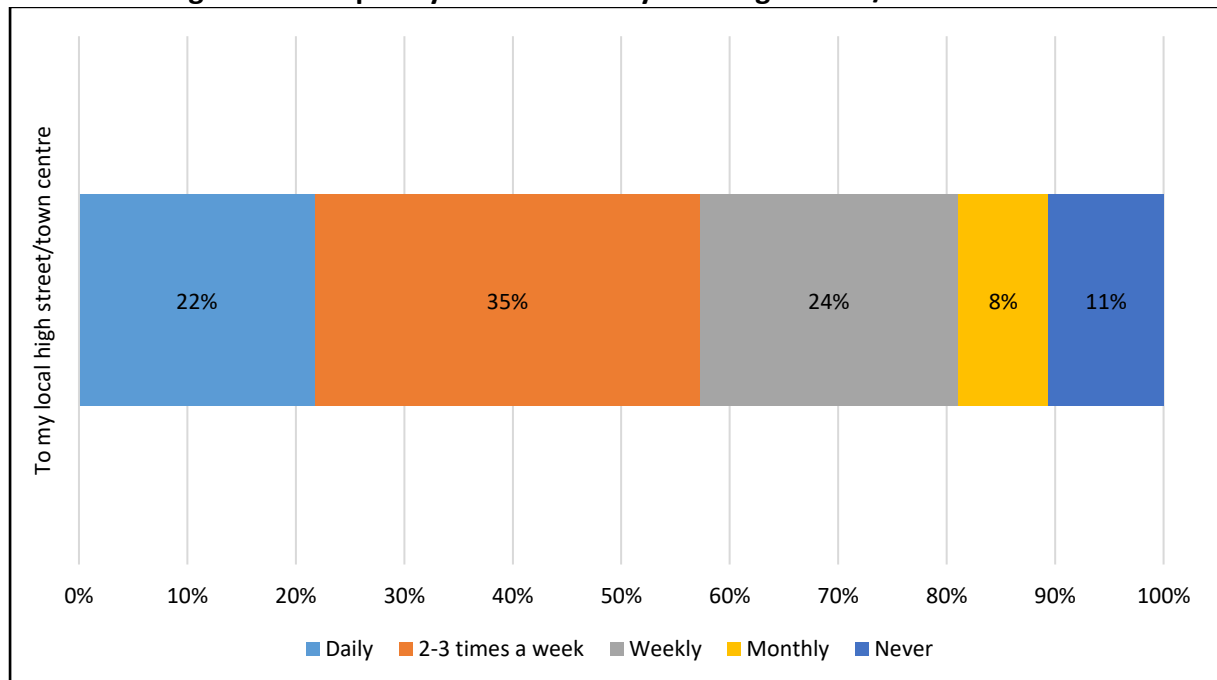


**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

896 respondents answered the question on how often they travel to their local high street/town centre.

- More than a third of the respondents indicated they travel to their local high street/town centre '2-3 times a week' (35%), just under a quarter 'weekly' (24%), and over a fifth 'daily' (22%).

Figure 12: Frequency of travel 'to my local high street/town centre'

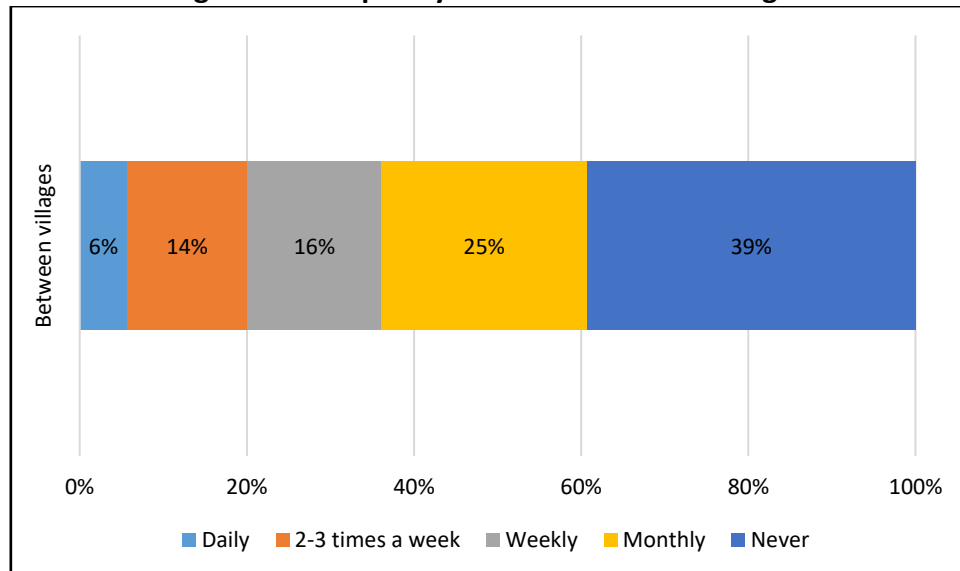


**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

878 respondents answered the question on how often they travel between villages.

- Just under two fifths of respondents indicated they 'never' travel between villages (39%) while a quarter indicated 'monthly' (25%) travel between villages.
- Almost a third travel between villages either '2-3 times a week' (14%) or 'weekly' (16%).

Figure 13: Frequency of travel 'between villages'

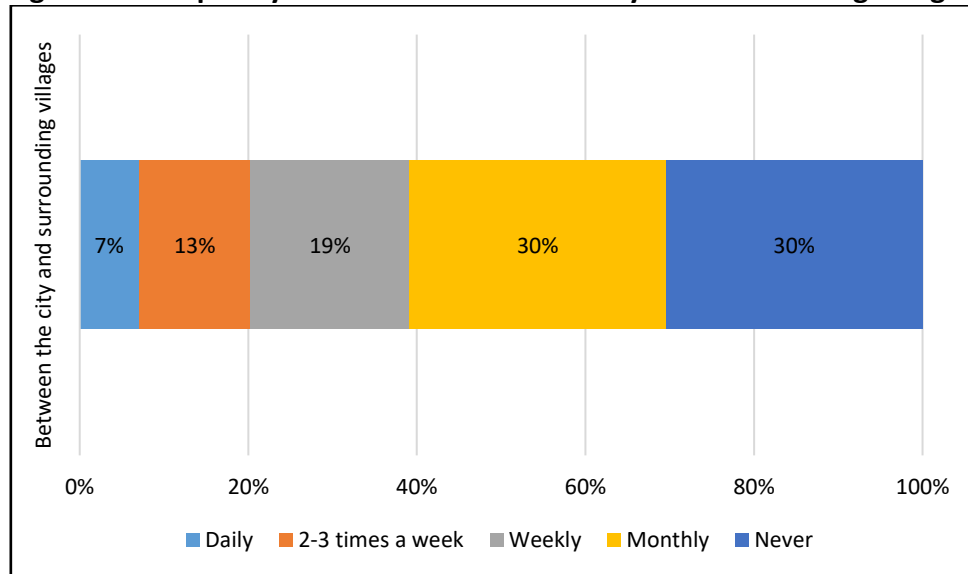


**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

897 respondents answered the question on how often they travel between the city and surrounding villages.

- Almost a third of respondents indicated that they travel between the city and surrounding villages either '2-3 times a week' (13%) or 'weekly' (19%)
- Under a third of the respondents indicated they 'never' travel between the city and surrounding villages (30%) and under a third indicated they travel between the city and surrounding villages 'monthly' (30%).

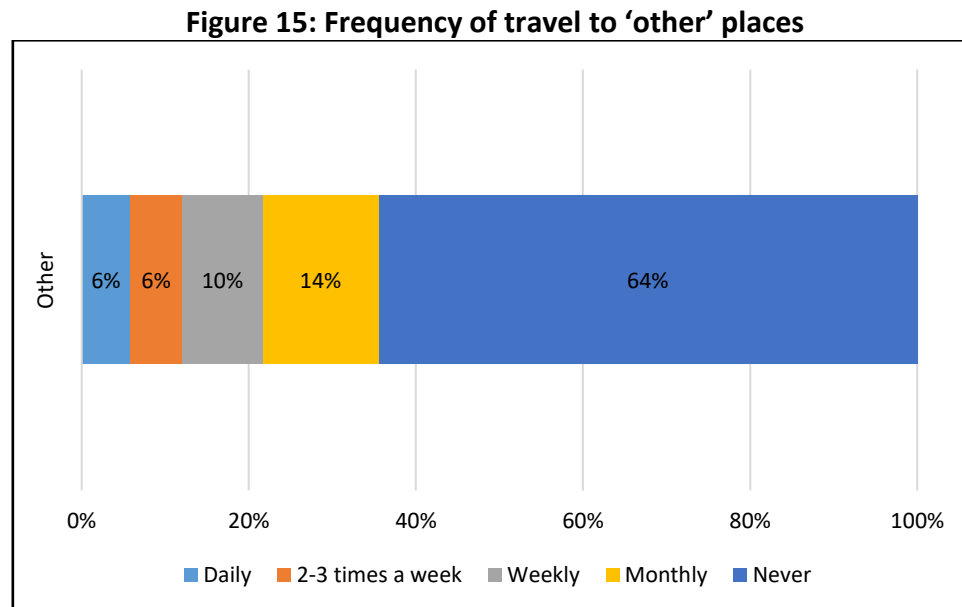
Figure 14: Frequency of travel 'between the city and surrounding villages'



**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

549 respondents answered the question on how often they travel to other places.

- The majority of respondents indicated they 'never' travel to any other places (64%).



**N.B. Figures in the graph may not exactly match the text in the report due to rounding*

Differences in response

Respondents who indicated they had a disability that influences travel decisions were more likely to indicate they 'never' travel 'to the city centre' (26%), 'across the city' (31%), 'to my local high street/town centre' (21%), 'between villages' (51%), or 'between the city and surrounding villages' (47%).

Respondents who are located in Cambridge were more likely to indicate they 'never' travel 'between villages' (50%) while respondents located in South Cambridgeshire were more likely to indicate they travel '2-3 times a week' 'between villages' (28%).

Question 4: I would walk more or use a mobility aid for journeys I currently make by car if....Please tick all that apply.

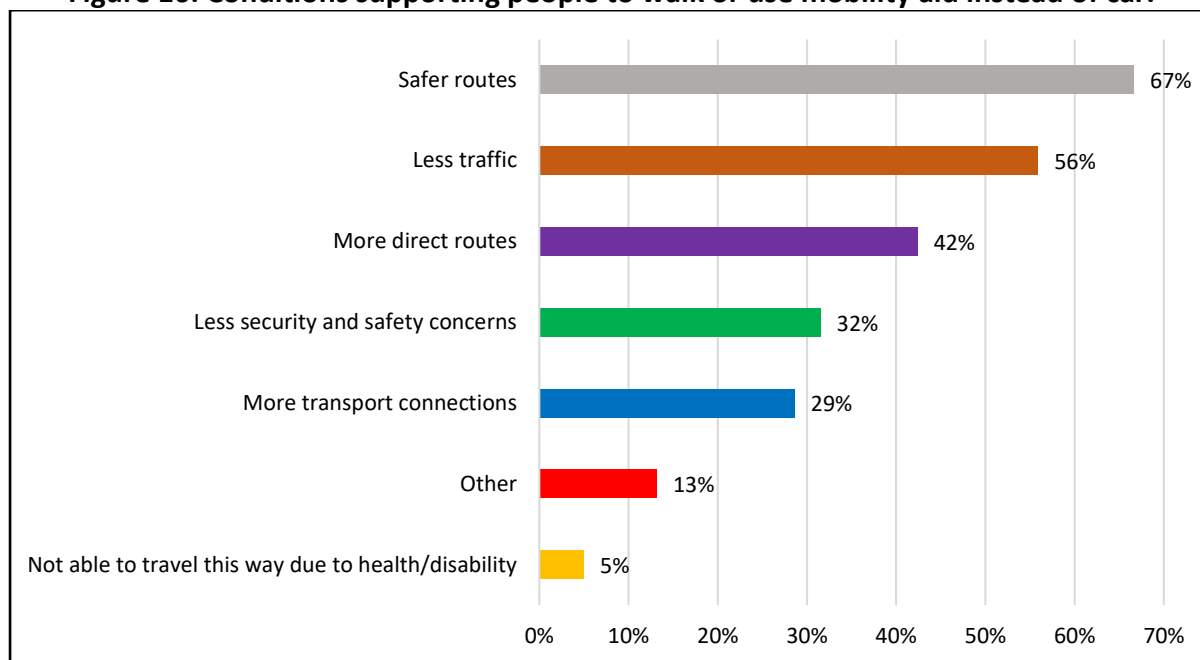
894 respondents answered the question on conditions that would support them walking or using a mobility aid instead of making the journey by car. The respondents could select multiple answers.

- **The majority of respondents indicated that ‘safer routes’ (67%) and ‘less motorised traffic’ (56%) would help them walk or use a mobility aid instead of a car.**

Respondents could leave a comment if they selected ‘other’. Of the 118 respondents who selected ‘other’, 3 left no answer. The comments included:

- Being closer to locations they needed to travel to/more time available to travel this way
- Indications they didn’t own or use a car
- Routes being better maintained from potholes/natural detritus/vegetation growth
- They weren’t making journeys that required transportation of cargo
- Routes were safer
- That they cycle instead
- That they needed to use a car due to work, transporting others to multiple spread-out locations, or due to health/disabilities
- That routes had segregation from traffic and other forms of active travel
- That more cyclists and pedestrians travelled with awareness of potential conflict between these groups
- That the weather is pleasant
- That there were more joined up cycle routes
- There was more secure cycle parking/they weren’t concerned about cycle theft
- That they already walk
- There was more pleasant scenery
- Pavement parking was banned or enforced where not allowed
- There were showers/changing facilities/personal storage available at their destinations
- There was better lighting
- That they would walk when they needed/were able to
- The air quality was better
- There was more enforcement of speed limits
- That none of the options would make them walk or use a mobility aid more
- There was better signage indicating routes/distances
- They were healthier
- Traffic signals gave more time for pedestrians to cross
- That there were no constraints on walking/using mobility aids more
- That electric scooters were allowed on pavements
- That electric scooters were banned

Figure 16: Conditions supporting people to walk or use mobility aid instead of car.



Conditions were phrased as following:

- Safer routes: routes felt safer (e.g. fewer potholes, less traffic).
- Less traffic: routes had less motorised traffic.
- More direct routes: routes to my destination(s) were more direct.
- More transport connections: I could make connections to other forms of transport
- Less security and safety concerns: I was less concerned for my personal security and safety
- Not able to travel this way due to health/disability: I am not able to travel this way due to health issues / disability
- Other: more bike parking, path and cycle lane better maintained for safety and accessibility (e.g. pot holes, kerbs and slabs, grass and trees, separations form traffic, signs and space)

Differences in responses

Respondents who indicated they had a disability that influences travel decisions were more likely to indicate they were 'not able to travel this way due to health issues/disability' (33%).

Question 5: I would cycle more if...Please tick all that apply.

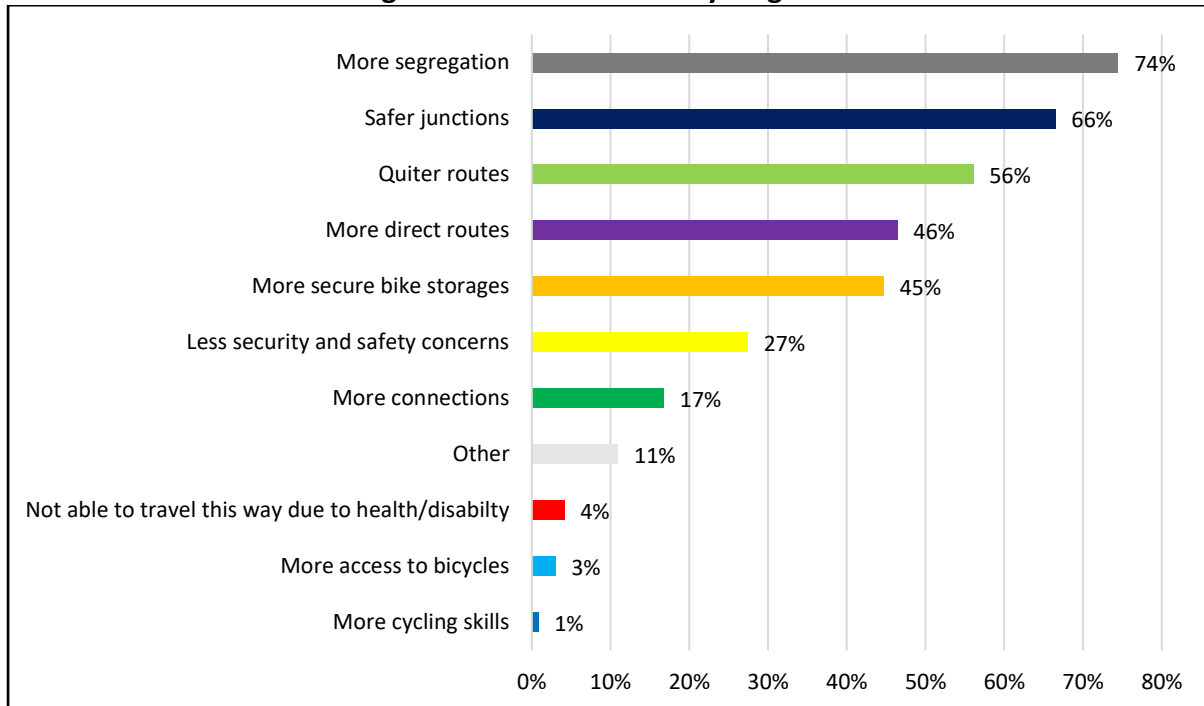
967 respondents answered the question on the conditions that would help them cycle more. Respondents could select more than one answer.

- **The majority of respondents indicated that ‘more segregation’ (74%), ‘safer junctions’ (66%), and ‘quieter routes’ (56%) would help them cycle more.**

Respondents could leave a comment if they selected ‘other’. Of the 106 respondents who selected ‘other’, 1 left no answer. The comments included:

- Cycle routes/roads needed to be better maintained (potholes/detritus/vegetation growth) and better surfaced
- Routes needed better segregation from pedestrians and motor vehicles
- Routes and parking locations needed to be safer, particularly for children
- That more cycle routes were needed, joining up existing routes and rural locations
- That they already cycle
- More should be done to prevent and investigate cycle theft
- That some journeys required transporting goods that weren’t suitable to do via cycling
- That more secure, safe cycling parking was needed
- More enforcement was needed over dangerous/inconsiderate driving
- Being closer to locations they needed to travel to/more time available to travel this way
- That the weather is pleasant
- Air quality was better
- There were safer ways to navigate junctions/side roads
- Cycle routes were wider
- That they were unable to cycle due to needing to use a car for work or due to health/disabilities/age/pregnancy
- There was better lighting on routes and at parking locations
- That pavement parking was banned or enforced where not allowed
- There were fewer motor vehicles
- There were better signage/maps of cycle routes/distances
- That cyclists/pedestrians/motorists travelled with consideration towards other users
- There were showers at their destination
- There were specialist routes for e-bikes or e-scooters
- There were emergency puncture repair services
- There were less delays at traffic lights/junctions
- Train services were more accessible by bike
- That more cycle routes were not needed
- That they preferred to drive

Figure 17: Conditions for cycling more



Conditions were phrased as following:

- More segregation: There was more segregation from motor vehicles on my route
- Safer junctions: The junctions on my route were safer
- Quieter routes: Routes were quieter
- More direct routes: Routes to my destination(s) were more direct
- More secure bike storages: There was more secure cycle storage at my destination
- Less security and safety concerns: I was less concerned for my personal security and safety
- More connections: I could make connections to other forms of transport
- More accessible: I am not able to travel this way due to health issues / disability
- More access to bicycles: I had access to a bicycle, e-cycle, or adapted cycle
- More cycling skills: I learnt to cycle
- Other: less pot holes, more time, segregated, safe, intuitive well/signed cycle network, maps, navigation support, bike storage, more sanctions for car parking on cycle lanes/not respecting speed limits.

Differences in responses

Respondents who were located in South Cambridgeshire were more likely to indicate 'More direct routes' (55%).

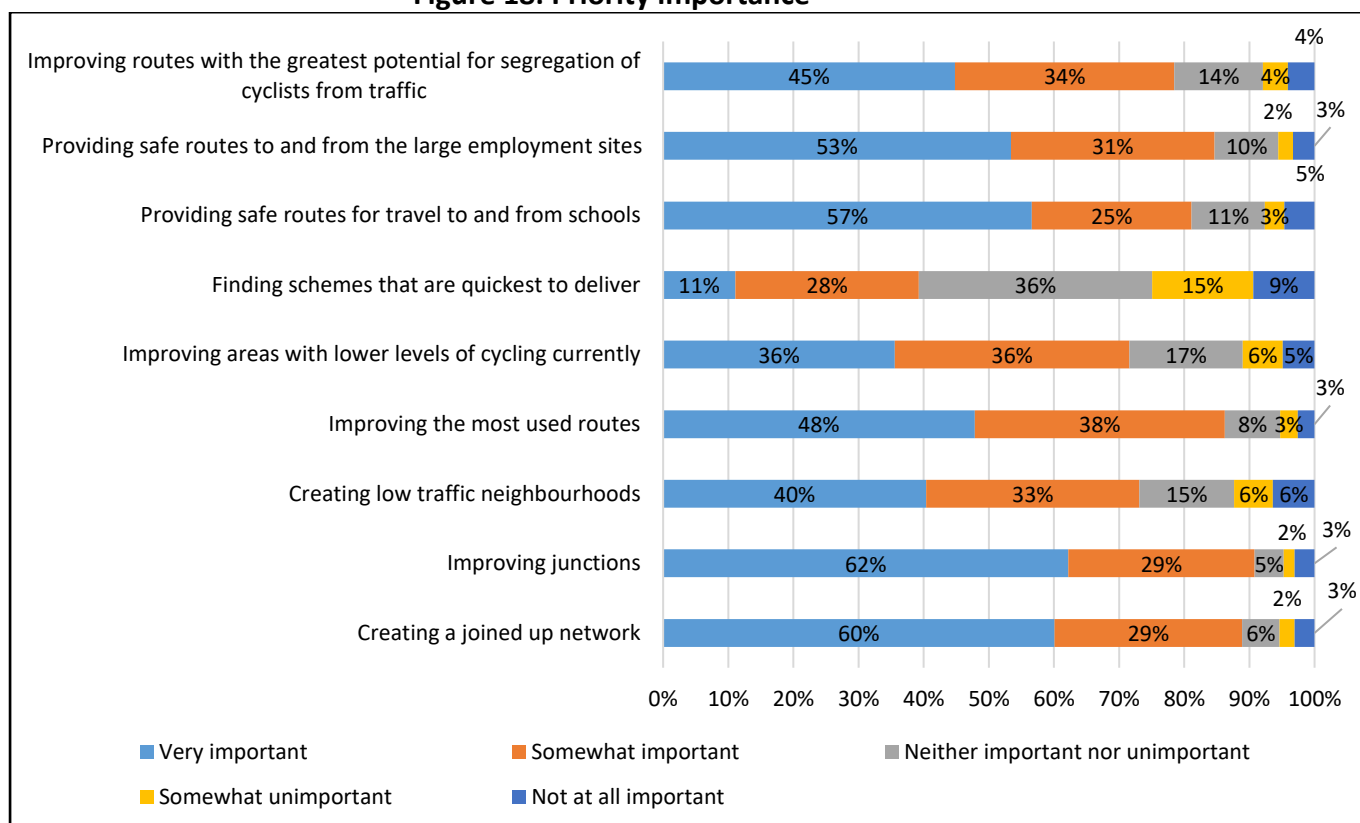
Respondents who indicated they had a disability that influences travel decisions were more likely to indicate they were 'not able to travel this way due to health issues/disability' (29%).

Question 6: How important to you are the following priorities for investment in active travel

993 respondents answered the question on how important 9 different priorities for investment in active travel was for them.

- **The majority of respondents felt that 8 of the 9 priorities were either ‘very important’ or ‘somewhat important’**
 - **‘Improving junctions’ (91%)**
 - **‘Creating a joined-up network’ (89%)**
 - **‘Improving the most used routes’ (86%)**
 - **‘Providing safe routes to and from the large employment sites’ (84%)**
 - **‘Providing safe routes for travel to and from schools’ (82%)**
 - **‘Improving routes with the greatest potential for segregation of cyclists from traffic’ (79%)**
 - **‘Creating low traffic neighbourhoods’ (73%)**
 - **‘Improving areas with lower levels of cycling currently’ (72%)**
- **Just under two-fifths of respondents indicated ‘finding schemes that are quickest to deliver’ are ‘very important’ (11%) or ‘somewhat important’ (28%)**
 - **Over a third of the respondents indicated this priority is ‘neither important nor unimportant’ (36%)**
 - **Just under a quarter of respondents indicated this priority is ‘somewhat unimportant’ (15%) or ‘not at all important’ (9%)**

Figure 18: Priority importance



9 stakeholders answered this question:

- **The majority of the stakeholders consider the same priorities as ‘somewhat important’ and ‘very important’**
 - **‘Creating a joined-up network’** (8 stakeholders indicated ‘very important’ and 1 ‘somewhat important’)
 - **‘Providing safe routes to and from the large employment sites’** (8 stakeholders indicated ‘very important’ and 1 ‘somewhat important’)
 - **‘Providing safe routes for travel to and from schools’** (8 stakeholders indicated ‘very important’ and 1 ‘somewhat important’)
 - **‘Improving the most used routes’** (7 stakeholders indicated ‘very important’ and 2 ‘somewhat important’)
 - **‘Improving areas with lower levels of cycling currently’** (7 stakeholders indicated ‘very important’ and 1 ‘somewhat important’)
 - 1 stakeholder indicated this was ‘neither important nor unimportant’
 - **‘Improving junctions’** (6 stakeholders indicated ‘very important’ and 3 ‘somewhat important’)
 - **‘Improving routes with the greatest potential for segregation of cyclists from traffic’** (6 stakeholders indicated ‘very important’ and 3 ‘somewhat important’)
 - **‘Creating low traffic neighbourhoods’** (6 stakeholders indicated ‘very important’ and 2 ‘somewhat important’)

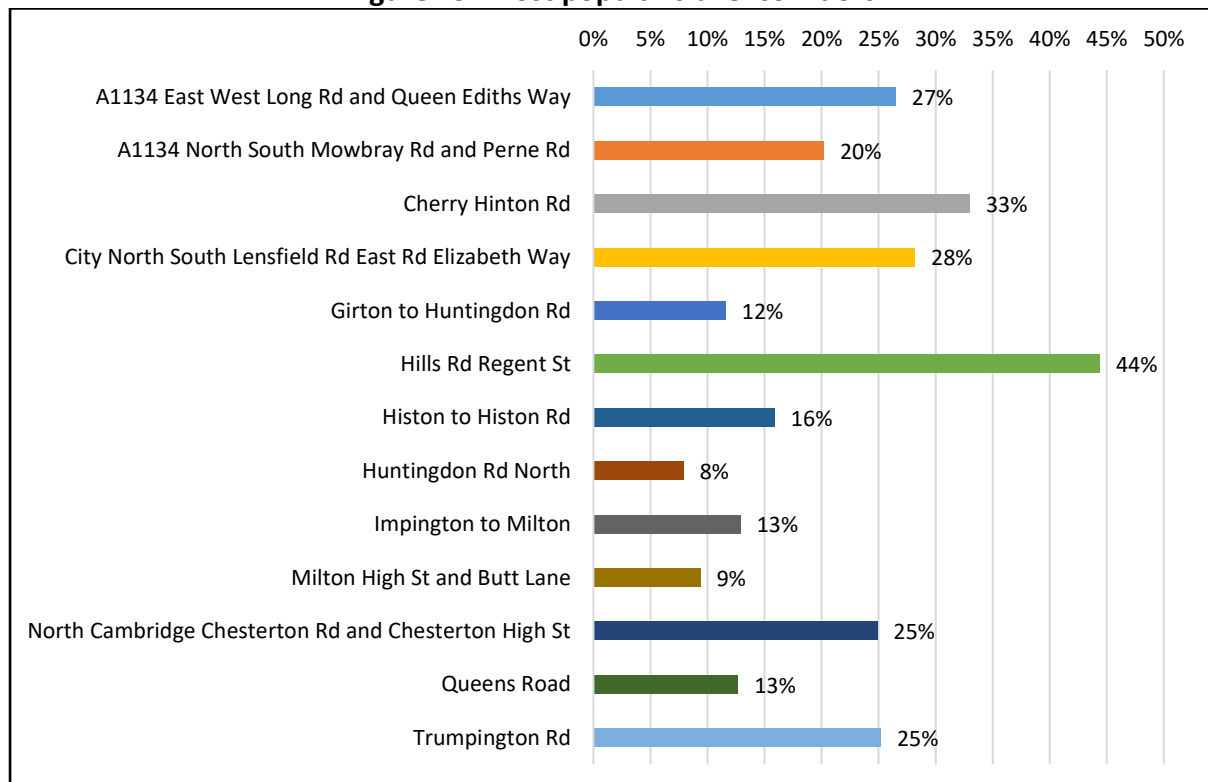
- 1 stakeholder indicated this was ‘neither important nor unimportant’
- Although the majority of stakeholders indicated ‘finding schemes that are quickest to deliver’ was ‘very important’ (2 stakeholders) or ‘somewhat important’ (5 stakeholders), 1 stakeholder felt it was ‘not at all important’, and 1 stakeholder did not leave an answer for this priority

Question 7: Do you have any additional comments on the proposed route options?

898 respondents answered the question on which corridors would be most likely used for active travel if they were improved. The respondents could select up to three corridors.

- ‘Hills Rd Regent St’ was selected by over two fifths of respondents (44%)
- ‘Cherry Hinton Rd’ was selected by a third of respondents (33%)
- ‘City North South Lensfield Rd East Rd Elizabeth Way’ was selected by over a quarter of respondents (28%)
- ‘A1134 East West Long Rd and Queen Ediths Way’ was selected by over a quarter of respondents (27%)
- ‘North Cambridge Chesterton Rd and Chesterton High St’ was selected by a quarter of respondents (25%)
- ‘Trumpington Rd’ was selected by a quarter of respondents (25%)

Figure 19: Most popular travel corridors



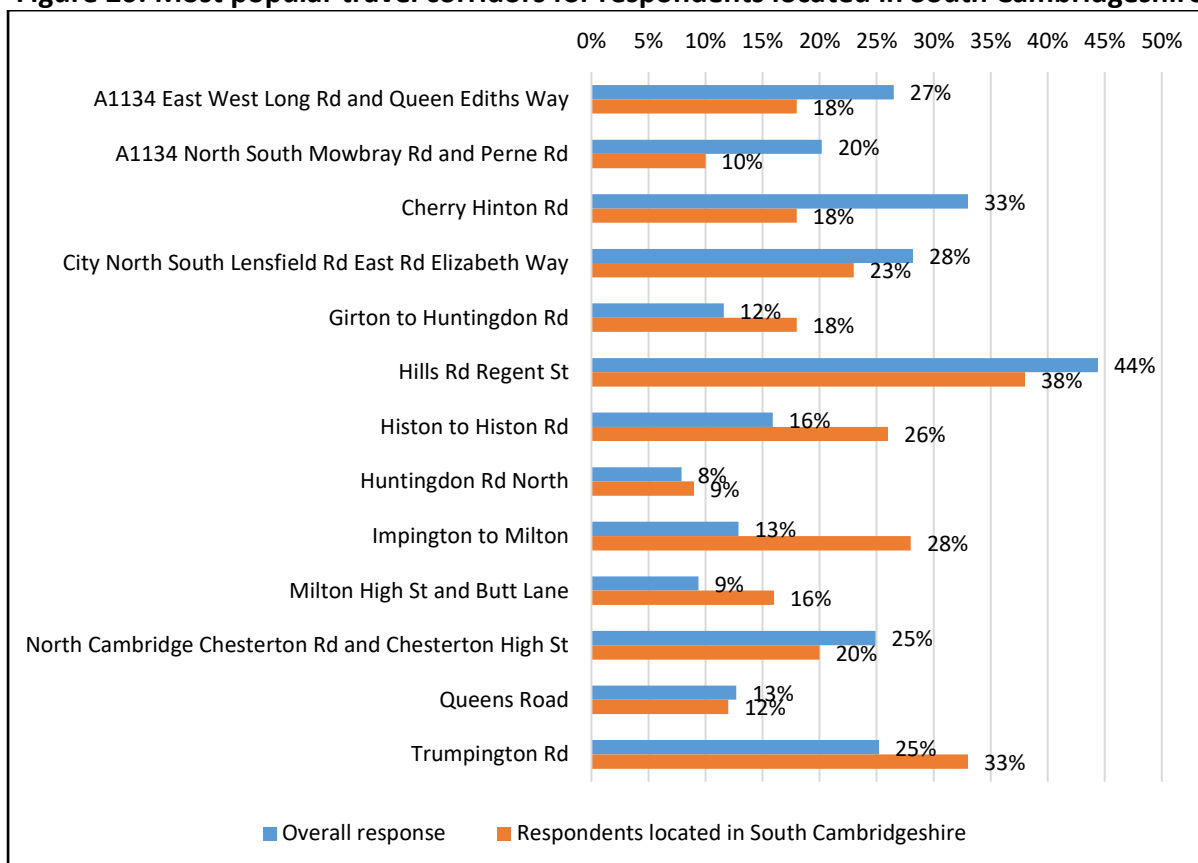
9 stakeholders responded to this question:

- 'Trumpington Rd' was selected by 3 stakeholders
- 'North Cambridge Chesterton Rd and Chesterton High St' was selected by 3 stakeholders
- 'Milton High St and Butt Lane' was selected by 3 stakeholders
- 'City North South Lensfield Rd East Rd Elizabeth Way' was selected by 3 stakeholders
- 'Impington to Milton' was selected by 2 stakeholders
- 'Histon to Histon Rd' was selected by 2 stakeholders
- 'Hills Rd Regent St' was selected by 2 stakeholders
- 'Cherry Hinton Rd' was selected by 2 stakeholders
- 'Huntingdon Rd North' was selected by 1 stakeholder
- 'Girton to Huntingdon Rd' was selected by 1 stakeholder
- 'A1134 East West Long Rd and Queen Ediths Way' was selected by 1 stakeholder

Differences in response

Respondents who were located in South Cambridgeshire were more likely to choose 'Impington to Milton' (28%) or 'Histon to Histon Rd' (26%) and less likely to choose 'A1134 North South Mowbray Rd and Perne Rd' (10%) or 'Cherry Hinton Rd' (18%). 'Hills Rd Regent St' was still the most popular corridor for respondents from South Cambridgeshire (38%), with 'Trumpington Rd' the next most popular (33%).

Figure 20: Most popular travel corridors for respondents located in South Cambridgeshire



Question 8: Are there any other routes you feel are particularly important for us to consider now or in the future?

556 respondents left comments on the question asking if there were any other routes that they felt were important to be considered now or in the future.

Summary of main themes

Comment Theme	Respondent comments
Safety	<ul style="list-style-type: none"> Respondents who discussed this theme were concerned about the safety of various routes for cyclists and pedestrians <ul style="list-style-type: none"> Most of the respondents who discussed this theme were concerned about the high volumes of motorised traffic, the close proximity of this traffic, and pavement parking of motorised vehicles Some of the respondents who discussed this theme were concerned that the cycle and footpaths were not well maintained, resulting in

	<p>potholes and overgrown foliage, which made the routes unsafe to use</p> <ul style="list-style-type: none"> ○ A few of the respondents who discussed this theme were concerned about the shared nature of cycle and footpaths, feeling that fast travelling cyclists endangered pedestrians ○ A few of the respondents who discussed this theme were concerned about the crossing points for cycles and footpaths across A and M roads, particularly the M11 slip roads
Cambridge (general)	<ul style="list-style-type: none"> • Most of the respondents who discussed this theme discussed routes that needed to connect to Cambridge as a whole. Areas mentioned in order of number of comments were: <ul style="list-style-type: none"> ○ Links to places of employment/education such as, Addenbrookes, the Science Park, Granta Park, and university campuses ○ Rural routes generally, these respondents felt that Cambridge needed better connections to the surrounding villages ○ Cambourne ○ Ely ○ Barton ○ Waterbeach ○ Royston ○ Milton ○ Linton ○ Haverhill ○ Comberton ○ Babraham ○ Hardwick ○ Coton ○ Trumpington ○ St Neots ○ Newmarket ○ Histon ○ Haslingfield ○ Girton ○ Cherry Hinton ○ Bourn ○ Wimpole ○ Whittlesford ○ Toft ○ Teversham ○ Stapleford ○ Shelford ○ Sawston

	<ul style="list-style-type: none"> ○ Quay ○ Northstowe ○ Newnham ○ Madingley ○ Longstowe ○ Landbeach ○ Horningsea ○ Hauxton ○ Harston ○ Halton ○ Grantchester ○ Fulbourn ○ Foxton ○ Fen Ditton ○ Eversden ○ Duxford ○ Dry Drayton ○ Cottenham ○ Caldecote ○ Burwell ○ Bottisham ○ Bar Hill ○ Arrington ○ The Abingtons <ul style="list-style-type: none"> • A few of the respondents who discussed this theme felt city centre footpaths and cycle routes needed improving, particularly by segregating traffic and making the paths wider, due to the busy nature of the area
Education and employment sites	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that more routes were needed to places of education, particularly primary schools, and employment sites, particularly Addenbrooke's Hospital
Mill Road	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that Mill Road needed better pedestrian and cycle routes <ul style="list-style-type: none"> ○ Some of these respondents went into more detail. These respondents felt that Mill Road was unsafe for cyclists due to the high volumes of motorised traffic and the narrow roads. They felt it was also unsafe for pedestrians, particularly on the northern end, due to the narrow footpaths and amount of parking of motorised vehicles on pavements
Maintenance	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that roads/footpaths/cycle paths needed better ongoing maintenance

	<ul style="list-style-type: none"> ○ Most of these respondents felt that cycle and footpaths aren't properly maintained, resulting in overgrowing foliage narrowing routes and potholes/poor surfaces resulting in damage to cycles or accidents ○ A few of these respondents felt that general maintenance of roads, cycle and footpaths was needed to improve safety rather than creating more routes
Newmarket Road	<ul style="list-style-type: none"> ● Respondents who discussed this theme felt that Newmarket Road needed improved cycle and pedestrian facilities <ul style="list-style-type: none"> ○ Some of these respondents provided more detail. These respondents felt that improved cycle and pedestrian facilities on Newmarket Road are needed to improve connectivity to areas east of Cambridge, such as the Wilbrahams, Chesterton, Barnwell, Fen Ditton, Bottisham, and Abbey
Rural routes	<ul style="list-style-type: none"> ● Respondents who discussed this theme felt that rural routes in general needed more attention <ul style="list-style-type: none"> ○ Some of these respondents felt that rural villages needed better connections to each other ○ Some of these respondents felt that rural villages needed better connections to Cambridge
Addenbrookes	<ul style="list-style-type: none"> ● Respondents who discussed this theme felt better cycle and pedestrian connectivity was needed to Addenbrooke's, particularly to areas/villages south of Cambridge <ul style="list-style-type: none"> ○ A few of these respondents felt the junctions around and routes into the Addenbrooke's site needed improving as they were busy routes and felt unsafe
Widening cycle/footpaths	<ul style="list-style-type: none"> ● Respondents who discussed this theme felt that cycle and footpaths needed widening in general, as active travel options are becoming more popular more space is needed to safely navigate them. This was a particular concern where paths were shared use as there is concern of conflict between users
Coldhams Lane	<ul style="list-style-type: none"> ● Respondents who discussed this theme felt that cycle and pedestrian facilities needed to be improved on Coldhams Lane <ul style="list-style-type: none"> ○ Some of these respondents went into more detail. These respondents felt that Coldhams Lane was a key point for connectivity from the

	city centre to Cherry Hinton, the Chisholm Trail, and other active travel routes. These respondents felt the area is a high traffic route.
Arbury Road	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that cycle and pedestrian facilities needed to be improved on Arbury Road <ul style="list-style-type: none"> ○ Some of these respondents provided more detail. These respondents felt that the final phase of Arbury Road connecting to Union Lane needed to be completed, as this area is felt to be hostile to pedestrians and cyclists
Around Cambridge railway station	<ul style="list-style-type: none"> • Respondents who discussed this theme felt the area around Cambridge Central Station needed improving for cyclists and pedestrians. These respondents felt that, particularly the forecourt and Station Road are unsafe for cyclists and pedestrians and lack connectivity to routes around the city
Waterbeach	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that cycle and pedestrian facilities needed to be improved in and around Waterbeach <ul style="list-style-type: none"> ○ Most of these respondents felt Waterbeach needed better connectivity to surrounding villages, such as Landbeach, Horningsea, Milton, Cottenham, Ely, and Histon <ul style="list-style-type: none"> ▪ The A10 route was mentioned by a few of these respondents as being unsafe due to the amount of motorised traffic ▪ A few of these respondents indicated that children of secondary school age travelled to Cottenham for school ○ A few of these respondents felt that Waterbeach needed better connectivity to Cambridge and surrounding employment sites
Hills Road	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that cycle and pedestrian facilities needed to be improved on Hills Road <ul style="list-style-type: none"> ○ Some of these respondents went into more detail. These respondents felt that Hills Road was busy with motorised traffic and that the road/cycle/footpath surfaces are of poor quality, making it unsafe ○ Some of these respondents made particular mention of connecting Hills Road to Addenbrooke's
Cottenham	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that cycle and pedestrian facilities needed to be improved in and

	<p>around Cottenham to many of the same areas as those discussed connectivity for Waterbeach</p> <ul style="list-style-type: none"> ○ The other areas mentioned included Oakington, Rampton, and the Willinghams
Guided bus route	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that improvements were needed to the cycle and pedestrian facilities on the guided bus routes <ul style="list-style-type: none"> ○ Some of these respondents felt the routes needed widening and segregating due to how busy they are and that improvements were needed to safety features, such as lighting and CCTV ○ Some of these respondents felt more connections were needed from other cycle/pedestrian routes and villages to the guided bus paths

Question 9: We have a duty to ensure that our work promotes equality and does not discriminate or disproportionately affect or impact people or groups with protected characteristics under the Equality Act 2010. Please comment if you feel any of the proposals would either positively or negatively affect or impact on any such person/s or group/s.

207 respondents left comments on the question asking if the proposals would have a positive or negative impact on any person/s or groups/s protected under the Equality Act 2010.

Summary of main themes

Comment Theme	Respondent comments
Disability	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme felt that shared paths are dangerous for those with disabilities due to potential conflicts with cyclists. These respondents felt that pedestrian routes should be widened to accommodate mobility aids <ul style="list-style-type: none"> ○ A few of these respondents were concerned about losing pedestrian space if cycle routes were widened • Some of the respondents who discussed this theme felt that cycle routes needed widening and consideration should be placed in their design for adapted/larger cycles, particularly around sharp bends and cycle gates • Some of the respondents who discussed this theme felt that improvements to active travel routes, particularly

	<p>safety improvements, would be beneficial to those with disabilities</p> <ul style="list-style-type: none"> ○ A few of these respondents specifically mentioned making more Low Traffic Neighbourhoods and modal filters <ul style="list-style-type: none"> ▪ Some of these respondents specifically mentioned Mill Road ○ A few of these respondents felt that improving active travel routes would reduce motorised traffic resulting in easier travel for those with disabilities that required motorised transport <ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned that Low Traffic Neighbourhoods and modal filters would negatively impact those with disabilities who needed motorised transport to travel because it would increase journey time and cost <ul style="list-style-type: none"> ○ Some of these respondents specifically mentioned Mill Road • A few of the respondents who discussed this theme felt that improvements were also needed to public transport routes, particularly connecting rural areas to each other and Cambridge, in order to ensure those with disabilities had a suitable range of travel options • A few of the respondents who discussed this theme were concerned that any potential loss of parking spaces, particularly disabled parking bays, as a result of improving active travel routes would negatively impact those with disabilities
Motorised traffic	<ul style="list-style-type: none"> • Most of the respondents who discussed this theme were concerned that expanding active travel routes would negatively impact on those needing a motorised vehicle, including delivery drivers, those with disabilities, older/younger travellers, those with lower incomes who cannot afford to live in Cambridge, and those who are pregnant • Some of the respondents who discussed this theme felt that improvements to active travel routes would be beneficial to those needing to use a car, due to lower overall traffic, and those who cannot use a car due to age, disability, or lower incomes
Age	<ul style="list-style-type: none"> • Respondents who discussed this theme discussed the impacts on older/younger residents in relation to the same issues as those with disabilities
Positive impacts	<ul style="list-style-type: none"> • Respondents who discussed this theme simply stated that they felt the proposals would have a positive impact

No impacts	<ul style="list-style-type: none"> • Respondents who discussed this theme simply stated that they felt the proposals would have no impact
Sex	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that improvements to the safety of active travel routes, particularly improving the space available and lighting, would be beneficial to female travellers

Question 10: We would like to thank you for completing our survey. If you have any further comments on the project or the proposed options, please add these in the space available below.

319 respondents left comments on the question asking if they had any further comments on the project or the proposed options.

Summary of main themes

Comment Theme	Respondent comments
Safety	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned about a lack of ongoing maintenance. These respondents felt that potholes, overgrown plants, and natural detritus resulted in unsafe surfaces and narrowed routes so needed to be repaired/trimmed/tidied • Some of the respondents who discussed this theme were concerned about the safety at junctions and felt that more improvements/priorities were needed for pedestrians and cyclists. Although a few respondents mentioned specific areas (Fen Causeway, Maris Lane, Long Road, Perne Road, Hills Road, Huntingdon Road, Eddington Avenue, Chaucer Road) there was little consensus to specific areas. Most of these respondents discussed issues with junctions more generally <ul style="list-style-type: none"> ○ Some of these respondents felt that clear signage/priority markings were needed ○ Some of these respondents felt that traffic light timings and priorities needed to benefit cyclists and pedestrians • Some of the respondents who discussed this theme were concerned about a lack of improvement to rural routes, particularly where connections to education sites were needed. These respondents felt that current rural routes were unsafe to cycle due to the speed of motorised traffic, narrow roads, and lack of lighting

	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned about cycle/pedestrian routes without clear segregation from motorised traffic. These respondents felt that the close passing of motor vehicles, particularly at high speed, made these routes unsafe and difficult to navigate at night due to the blinding nature of vehicle headlights • Some of the respondents who discussed this theme felt that more enforcement was needed on negative motorised traffic behaviour, including speeding and pavement parking along pedestrian/cycle routes • A few of the respondents who discussed this theme were concerned about shared spaces for pedestrians/cyclists. These respondents felt that they resulted in conflict between users and made them particularly unsafe for pedestrians • A few of the respondents who discussed this theme were concerned about the increased use of electric motorbikes and e-scooters using pedestrian and cycle routes. These respondents felt the speed of these vehicles made it unsafe for other users and that some form of enforcement was needed to stop this • A few of the respondents who discussed this theme felt that no cycle routes should be advisory. These respondents felt that all cycle spaces should be protected and safe, with advisory lanes resulting in motorised traffic encroaching on cyclist space • A few of the respondents who discussed this theme felt that more funding was needed for cycling proficiency and training. These respondents were concerned about cyclists not obeying the Highway Code or lacking consideration towards other users <ul style="list-style-type: none"> ○ A few of these respondents felt that some form of licensing/plating of bikes would be beneficial to enforcing those who broke the law. These respondents also felt this would help reduce cycle theft and / or aid police in finding stolen bikes
Motorised traffic	<ul style="list-style-type: none"> • Most of the respondents who discussed this theme felt that more was needed to reduce motorised traffic within Cambridge itself, particularly personal vehicles and heavy goods vehicles. This included pedestrianising the city centre, introducing more Low Traffic Neighbourhoods, reducing speed limits, congestion charging, creating more modal filters, and banning on-pavement/road parking

	<ul style="list-style-type: none"> ○ A few of these respondents also felt that improvements to public transport were needed, particularly connections to rural areas, to ensure those who couldn't walk/cycle (due to age or disabilities) weren't discriminated against • Some of the respondents who discussed this theme were concerned that reducing the viability of using personal vehicles, through road closures/modal filters/Low Traffic Neighbourhoods, would negatively impact those who couldn't walk or cycle (due to age or disabilities) <ul style="list-style-type: none"> ○ Some of these respondents were concerned that, with certain roads being closed to personal vehicles, more motorised traffic would end up on neighbouring streets which would negatively impact on local residents • Some of the respondents who discussed this theme were concerned about the close proximity of motorised traffic to cyclists and pedestrians in areas where there was no clear segregation of traffic, resulting in reduced safety
Maintenance	<ul style="list-style-type: none"> • Respondents who discussed this theme were concerned about a lack of ongoing maintenance. These respondents felt that potholes, overgrown plants, and natural detritus resulted in unsafe surfaces and narrowed routes so needed to be repaired/trimmed/tidied <ul style="list-style-type: none"> ○ Some of these respondents felt that funding maintenance of existing cycle/pedestrian routes was more important than creating new ones
Segregated routes	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned about cycle/pedestrian routes without clear segregation from motorised traffic. These respondents felt that the close passing of motor vehicles, particularly at high speed, made these routes unsafe and difficult to navigate at night due to blinding nature of vehicle headlights • Some of the respondents who discussed this theme were concerned about shared spaces for pedestrians/cyclists. These respondents felt that they resulted in conflict between users and made them particularly unsafe for pedestrians
Lack of cycle/pedestrian routes	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme felt that more cycle and pedestrian routes were needed to connect rural locations to Cambridge and each other

	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme felt that more of the option proposals should be implemented, particularly for the costs involved • Some of the respondents who discussed this theme felt that new cycle/pedestrian routes should join up with other planned and existing active travel infrastructure, particularly the Greenways projects <ul style="list-style-type: none"> ○ A few of these respondents were concerned about cycle/pedestrian routes having sudden ends, particularly routes to education sites. These respondents felt this made routes unsafe for cyclists and pedestrians • A few of the respondents who discussed this theme felt that the development of new communities in and around Cambridge had lacked cycle/pedestrian routes being created as part of their development • A few of the respondents who discussed this theme felt that limiting pedestrians and cyclists to predefined routes wasn't going far enough. These respondents felt that the whole infrastructure for travel should accommodate safe active travel, allowing for individuals to choose the best and most direct routes for them
Age and disability	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned about a lack of routes for younger residents to safely walk/cycle to education sites, particularly from/to rural areas • Some of the respondents who discussed this theme were concerned about the lack of maintenance of roads and cycle/pedestrian routes. These respondents were concerned about the safety of older/younger/disabled residents having to navigate potholes/overgrown vegetation/natural detritus • Some of the respondents who discussed this theme felt that the width of cycle/pedestrian routes needed to consider the use of buggies/wheelchairs/larger cycles that are often used by families or those with disabilities <ul style="list-style-type: none"> ○ Some of these respondents were also concerned about shared use paths as the potential conflict between pedestrians and cyclists, particularly those with buggies/wheelchairs/larger cycles made it unsafe for older/younger/disabled travellers • Some of the respondents who discussed this theme were concerned that reducing the accessibility of routes for motor vehicles would negatively impact on older/disabled residents who could not walk or cycle

	<ul style="list-style-type: none"> Some of the respondents who discussed this theme felt that improvements were needed to public transport to ensure younger/older/disabled residents who couldn't walk or cycle weren't negatively impacted
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Stakeholders responses

Background

22 responses were received on behalf of a number of different groups or organisations.

- A10 Corridor Cycling Campaign
- Cambridge Biomedical Campus
- Cambridge City Councillor
- Cambridge Past, Present & Future
- Cambridge University Hospital
- Cambridgeshire Local Access Forum
- Camcycle
- Cllr Mike Sargeant
- Cllr Paul Bearpark
- Cllr Richard Howitt
- Cllr Robert McCubbin
- County Councillor Histon & Impington
- District Councillor
- Ely Cycling Campaign
- Green Party
- Living Streets Cambridge
- Smarter Cambridge Transport
- Travel Committee of the University of Cambridge Primary School, Eddington
- Trumpington Residents' Association
- Well-brahams' Mental Health and Wellbeing Group
- Wilbrahams Environment Group
- Willingham Parish Councillor

All of the responses from these groups will be published alongside the results of the public consultation survey. The following is a brief summary of the common themes expressed through this correspondence; it should be noted that stakeholder responses can contradict each other and so no reference to the relative merit or otherwise of the information received is made.

Summary of main themes

Disability	<ul style="list-style-type: none"> • Some of the stakeholders who discussed this theme were concerned about the use of shared use paths, feeling these led to conflicts between cyclists and pedestrians particularly those with disabilities. These respondents also felt that footpaths needed to be wider and were concerned about the potential loss of safe pedestrian space to other modes of travel • Some of the stakeholders who discussed this theme felt that more consultation should have been directed at groups representing disabled needs to ensure route designs took these needs into account • Some of the stakeholders who discussed this theme felt that path surfaces should be accommodating to those with disabilities or those using mobility aids
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	<ul style="list-style-type: none"> • Some of the stakeholders who discussed this theme felt that more pedestrian crossing points and dropped kerbs were needed, particularly for those with disabilities • A few of the stakeholders who discussed this theme felt that low traffic routes were needed to improve access for those with disabilities
Safety	<ul style="list-style-type: none"> • Most of the stakeholders who discussed this theme were concerned about the use of shared use paths, feeling these led to conflicts between cyclists and pedestrians, particularly those with disabilities and younger/older travellers. These respondents also felt that footpaths needed to be wider and were concerned about the potential loss of safe pedestrian space to other modes of travel • Some of the stakeholders who discussed this theme felt that improvements were needed in making active travel routes more visible, either by improving fields of view, lighting or use of monitored CCTV, and these were needed to improve the personal safety of active travellers, particularly female travellers • Some of the stakeholders who discussed this theme felt that existing and future routes needed ongoing maintenance, as potholes/overgrown vegetation/poor road surfaces were felt to be unsafe for cyclists and pedestrians • Some of the stakeholders who discussed this theme felt that junction improvements were needed to facilitate safe journeys for cyclists and pedestrians
Connections to other projects	<ul style="list-style-type: none"> • Stakeholders who discussed this theme wanted to see this project link up to existing active travel infrastructure, particularly the Greenways, and questioned how this project would connect with other active travel consultations running at the same time (Local Cycling and Walking Infrastructure Plan and the Cambridgeshire Active Travel Schemes) <ul style="list-style-type: none"> ○ Some of these stakeholders were concerned that having multiple active travel focused consultations running at the same time would cause confusion for potential respondents
Segregated routes	<ul style="list-style-type: none"> • Stakeholders who discussed this theme were concerned about the use of shared use paths, feeling these led to conflicts between cyclists and pedestrians, particularly those with disabilities and younger/older travellers. These respondents also felt that footpaths needed to be wider and were concerned about the potential loss of safe pedestrian space to other modes of travel. These stakeholders felt it was important that all modes of travel

	(cycling, walking, public transport, and motorised travel) were suitably segregated from each other
Pedestrian needs	<ul style="list-style-type: none"> Stakeholders who discussed this theme were concerned the proposals were more focused on cyclist needs over pedestrians. <ul style="list-style-type: none"> Most of these stakeholders were concerned about the focus on shared use spaces, as these put pedestrians at risk, particularly those with disabilities and younger/older travellers Some of these stakeholders were concerned that there would be a loss of pedestrian footpath space to accommodate cycle paths
Rural routes	<ul style="list-style-type: none"> Stakeholders who discussed this theme felt the proposals needed to go further to connect rural locations with each other, Cambridge, and existing active travel routes (Greenways). These stakeholders felt that residents in rural locations had fewer safe transport choices and were often unable to travel in anything other than a personal motor vehicle <ul style="list-style-type: none"> Most of these stakeholders discussed this in relation to the Wilbrahams (Little Wilbraham and Great Wilbraham) and Six Mile Bottom
Maintenance	<ul style="list-style-type: none"> Stakeholders who discussed this theme felt that improvements were needed to maintaining existing and future cycle/pedestrian routes and road surfaces. These stakeholders felt that a lack of maintenance caused poor surfaces due to potholes/surface damage/overgrown vegetation, making it unsafe for pedestrians/cyclists, particularly younger/older travellers and those with disabilities
Age	<ul style="list-style-type: none"> Most of the stakeholders who discussed this theme were concerned about the use of shared use paths, feeling these led to conflicts between cyclists and pedestrians particularly younger/older travellers. These respondents also felt that footpaths needed to be wider and were concerned about the potential loss of safe pedestrian space to other modes of travel A few of the stakeholders who discussed this theme felt that more pedestrian crossing points and dropped kerbs were needed, particularly for younger/older travellers A few of the stakeholders who discussed this theme felt that more consultation should have been directed at groups representing younger/older travellers to ensure route designs took these needs into account A few of the stakeholders who discussed this theme felt that low traffic routes were needed to improve access for those with disabilities

Environment	<ul style="list-style-type: none"> Stakeholders who discussed this theme were concerned about the references to using grass verges to accommodate extra cycle space. These stakeholders felt that these should be preserved as they were important to the natural environment and that road space allocated to make space instead
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Email, social media and consultation event responses

51 responses from 33 respondents were received regarding the consultation through email and social media platforms, such as Facebook and Twitter. Comments were too singular to be grouped together for analytical purposes but followed the sentiment given within comments in the survey. Following a thematic analysis of these responses the following themes have been noted.

Summary of major themes

Safety	<ul style="list-style-type: none"> • Most of the respondents who discussed this theme were concerned with the lack of maintenance of roads/footpaths/cycle paths, feeling that vegetation overgrowth and potholes/surface damage meant road surfaces were dangerous for cyclists/pedestrians, particularly younger/older travellers and those with disabilities • Some of the respondents who discussed this theme were concerned there was not enough segregation of cycle/pedestrian/motorised traffic, particularly cyclists and pedestrians. These respondents felt that cycle/pedestrian routes needed to be wider to avoid conflict between different modes of transport • A few of the respondents who discussed this theme felt that improvements were needed to junction approaches, blind corners, and lighting in order to increase safety for cyclists/pedestrians • A few of the respondents who discussed this theme felt that more enforcement was needed to prevent pavement/cycle lane parking, as this was felt to make travelling unsafe for pedestrians/cyclists
Maintenance	<ul style="list-style-type: none"> • Respondents who discussed this theme felt that improvements were needed to maintaining existing cycle/pedestrian routes and road surfaces. These respondents felt that these caused poor surfaces due to potholes/surface damage/overgrown vegetation, making it unsafe for pedestrians/cyclists, particularly younger/older travellers and those with disabilities
Lack of routes	<ul style="list-style-type: none"> • Most of the respondents who discussed this theme felt that there was a lack of joined up cycle/pedestrian routes linking East Cambridgeshire with Cambridge • Some of the respondents who discussed this theme felt that all 13 travel corridors were needed and that more funding was needed to develop these
Age	<ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned a lack of maintenance on existing routes and

	<p>lack of segregation of pedestrian/cycle routes meant routes were dangerous for younger/older travellers</p> <ul style="list-style-type: none"> • Some of the respondents who discussed this theme were concerned the proposals didn't take the needs of younger/older travellers into consideration, particularly those who couldn't walk/cycle
Disability	<ul style="list-style-type: none"> • Most of the respondents who discussed this theme were concerned the proposals didn't take the needs of travellers with disabilities into consideration, particularly those who couldn't walk/cycle • Some of the respondents who discussed this theme were concerned a lack of maintenance on existing routes and lack of segregation of pedestrian/cycle routes meant routes were dangerous for travellers with disabilities



Future Investment Strategy

Active Travel Opportunities
Addendum



GREATER
CAMBRIDGE
PARTNERSHIP

November 2021



Quality Control

Issue/revision	First Issue (Draft)	Second Issue (Final)
Date	22/10/2021	05/11/2021
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Introduction

Background

Greater Cambridge Partnership's (GCP) *Future Investment Strategy* (FIS) – initially adopted in March 2019 – looks across the funding period for the **Greater Cambridge City Deal (2015-2030) to identify priorities for investment, informed by a range of evidence.**

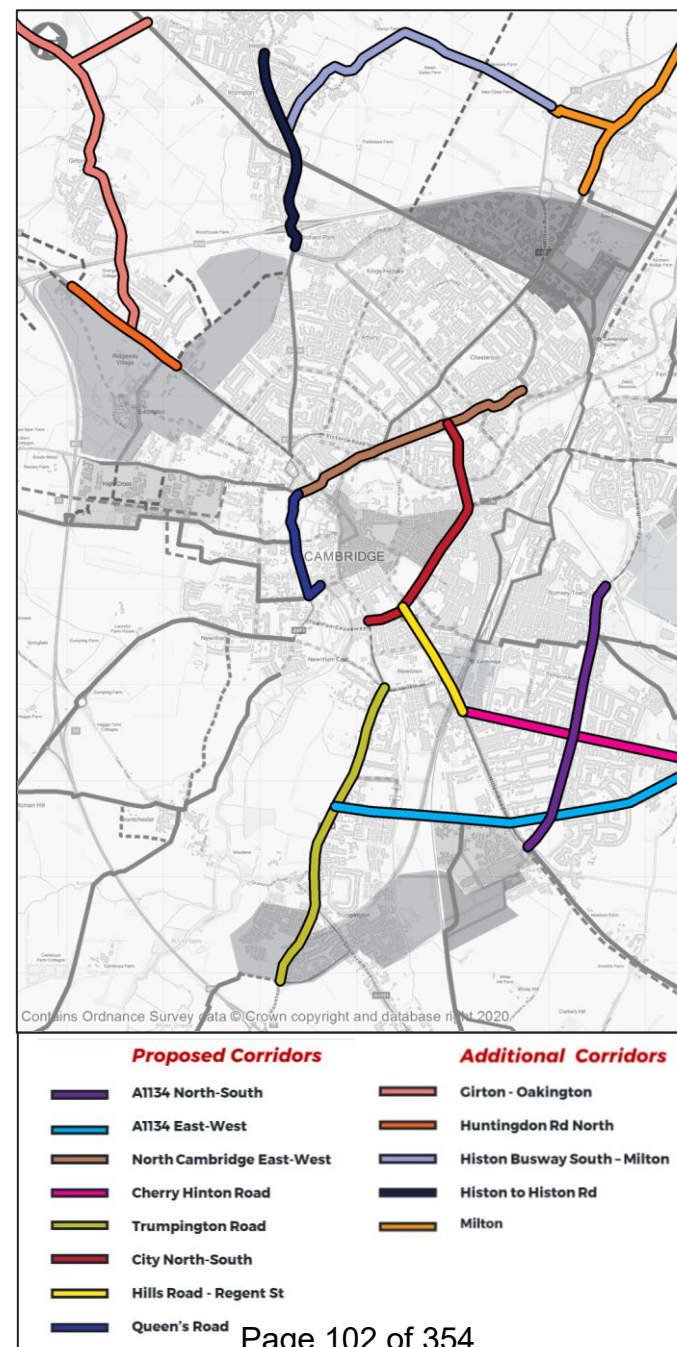
The *Greater Cambridge City Deal* programme has already agreed significant investment in active travel schemes and, as a result of the Covid-19 pandemic, **there is a unique opportunity to lock in long-term modal shift away from car travel towards active travel.**

In March 2021, WSP (on behalf of the GCP) produced an *Active Travel Opportunities* report which **identified 13 corridors – see Figure 1 – where additional investment in active travel infrastructure should be focused** (over and above schemes already funded by the *Greater Cambridge City Deal* or those being delivered and funded by other sources). A summary of the methodology that led to the corridor identification is provided on **page 4.**

A working budget assumption of £20m was used, only for the purposes of illustrating the nature of the benefits that could be achieved with this level of investment.

The 13 corridors were assessed against a series of equally-weighted criteria across two tests (objectives and deliverability). The *Active Travel Opportunities* report led to a **scheme prioritisation and a recommendation for the GCP Executive Board to consider and review.**

Figure 1 Active Travel Opportunities – Identified Corridors for Investment



Addendum Purpose

Between 05 July and 16 August 2021, the GCP held a **public consultation (Cycling Plus), seeking the public's view on active travel in and around Cambridge.** In particular, the public consultation asked participants their views on priorities for active travel investment, with specific reference to the 13 corridors identified within the *Active Travel Opportunities* report. A summary of the key outcomes of the *Cycling Plus* public consultation is provided on **pages 5-6.**

The purpose of this *Addendum* to the *Active Travel Opportunities* report is to **reflect on the outcomes of the Cycling Plus public consultation and provide an updated scheme prioritisation matrix**, taking into consideration:

- levels of public support expressed for the 13 identified corridors; and,
- the extent to which each corridor addresses / supports public priorities for investment.

This *Addendum* considers comments on any of the identified, or new corridors, and assesses whether these alter any of the assumptions made within the *Active Travel Opportunities* report. In response, the *Addendum* reassesses the scoring criteria and provides an updated prioritisation matrix, before concluding and **recommending schemes for investment and potential next steps for other corridors.**

The Existing Situation

In order to assess where further investment should be made, the *Active Travel Opportunities* report sought to gain an **understanding of the quality of the existing cycle network and the contribution of funded schemes towards creating a comprehensive network.**

The Greater Cambridge area benefits from a good existing cycle network. **The wider area is well connected via existing National Cycle Network (NCN) routes and funding is in place for a series of “Greenways”** (high-quality, segregated cycle routes) which will connect local towns, villages and major planned growth sites in South Cambridgeshire with key destinations in and around the city. Within the city, **GCP funding is supporting the delivery of the Chisholm Trail and has also been used to complete five Cross City cycling improvement schemes**, which form part of an extensive cycle network.

Whilst the **existing and funded cycle routes will facilitate a range of movements across the study area**, the existing routes within Cambridge City and in South Cambridgeshire vary in quality and gaps in the network reduce connectivity on some key desire lines.

In considering the gaps in the existing network and key desire lines (connections to existing and future planned growth sites), a number of ‘*opportunity corridors*’ for improvement were identified in both the City and South Cambridgeshire.

Corridor Identification

	Methodology	Concept Corridors
South Cambridgeshire	<p>As a part of Cambridgeshire County Council’s (CCC) draft <i>Local Cycling and Walking Infrastructure Plan</i> (LCWIP), CCC Cycle Officers had identified a shortlist of 18 corridors within South Cambridgeshire.</p> <p>WSP undertook an independent spatial review – mapping the shortlisted corridors alongside the ‘Greenways’ – to identify which best formed part of a cohesive network. Furthermore, the shortlisted corridors were compared against the <i>Propensity to Cycle Tool</i> (PCT) to determine which corridors had the highest existing cyclist usage and those that had the highest propensity to encourage additional cycling – using the Department for Transport’s (DfT) <i>Uplift Tool</i> therefore accounting for bi-directional commuter, school and leisure trips.</p> <p>The independent review demonstrated that, of the 18 South Cambridgeshire cycle corridors (identified through the LCWIP process), all of the corridors would contribute towards a more cohesive network; however, five corridors presented significantly higher cycle flows – over 1,000 trips a day – and were therefore assessed within the study. Those corridors with lower propensity to encourage cycle trips were not taken forward, as they would be less likely to generate a positive Benefit to Cost Ratio (BCR).</p>	<p>Girton - Huntingdon Road</p> <p>Histon - Histon Road</p> <p>Huntingdon Road North</p> <p>Impington - Milton</p> <p>Milton</p>
Cambridge City	<p>Evidence gathered within Step 1 and Step 2 of the <i>Active Travel Opportunities</i> report indicated that cycle routes within the city, although well used, vary in quality, and as such connectivity is reduced in key areas of the network.</p> <p>A review of the <i>Rapid Cycleway Prioritisation Tool</i> (RCPT) – which identifies priority locations for new cycleways, ranking roads by their “cycling potential” – was undertaken and, in combination with WSP’s extensive local knowledge, a series of City-based active travel corridors for potential investment were identified which:</p> <ul style="list-style-type: none"> • focused upon high-trafficked radial routes which provide direct connectivity across the city but are poorly served by attractive cycle infrastructure; • focused upon access to / from existing and future residential areas / strategic growth sites and the city; and • focused upon the existing lack of segregation along the main radials that is inhibiting modal shift, particularly for school children and workers. • focused upon junctions which act as a barrier to less confident cyclists or have a cycle accident record. <p>The methodology used to identify these corridors broadly aligned with that which underpins the DfT’s guidance for LCWIP and <i>Emergency Active Travel Fund</i> (EATF), as well as being similar to the LCWIP work for South Cambridgeshire.</p>	<p>A1134 (East-West)</p> <p>A1134 (North-South)</p> <p>Cherry Hinton Road</p> <p>City (North-South)</p> <p>Hills Road – Regent Street</p> <p>North Cambridge</p> <p>Queens Road</p> <p>Trumpington Road</p>

Overview

Between 05 July and 16 August 2021, the GCP held a **public consultation (Cycling Plus), seeking the public's view on active travel in and around Cambridge, covering:**

- whether and how often people use active travel to get into and around Cambridge;
- what barriers discourage people from using active travel methods; and
- people's priorities for active travel investment, including the 13 identified corridors, alongside any other routes.

The consultation adopted a multi-channel approach to promote and seek feedback. Five drop-in events were held across the area to enable people to have their say in person and the opportunity to question project officers.

Responses

Quantitative data was recorded through a formal consultation **questionnaire (online) with 1,009 complete responses (1,000 individuals and nine stakeholders)**. A significant amount of qualitative feedback was also gathered via the questionnaire and through social media, emails and written responses (72).

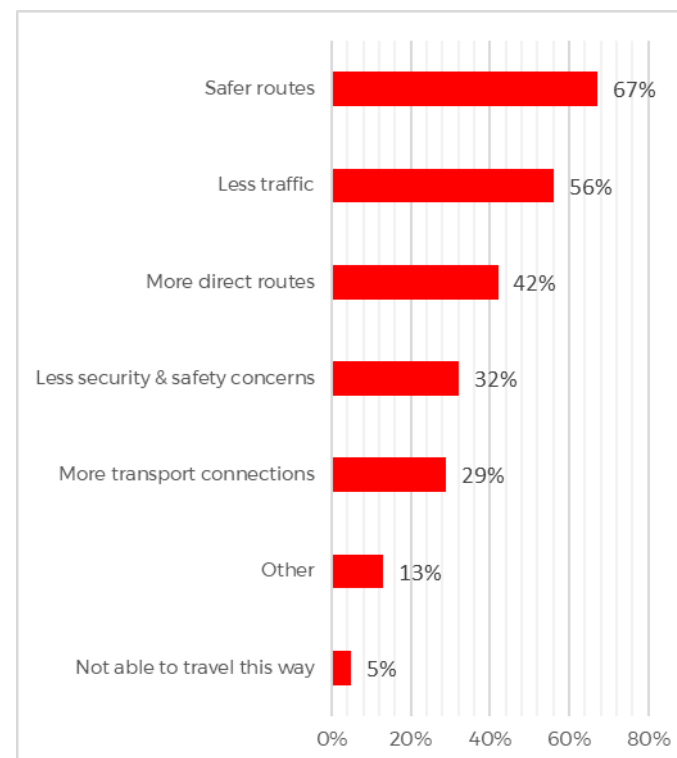
Of the 924 respondents that provided their location, **89% were located within Cambridge (60%) or South Cambridgeshire (29%)**, with smaller proportions from East Cambridgeshire, Huntingdonshire, Fenland and other authorities further afield.

Public Priorities – Walking

Question 4 of the questionnaire asked respondents, from a pre-defined list, what would encourage them to walk or use a mobility aid for journeys more (multiple selections permitted).

Of the 894 responses, **the majority indicated that 'safer routes' (67%) and 'less motorised traffic' (56%) would help them walk or use mobility aids more** – see **Figure 2**. Other prominent themes were more direct routes, greater personal security and safety and more transport connections.

Figure 2 Conditions for Walking More

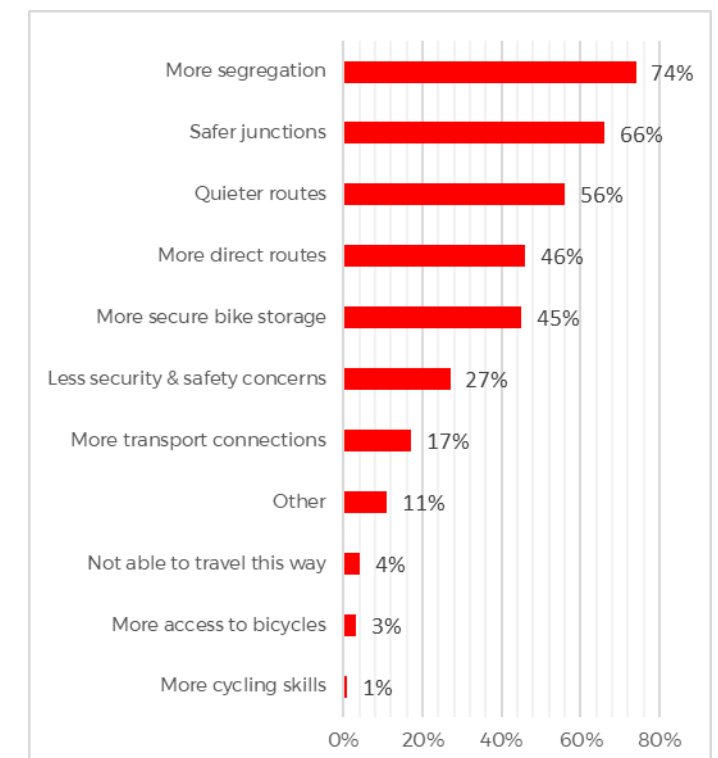


Public Priorities – Cycling

Question 5 of the questionnaire asked respondents, from a pre-defined list, what would encourage them to cycle more (multiple selections permitted).

Of the 967 responses, **the majority indicated that 'more segregation' (74%), 'safer junctions' (66%), 'quieter routes' (56%) and 'more direct routes' (46%) would help them cycle more** – see **Figure 3**. Other prominent themes were secure bike storage and greater personal security and safety.

Figure 3 Conditions for Cycling More



Public Priorities – Investment

Question 6 of the questionnaire asked respondents the importance of nine different priorities for investment in active travel, on a scale of ‘very important’ to ‘not at all important’.

Of the 993 responses, **the majority of respondents felt that eight of the nine priorities were either ‘very important’ or ‘somewhat important’** – see **Figure 4**. ‘Finding schemes that are quickest to deliver’ was significantly less important to the public; thus demonstrating that investment in schemes that deliver the key priorities and themes – identified in **Figure 2** and **Figure 3** – are more important than those that are quick to deliver.

Corridor Support

Question 7 asked respondents which of the 13 identified corridors they would likely use if the active travel infrastructure were to be improved (multiple selections permitted).

Of the 898 responses, **‘Hills Road - Regent Street’ was selected by over two-fifths (44%); ‘Cherry Hinton Road’ was selected by one-third (33%) and ‘City (North-South)’, the ‘A1134 (East-West)’ and ‘North Cambridge (East-West)’ were selected by approximately one-quarter (28%, 27% and 25% respectively)** – see **Figure 5**. Respondents who were located in South Cambridgeshire were more likely to choose ‘Impington - Milton’ (28%) or ‘Histon to Histon Road’ (26%); however, ‘Hills Road - Regent Street’ was still the most popular corridor for South Cambridgeshire respondents (38%).

Figure 4 Priorities for Investment

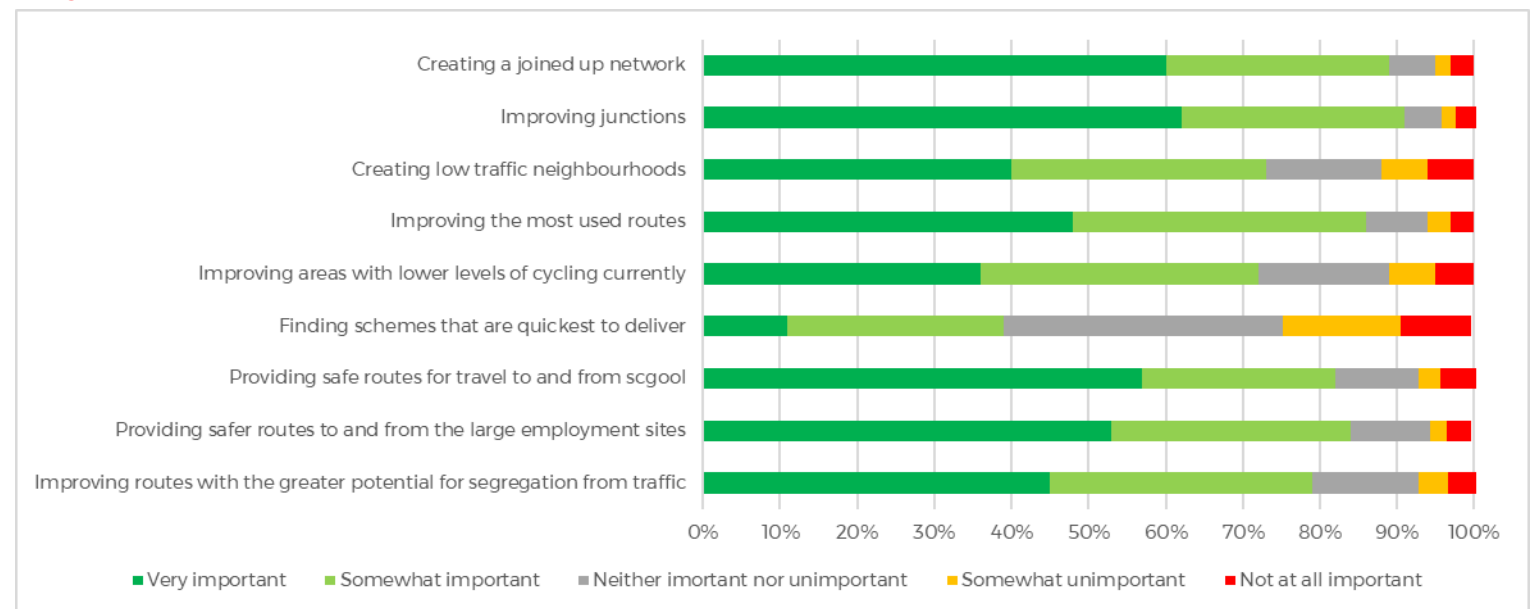
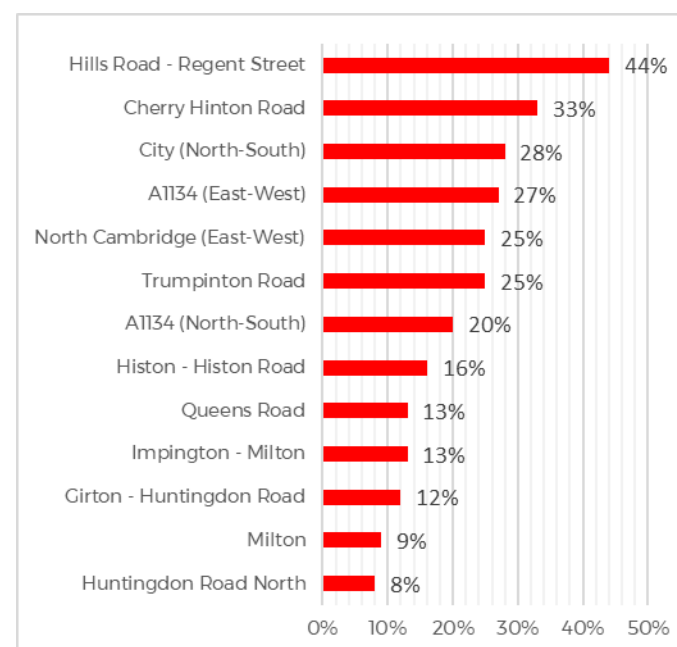


Figure 5 Most Popular Travel Corridors



Cycling Plus

The *Cycling Plus* public consultation results have been incorporated into this study:

- The 13 identified corridors have been appraised against their ability to deliver the most popular themes, and an additional category – **Public Priorities** – has been added to the Test A (Objectives) scoring matrix.
- An additional category – **Consultation Support** – has been added to the Test B (Deliverability) scoring matrix, based upon the level of support for each corridor identified at public consultation.

Further details on the appraisal and prioritisation methodology are provided on **page 7**.

Appraisal & Prioritisation

Ranking Framework

As was done previously, a **strategic evaluation of the corridors has been undertaken, taking into consideration the two new criterion** – Public Priorities and Consultation Support (highlighted in **Figure 6**) – in order to re-rank and re-prioritise the corridors.

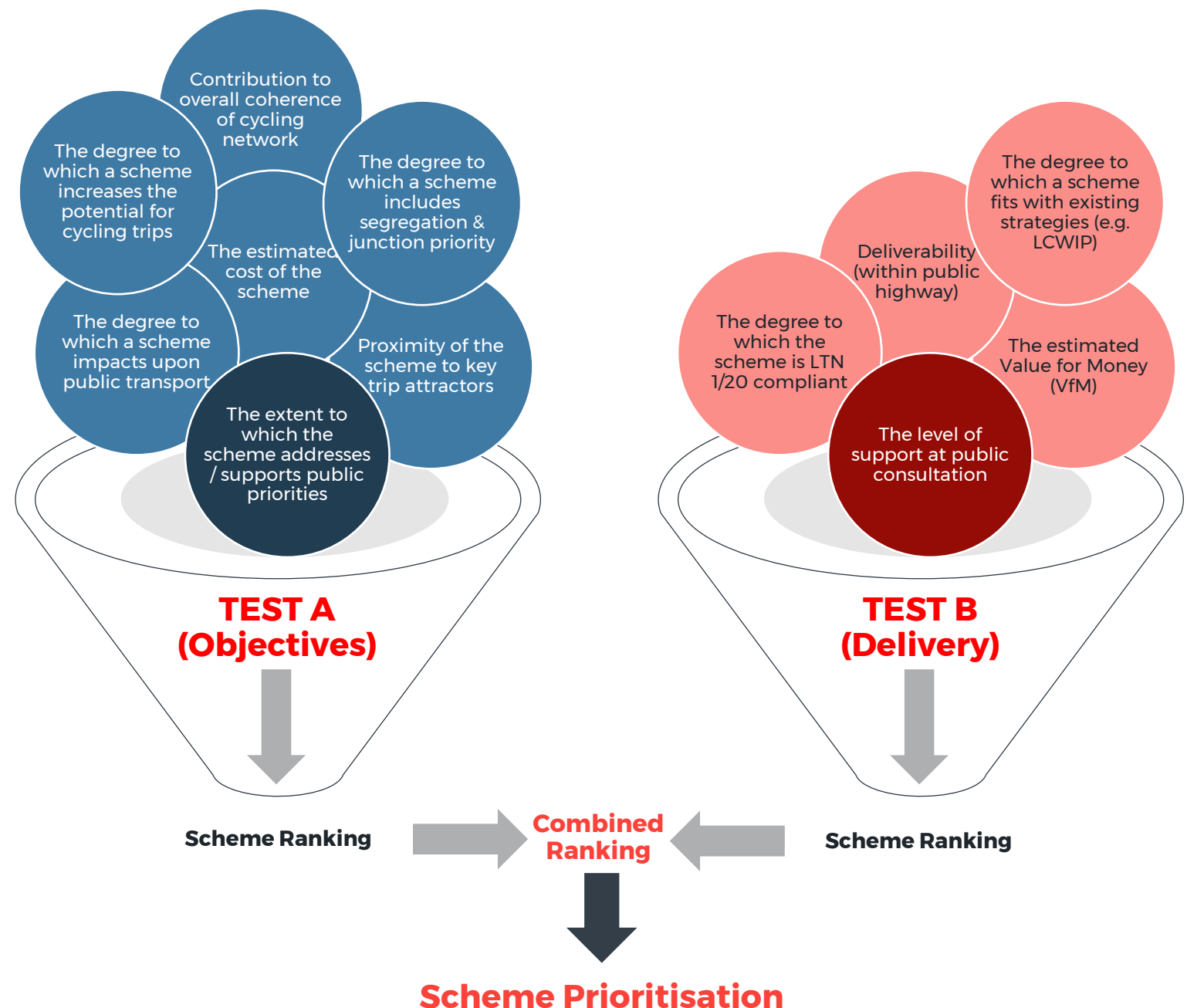
Once again, the corridors have been **assessed using a Multiple Criteria Assessment Framework (MCAF)**, which allowed them to be ranked against one another based upon a series of equally-weighted criteria. The appraisal involved two simultaneous tests:

- Test A: the extent to which each corridor met with the **study objectives**; and
- Test B: the extent to which each corridor is **technically deliverable**.

For each criteria, a score is given between -2 and 2 (based upon data analysis and professional judgement. Details are provided on **pages 8-9**). The scores across all criteria are combined and a subsequent ranking is given. **The rankings for each of the corridors, across both the objectives and deliverability tests have then been combined** in order to prioritise the options.

Those that score the highest are deemed most likely to: meet GCP objectives; fit with wider active travel strategies; have stakeholder support; have the potential to increase cycling; comply with the most recent design guidance; offer value for money; and, be feasible and deliverable. The results of this revised ranking is shown on **page 10**.

Figure 6 Ranking Methodology & Criteria

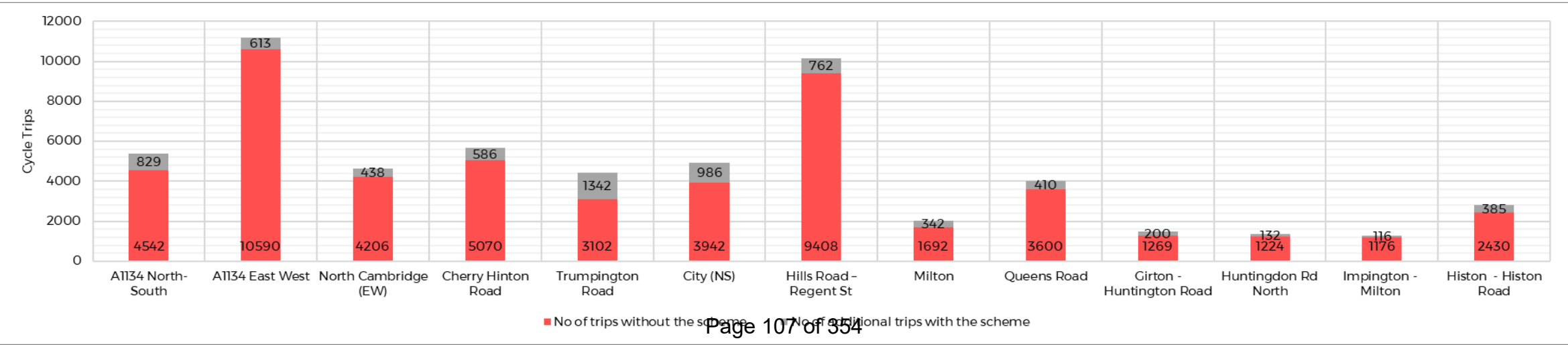


Appraisal & Prioritisation

Scoring Methodology - Objectives

Criteria	Scoring Methodology
Segregation / Cycle Priority	The extent to which the corridor scheme proposals (outlined in the <i>Active Travel Opportunities</i> report) delivered appropriate levels of segregation for cyclists along busy links and offered sufficient cycle priority and safety features at junctions. For example, a high scoring scheme (+2) would seek to segregate cyclists from vehicular traffic along the majority of its length whilst enabling safe cycle movements in all permitted directions at key junctions.
Coherence of Network	Cycle networks should be planned so that they are simple to navigate and are of a consistently high quality. The <i>Rapid Cycleway Prioritisation Tool</i> (RCPT) identifies priority locations for new cycleways – based upon cycling potential and available road space – and highlights links that would contribute to a joined-up, cohesive cycle network if investment in infrastructure were considered. A review of each of the identified corridors against the RCPT was undertaken, and the corridors scored from -2 to +2 based upon their overall alignment with the “top ranked” and “cohesive” corridors identified within the RCPT.
Cycling Potential	The degree to which the corridors would increase cycling was assessed using the Propensity to Cycle Tool (PCT) – a web-based tool for estimating cycling potential – and the DfT’s <i>Uplift Tool</i> . The PCT was used to determine the existing usage of each corridor by commuting cyclists (based upon 2011 Census data) and elevated to account for non-commuting trips using <i>National Travel Survey</i> (NTS) data. The baseline figures and scheme cost were then input into the DfT <i>Uplift Tool</i> to provide an estimate of the increase in cycling trips as a result of scheme implementation. The absolute difference (number of cyclists) between the baseline and the uplifted number was used to determine the scoring between -2 and +2.
Impact on Public Transport	The extent to which the corridor scheme proposals (outlined in the <i>Active Travel Opportunities</i> report) impact upon public transport – in terms of infrastructure (for example, requirements to relocate or redesign bus stops or the impact upon on-street bus lanes / coach parking facilities), and the extent to which the corridors would provide cycling infrastructure to support cycle trips along routes that are currently not well served by buses (i.e. non-competing routes impacting upon patronage).
Proximity to Trip Attractors	Cycle networks should be planned and designed to allow people to reach their day-to-day destinations easily. The <i>Active Travel Opportunities</i> report demonstrated that there are plans (adopted Cambridge City and South Cambridgeshire Local Plans and forthcoming <i>Greater Cambridge Local Plan</i>) for significant residential development along with growth of existing employment locations. The degree to which the corridors would deliver more direct connectivity to / from and between key major trip attractors has been scored on a scale of -2 to +2.
Estimated Cost	Indicative costs for each of the corridor scheme proposals (outlined in the <i>Active Travel Opportunities</i> report) have been built up using unit rates from industry standard data (with allowances added for optimism bias, statutory diversion works, design costs and construction supervision costs). Based upon the working budget assumption of £20m, the schemes were scored between -2 and +2 (i.e. the higher cost schemes resulted in lower scores) to implement the proposals.
Public Priorities	The 13 corridors have been appraised against their ability to deliver the most popular themes, identified within the <i>Cycling Plus</i> public consultation, that would encourage more walking and cycling along with how each corridor supports the key public priorities for investment. The extent to which each corridor supports the outcomes of the Cycling Plus public consultation has been scored between -2 and +2. For example, a high-scoring scheme would seek to provide segregation and improve safety at junction along direct routes, connecting to key employment sites and schools as well as contributing to a joined up network.

Figure 7 Cycling Potential

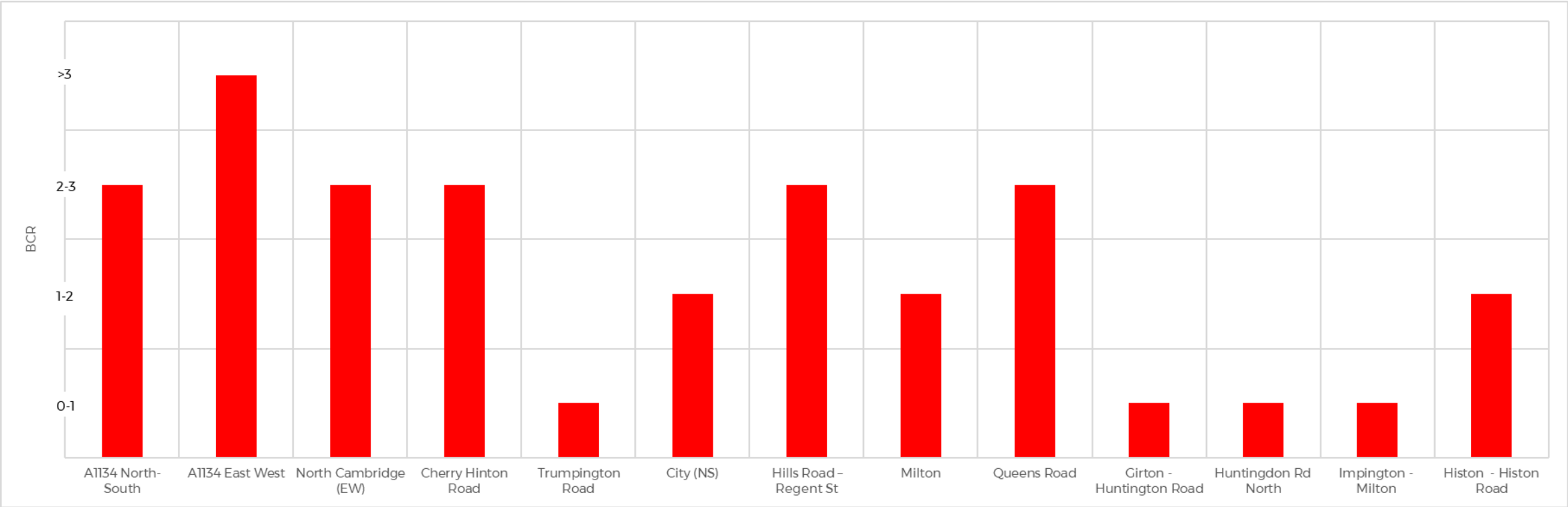


Appraisal & Prioritisation

Scoring Methodology - Deliverability

Criteria	Scoring Methodology
Ease of Deliverability	The feasibility of implementing the schemes in engineering terms, based upon the corridor scheme proposals (outlined in the <i>Active Travel Opportunities</i> report) and the physical constraints of the corridors (for example, number of key junction interactions, available road space, land requirements, environmental and historic considerations) has been scored on a scale of -2 to +2 based upon professional judgement. A high-scoring scheme (+2) would likely encounter less engineering and physical constraints during construction and would be able to minimise disruption on other network users.
LTN 1/20 Compliance	The DfT's <i>Local Transport Note</i> (LTN) 1/20 provides guidance to local authorities on delivering high quality, cycle infrastructure including; planning for cycling, space for cycling within highways, transitions between carriageways, cycle lanes and cycle tracks, junctions and crossings and traffic signs and road markings. The extent to which the corridor scheme proposals (outlined in the <i>Active Travel Opportunities</i> report) follow the design principles contained in LTN 1/20- for example, whether cycle facilities were accessible and whether cyclists were treated as vehicles and kept separate from pedestrians - has resulted in a score between -2 and +2 for each corridor.
LCWIP Strategic Fit	CCC's draft LCWIP highlights priority routes for cycling, using census data to identify where funding could have the greatest effect in terms of where people live and work and the connectivity to key trip attractors such as schools, local shops, employment centres and train / bus stations. The extent to which the 13 identified corridors aligned with or intersected with the LCWIP priority routes determined the associated score for each corridor.
Consultation Support	The <i>Cycling Plus</i> public consultation asked respondents which of the 13 identified corridors they would likely use if the active travel infrastructure were to be improved. Based upon the level of public support received at the public consultation determined the score each corridor received (between -2 and +2).
Estimated Value for Money (VfM)	An initial Benefit-Cost Ratio (BCR) has been calculated using DfT's <i>Active Mode Appraisal Toolkit</i> (AMAT) which ensures that the calculation of a schemes benefits is in accordance with DfT guidance and its value for money can be consistently compared against other proposed schemes. The AMAT calculates impacts linked to an increase in cycle and walking use based upon scheme-specific variables (i.e. scheme length and forecast users). The anticipated BCR determined the score received for each corridor between -2 and +2.

Figure 8 Estimated Value for Money



Appraisal & Prioritisation

Prioritisation Matrix



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	A1134 (North-South)	A1134 (East-West)	North Cambridge (East-West)	Cherry Hinton Road	Trumpington Road	City (North-South)	Hills Road - Regent Street	Milton	Queens Road	Girton - Huntingdon Road	Huntingdon Road North	Histon - Histon Road	Impington - Milton
Segregation / Cycle Priority	2	1	1	1	1	2	1	2	1	-1	1	-1	1
Coherence of Network	2	2	2	2	2	2	2	1	2	2	2	2	2
Cycling Potential	2	1	0	0	2	2	2	-1	0	-1	-2	-2	-1
Minimal Impact on Public Transport	1	1	1	1	1	1	1	1	0	1	1	2	2
Proximity to Trip Attractors	2	2	2	2	2	2	2	2	2	0	2	1	1
Estimated Cost	0	1	1	1	-2	-1	0	2	2	2	2	2	2
Public Priorities	2	0	0	1	2	2	1	0	0	-2	0	-2	0
Total Score	11	8	7	8	8	10	9	7	7	1	6	2	7
Rank A Ranking (Objectives)	1	4	5	4	4	2	3	5	5	8	6	7	5
Ease of Deliverability	2	0	-1	0	-2	-2	1	1	1	0	1	0	-1
LTN 1/20 Compliance	2	2	2	1	1	1	1	1	1	-1	1	-1	-1
LCWIP Strategic Fit	2	1	2	0	2	2	2	2	1	2	2	2	2
Consultation Support	1	1	1	2	1	1	2	0	0	0	0	0	1
Estimated Value for Money (VfM) [^]	0	2	0	0	-2	-1	0	-1	0	-2	-2	-2	-1
Total Score	7	6	4	3	0	1	6	3	3	-1	2	-1	0
Rank B Ranking (Delivery)	1	2	3	4	7	6	2	4	4	8	5	8	7
Ranks Combined	2	6	8	8	11	8	5	9	9	16	11	15	12
Overall Prioritisation	1	3	4	4	7	5	2	6	6	10	7	9	8
Estimated Cost*	£11.5m	£8.5m	£6.0m	£8.0m	£18.5m	£13.0m	£10.5m	£4.5m	£5.5m	£2.4m	£1.8m	£2.9m	£1.5m

* Construction cost estimates have been built up using unit rates from industry standard data adjusted for working in and around the live carriageway. Allowances have been added for optimism bias, statutory utility diversion works, design costs and construction supervision costs. Therefore, costings identified for each potential corridor should be treated as indicative only, for the purposes of illustrating the nature of the benefits that could be achieved with this level of investment. Should any of these potential schemes proceed to the next stage of development, a budget setting process will be required as well as further detailed costing, once scheme designs are confirmed and a contractor is appointed.

[^] An initial BCR has been calculated using The Department for Transport's Active Mode Appraisal Toolkit (AMAT) which ensures that the calculation of a schemes benefits is in accordance with Department for Transport guidance and its value for money can be consistently compared against other proposed schemes. The AMAT calculates impacts linked to an increase in cycle and walking use based upon scheme-specific variables (e.g. scheme length and forecast users). The AMAT also includes a number of default assumptions which, for the purposes of this study, were retained.

Conclusion

Study Outcome



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Scheme	Rank	Cost*	Pros	Cons
A1134 (North-South) (Mowbray Road & Perne Road)	1	£11.5m	<ul style="list-style-type: none"> Connects with Dutch Roundabout High cycling potential Relatively good deliverability Supports emerging LCWIP Contributes to a coherent network Strongly supports public priorities for investment 	<ul style="list-style-type: none"> Relatively high-cost scheme Good but not highest VfM
Hills Road - Regent Street	2	£10.5m	<ul style="list-style-type: none"> High cycling potential Relatively good deliverability Supports emerging LCWIP Contributes to a coherent network High level of support from public consultation 	<ul style="list-style-type: none"> Relatively high-cost scheme Cyclists required to use bus lane in sections
A1134 (East-West) (Long Road & Queen Edith's Way)	3	£8.5m	<ul style="list-style-type: none"> Connects with Dutch Roundabout Supports emerging LCWIP Relatively high value for money Contributes to a coherent network 	<ul style="list-style-type: none"> May encounter deliverability issues Low level of segregation achievable in sections
North Cambridge (Chesterton Road & Chesterton High Street)	3	£6.0m	<ul style="list-style-type: none"> Relatively low-cost scheme Relatively high value for money Supports emerging LCWIP Contributes to a coherent network 	<ul style="list-style-type: none"> Low level of segregation achievable in sections Deliverability issues including Mitcham's Corner Gyratory
Milton	4	£4.5m	<ul style="list-style-type: none"> Supports emerging LCWIP Helps facilitate trips from Park & Ride 	<ul style="list-style-type: none"> High cost / low VfM Low level of segregation achievable in sections
Cherry Hinton Road	4	£8.0m	<ul style="list-style-type: none"> Relatively low-cost scheme Contributes to a coherent network High level of support from public consultation 	<ul style="list-style-type: none"> May encounter deliverability issues Not identified in emerging LCWIP
Queens Road	5	£5.5m	<ul style="list-style-type: none"> No bus stops impacted Relatively low-cost scheme Supports emerging LCWIP Contributes to a coherent network 	<ul style="list-style-type: none"> Relatively low cycling potential Few connections to key trip attractors May encounter deliverability issues Potential impact on coach parking
City (North-South) (Lensfield Road, East Road & Elizabeth Road)	6	£13.0m	<ul style="list-style-type: none"> High cycling potential Contributes to coherent network Close to several key trip attractors Strongly supports public priorities for investment 	<ul style="list-style-type: none"> High cost / low VfM Would be difficult to deliver due to physically constrained sections
Huntingdon Road North	6	£1.8m	<ul style="list-style-type: none"> Connects with multiple schools Builds on existing infrastructure and route Relatively low-cost scheme Supports emerging LCWIP 	<ul style="list-style-type: none"> May encounter deliverability issues
Trumpington Road	7	£18.5m	<ul style="list-style-type: none"> High cycling potential Supports emerging LCWIP Contributes to coherent network Strongly supports public priorities for investment 	<ul style="list-style-type: none"> High cost / low VfM Would be difficult to deliver due to high number of junctions
Impington - Milton	7	£1.5m	<ul style="list-style-type: none"> Relatively low-cost scheme Helps facilitate sustainable trips to P&R Supports emerging LCWIP 	<ul style="list-style-type: none"> Low level of segregation achievable in sections
Histon - Histon Road	8	£2.9m	<ul style="list-style-type: none"> Extends the planned Histon Road scheme into Histon Relatively low-cost scheme Supports emerging LCWIP 	<ul style="list-style-type: none"> May encounter deliverability issues Low value for money
Girton - Huntingdon Road	9	£2.4m	<ul style="list-style-type: none"> Relatively low-cost scheme Supports emerging LCWIP 	<ul style="list-style-type: none"> Low level of segregation achievable in sections May encounter deliverability issues Few connections to key trip attractors

Conclusion

Recommendation & Next Steps

Recommendation

In consideration of the results of the *Cycling Plus* public consultation, incorporating into the results of the original study, and assuming a working budget of £20m ($\pm 10\%$), **it is recommended that the following corridors are progressed to preliminary design:**

- **A1134 (North / South) (Mowbray Road & Perne Road); and**
- **Hills Road – Regent Street**

These recommendations align with the draft LCWIP aspirations of CCC.

A1134 (North / South)

The A1134 (North / South) corridor is assessed to have a high cycling potential, building upon the Dutch Roundabout investment, and thereby supporting the emerging LCWIP.

It would support public priorities by contributing to a more coherent network and delivering more direct north-south connectivity – providing a key link between major trip attractors to the east and south of the city, including Addenbrookes Hospital and the wider Cambridge Biomedical Campus.

Whilst the A1134 (North / South) corridor would seek to improve safety at a number of junctions, the *Active Travel Opportunities* report did not include the Addenbrookes Roundabout. Junction improvements were the most supported priority for investment by *Cycling Plus* consultation respondents; therefore, consideration should be made as to whether to include this junction within the scope of this corridor as it progresses into preliminary design and more detailed analysis and costing.

Hills Road – Regent Street

The Hills Road – Regent Street corridor is assessed to have a high cycling potential, which is substantiated through high levels of support received at the *Cycling Plus* public consultation.

As with the A1134 (North / South) corridor, the Hills Road – Regent Street corridor would also support public priorities by contributing to a more coherent network (building upon the investment of cycling improvements already implemented further south along Hills Road).

It should be noted that due to the constrained nature of Hills Road – Regent Street, reallocation of road space to provide compliant cycle infrastructure may impact upon deliverability and may have budgetary implications which need to be carefully monitored as scheme progresses into preliminary design.

Next Steps

This *Addendum* has sought to take into consideration the results from the *Cycling Plus* public consultation and reappraise and reprioritise the 13 corridors identified within the *Active Travel Opportunities* report (WSP, March 2021). **The outcome of this exercise has led to a scheme re-prioritisation and revised recommendation for two corridors to be progressed to preliminary design,** which is presented to the GCP Executive Board for consideration and review.

Whilst funding is not currently available to take all of the identified schemes forward to preliminary design, should additional funding opportunities present themselves (via the *Greater Cambridge City Deal* or other sources), this work should be used as an ongoing reference to assist in bringing specific schemes forward sooner (potentially ahead of their ranking), if linked to wider city initiatives over the next 10 years.

Should additional revenue / funding streams be established in the future, further analysis should be undertaken to develop a wider delivery programme for active travel investment – looking beyond the corridors identified within this study, assessing other gaps in the network within the City and throughout South Cambridgeshire – for example, delivering a package of junction safety improvements.

Going forward, consideration should also be made to the GCP's / CCC's *Road Network Hierarchy* review and CCC's forthcoming *Active Travel Strategy*, in reflection on further investment in active travel infrastructure.





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Foxton Travel Hub

Report to: Greater Cambridge Partnership Joint Assembly

Date 18th November 2021

Lead Officer: Peter Blake – Director of Transport, GCP

1. Background

- 1.1 The A10 corridor from Royston and Foxton is a key radial route into Cambridge. It suffers considerably from congestion particularly during peak times. The corridor has been identified by the Greater Cambridge Partnership's (GCP's) Executive Board, as a priority project for developing public transport, walking and cycling improvements.
- 1.2 The purpose of this report is to update the Board on the progress made on the Foxton Travel Hub project. The report proposes that the project be progressed to the next stage of the project programme. Specifically, the next stage would involve preparing the Full Business Case (FBC) and revising design features of the Travel Hub following the recent public engagement exercise and the proposed submission of a planning application.
- 1.3 The Foxton Travel Hub will support future economic growth by improving connectivity and accessibility to key growth sites and existing areas of economic activity within Greater Cambridge. This new opportunity for transport interchange will offer users a quicker and more reliable public transport alternative to the high levels of highway congestion and journey time delay experienced on the A10. This is particularly the case with the Cambridge South Station on the Cambridge Biomedical Campus site now planned for delivery.
- 1.4 Reducing journey time delays and promoting local rail services supports the GCPs vision of creating better, greener transport networks, connecting people to homes, jobs and study, and supporting economic growth.
- 1.5 The Joint Assembly is invited to consider the proposals to be presented to the Executive Board and in particular:
 - a) The findings of the recent public engagement;
 - b) The recommendation to develop a new site based on 200 parking spaces, 100 cycle parking spaces, associated infrastructure and bus service enhancements;

- c) The preparation and submission of a planning application for the recommended scheme, including continued dialogue with local communities and further work to mitigate the local impacts of the scheme;
- d) The negotiation of land and rights required for the early delivery of the scheme including Compulsory Purchase and Side Road Orders as appropriate; and
- e) The development of a bus service agreement with the Cambridge and Peterborough Combine Authority on GCP's behalf.

2. Issues for Discussion

- 2.1 The A10 south is currently heavily congested during the peak hours, with slow-moving traffic through Harston and Hauxton and on the approach to the M11 Junction 11, and the Foxton level crossing, causing delay to private vehicles commuting onwards to Cambridge. In the AM peak, the eastbound approach to the M11 Junction 11 from the A10, and the northbound approach from the M11 southbound, experience 25-50% slower travel speeds when compared to free flow conditions.
- 2.2 Congestion in the Royston to Cambridge section of the A10 is also caused by the down time of the rail barrier at the level crossing which, in the peak hour, can cause a 15 – 20 mins delay. Further services on the rail line stopping and passing through Foxton station are proposed by Network Rail and this will result in further delay at the level crossing.
- 2.3 The provision of the new Cambridge South Station is predicted to generate significant additional demand for rail journeys across the wider Greater Cambridge geography. The technical assessment of the scheme, including the impact of the new Cambridge South station, projected a significant car parking requirement in the area.
- 2.4 The Cambridgeshire and Peterborough Combined Authority (CPCA) Local Transport Plan (LTP) defines travel hubs as acting “as gateways to the public transport network, giving car users the opportunity to travel sustainably for part of their journey”.
- 2.5 In September 2021 officers completed public engagement on the proposed option as illustrated in Figure 1: The plan shows a site with 500 car parking spaces, 150 cycle parking spaces, a pedestrian rail crossing and associated infrastructure.



Figure 1: Proposed Foxton Travel Hub layout in engagement period.

3. Consultation and Engagement

- 3.1 Foxton Travel Hub: Foxton Travel Hub Engagement Outcomes (Source document 1) summarises the core 224 responses to the Engagement and the 23 additional written responses received. In addition comments were also registered from the 2 events held in the engagement period and from social media.
- 3.2 Engagement with the local parishes and local community has been undertaken following the last Executive Board report and a public engagement exercise was undertaken in September 2021. A number of key themes were raised during the engagement process:

Principal Design Themes:

- A10 Crossing – unsafe, poor design (uncontrolled), poor for vulnerable users
- Justification for scheme – location, no benefits to Foxton, poor multi-modal connectivity
- Traffic congestion – increased traffic on A10, poor access to/from Station Rd, increased rat-running & localised traffic
- Environmental impacts - flood resilience, poor drainage, loss of greenspace, increased air & noise pollution
- Road safety – poor A10 road safety, unsafe vehicle access to the site, poor pedestrian & cyclist safety outcomes on A10

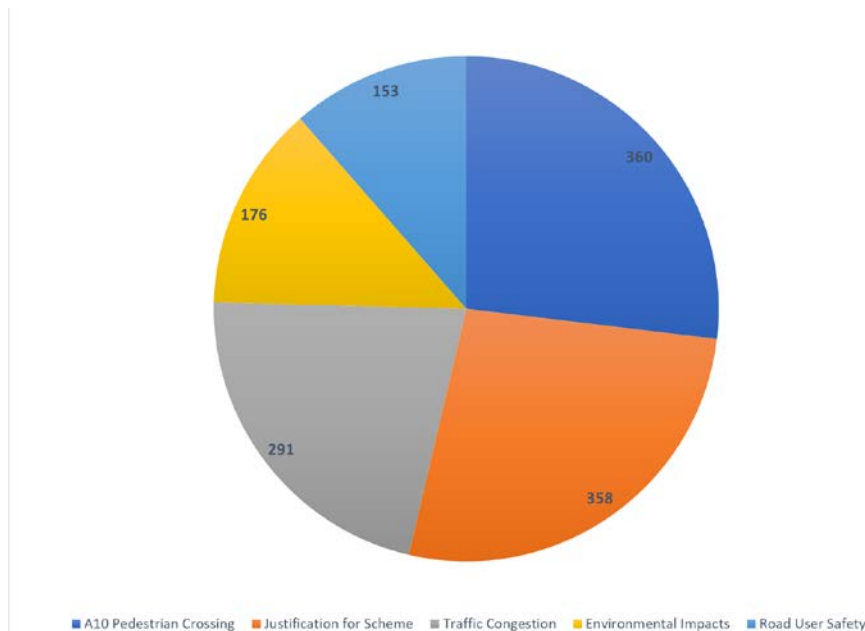


Figure 2: Public Engagement Comment Themes showing number of comments

3.3 The Summary Report of Engagement Findings is included in Appendix 1.

4. Options and Emerging Recommendations

4.1 In compliance with the three stages of the Department for Transport's (DfT) transport appraisal process, the Foxton Travel Hub scheme has progressed through a series of optioneering steps to identify and assess options that address the scheme objectives. The OBC stage options assessment concluded with the preferred site as endorsed by the Executive Board in 2019 with the identification of the preferred site location. The Board also requested further engagement with local parishes and the local community on the design elements of the scheme.

4.2 The design for the Travel Hub has been developed in accordance with national standards and the requirement to undertake a Road Safety Assessment (RSA). A number of key design features have already been agreed that will address concerns raised during the public engagement, including:

- Speed limit reduction.
- Enhanced pedestrian crossing facilities.
- Traffic Signals.
- Enhanced station access.
- Environmental Improvements – Orchard planting etc.
- Flood & drainage measures.
- Bus interchange improvements.
- Connections with Melbourn Greenway.
- Air quality assessments - baseline monitoring has been undertaken over a 6-month period to support the assessment. Based on the current local air quality and the expected changes in traffic, it is not expected the scheme will have an impact on air quality.

4.3 Following the engagement with the local community a number of proposed design changes to the scheme are proposed:

- Reduce the number of car parking spaces to 200.
- Increase the number of cycle parking spaces to 100.
- Introduction of parking charges in line with the other rail Travel Hub sites across the county.
- Introduce station enhancements including waiting shelter and ticket machine.
- Introduce, in partnership with the Combined Authority, a village bus service to the rail station.
- In response the recent public engagement the design of the Travel Hub has been amended to reflect the feedback received from the local residents and some stakeholders. The revised design shows a considerably smaller site with a significant reduction in car parking spaces (from 500 to 200) and a further increase in percentage of cycle spaces being allocated (from 30% to over 50%). The proposed design does not alter the original design to the station area improvements and the disabled parking, cycle parking and pedestrian foot bridge over the rail line still form part of the proposals. An illustration of the new design can be seen in Figure 3 below.



Figure 3 – Proposed new outline Design

4.4 The revised design and access to the site could be re-engineered to increase its capacity should demand increase beyond the 200 car parking spaces currently proposed. However, such a decision would require a separate Board decision at the appropriate time.

4.5 The Executive Board will be asked to:

- Note the findings of the public engagement exercise;
- Approve the amendments to the design and associated infrastructure;

- Agree that a planning application is made for the scheme; and
- Approve plans for continued work in partnership with stakeholders and the GCP's Engagement Group to potentially develop a package of local mitigation to support the scheme.
- Approve the negotiation of land and rights required for the early delivery of the scheme including Compulsory Purchase and Side Road Orders as appropriate;

5. Alignment with City Deal Objectives

- 5.1 The Travel Hub will reduce journey time delays and promote local rail services which supports the GCPs vision of creating better, greener transport networks, connecting people to homes, jobs and study, and supporting economic growth.
- 5.2 The Travel Hub will intercept traffic from the A10 giving a sustainable transport option as part of their overall commute to access employment sites.
- 5.3 The Travel Hub will support future economic growth by improving connectivity and accessibility to key growth sites and existing areas of economic activity within Greater Cambridge. This new opportunity for transport interchange will offer users a potentially quicker and more reliable public transport alternative to the high levels of highway congestion and journey time delay experienced on the A10.
- 5.4 This programme takes on even greater importance in light of Covid-19 and the likely increase in commuters wanting to access active travel solutions for their daily journey to work.

6. Citizen's Assembly

- 6.1 Citizens' Assembly members developed and prioritised their vision for transport in Greater Cambridge. The proposals have the potential to complement delivery of the some of the highest scoring priorities
 - Provide affordable public transport
 - Provide fast and reliable public transport
 - Be people centred – prioritising pedestrians and cyclist
 - Enable interconnection (e.g. north/south/east/west/urban/rural)
 - Restrict the city centre to only clean and electric vehicles
 - Be managed as one coordinated system (e.g. Transport for Cambridge)
- 6.2 The Citizens' Assembly voted on a series of measures to reduce congestion, improve air quality and public transport. While Foxton Travel Hub is not the largest of GCP's schemes the proposals do provide an alternative for vehicles travelling into Cambridge and improving access to public transport.

7. Financial Implications

- 7.1 High level construction costs associated with the future development of the scheme have been provided within the Outline Business Case. The anticipated construction capital costs approximately £9M.

- 7.2 The scheme development costs are charged to the West of Cambridge budget. Subject to the Executive Board's approval and planning permission being granted then the detailed construction costs will be presented to the Executive Board for approval as part of the next steps.

Have the resource implications been cleared by Finance? Yes

Name of Financial Officer: Sarah Heywood

8. Next Steps and Milestones

- 8.1 Subject to the Executive Board's approval, further work will be undertaken on the design and a planning application will be submitted in Spring 2022. The Statutory planning process will then be triggered and managed by the Local Planning Authority.
- 8.2 It is proposed that discussions with NR regarding the development of design options for a pedestrian bridge over the Cambridge Line railway continue.
- 8.3 Should a favourable outcome from planning be achieved the Executive Board will be presented with the Full Business Case (FBC), the current programme forecasts construction to start in in 2023.
- 8.4 As part of joint working with the CPCA options to provide a new bus service that will serve the local villages connecting to the travel hub are ongoing. The CPCA will need to publicly advertise and tender the service and the current programme forecasts this activity in the first quarter of the next financial year.

Background Papers

Source Documents	Location
Foxton Travel Hub Engagement Outcomes	https://www.greatercambridge.org.uk/asset-library/Transport/Transport-Projects/Foxton-Travel-Hub/Foxton-Travel-Hub-Report-2021/Foxton-Travel-Hub-Engagement-Outcomes-2021.pdf

Project:	Foxton Travel Hub		
Our reference:	418368-MMD-MAN-XX-TN-TA-0001	Your reference:	
Prepared by:	D Levers	Date:	26/10/21
Approved by:	J Pearson	Checked by:	E Jackson
Subject:	Foxton Travel Hub Engagement Outcomes – Final Draft		

1 Introduction

This technical note outlines the methodology and outcomes of public engagement on the design for the proposed Foxton Travel Hub scheme. Public engagement took place over a two-week period from 6th September to 17th September. During this time several engagement events took place and responses were received from members of the public and stakeholders.

1.1 Aims of the Engagement

Following the public consultation on the shortlisted Travel Hub options held between 9th September and 21st October 2019, and a decision from the GCP Executive Board in June 2020 to endorse the preferred location, work to develop the design of the site has continued. This has included regular engagement with key stakeholders during the development of the design, access, and landscape arrangements for the Travel Hub.

The public engagement held in September 2021 aimed to present the updated Travel Hub proposals to the general public, and seek feedback on the design aspects of the proposal, in particular the access arrangements and landscaping proposals.

An overview of the engagement process is included in section 2.

2 Engagement Methodology

2.1 Lead in and webinar invitations

Two weeks' notice was provided to the public ahead of the engagement period, with informal notification of the engagement provided to key stakeholders prior to this. Invitations to two evening webinar events were issued to the stakeholders via email, and general notices posted on the GCP website and events calendar. Local groups and organisations including Parish Councils assisted in notifying members of the public.

2.1.1 Webinars and meetings

In view of COVID-19 guidance, engagement events were held primarily online via Zoom. In place of the face-to-face events that would usually take place in local community centres, two online webinars were held – one in each week of the engagement period - with an open invitation to the public to attend.

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The webinars were led by GCP and attended by key members of the project team. The format included a brief presentation outlining progress on the project since the public consultation and an overview of the key changes to the design. The presentation was followed by a question-and-answer session.

A face-to-face public meeting was held with Foxton Parish Council on 8th September 2021. This meeting was attended by the GCP Project Manager, and included a presentation and the opportunity for the public to ask questions.

2.1.2 Website

Information on the scheme design was published on the Consult Cambs portal at the same time as the webinar invitations were issued. Stakeholders and the public were able to view key documents – including the Travel Hub design, Landscaping Design and Environmental Constraints ahead of the webinars to allow for the most productive use of the webinar time. A 'Key Questions' list was provided to provide clear answers to the most anticipated questions.

A short survey form on the website provided a template for respondents to provide feedback – although responses via email and other means were also accepted.

2.2 Survey Responses

In total 224 survey responses were received over the engagement period.

In the survey, respondents were asked to provide responses to three survey questions:

1. Do you have any comments on the access arrangements for the Travel Hub? For example, are there elements of the access arrangements for people arriving at the Travel Hub on foot, cycling, in buses or in cars that you would like to comment on?
2. Do you have any comments on the proposed site design or landscaping of the Travel Hub? For example, are there any elements of the planting or proposed layout of the Travel Hub site that you would like to comment on?
3. Do you have any other comments or suggestions on the proposed Travel Hub design?

Analysis of the survey responses was then undertaken to determine the key themes of the feedback and to identify a series of actions that should be undertaken in response to the feedback.

2.2.1 Email Responses

A total of 23 responses from the public were received by email over the engagement period in response to the engagement. Analysis of these emails was undertaken to identify key themes and design actions to be taken forward. Responses to the emails were then drafted and sent to recipients where appropriate.

2.2.2 Stakeholder Responses

Several responses were received from stakeholders over the engagement period. Responses were received from:

- Foxton Parish Council/Other Parish Council Feedback
- Smarter Cambridge Transport
- Meldreth, Shrepreth & Foxton Community Rail Partnership
- Cambridge Past, Present & Future (CPPF)
- Cambridge & Peterborough Combined Authority
- Axis Land Partnerships
- Network Rail
- Anthony Browne MP
- Cambridgeshire County Council Highways Maintenance Service – Asset Information Team

The comment themes from stakeholders are summarised in Section 4 of this Technical Note.

2.2.3 Contact and Comments

Contact details for the GCP Communications Team were provided on the website and in the webinars. A feedback form on the website allowed stakeholders to provide comments in a structured format, and comments were taken by email. The webinars were recorded, and questions taken during the webinar events. The events were recorded and comments logged alongside other comments received.

2.3 Post-Engagement

2.3.1 Collation and Analysis of Feedback

Following the two-week engagement period, comments and feedback from stakeholders was collated and analysed.

An internal workshop session has been held with the project team to go through the responses received during the engagement period, understand the key comment themes, identify any updates to the design that may be incorporated to accommodate the feedback and improve the Travel Hub design.

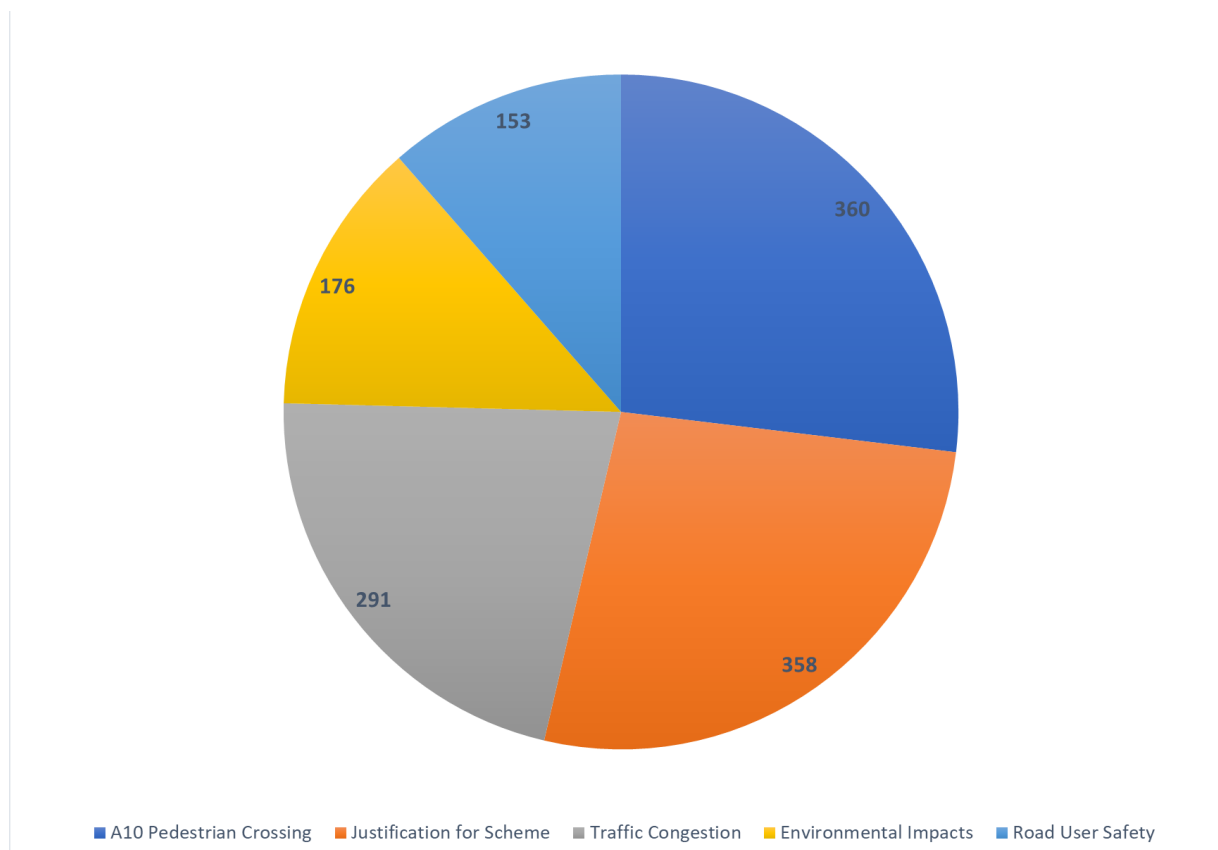
3 Public Engagement Response Themes

Analysis of public engagement responses was undertaken to determine the major comment themes and assist the project team in determining the design actions to be taken forward. For the purposes of analysis, the comments received were categorised into themes, with five major themes emerging:

- **A10 Pedestrian Crossing** - Concern over the proposed arrangements for pedestrians crossing the A10 between the Travel Hub and Railway Station.
- **Justification for Scheme** - Justification for the scheme or of aspects of the scheme such as location, size and proximity to Foxton station.
- **Traffic Congestion** - Concern over how the scheme will impact traffic congestion on the A10, on local roads and in neighbouring villages.
- **Environmental Impacts** - Comments relating to environmental impacts of the scheme such as air pollution, noise pollution, increased air quality and loss of greenspace.
- **Road User Safety** - More general concerns over road user safety on the A10 and surrounding roads resulting from the scheme. Comments referred to vehicle safety due to the level crossing and increased traffic, pedestrian safety near to the A10/on the footway, or cycle safety on the A10/cycle route.

The total number of responses where these themes were referenced in is displayed in Figure 3.1. The themes are discussed in more detail in sections 3.1 to 3.5.

Figure 3.1: Public Engagement Comment Themes showing number of comments

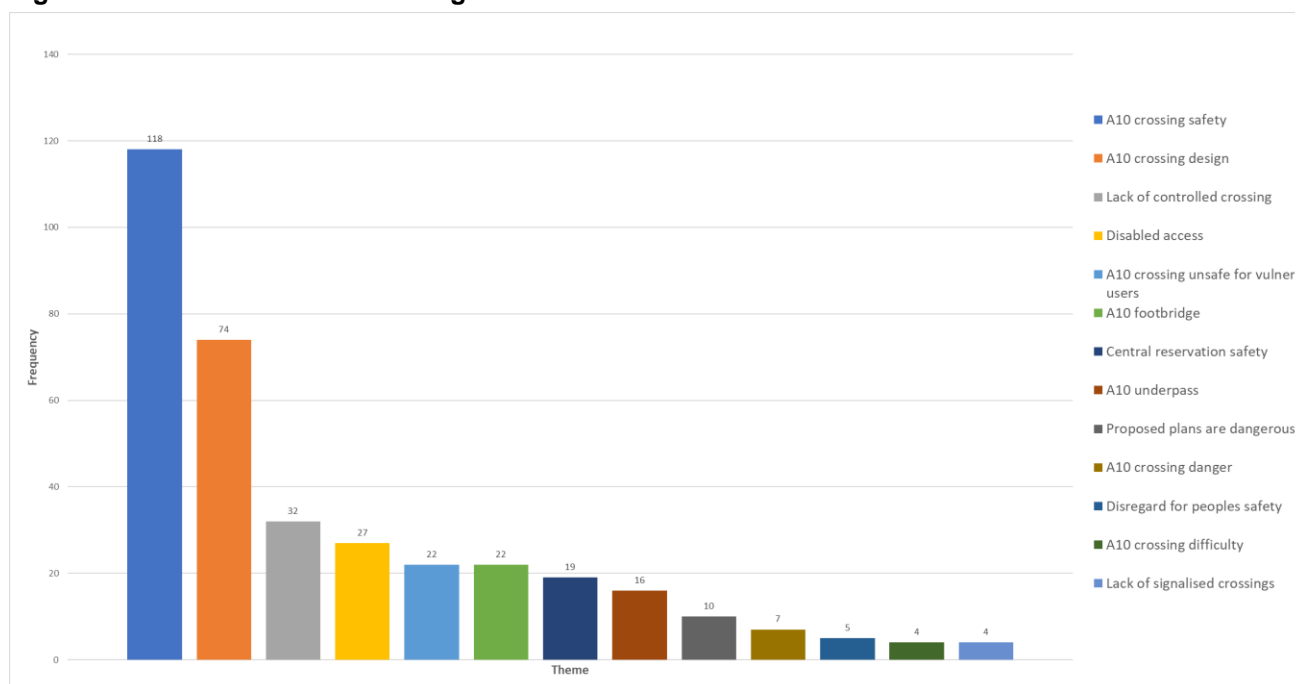


Source: Mott MacDonald

3.1 A10 Pedestrian Crossing

The A10 Pedestrian Crossing was marginally the most prevalent comment theme within the public engagement responses. The A10 Pedestrian Crossing theme consists of 13 more specific comment areas, with the A10 crossing safety, A10 crossing design and lack of controlled crossing being the most frequently raised. Comments vary in their specificity but are largely concerned with the appropriateness of the A10 pedestrian crossing facility between the Travel Hub and the railway station. Several respondents felt that the uncontrolled crossing included in the current design would be unsafe on this busy stretch of road, or that the design could be improved – particularly for disabled or more vulnerable users. The inclusion of a different type of crossing – controlled by signals, or entirely separated from traffic through a bridge or underpass – was suggested by several people.

A total breakdown of the prevalence of each individual comment area is displayed in Figure 3.2.

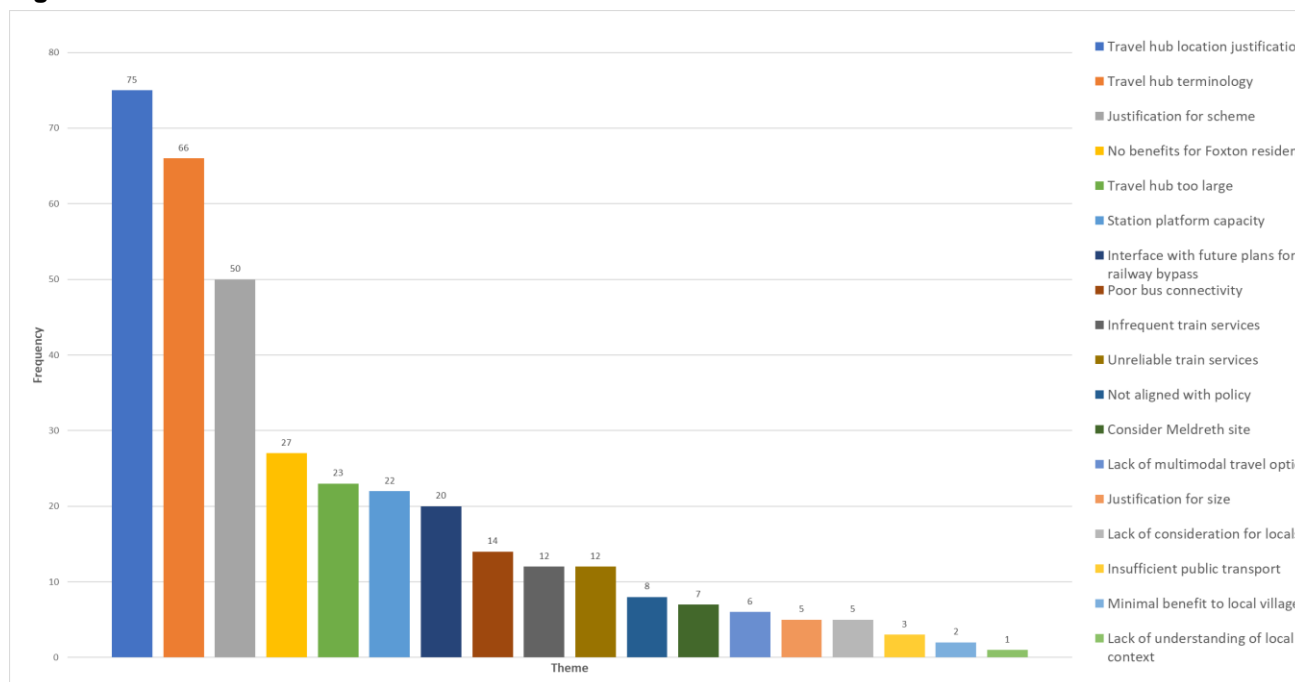
Figure 3.2: A10 Pedestrian Crossing Comment Theme Breakdown

Source: Mott MacDonald

3.2 Justification for Scheme

The justification for the travel hub was the second most prevalent comment theme to emerge from the public engagement responses. The most recurring individual themes include justification for the travel hub's proposed location in the wider area, the use of the term "travel hub" (as opposed to a car park or park and ride) and the general justification/strategic case for the scheme to go forward. The comments varied widely in nature, however there was a strong response to the proposed travel hub location, with many comments questioning the site choice and why alternative sites/locations were not progressed. Several respondents also questioned the 'travel hub' terminology and asked why it was labelled as such believing there to be a lack of multi-modal connectivity. Another popular theme to emerge from the responses was the perceived lack of benefits that the scheme will have for Foxton residents, citing increased traffic congestion and pollution as issues that will be faced by residents.

A total breakdown of the prevalence of each individual comment area is displayed in Figure 3.3.

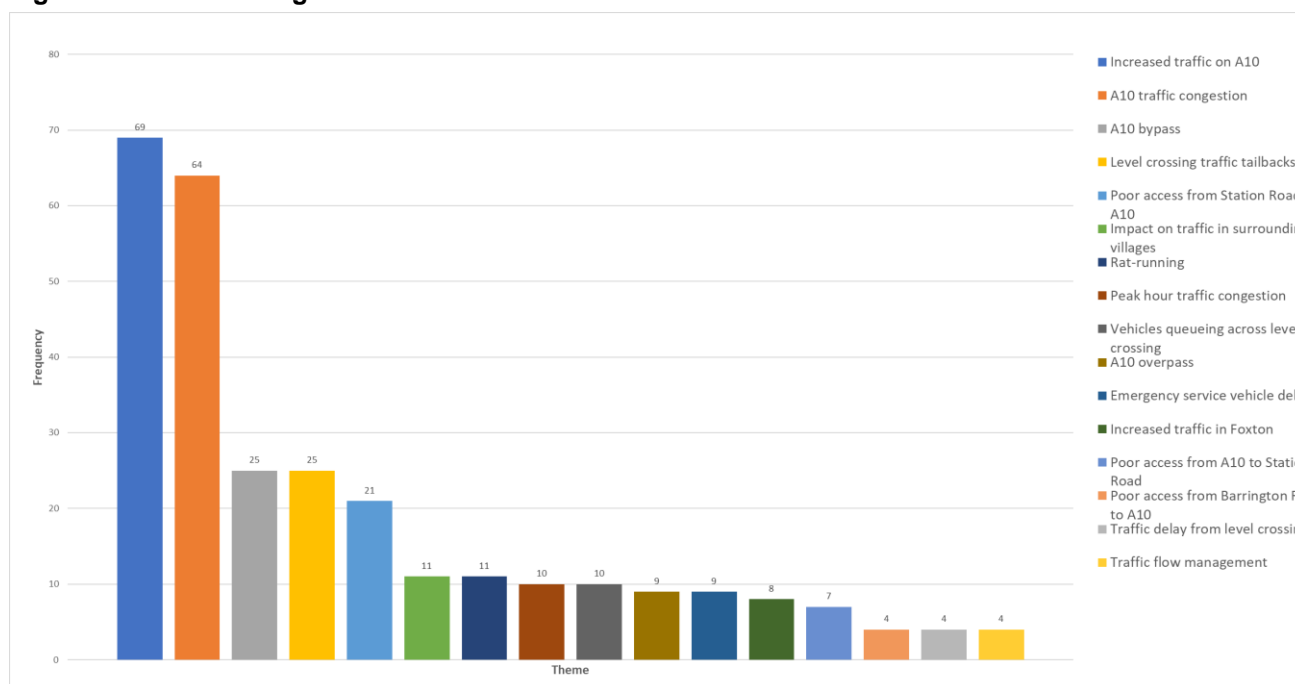
Figure 3.3: Justification for the Scheme Comment Theme Breakdown

Source: Mott MacDonald

3.3 Traffic Congestion

A significant number of engagement responses were related to traffic congestion. These responses referred to the current baseline (e.g., traffic is already too high) and to the possible future impacts following the completion of the proposed scheme (e.g., the travel hub will increase congestion). Most comments on traffic congestion referred to the A10, however, there were also concerns around how the scheme will impact traffic and access on Station Road, in Foxton village and in surrounding local villages. A strong theme to emerge from the responses was the lack of consideration of a A10 Foxton bypass, with many respondents believing strongly that the travel hub will prevent a bypass from being delivered in the future. Other popular themes to emerge from respondents include a possible increase in rat-running in local villages, vehicles queuing across the level crossing and the possibility for emergency service delays to occur due to increased congestion.

A total breakdown of the prevalence of each individual comment area is displayed in Figure 3.4.

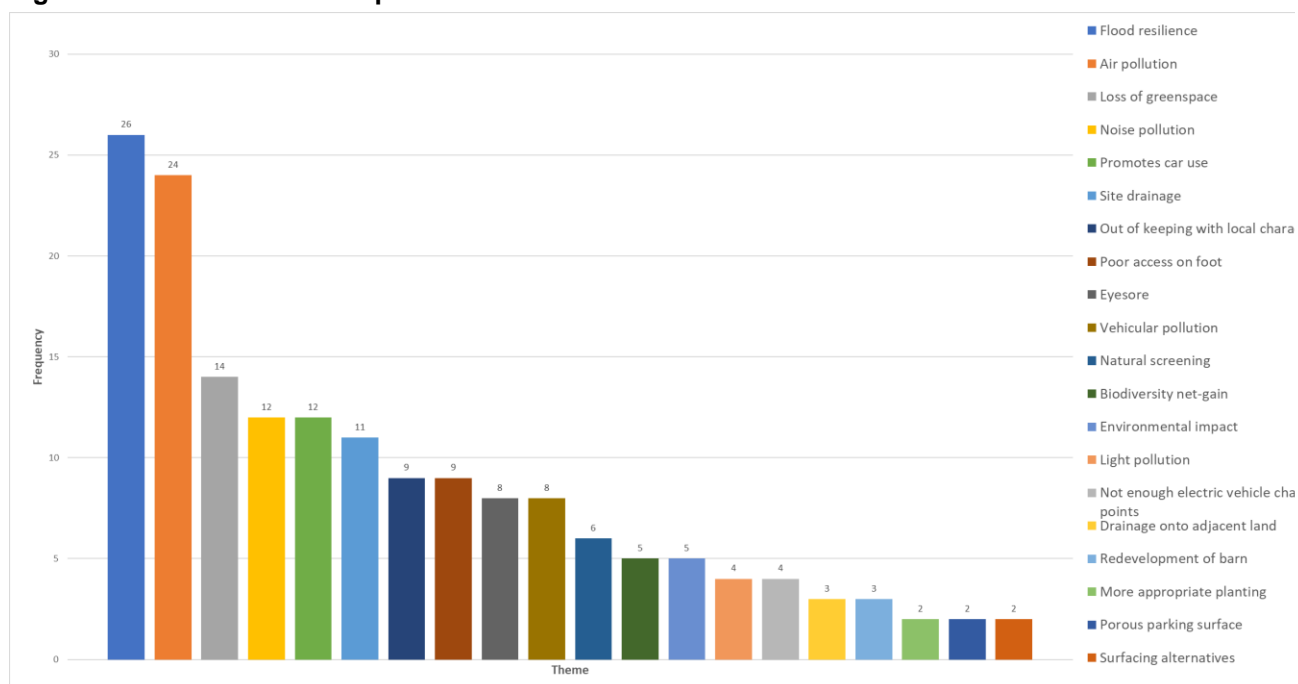
Figure 3.4: Traffic Congestion Comment Theme Breakdown

Source: Mott MacDonald

3.4 Environmental Impacts

Another recurring theme from the engagement responses was concern over the environmental impacts of the scheme. A significant number of comments on this theme were made, varying in specificity, however the most prevalent relate to environmental impact, flood resilience, air pollution and loss of greenspace. Other comments include a possible increase in noise pollution resulting from increased vehicle activity at the site, an increase in vehicle dependency and car use resulting from the development, site drainage issues and visual amenity and keeping with local character. Several respondents made clear that they would like to see more natural screening at the site and a biodiversity net-gain.

A total breakdown of the prevalence of each individual comment area is displayed in Figure 3.5.

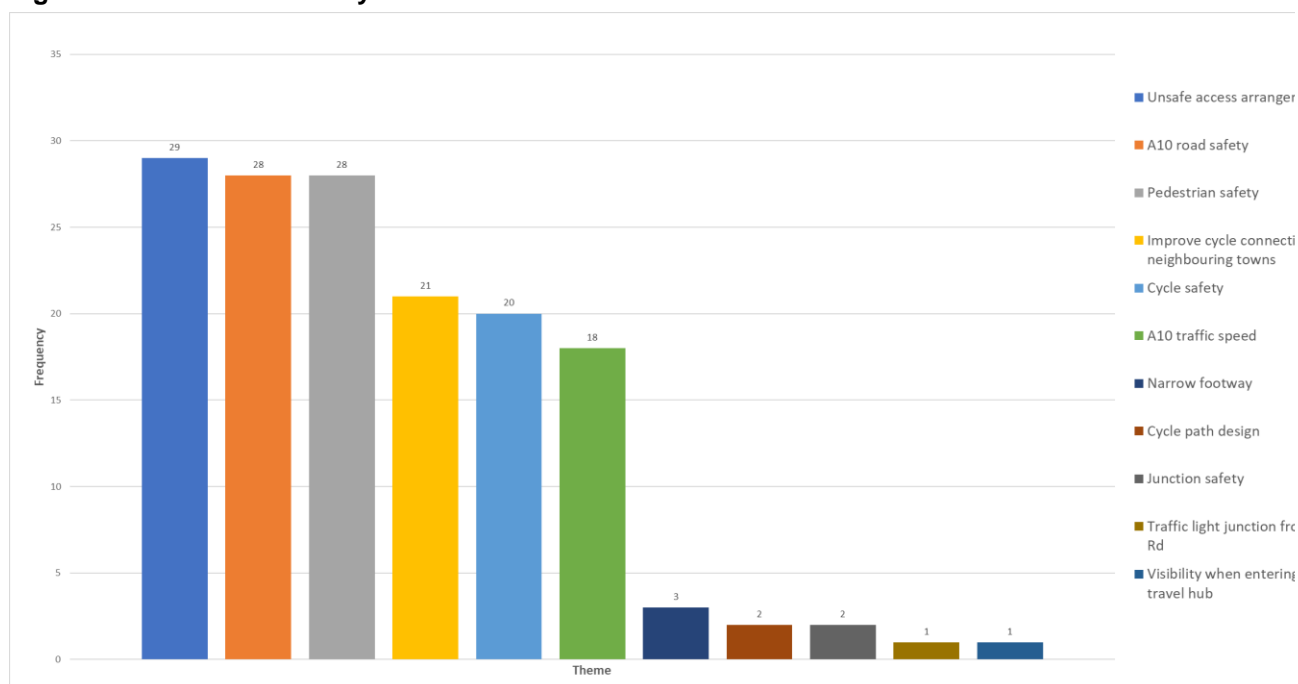
Figure 3.5: Environmental Impacts Comment Theme Breakdown

Source: Mott MacDonald

3.5 Road User Safety

Road user safety was another theme to emerge from the public engagement responses. Comments within this theme vary significantly but all relate to road safety, whether for vehicle users, cyclists or those on foot. The most frequent themes to emerge from the responses were unsafe access arrangements to the site, scheme impacts on A10 road safety and impacts on general pedestrian safety. A significant number of respondents raised concerns over cycle connectivity to neighbouring towns such as Barrington and Fowlmere, citing a lack of dedicated cycle provision. Cycle safety and traffic speed were also mentioned frequently, with many believing a 30mph speed limit would be unenforceable on the A10 and that cyclists would not be safe because of speeding traffic.

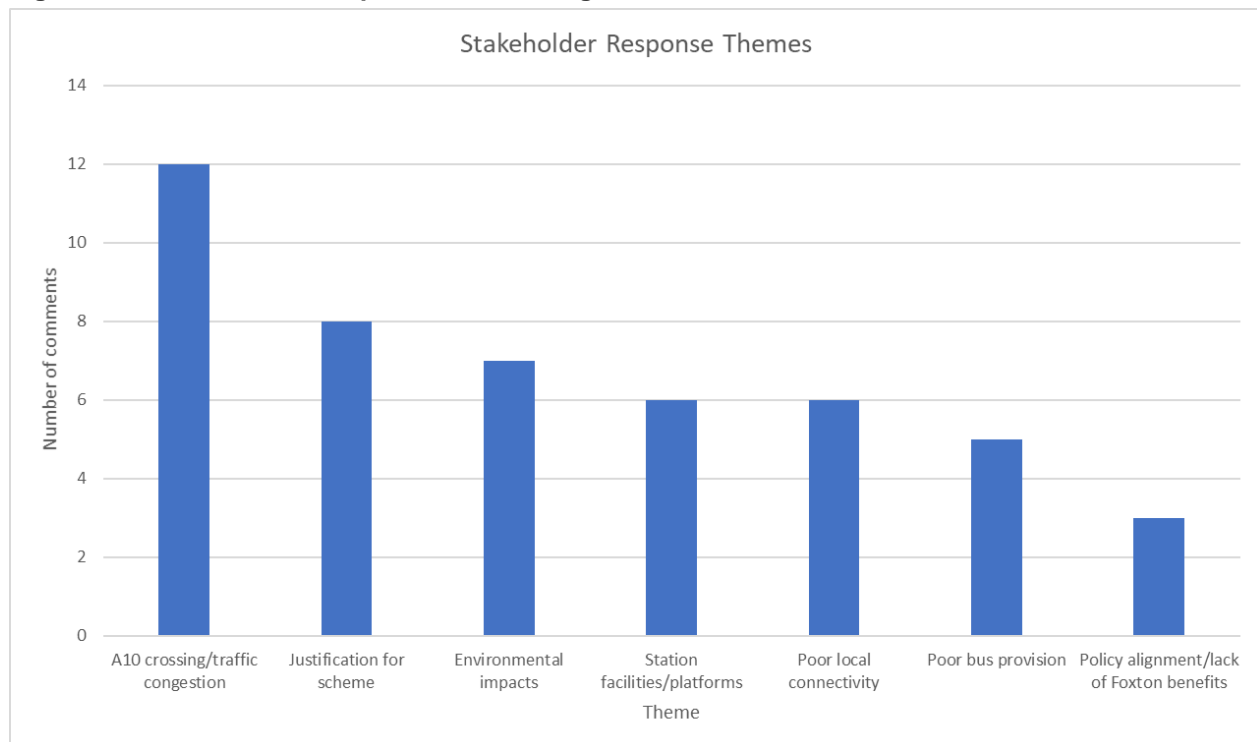
A total breakdown of the prevalence of each individual comment area is displayed in Figure 3.6.

Figure 3.6: Road User Safety Comment Theme Breakdown

Source: Mott MacDonald

4 Key Stakeholder Responses

In addition to the comments received via the survey, responses were received from several key stakeholders over the engagement period. Analysis of stakeholder responses was undertaken to determine key themes and actions to be taken forward and addressed. The key themes to emerge from stakeholder responses are broadly similar to those emerging from the survey comments, and are outlined in Figure 4.1, with more detail on comments from individual stakeholder groups provided in sections 4.1 to 4.9.

Figure 4.1: Stakeholder Response Themes Figure

Source: Mott MacDonald

An overview of key stakeholder responses is outlined below.

4.1 Foxton Parish Council/Other Parish Council Feedback

Several comments were received from Foxton Parish Council referencing both design and non-design aspects of the scheme. The key design themes to emerge from the Parish Council feedback are described here:

- Pedestrian safety at the uncontrolled A10 pedestrian crossing
- Concerns over platform size and station grading
- The quantity of cycle parking spaces
- Not meeting the Neighbourhood Plan Policy *FOX/19 Foxton Travel Hub* which states that the travel hub must clearly demonstrate benefits to the community of Foxton, including integrated transport services and employment opportunities.
- Nothing for the Foxton community/parking charges should be directed to Parish Council.

Several other comments were received, including:

- Poor levels of engagement and outdated information on the GCP website
- Poor bus frequency serving the travel hub
- The impacts of covid-19 on commuting patterns and numbers
- The need for a bypass
- Travel hub terminology (not a 'hub', just a car park)
- Unsustainable design as there isn't cycle path connectivity to all surrounding villages

4.2 Smarter Cambridge Transport

During the engagement period a consultation response was received from Smarter Cambridge Transport. The primary themes of the consultation response are detailed here:

Objection to the definition of Travel Hub:

- Car parking at the Travel Hub undermines rural bus services & exacerbates social inequalities
- Will not reduce emissions
- Will increase traffic locally
- Reduces biodiversity – requiring mitigation
- Increases risk of injury and death on the roads – especially A10 crossing at peaks

Objection to methodology:

- Demand modelling underestimates London-bound rail demand
- Southbound platform capacity is insufficient
- No consultation with train operating company

Alternative proposal:

- Work with the Combined Authority to develop rural bus services
- Provide a network of truly multi-modal travel hubs
- Develop a network of cycleways linking villages to travel hubs

4.3 Meldreth, Shrepreth & Foxton Community Rail Partnership

The Community Rail Partnership consultation response was developed following the CRP's attendance at both Zoom consultation events and from a subsequent conversation with the Project Manager. The key themes of the consultation response are outlined here:

Bus integration:

- Inclusion of bus layby welcomed – need to co-ordinate bus services with trains

Traffic Impacts/Pedestrian Crossing:

- Concern at traffic impact on busy A10. Will be exacerbated by improved Foxton-London rail service.
- Uncontrolled crossing of A10 with high traffic volume not suitable

Site Design:

- Include disabled parking/drop off to north of station as well as main site. Can the car wash site be acquired?
- Include Changing Places facilities in proposed toilet block
- Extend southbound platform
- Widen platforms
- Convert barn to community use – cycle hub/café/meeting space

Facilities:

- Provide a ticket machine on the northbound platform side
- Consider improvements to neighbouring stations

Access:

- Improve footpath to Foxton village to make accessible for all

4.4 Cambridge Past, Present & Future (CPPF)

A consultation response was received from CPPF during the engagement period. Key comments from the response are detailed here:

- What is the relationship between the Foxton Hub and South West Travel Hub?
- If both go ahead is the scale proposed still required?
- If both are developed, what is the evidence that drivers will use Foxton as opposed to the South West Travel Hub?
- Have the comparative fares, travel times, frequency of journeys been considered?
- Concerns that the travel hub will be used by London commuters, taking up car spaces to those commuting to Cambridge
- Support the southern site over the northern site
- Welcome the inclusion of a bus interchange on site
- Would like to see a 20% biodiversity net gain and a lighting scheme to reduce light pollution

4.5 Cambridge & Peterborough Combined Authority

The following consultation response was received from Cambridge & Peterborough Combined Authority:

- 'Our position on this is that we support proposals that encourage and enable individuals to consider alternatives to the car and therefore watch with interest as your proposals progress'.

4.6 Axis Land Partnerships

Axis Land Partnerships produced a consultation response during the engagement period. Their response was based around four headline themes:

Doesn't Deliver on the objectives of GCP:

- Maximise the potential for all journeys to be undertaken by sustainable modes of transport – the proposed travel hub increases vehicular movement on the rural road network
- Improve overall connectivity and accessibility within Greater Cambridge to support economic growth – the scheme misses a significant opportunity to enable economic growth and the development of new community assets in a sustainable location
- To accommodate future growth in trips along the corridor to Cambridge and reduce traffic impact levels and congestion – only the removal of the level crossing will reduce congestion at Foxton and the proposed scheme blocks any future delivery of a bypass
- Contribute to the enhanced quality of life for those living and working within Greater Cambridge – the proposed scheme will increase congestion and therefore local noise and air pollution. It will also dramatically increase the number of people crossing a high-speed road creating significant risk to those using the facilities

Doesn't deliver for Foxton:

- The plan as shown is a large car park bolted onto the village that is out of scale and character, the proposals do not relate to surrounding uses and characteristics of the village.
- The scale of the car park prevents future placemaking potential around the station which is one of the key attributes of the village and key to an accessible and low carbon future.
- Surface parking at this scale is an inefficient use of important and valuable land.
- The increased congestion caused by significant additional vehicular movements, will make it harder for residents to get in and out of the village onto the A10.
- The proposed green infrastructure is of limited value in terms of its benefit to the community.

Doesn't address highways safety:

- The GCP proposals do not deliver the A10 bypass allowing the closure of the level crossing. The location and scale of the proposed car park blocks any future delivery of a feasible scheme.

Doesn't deliver for Greater Cambridge:

- The First Proposals document sets a clear ambition for progressing a comprehensive and integrated approach to development. However, the current proposals for the Foxton Travel Hub fall short of this ambition, presenting a scheme that seeks to address transportation matters in isolation.
- The proposals are too narrowly focused and fail to maximise the opportunity to provide a comprehensive approach to development as promoted in the GCLP.
- The current proposals also do not sufficiently align with the understanding of what makes a 'great place' as set out in the First Proposals document, as somewhere that ensures that infrastructure is delivered coherently in a way that is integrated with place.
- They fail to consider how designing for climate change mitigation and climate change adaptation can be an opportunity to create distinctive and characterful developments, fail to ensure that services and infrastructure are developed alongside new housing and jobs, and miss the opportunity to create a well-used and active public place which helps to foster a sense of community

4.7 Network Rail

Network Rail did not respond formally during the engagement period but have been engaged as a key stakeholder throughout the design development. A formal response to the engagement is currently being prepared.

4.8 Anthony Browne MP

A consultation response was received from Anthony Browne MP during the engagement period. The response focuses around eight key points:

- What work has the GCP undertaken to risk assess the safety of pedestrians and cyclists using an uncontrolled crossing on the A10 (for a car park with a potential capacity of up to 950 car spaces plus cycle parking) and what were the results of any such work?
- What work has the GCP undertaken to risk assess the safety of pedestrians, cyclists and vehicles using the level crossing if the carriageway is narrowed as planned to 6.4m, and what were the results of any such work?
- What assurance can the GCP give that the Foxton Travel Hub will not be used predominantly by commuters travelling to London?
- What plans, if any, are in place to increase the frequency and geographical coverage of local bus services to and from the Travel Hub?
- What assurance can the GCP give that the Foxton Travel Hub will not create more congestion than is presently experienced at the Foxton level crossing?
- What work has the GCP undertaken to assess the impact of the proposed Travel Hub on air quality in Foxton?
- What further opportunities will be given to the public to influence the plans for the Foxton Travel Hub?
- Will the GCP commit to working with me, other transport authorities and the Department for Transport to revisit the option of a bypass?

4.9 Cambridgeshire County Council Highways Maintenance Service – Asset Information Team

The following comments were received from the CCC Highways Maintenance Service during the consultation period:

- Construction of the Travel Hub represents an opportunity to improve pre-existing facilities in the locality. The current roadside footway/cycle track that is in place on the western side of the A10 should be considered for improvement. If it does not currently meet the standards of LTN1/20, it should be improved to meet this standard as a minimum.
- The current footway/cycle track alongside the A10 is proposed to be repositioned to allow the construction of the new road junction into the Travel Hub. Where this happens, the realigned path is moved further from the carriageway and this may result in it falling outside of the existing highway. Therefore, it is possible that a dedication may be required in order to record it as a public highway. The Asset Info team or the Highways Development Management team can advise how this can be done through the appropriate legal agreement.
- The existing treeline along the western side of the A10 currently forms the highway boundary. However, the trees are not part of the highway and their maintenance is currently the responsibility of the adjoining private landowner. If the identified land is purchased for the scheme and turned into a travel hub, this will not change, and the trees will remain the responsibility of the landowner. Accordingly, they should be maintained as part of the management plan for the travel hub site, and not as part of the highway. The trees would only be considered the responsibility of the Highways Maintenance service if the legal extent of the highway is changed to include them – this is not a course of action the service would endorse.

5 Summary

This technical note has outlined the outcomes of public engagement for the proposed Foxton Travel Hub scheme. A significant number of responses were received over the two-week engagement period, from both members of the public and stakeholders across a variety of formats (refer to section 2 for details of the engagement process). Analysis of engagement responses has shown that the emerging themes were consistent across both public and stakeholder responses, and in general the same key concerns were raised by both.

An overview of the main themes to emerge from public engagement (both public and stakeholder responses) are outlined below.

1. A10 Pedestrian Crossing

The most frequent comment theme to emerge from both public and stakeholder responses was the A10 pedestrian crossing. Respondents queried several aspects of the crossing, such as its overall safety, uncontrolled design, disabled access, and whether alternatives such as a controlled crossing/underpass/overpass could be considered.

2. Justification for Scheme

The second most common theme to emerge from the engagement responses was the justification for the scheme and for various aspects of the scheme. Respondents questioned the choice of location, size, and overall justification for its development and whether it is really needed. The demand for the scheme was questioned with reference to the impacts of the Covid-19 pandemic, as well as the benefits that it will bring to Foxton residents. The terminology of the scheme as a 'travel hub' was another recurring comment theme, with many believing a 'car park' or 'park and ride' was a more accurate reflection of the proposal believing

bus connectivity and frequency is poor and does not integrate well with the site. Stakeholder responses also raised concerns over platform size and capacity and station facilities.

3. Traffic Congestion

Traffic congestion was a major theme emerging from both public and stakeholder responses. Issues stemming from the current level of traffic congestion on the A10 and potential issues with congestion following completion of the scheme were raised, in many places with reference to the level crossing and possible level-crossing traffic tailbacks during peak hours. The interface of the travel hub with plans for a future A10 bypass was also raised on several occasions by both public and stakeholder responses.

4. Environmental Impacts

A significant number of individual comments and themes relating to environmental impacts were received from both public and stakeholders. The key issues that were raised include air quality impacts resulting from an increased number of vehicles on local roads and at the travel hub site, the site's resilience to flooding and ability to drain surface water, and a loss of greenspace. Other issues such as promoting vehicle dependency, noise pollution and keeping with local character were also raised.

5. Road User Safety

Road user safety was raised on several occasions in both public and stakeholder responses. These comments were generally less specific in scope and as such were not categorised under the A10 pedestrian crossing or traffic congestion themes. Comments included safety concerns over access arrangements to/from the site, as well as to/from neighbouring roads such as Station Road. In addition to this both cycle and pedestrian safety was raised, both on the A10 and footpath.

Electricity Grid Reinforcements: Update and Next Steps

Report to: Greater Cambridge Partnership Joint Assembly

Date: 18th November 2021

Lead Officer: Rachel Stopard - Chief Executive, GCP

1 Background and Purpose

- 1.1 Electricity grid capacity constraints in the Greater Cambridge area represent a significant barrier to growth and to schemes which aim tackle climate change. Utility providers are constrained to operate reactively to confirmed demand and this can create significant delays in housing and commercial developments and can make unviable projects that help to achieve net zero objectives such as the electrification of transport and renewables projects.
- 1.2 The Greater Cambridge Partnership (GCP) has recognised that although Distribution Network Operators (DNOs) have a statutory duty to provide infrastructure in line with growth, they are constrained to operate reactively to confirmed demand which can create significant delays to both residential and commercial developments. The way in which the electricity market operates is extremely problematic for areas such as Greater Cambridge with high growth forecasts and ambitious plans for addressing climate change.
- 1.3 In order to unlock capacity in the grid in Greater Cambridge, officers have investigated the option to fund reinforcement works through two additional grid substations, one at Trumpington and one at Cambridge East, in anticipation of increased demand or “ahead of need”. As set out in Sections 4 and 5 of Appendix A (the Outline Business Case), the proposal is to recoup the cost of this investment from developers, as subsequent connectees to the network, principally through a statutory mechanism known as the Electricity Connection Charges Regulations (ECCR) 2017.
- 1.4 If the GCP does not support intervention then grid reinforcements could proceed at a slower pace in line with UKPN’s negotiation with Ofgem on the funding settlement for the RIIO ED-2 regulatory price control period (2023-2028), (see Section 2.6 of Appendix A). However, the outcome of this process will not be known until the end of 2022 and even if funding is awarded, delivery by UKPN cannot start until April 2023 at the earliest but could be as late as 2028. This would result in a 2 to 7 year delay in the substations being energised and able to accept connections.

Alternatively, should the work by the GCP continue and UKPN be successful in securing funding to cover the capital costs of the project, much of the groundwork will have already been done to ensure that UKPN can begin work to deliver the substations at the earliest possible opportunity. Therefore, the GCP's current work and any potential further work (detailed in the proposal set out at 1.7) will have effectively brought the project forward to a position which enables delivery and construction to begin more quickly.

If UKPN are not successful in securing the funding, then the work which the GCP has been doing could continue to facilitate the project and enable delivery of significant numbers of homes and jobs, as set out below. Given that the timing of the funding round is such, the Joint Assembly and Executive Board may wish to balance the risk of stepping away from this work with the possibility that it may not happen without the GCP's intervention. The timing is outside of the GCP's control and adds a complexity to the decision-making process.

- 1.5 Investment from the GCP, will facilitate the development of 3,780 new homes and 162,000m² of Research and Development (R&D), Commercial and Clinical floorspace if the Cambridge East Grid alone is built, which increases to 5,700 new homes and 270, 000m² R&D, Commercial and Clinical floorspace if both Cambridge East and Trumpington Primary substations are built. These figures are based on the Adopted Local Plans (covering 2021-2031) but there are expected to be further benefits to the planned developments within the Emerging Local Plan (covering 2031-2041). Amongst the planned developments, are 2 hospitals on the Cambridge Biomedical Campus which will most likely need the grid capacity enhancements to be able to operate.
- 1.6 Furthermore, this investment will provide the flexibility to enable the delivery of the electrification of transport and renewable generation projects. Without intervention the network capacity would be likely to become a constraint for projects which will contribute to achieving net zero carbon goals.

Joint Assembly Considerations

- 1.7 The Joint Assembly is invited to consider the below issues and offer officers their views on a potential way forward, and in particular to:
 - (a) Consider whether the current preferred option, presented in Section 3 of this report and in Section 3.2. of Appendix A, should be taken forward and progressed to the Full Business Case stage. This will enable some remaining uncertainties to be addressed through further demand analysis and stakeholder engagement work, including continuing to engage with external technical and legal consultants.
 - (b) Support further work to mitigate the risks presented in Section 3.3 of this report and in the Outline Business Case (OBC) appended to this report as Appendix A. This would include engaging with outside agencies to explore potential joint-working and investment arrangements.
 - (c) Consider enabling the project to progress with engineering feasibility work, detailed design, and planning, by securing the current UKPN 'Grid Connection Offers' (as set out in Section 4.1 of the OBC) at a cost of £275K per grid

substation from the already allocated budget. Issues and risks associated with this are set out at Section 3.3 of this report and in Section 6.5 of Appendix A.

Project Update

- 1.8 In July 2021, the Joint Assembly and Executive Board considered a proposal for the Greater Cambridge Partnership (GCP) to forward fund electricity grid reinforcement works, to remove the barrier to growth posed by a lack of energy demand capacity in the Greater Cambridge area. This proposal included an update on the intention to recoup the initial cost of investment from developers through the Electricity Connection Charges Regulation (ECCR).
- 1.9 The Executive Board agreed to support a formal grid application for the proposed reinforcements to UK Power Networks (UKPN) as the Distribution Network Operator (DNO). Following the submission of the applications for two of the substations, Cambridge East Grid and Trumpington Primary, formal offers were received from UKPN in late August 2021. These offers are detailed in Section 4.1.1 of Appendix A. If the GCP wish to accept these offers, there is £100k acceptance fee per offer which contributes towards the overall project cost and is the same regardless of the delivery route chosen from the options outlined in Section 4 of this report.
- 1.10 As at Section 1.4 of this report and explained further in Section 2.6 of the OBC appended as Appendix A, we are waiting for the outcome of funding from RII0 ED-2 to understand if UKPN might be in a position to financially support this work, expected in late 2022. In advance of that outcome, officers are suggesting we twin-track this work with the UKPN bid in order to ensure that the preliminary design work can be progressed and avoid delays to energising the grid substations.
- 1.11 It was also agreed that the GCP should explore the option for delivering some of the elements of the infrastructure through an Independent Connection Provider (ICP) and/or an Independent Distribution Network Operator (IDNO). Initial market testing research has therefore been carried out to explore the viability of these alternative options and the results of this are summarised in Section 3 of this report, and in Schedule 1 attached to the OBC, appended as Appendix A.
- 1.12 Following the receipt of the offers from UKPN and the conclusion of the market testing exercise, the GCP is now able to consider the costs and benefits associated with delivering the proposed grid reinforcement works. Further energy demand analysis has also been conducted to support the business case which is aligned with the planned housing and commercial developments outlined in the adopted Local Plans (2018).
- 1.13 Alongside the development of the business case, work has continued to lobby relevant bodies including Ofgem and the Department for Business, Energy and Industrial Strategy (BEIS) to change the current market operation to enable a timelier, and more satisfactory approach to investing in energy infrastructure, especially in high growth areas such as Greater Cambridge.

2 Alignment with City Deal Objectives

- 2.1 The proposed investment is consistent with the City Deal agreed between Government and Greater Cambridge which allows Greater Cambridge to maintain

and grow its status as a prosperous economic area. The City Deal is intended, amongst other things to accelerate delivery of 33,480 planned homes which will not be possible without electricity grid connections.

- 2.2 Grid reinforcement aligns well with GCP objectives as it facilitates growth in the Greater Cambridge area and supports the electrification of transport. The GCP Executive Board has already agreed the principle of investing in grid reinforcement, and this was confirmed by the Future Investment Strategy process in March 2019.
- 2.3 The proposal is that GCP should support investment to pro-actively increase the capacity of the electricity grid in the Greater Cambridge area in order to achieve the following objectives:
 - To ensure that growth in Greater Cambridge is not stalled due to limitations in the electricity grid and that costs for new connections are not prohibitive; and
 - To contribute to a net zero economy by ensuring that there is adequate headroom in the electricity grid to enable the following:
 - take-up of renewable technologies
 - take-up of electric vehicles
 - reductions in dependence on gas for domestic power supply

3 Issues for Discussion

3.1 Energy Demand Capacity Issues in Greater Cambridge:

3.1.1. In 2019, the GCP commissioned a Local Network Analysis report by Asset Utilities, appended as Appendix B, to assess the condition of the electricity grid in the Greater Cambridge area and to establish the extent to which

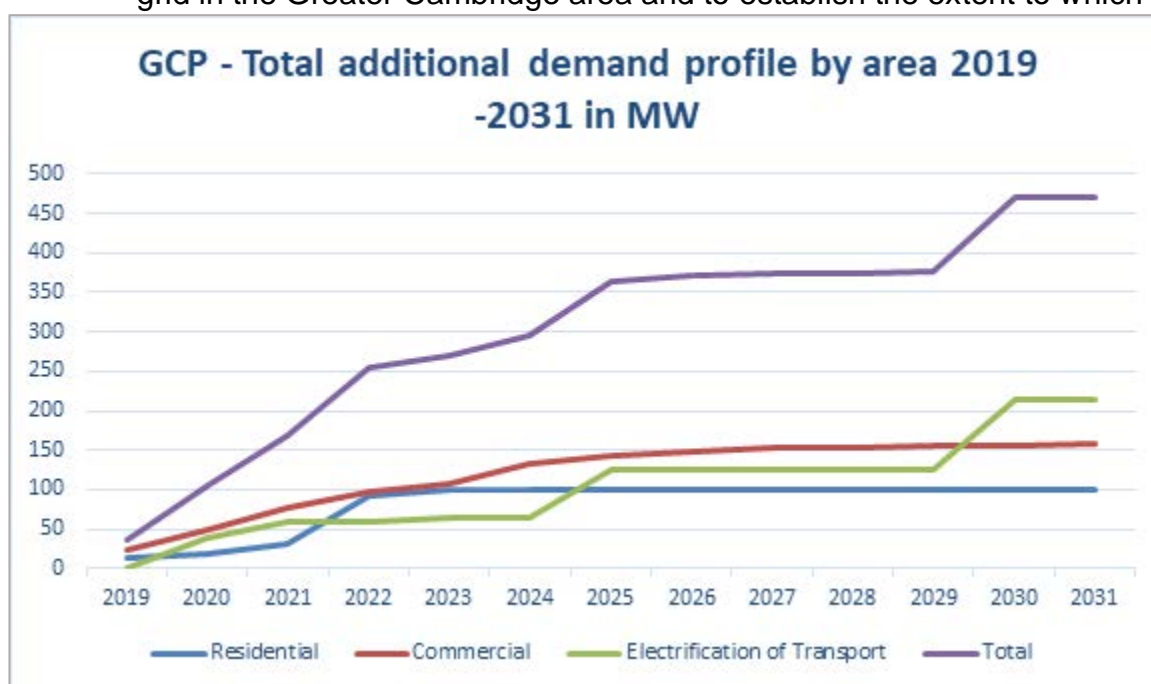


Figure 1 - From Asset Utilities (2019), the cumulative additional demand profile by area together with the total cumulative demand profile from 2019-2031.

constraints on the electricity network were preventing local development. The report noted that present demand capacity for Greater Cambridge is 240 MW and that the additional demand, driven by the electrification of transport, could almost triple the existing total demand requirement for the Greater Cambridge area to 710MW by 2031 as illustrated in Figure 1.

- 3.1.2 In 2021, two further demand analysis studies were commissioned from Roadnight Taylor and WSP respectively, to provide a more detailed picture of the additional energy demand capacity needed based on the new residential and commercial developments within the Adopted Local Plans and the Planning Register, as well as the demand created by electric vehicle charging and the ‘degasification’ of heating within existing housing through the installation of heat pumps. These reports are included as part of the OBC appended as Appendix A. The results of these reports demonstrated that there is a total of 5,700 new homes and 270,000m² of new research and development, clinical and commercial floorspace which will require additional energy demand capacity before 2031.
- 3.1.3 Based on this demand estimate work, the proposal is that the GCP should support investment to pro-actively increase the capacity of the electricity grid in the Greater Cambridge area. This will ensure that economic growth in the area is not prevented through a lack of energy grid infrastructure, facilitating the developments within the Adopted Local Plans and likely those in the Emerging Local Plan (2031-2041) as well.

3.2 Outcomes of the Market Testing Exercise:

- 3.2.1 The formal grid offers received from UKPN indicated a construction price of approximately £11.5m for East Grid and £11m for Trumpington Primary if the entirety of the construction works are completed by UKPN, further details of which are included in Section 4.1.1 of Appendix A. However, the GCP has the option to consider having the “contestable” works constructed by an ICP. Therefore, to compare the expected costs, a market testing exercise was conducted with several ICPs. Further details of the market testing are included in Section 4.3 of Appendix A.

Summary: ICP Marketing Testing Cost Estimates		
Metric	East Grid Cost Estimate	Trumpington Cost Estimate
Highest Estimate	£ 12,325,834.00	£ 12,325,834.00
Lowest Estimate	£ 5,569,119.00	£ 5,735,520.00
Range	£ 6,756,715.00	£ 6,168,077.00
Mean Average	£ 8,254,140.60	£ 8,333,822.20
Average + UKPN Costs	£ 10,968,146.78	£ 8,666,541.85

Table 1 - Indicative costs from ICP market testing exercise.

3.2.2 The market testing exercise generated indicative cost estimates from a total of eight companies. A summary of the results is provided in Table 1. The “non-contestable” works which must be constructed by UKPN, have been factored into the calculation in the final row. It is important to note that the figures in Table 1 account for the direct construction costs only, and do not consider project management time, land acquisition or other costs.

3.3 Project Risks:

The below section summarises some of the key project risks to be noted. The OBC appended as Appendix A contains a more detailed risk management strategy and there is a risk register for the project, kept as a live document.

3.3.1 Cost Recovery Risks

- In the event that UKPN secure RIIO ED-2 funding from Ofgem and the GCP decide to withdraw, then the initial £275k per grid substation will not be recoverable through the Electricity Connection Charges Regulation (ECCR) as no connection will have been created. However, this risk is balanced to facilitate work as stated in Sections 1.4-1.7 of this report. Moreover, this risk is mitigated in part, as UKPN work on a ‘cash-positive’ basis and therefore any funds not spent at the time of withdrawal would be refunded to the GCP.
- The Electricity Connection Charges Regulation (ECCR) is potentially subject to review in the coming years to align it better to the outcomes of Ofgem’s Strategic Charging Review. Potential changes could reduce cost recovery. An initial discussion with UKPN suggest that the majority of works at Trumpington substation could be at risk, however further engagement is required. To further mitigate this risk, there is ongoing engagement with both Ofgem and BEIS around the proposed regulatory changes.
- Although several demand analyses have been undertaken, there remains a level of uncertainty over demand uptake. To mitigate this risk further work is proposed at next stage of the project.
- There is a risk that any payment made to the GCP under the ECCR could be the subject of a future legal challenge on the grounds that ECCR does not apply to the GCP in relation to the connection works. However, any application of the ECCR must be made in accordance with the relevant legislation and connection charges methodology statement, which is agreed with Ofgem as regulator. The highly regulated nature of the process therefore mitigates the risk of challenge.

3.3.2 Delivery Risks

- The UKPN formal grid offers are subject to the availability of space at the existing Fulbourn Grid to facilitate the East Grid works. A detailed design study will be conducted by UKPN post-offer acceptance, and a formal notification of any adjustment(s) will be issued.

- The UKPN offers are also subject to change depending on the suitability of the land at the proposed locations for planning and acquisition. Again, a detailed design study will be conducted by UKPN post-offer acceptance, and a formal notification of any adjustment(s) will be issued.
- If the option to use an IDNO and ICP is pursued, then the GCP would be forging a new path for a Local Authority with no similar projects to compare to and/or use as learning
- If the option for an IDNO to adopt the assets is pursued then this delivery route would also require a revision to the UKPN offer for Trumpington, as this is currently dependent on UKPN adopting the assets built at the East Grid.

4 Options and Emerging Recommendations

- 4.1 The options available to the GCP are outlined in Sections 3 and 4 of the OBC appended as Appendix A, but can be summarised as follows:

Deliver up to three grid substations originally identified in the UKPN feasibility study and short-listed by Officers; these are Cambridge East Grid, Cambridge West Grid and Trumpington Primary. At present, this report and the accompanying OBC recommend progressing the delivery of East Cambridge and Trumpington substations only. The business case for West Cambridge is still under development and the need for this substation is likely to depend on the progress of the University of Cambridge's North-East developments.

Delivery of the construction works through different routes for some parts of the infrastructure. As previously presented to the Joint Assembly and the Executive Board in February/March 2021, there are three possible options to facilitate the grid reinforcement works:

- **Delivery Option 1:** DNO *only*
- **Delivery Option 2:** DNO + Independent Connection Provider (ICP)
- **Delivery Option 3:** DNO + ICP + Independent Distribution Network Operator (IDNO)

- 4.1.1 Technical consultants supporting the project have undertaken a brief assessment of the three possible delivery routes, which is included in Section 4 of the OBC, appended as Appendix A.

- 4.1.2 The options assessment ruled out Option 2 due to the additional risk and resource associated with procuring an ICP for minimal cost savings. It was also noted that Option 3 would require the reworking of the UKPN formal grid offer for Trumpington if both substations are delivered via this route. Table 2 provides a comparison of the most viable delivery routes.

The preferred route has been identified as one which delivers both grid substations through Delivery Option 1 (DNO only) as the least-risk and highest-benefit route. Using the DNO provides the greatest level of certainty in terms of costs and timescales.

Grid Substation Name:	East Grid	East Grid + Trumpington	
Delivery Route:	Option 1: UKPN build and adopt	Option 1: UKPN build and adopt	Option 3: ICP build, IDNO adopt
Capital Cost Estimate	£12.1m	£23.5m	~£21m
Capacity Reserved	41MVA	41MVA + 20MVA	
Development Facilitated	3,780 new homes 162,000m ² R&D, Commercial and Clinical floorspace	5,700 new homes 270,000m ² R&D, Commercial and Clinical floorspace	
Total Cost Recovery*	£10.4m	£20.5m	~£18m

*Subject to regulatory change if ECCR legislation is reviewed.

Table 2 - Delivery route options and associated costs and benefits. The cost recovery is based on the demand analysis undertaken, the UKPN offers and the initial market testing.

5 Citizen's Assembly

- 5.1 This work will remove a potential barrier to the electrification of transport by ensuring adequate electricity supply for Greater Cambridge. This supports the Citizen's Assembly vision for transport, in particular 'be environmental and zero carbon' and 'restrict the city centre to only clean and electric vehicles.'

6 Financial Implications

- 6.1 The full financial implications are detailed in the Outline Business Case appended as Appendix A. The total cost of the project will differ depending on whether one or both grid substations are to be built. As summarised in Table 1, if only the East Grid substation is built the total project cost will be approximately £12.1m and if both grid substations are built the likely cost will be £23.5m. However, it should be noted that these costs are estimates based on the formal grid offers received from UKPN and are subject to change depending on land, planning and other issues which may arise. The total cost will also be lower in the event that the GCP decide to withdraw from the project if UKPN are successful in their funding bid to Ofgem as part of the RIIO ED-2 process (outlined in Section 1.4 of this report).
- 6.2 To enable the project to progress to the next stage, including securing the current UKPN 'Grid Connection Offers' (as set out in Section 4.1 of the OBC), it is

recommended that £275K per grid substation is drawn down from the already allocated budget.

Have the resource implications been cleared by Finance? Yes

Name of Financial Officer: Sarah Heywood

7 Next Steps and Milestones

- 7.1 The immediate next steps for the project will require a formal acceptance of either one or both the UKPN grid offers, at which point GCP will enter into a contract with UKPN.
- 7.2 Once the offers are accepted, UKPN will need to engage with National Grid about the transmission impact of the project. Depending on the result of these conversations there may be implications for the cost and timescale of the proposed works.
- 7.3 Following the acceptance of the offers, procurement activity will also need to begin to establish delivery partners which will include technical and legal support, as well as an ICP and an IDNO if either of delivery route options 2 or 3 are chosen.
- 7.4 The major milestones on the project are summarised in Figure 2. Following the Executive Board decision, the next milestone will be the commencement of detailed design in early 2022.

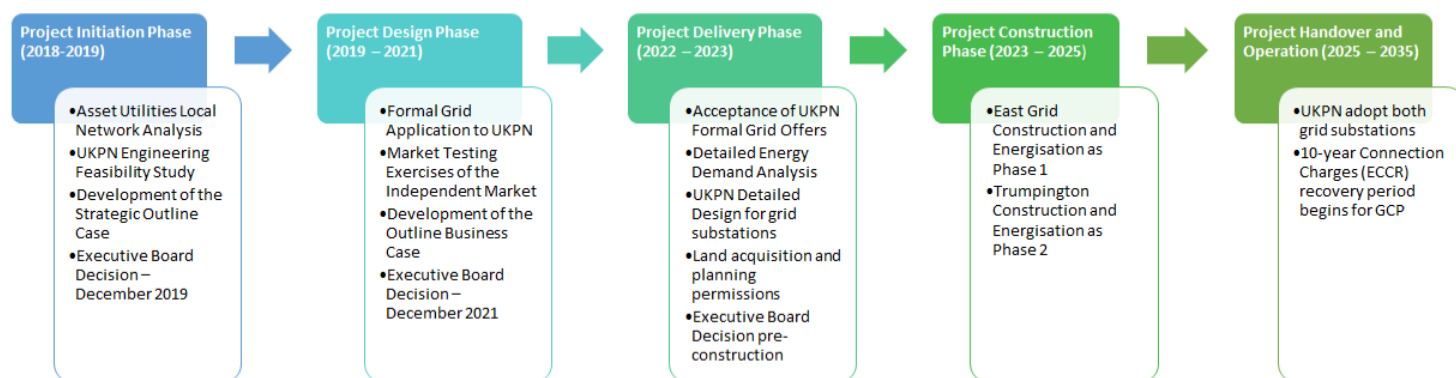


Figure 2 - Project milestones summary from inception to completion.

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Appendix A	Electricity Grid Reinforcements: Outline Business Case (and its appendices)
Appendix B	Greater Cambridge Partnership - Local Network Analysis prepared by Asset Utilities, 2019

Background Papers

Source Documents	Location
Greater Cambridge Partnership Joint Assembly February 2021	Joint Assembly Report Feb 2021 (cmis.uk.com)
Cambridge City Council – Local Plan 2018	https://www.cambridge.gov.uk/media/6890/local-plan-2018.pdf
South Cambridgeshire District Council – Local Plan 2018	https://www.scambs.gov.uk/media/17793/south-cambridgeshire-adopted-local-plan-2018.pdf
Electricity (Connection Charges) Regulation 2017	The Electricity (Connection Charges) Regulations 2017 (legislation.gov.uk)
Ofgem Network Price Control Period 2021-2028 (RIIO-ED2)	Network price controls 2021-2028 (RIIO-2) Ofgem
Ofgem Charges Significant Code Review Consultation on proposed regulatory changes 2021	Access and Forward-looking Charges Significant Code Review - Consultation on Minded to Positions Ofgem



ELECTRICITY GRID REINFORCEMENT PROJECT

OUTLINE BUSINESS CASE

November 2021

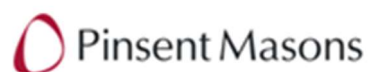


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Glossary of Terms

Adoption	The process whereby title to and risk in the Assets passes to the DNO or IDNO.
Asset Value Payment	A payment made by an IDNO to an ICP upon Adoption, which reflects the value of the assets being adopted. The ICP will pass this payment through to the customer.
Assets	The electricity infrastructure assets to be installed as part of the Works.
Connectee	A party connecting to the Electricity Distribution Network, and who has received a Formal Grid Offer from a DNO
Contestable Works	Works to install electrical assets on the Distribution Network which can be undertaken by an Independent Connections Provider, as well as the DNO. <i>See also Non-Contestable Works.</i>
Degasification	The process of moving away from the use of gas-powered central heating in housing towards electric heating. <i>See also Electrification.</i>
Demand Capacity	The amount of electrical demand that could be connected to a particular part of the Distribution Network.
Demand Forecast	An estimate of the amount of electricity used by future customers connected to a particular part of the Distribution Network. Where demand is given in MVA or kVA, this usually represents a maximum value, considering the average behaviour of a group of customers across the network.
Demand Uptake	The speed or rate at which new or existing customers increase their electricity consumption.
Distribution Network Operator (DNO)	An entity licensed under the Electricity Act 1989 to distribute electricity via a distribution network
Economic Advantage	Under the Subsidy Control Bill 2021, defined as where a public body confers a financial benefit on an enterprise that it would not have received under normal market conditions.
Electricity (Connection Charges) Regulations 2017 (ECCR)	Regulations under which the cost of reinforcement works to the Electricity Grid which are triggered by a Connectee are reimbursed to that Connectee by any subsequent Connectees (known as “second comers”) through their connection charges.
Electricity Distribution Network	Also known as the Electricity Grid or Energy Grid. The interconnected electrical lines, transformers and other equipment and installations which are an integral part of the system which supplies electricity through low, medium, and high voltage.
Electrification	The process of changing from a fossil fuel-powered method to an electricity-powered method: <i>e.g.</i> , moving away from diesel and petrol cars in favour of electric vehicles.

Extension Works	Works/Assets required to connect a customer to the existing distribution network, but which exclude Reinforcement Works/Assets. <i>See also Reinforcement Works.</i>
Formal Grid Application	An application made to a DNO for a connection to the Electricity Distribution Network.
Formal Grid Offer	An offer of connection to the Electricity Distribution Network made by a DNO to a Conectee
Four Part Test	<p>The test for defining a “subsidy” under the proposed Subsidy Control Bill, which comprises the following elements:</p> <ul style="list-style-type: none"> Part 1: financial assistance from public resources by public authority; Part 2: which confers a specific <i>economic advantage</i>; Part 3: on one or more <i>enterprises</i>; Part 4: which has, or could have, an effect on: (i) competition and investment within the UK; or (ii) trade or investment between the UK and the EU.
Generation	The generation of electricity.
Grid Substation	For the purposes of this report, a Grid Substation is used to refer to a Substation within the Distribution Network which transforms the 132kV network down to 33kV or 11kV. <i>See also Primary Substation.</i>
Independent Connection Provider (ICP)	A regulated independent contractor who carries out Contestable Works.
Independent Distribution Network Operator (IDNO)	An Electricity Distribution Network operated by an IDNO.
Initial Connection	The first connection to be made pursuant to GCPs Formal Connection Offer, which is for a small part of the reserved capacity
Kilo Volt (kV)	Unit of voltage. 1kV = 1000 Volts.
Kilo Volt Amps (kVA)	Unit of Electrical Power. Domestic demand is usually measured in kVA.
Mega Volt Amps (MVA)	Unit of Electrical Power. Used for larger demands and equipment ratings. 1MVA = 1,000kVA.
Mega Watt (MW)	Unit of Real Power. The useful electrical power that flows around the grid.
Minimum Scheme	The lowest capital cost for which a connection can be offered by a DNO.
Net Present Value (NPV)	The value of all future cash flows over the entire life of an investment discounted to the present.

Non-Contestable Works	Works which can only be completed by the DNO as the owner of the Electricity Distribution Network, includes the final connection into the existing network and any upstream reinforcement works. <i>See also Contestable Works.</i>
Point of Connection (PoC)	The physical location at which the Connectee's equipment connects to the Electricity Distribution Network, which is set out in the Formal Grid Offer
Price Control (Review) Period	A 5-year period during which Ofgem controls the revenue that DNOs may connect from customers through their electricity bills.
Primary Substation	A substation within the Distribution Network which transforms the 33kV network down to 11kV. <i>See also Grid Substation.</i>
Public Contracts Regulations 2015 (PCR)	Regulations which govern how a contracting authority may procure public works contracts.
Reinforcement Works	Works or Assets installed that add capacity to the existing shared use Distribution Network. <i>See also Extension Works.</i>
RIIO ED-2	The Price Control Period running from 1 April 2023 – 31 March 2028. <i>See also Price Control Period.</i>
RIIO ED-3	The Price Control Period running from 1 April 2028 – 31 March 2033. <i>See also Price Control Period.</i>
Second Comer	A subsequent Connectee. <i>See also Electricity (Connection Charges) Regulation.</i>
Subsidy Control	The legislative regime which controls how state aid may be offered by public authorities.
Switchboard/Switchgear	Electrical equipment used to switch different parts of the distribution network on and off.
System Charges	Charges paid by Connectees to the electricity grid in order to use the electricity grid. <i>See also Electricity (Connection Charges) Regulation.</i>
Transformer	Electrical equipment used to transform between voltage levels at a substation.
Utilities Contracts Regulations 2016 (UCR)	Regulations which govern how a contracting authority may procure public works contracts.

1 Introduction

This document is the Outline Business Case (OBC) that makes the case for securing City Deal funding for the delivery of the Greater Cambridge Partnership Electricity Grid Reinforcement project. The project aims to deliver new energy grid infrastructure in the Greater Cambridge area to facilitate planned developments and enable further economic growth by improving electricity demand capacity.

1.1 Context

Electricity distribution network operators (DNOs) or independent distribution network operators (IDNOs) own and operate the electricity distribution network. They are required by law to offer a connection to anyone who asks, at the lowest capital cost. This is known as the “minimum scheme”. The DNO for the Greater Cambridge area is UK Power Networks (UKPN), with their full coverage area shown in Figure 1.1.



Figure 1.1 UK Power Networks (UKPN) own and maintain electricity cables and lines across London, South East and East of England.

In some cases, as in the Greater Cambridge area where there is a high rate of economic growth, connections cannot be completed until the network is upgraded. The DNO is able to recover the cost of such an investment from the connecting customer(s) and/or existing customers through use of system charges. However, in order to pass the cost onto existing customers, the DNO must demonstrate to Ofgem, as the Independent National Regulatory Authority (INRA), that the benefits of upgrading the system outweigh the costs, and that the upgrade is in the interests of the wider customer base.

Ofgem controls the revenue that DNOs are allowed to collect from customers through system charges added to their electricity bills. These price controls are reviewed every five years and during a review, each DNO must submit a business plan that forecasts the volume and justifies the cost of the work that they intend to undertake in the upcoming price control period. The business plans are assessed by Ofgem and used to set a revenue allowance for the DNO for the forthcoming price control period. If a DNO is unable to justify the cost of a proposal, then the investment will not be included in the DNO's revenue allowance. In that case, the full costs of the investment must be borne by the customer seeking a connection. These costs are typically perceived as prohibitive and present a barrier to growth and development.

There is currently a price control review period underway, with DNOs required to submit their final business plans on 1 December 2021 for the next price control period, known as RIIO ED-2. RIIO ED-2 will run for 5 years from 1 April 2023 until 31 March 2028. Throughout 2021, the GCP has lobbied UKPN to include the reinforcement works identified in this business case as critical for the Greater Cambridge area within its business plan for RIIO ED-2, however the outcome of this process will not be known until the end of 2022. Even if funding is awarded, delivery cannot start

until 2023, but could be as late as 2028. This would result in a 2-to-7-year delay in the substations being energised and able to accept connections.

1.2 Project Background

In 2019, the Greater Cambridge Partnership (GCP) commissioned two reports¹ to assess the condition of the electricity grid in the Greater Cambridge area and to establish the extent to which constraints on the electricity network were preventing local development. These reports found that reinforcement works to the grid were required in order to meet demand in Greater Cambridge, Section 2.2 of this paper explains the findings in more detail. From the long list of options identified in these reports, detailed in Section 3.1, there were 3 grid substations short-listed by the GCP as being critical to enabling economic growth and planned developments in the area: Cambridge East, Trumpington Primary and Cambridge West grids.

In order to unlock electricity demand capacity in Greater Cambridge, the GCP has considered funding the reinforcement and upgrade of 2 of the 3 critical grid substations: one at Trumpington and one at Cambridge East in anticipation of increased demand. As set out in the main body of this Outline Business Case, the GCP intends to recoup the cost of this investment from developers and other subsequent connectees to the network, through the same mechanism as a DNO which is the Electricity (Connection Charges) Regulation (ECCR) 2017.

The ECCR mechanism requires subsequent connectees to pay a fair proportion of the initial capital cost paid by the first connecting party. By enabling developers to pay connection charges which are in proportion to the level of electrical capacity which they require, the GCP will significantly reduce the risk of development failing to materialise by providing the marketplace with an equitable solution.

The current grid infrastructure around Cambridge has a total demand capacity of approximately 240MVA in total. As described in Section 3 of this business case and as shown in **Error! Reference source not found.**1, the delivery of the 3 short-listed grid substations, could unlock up to 120MVA of additional demand capacity, over a 4-to-5-year delivery timeframe. This additional capacity would be a 50% increase.

The capacity of grid infrastructure is measured in units of MVA (Mega Volt Amps)

1 MVA = 1 MW (Mega Watt) of electrical power when the grid is operating normally

At present, this paper recommends progressing the delivery of 2 of these substations, at East Cambridge and Trumpington substations only. The delivery of these substations will unlock approximately 69MVA for the south of the Greater Cambridge area, meaning a 29% increase in demand capacity. The business case for West Cambridge is still under development and the need for this substation is likely to be highly dependent on the progress of the University's North-East Campus developments.

¹ "Greater Cambridge Partnership – Local Network Analysis" dated February 2019 and prepared by Asset Utilities and "Growth in Greater Cambridge: Network Expansion Programme. Feasibility Study for the Greater Cambridge Partnership" dated October 2019 and prepared by UK Power Networks.

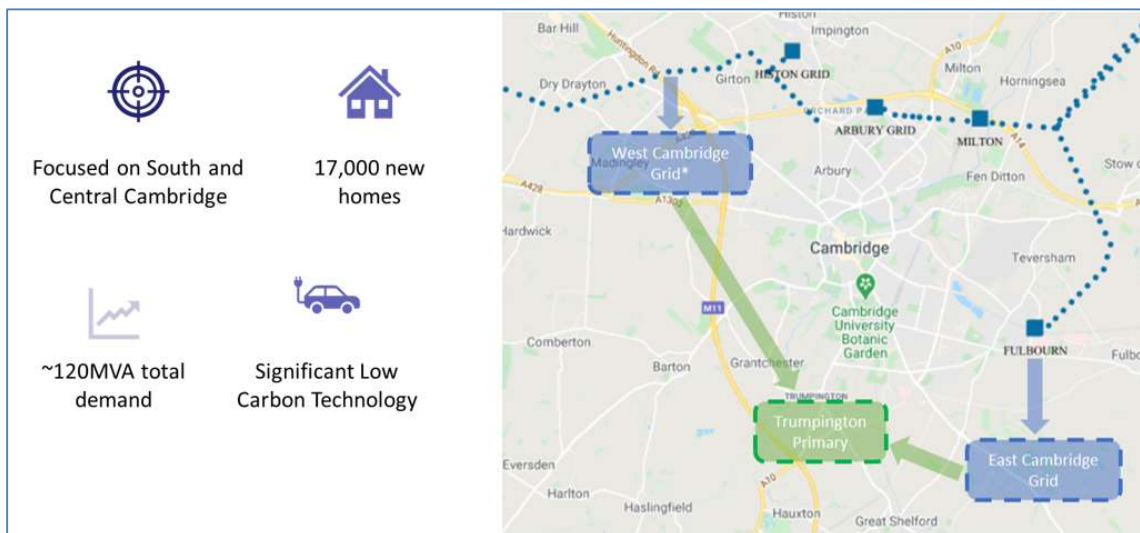


Figure 1.2 Relevant Grid Reinforcements under consideration in this project (NOTE: West Cambridge Grid is not currently recommended to proceed)

2 The Strategic Case

This section is the Strategic Case, which will aim to demonstrate the case for change, and explain how the proposed investment will further the aims and objectives of the organisation.

2.1 Objectives

The proposal put forward in this Outline Business Case is that the GCP should support investment to pro-actively increase the capacity of the electricity grid in the Greater Cambridge area in order to achieve the following objectives:

- To ensure that growth in Greater Cambridge is not delayed due to limitations in the electricity grid and that costs for new connections are not prohibitive; and
- To contribute to a net zero economy by ensuring that there is adequate headroom in the electricity grid to enable the following:
 - take-up of renewable technologies
 - take-up of electric vehicles
 - reductions in dependence on gas for domestic power supply

2.2 The Case for Intervention

In 2018, the Greater Cambridge Partnership's (GCP's) Economy and Environment Working Group commissioned Asset Utilities to undertake a Local Electricity Network analysis study. The key areas of work covered included:

- The types and levels of constraints on the local distribution network in the Greater Cambridge area and how this impacts a) the delivery of housing and jobs and b) opportunities for clean energy projects and the electrification of transport to improve air quality and reduce carbon emissions; and
- The quantification of these impacts on the growth targets and timescales agreed by Government with the GCP as part of the Cambridge City Deal; and
- Identification and recommendation of the most effective interventions that the GCP and partners could facilitate and/or invest in.

The report, produced in Feb 2019, noted that UKPN advised that present demand capacity for Greater Cambridge is 240 MegaWatts (MW). The predicted additional demand, notably driven by the electrification of transport, could almost triple the existing total demand requirement for the Greater Cambridge area from 240MW in 2019 to 710MW by 2031, as illustrated in Figure 2.1.

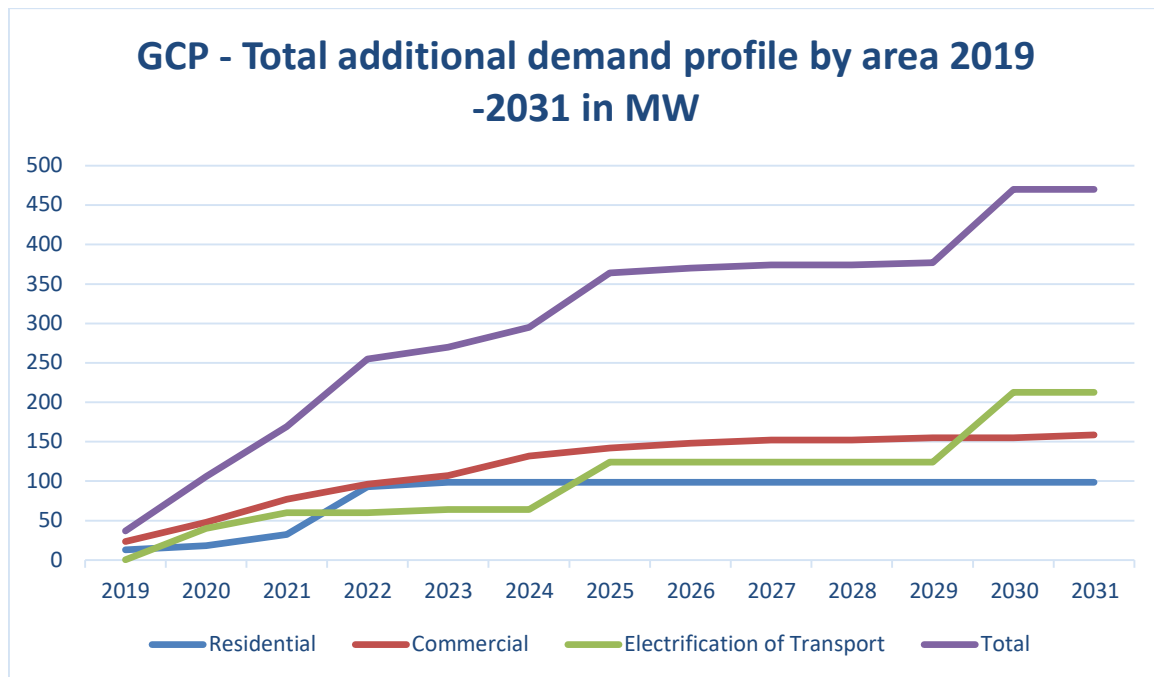


Figure 2.1 The cumulative additional demand profile by area together with the total cumulative demand profile from 2019-2031.

Despite some planned reinforcement works by UKPN detailed in Section 3.1, there remains to be a limited capacity within the existing high voltage (132kV) primary substation network. The problems are particularly acute at Histon, Arbury and Fulbourn grid substations. Power supply from these existing substations is limited by the circuits feeding them and the size of the transformers. The state of the current electricity grid infrastructure means that there are numerous planned private and public sector projects that would be ‘at risk’ of not taking place.

The electricity grid network capacity is also constrained for generation, which means that opportunities to exploit alternative energy sources, such as solar power, cannot be fully realised until capacity is reinforced. The key finding of the report was that “the electricity network as designed, is unable to meet the future electrical demand requirements or the changing face of technology (e.g., electrical vehicle connections) in Greater Cambridge.”

2.3 Demand Forecasts

The demand forecasting used to support this business case includes the Asset Utilities study detailed above in Section 2.2., as well as further analysis undertaken by Roadnight Taylor and WSP (see Appendices 1 and 2). The demand forecasts have all used known planning applications to predict growth in the area and the subsequent additional energy demand capacity necessitated.

Following the Asset Utilities report, the GCP commissioned an engineering feasibility study from UKPN as the local Distribution Network Operator (DNO) with the resulting report produced in October 2019.

The outcome of the feasibility study stated that development to the West and South of Cambridge is currently limited by the absence of high voltage (132kV and 33kV) network infrastructure. The strategic view to support growth in these areas is centred in the extension of the 132kV and 33kV networks between East and West Cambridge. These extensions would provide significant flexibility to offer grid access more widely across the city as and where it might be required in the future.

Furthermore, to add to the demand forecasting the GCP instructed Roadnight Taylor as the supporting technical consultants on the project to conduct some high-level demand analyses to support a formal grid application to UKPN in April 2021, the resultant report is appended as

Appendix 1. Then in June 2021, WSP were contracted to conduct a more detailed demand study which also considered net zero targets and mechanisms to reach them, including the 'degasification' of heating in existing housing through the use of heat pumps. The WSP report is appended as Appendix 2.

All the different demand forecasts compiled to date are based on the residential and commercial developments identified in the planning registers and the Adopted Local Plans. There is a broad consensus around the level of commercial demand, however there was a wide range of assumptions used to determine residential demand. Table 2.1 summarises the different residential demand forecasts undertaken for this project.

Table 2.1 Residential demand analyses conducted to support the development of the Greater Cambridge Electricity Grid Reinforcement project proposal.

Date	Report	Demand Assumptions	Comments
2018	GCP Local Network Analysis (Asset Utilities)	5.5kVA - 10.5kVA per dwelling	4 scenarios considered. 10.5kVA assumes all properties have EV charger + heat pump.
2019	UKPN Feasibility Assessment	3.0 – 3.9kVA per dwelling	Considered Moderate, High, and Gone Green scenarios
2021	GCP Demand Report (Roadnight Taylor)	3.9kVA per dwelling	Corresponds to the "Gone Green" demand growth scenario considered in the UKPN feasibility assessment
2021	Greater Cambridge Demand Report (WSP)	1.4kVA per dwelling	Assumes electrified heating but assumes low level of EV charging demand.
Residential Demand included in Formal Grid Applications:		3.9kVA per dwelling	

2.4 Policy Alignment

As part of the development of the business case, a brief policy review has been undertaken to ensure that the proposed project is aligned with wider policy and strategy.

It is worth noting that the Adopted Local Plans (covering the period 2021 – 2031) have been considered throughout the development of this proposal and the developments included in the plans have formed the basis of much of the demand analysis. At the time of writing, the emerging Local Plan (covering the period 2031 – 2041) was being finalised and has therefore not been included in this Outline Business Case but will be considered at the next stage of the project.

2.4.1 Greater Cambridge City Deal

The proposed investment is consistent with the deal agreed between Central Government and the Greater Cambridge partners which allows Greater Cambridge to maintain and grow its status as a prosperous economic area. The deal is intended, amongst other things to accelerate delivery of 33,480 planned homes and enable the delivery of 1,000 extra new homes in rural areas.

2.4.2 CPCA Independent Economic Review

The findings of the report are consistent with those of the CPCA Independent Economic Review (CPIER 2018) which recognises that the current electricity network is a barrier to growth in two key respects:

- without significant grid reinforcement works to the existing network by UKPN, capacity problems would result across the GCP area; and
- constraints on the grid also severely impact localised generation of clean energy and our ability to install Electric Vehicle (EV) charging.

2.4.3 The Cambridgeshire & Peterborough Local Transport Plan

Creation of grid capacity to serve an increased electric vehicle fleet is also consistent with Objective 10 of The Cambridgeshire & Peterborough Local Transport Plan which states “Reduce emissions to ‘net zero’ by 2050 to minimise the impact of transport and travel on climate change”

The specific policy under Policy Theme 10.1 “Reducing the carbon emissions from travel” is “Reducing emissions by encouraging the uptake of new emissions free technologies and encouraging sustainable alternatives to the private car.”

2.4.4 Adopted Local Plans

The Adopted 2018 Cambridge City Local Plan Policy 29: Renewable and low carbon energy generation states that:

“Proposals for development involving the provision of renewable and/or low carbon energy generation, including community energy projects, will be supported, subject to the acceptability of their wider impacts. As part of such proposals, the following should be demonstrated:

- a. that any adverse impacts on the environment, including local amenity and impacts on the historic environment and the setting of heritage assets, have been minimised as far as possible. These considerations will include air quality concerns, particularly where proposals fall within or close to the air quality management area(s) or areas where air pollution levels are approaching the EU limit values, as well as noise issues associated with certain renewable and low carbon technologies; and
- b. that where any localised adverse environmental effects remain, these are outweighed by the wider environmental, economic or social benefits of the scheme.”

In the South Cambridgeshire Local Plan, Policy CC/2: Renewable and Low Carbon Energy Generation states “Planning permission for proposals to generate energy from renewable and low carbon sources, with the exception of proposals for wind turbines, will be permitted provided that:

- a. The development, and any associated infrastructure, either individually or cumulatively with other developments, does not have unacceptable adverse impacts on heritage assets (including their settings), natural assets, high quality agricultural land, the landscape, or the amenity of nearby residents (visual impact, noise, shadow flicker, odour, fumes, traffic);
- b. The development can be connected efficiently to existing national energy infrastructure, or by direct connection to an associated development or community project, or the energy generated would be used for on-site needs only;

- c. Provision is made for decommissioning once the operation has ceased, including the removal of the facilities and the restoration of the site; and
- d. Developers have engaged effectively with the local community and local authority.”

2.4.5 Cambridgeshire and Peterborough Independent Commission on Climate

The latest report from the Independent Commission titled *Fairness, nature and communities: addressing climate change in Cambridgeshire and Peterborough* (October 2021) includes a recommendation to partner authorities and Local Government bodies around the development of a local area energy plan.

The report focuses on energy because of its role in the electrification and decarbonisation of transport and buildings. Specifically, the report recommends:

- Developing local energy plans, working with stakeholders, to have a key role in preparing for decarbonisation
- Embracing the full range of economic and business opportunities arising from the transition to net zero
- The creation of green jobs linked to energy (EV, renewables etc.)
- Using Local Government purchasing power in the form of green innovation

2.5 The Case for Public Funding

Utility providers have a statutory duty to deliver required upgrades and reinforcements within their networks to support the delivery of growth. However, they are regulated by Ofgem and constrained to operate reactively to demand. They are only able to commit to designing upgrades on their networks when outline planning consent is available, and they have been approached by developers and are certain that that development will come forward to avoid the risk of ‘stranded’ assets. This can create significant delays for housing and commercial developments as it can take several years to deliver power infrastructure, thereby delaying growth, renewables projects and the electrification of transport. This challenge is not unique to Greater Cambridge and other ‘high-growth’ areas face the same issues.

If the GCP does not support intervention then grid capacity enhancements will proceed at a slower pace and will be dependent on the outcome of UKPN’s negotiations with Ofgem as part of the Price Control Review Period, known as RIIO ED-2 (2023 – 2028). It is not anticipated that public funding would be used in the event that UKPN are granted funding within their RIIO ED-2 settlement, but any works on the substations could not start until 2023 at the earliest. Until that time, without investment, any single developer who applies for a connection at the point where capacity is not available would be quoted for the full cost of reinforcement, which can have a significant impact on development viability.

To balance the risk of delay against the risk of public funding being used in place of the established DNO funding mechanism, GCP will progress only the initial design, and planning feasibility works until the final outcome of UKPN’s funding negotiations with Ofgem is complete. This is considered to be the least regret option, as it minimises at risk investment, without delaying the energisation of the substations.

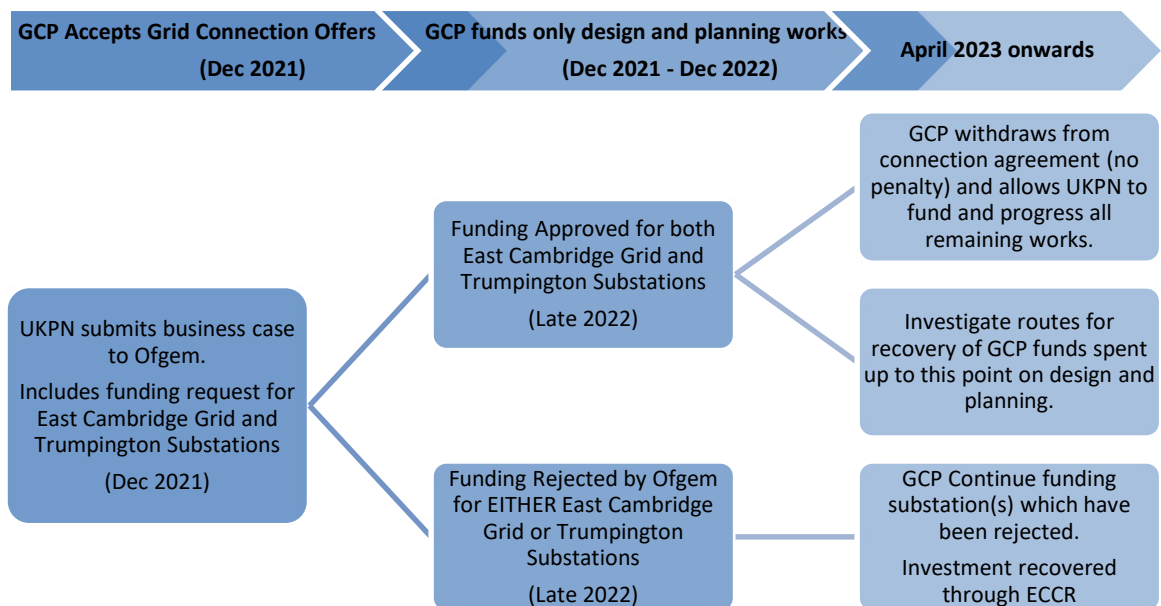


Figure 2.2 Least Regret Path to balance risk of delay against risk of public funding replacing DNO funding

A coordinated approach to transform the local energy network is required across a range of public and private organisations to help protect the delivery of; future residential developments, commercial developments and the associated job creation, electric vehicle charging infrastructure to support the electrification of transport, and renewable energy generation projects. Without intervention the network might become a constraint for projects which will contribute to achieving net zero carbon goals.

The partner councils of the GCP have all issued a Climate Emergency Declaration² and have put forward their own climate change strategies and targets. The electrification of transport and similar goals put forward in these strategies will require enhancements to the current electricity grid network and capacity. The proposal to forward-fund reinforcements to the Greater Cambridge electricity network aligns with the wider ambitions to tackle climate change, and also provides an opportunity for the GCP to become a leading authority in creating a Green Economy.

The grid reinforcement works proposed align well with the GCP objectives to enable economic growth, accelerate housing developments and to support the electrification of transport. This project proposal is centred on addressing an identified barrier to growth, the current energy grid capacity, which will impact developments within the Adopted Local Plans (2021-2031) and has the possibility to also support developments within the Emerging Local Plan (2031 – 2041). Sections 3, 4 and 5 of this business case outline potential commercial and funding options in more detail which might allow a shared approach to funding whilst achieving a degree of risk transference.

2.6 The Impact of No Intervention (“Do Nothing” Scenario)

Without intervention by GCP, it would be left to UKPN as the DNO to build a case in their business plan for the next regulatory price control period for investment in Cambridge East and Trumpington.

As previously mentioned in Section 1.1, there is currently a price control review period underway, with DNOs required to submit their final business plans on 1 December 2021 for the next price control period, known as RIIO ED-2 (2023 - 2028). Throughout 2021, the GCP has lobbied UKPN to include the reinforcement works identified as critical for the Greater Cambridge area within its business plan for RIIO ED-2.

UKPN's potential investment in these scheme's is dependent on Ofgem's decision on the funding settlement for the RIIO ED2 regulatory price control period which covers investment from 2023-2028. The outcome of this process will not be known until the end of 2022. Even if funding is

awarded, delivery cannot start until 2023, but could be as late as 2028. This would result in a 2-to-7-year delay in the substations being energised and able to accept connections.

Such a delay will have a significant impact on growth in South Cambridge. These areas are already grid constrained, and most new developments will be unable to proceed until the substations are energised. Without pro-active investment by GCP therefore, the schemes detailed in Table 2.2. would be significantly delayed due to grid connection timeframes.

As well as the developments identified in Table 2.2., there are possibly developments in the Emerging Local Plan (2031 – 2041) which will be similarly impacted by the lack of energy infrastructure and demand capacity, though these developments have not yet been considered within this project proposal.

It is also worth considering that although the benefits in Table 2.2. are summarised in terms of new homes and commercial or R&D floorspace, there are further benefits which are harder to quantify including the creation of new jobs from these developments when they go ahead, and possible carbon savings achieved by enabling renewable energy and net carbon zero-centred projects to go ahead. Furthermore, amongst the Cambridge Biomedical Campus developments are proposals for new hospitals which will serve Cambridgeshire residents and the wider region, but which will require significant improvements to the current energy infrastructure in order to go ahead.

Table 2.2 Summary of the planned developments in the Adopted Local Plans and/or the Planning Register, and which grid substation they are dependent on.

Development	Planning Ref	Benefits	Dependent on
Fen Ditton – Cambridgeshire East	S/2682/13/OL & S/1096/19/RM	1400 new homes	Cambridge East
Station Area & Mill Road	LocalPlan/M2 LocalPlan/M14 LocalPlan/M44	1600 new homes	Cambridge East
Worts Causeway	LocalPlan/GB1 & 2	430 new homes	Cambridge East
Trumpington Housing	S/0054/08/O & LocalPlan/R42b	700 new homes	Trumpington + Cambridge East
Granta Park Phase 2	S/01110/15	34,000 sqm of R&D floorspace	Cambridge East
Plot 1000 Discovery Drive (Part of CBC expansion)	C/00176/16	75,000 sqm of R&D and Clinical floorspace	Cambridge East
Biomedical Campus Extension	S/LocalPlan/E2	30,000 sqm of R&D floorspace	Trumpington + Cambridge East
Land South of Addenbrooke's Campus	C/00796/06	13,000 sqm of R&D floorspace 63,000 sqm of Clinical floorspace	Trumpington + Cambridge East
Total <i>Including smaller developments</i>		5,700 new homes 270,000+ sqm of new R&D, Clinical and Commercial floorspace	

3 The Economic Case

This section contains the Economic Case for the Electricity Grid Reinforcements project which includes an options appraisal to identify their impacts, costs, and benefits.

For the purposes of the Outline Business Case the benefits have been assessed in terms of new homes and commercial developments enabled, however it is important to note that there may be further environmental co-benefits of delivering the project, such as carbon savings. It is proposed that further work to assess the potential carbon savings is undertaken at the Full Business Case stage.

3.1 Long-Listed Options

Both UKPN and independent consultants Asset Utilities have undertaken previous feasibility studies in 2018-19 which outlined a long list of possible interventions to address grid capacity issues in the Cambridgeshire network. These are summarised in Table below.

Table 3.1 – Long List of Grid Interventions, with GCP Short-listed options highlighted.

Grid Reinforcements Identified		Current Status
A	Madingley Road primary transformer upgrade	Completed
B	Fulbourn Grid 33kV switchgear replacement	Due for completion 2022
C	Histon - Longstanton 33kV circuit upgrade	Completed
D	Fulbourn – Sawston 33kV circuit upgrade	Due for completion 2022
E	Histon new 132kV/33kV transformer + 33kV switchboard	Due for completion 2023
F	Replacement of Burwell Local Grid transformers	Due for completion 2024
G	Creation of East Cambridge Grid	Recommended in UKPN Feasibility Study but no UKPN funding allocated
H	Creation of Granta Park Primary	Subject to connections activity in this area – funding proposed in 2023-2028 regulatory period.
I	Creation of Trumpington Primary	Recommended in UKPN Feasibility Study but no UKPN funding allocated yet
J	Creation of West Cambridge Grid	Recommended in UKPN feasibility study, but not until 2028, subject to connections activity in this area.
K	Madingley Road Primary upgrade works	Not required until ~2029
L	Establishment of new Madingley Road – St Anthony Street interconnectors	Not required until ~2030

A number of these project have already been progressed by UKPN, whereas others have been deemed unnecessary at present. East Cambridge Grid, Trumpington Primary, and West Cambridge Grid were shortlisted as schemes required to unlock critical grid capacity withing Greater Cambridge, but which have not been allocated funding by UKPN.

At present these schemes will not be progressed unless forward funded by an external party, such as GCP. A summary of each scheme is presented in Table 3.2.

Table 3.2. Summary of each short-listed grid substation scheme.

<p>East Cambridge Grid</p> <p>A new 132/33kV grid substation around the Babraham Road area.</p> <p>High level scope:</p> <ul style="list-style-type: none"> • New grid substation with one 45/90 MVA transformer • 132kV switching (“transformer swinger”) arrangement at Fulbourn Grid • 4km of 132kV cable from Fulbourn Grid to the new grid site • 33kV switchboard with nine panels initially (2 transformers, 1 bus section, 6 feeders) <p>Anticipated cost to deliver (provisional): £11.5m to £12.5m</p>
<p>Trumpington Primary</p> <p>A new primary substation is proposed in the west side of Cambridge (Trumpington), with two 33/11kV transformers and a new 11kV switchboard. The primary substation will be supplied from Cambridge East Grid substation and will form part of the “Bourn 33kV ring”.</p> <p>This scheme is dependent on Cambridge East Grid being completed.</p> <p>High level scope:</p> <ul style="list-style-type: none"> • New primary substation, with two 24 MVA 33/11kV transformers and a new 10 panel 11kV switchboard (2 transformers, 1 bus section, 7 feeders) • approx. 5km (2x 2.5km) of 33kV cable + jointing to loop in and out of the “Bourn 33kV ring” • a five panel 33kV switchboard at Trumpington Primary • approx. 6.2km of dual 33kV cable from East Cambridge Grid to Trumpington via Addenbrookes (2km from East Cambridge to Addenbrookes and 4.2 km from Addenbrookes to Trumpington) • two three panel 33kV boards at Addenbrookes Primary. <p>Anticipated cost to deliver (provisional): £10.5m to £11.5m</p>
<p>West Cambridge Grid</p> <p>A new grid substation is proposed south of the A428/A14/M11 junction, with two 132kV/33kV transformers. The 132kV network will be extended south from the overhead circuits between Histon and Little Barford (PT route). The new grid substation will break the existing “Bourn 33kV ring”, creating three independent feeders from the new 33kV switchboard. West Cambridge Grid will unlock capacity in the western side of Cambridge, strengthen the interconnection with the network supplied by Little Barford and enhance the interconnection capability with the “Fulbourn/East Cambridge Grid” group.</p> <p>High level scope:</p>

- New grid substation with two 132kV/33kV 90 MVA transformers
- 132kV tee + inline circuit breakers at the tee point on the PT route
- approx. 7km of dual 132kV cable from the tee point to West Cambridge Grid
- 33kV switchboard with seven panels initially (2 transformers, 1 bus section, 4 feeders)
- Break the “Bourn 33kV ring” tee point and extend the three circuits to circuit breakers at West Cambridge Grid (approx. 500 meters each)

Anticipated cost to deliver (provisional): **£19.1m to £20.1m**

3.2 Short-Listed Options

The short list of options available to GCP has been shaped further by consideration of the timeframes within which each grid intervention is required before growth is constrained in a particular area. Cambridge West Grid has not been included in the short-listed options within this business case, due to uncertainty over the timeframe of the University’s North-East developments. This scheme could be progressed separately in future once there is more information available regarding the timeframes.

The following short-listed options are described below and the costs and benefits of each are assessed:

- Option 1: Do Nothing
- Option 2: GCP fund the delivery of Cambridge East Grid and Trumpington Primary
- Option 3: GCP fund the delivery of Cambridge East Grid only

3.2.1 Cost/Benefit Appraisal

The cost of delivering each option has been estimated and is presented in Table 3.3 below. These are initial estimates only and are based on UKPN delivery the works in option 2 and option 3 (alternative delivery routes are considered in section 4.1). It is important to note that the costs may vary from those presented here once the project progresses to detailed design.

Table 3.3. – Initial estimate of net capital costs for each short-listed option

Cost Estimates	Option 1: Do Nothing	Option 2: East Grid and Trumpington	Option 3: East Grid only
Grid Costs (UKPN)	n/a	£22,500k	£11,500k
Land Costs	n/a	£500k	£270k
GCP Management costs	n/a	£550k	£330k
TOTAL	£0	£23.5m	£12.1m

The primary benefit and purpose of this investment is the potential to unlock housing and commercial growth which is currently restricted due to the lack of grid capacity in the south Cambridge area. For each option, this has been quantified in terms of numbers of new homes and employment floorspace, as well as low carbon transport enablers in Table 3.4.4.

Table 3.4. – Growth Benefits from each short-listed option

Growth Enabled	Option 1: Do Nothing	Option 2: East Grid and Trumpington	Option 3: East Grid only
New Homes	n/a	5,700 new homes	5,000 new homes
New Employment Floorspace	n/a	270,000m ²	110,000m ²
Low Carbon Transport	n/a	1700 new EV charge points	1500 new EV charge points

In addition to the primary benefit of enabling new homes and employment, there is also the potential to recover back the investment, as new demand connects. The investment recovery is discussed more in Sections 4 and 5 of this report but summarised here in Table 3.5. in order to capture the full benefits.

Table 3.5. – Cost Benefit Evaluation of each short-listed option

	Option 1: Do Nothing	Option 2: East Grid and Trumpington	Option 3: East Grid only
Capital Costs	£0	£23.5m	£12.1m
New Grid Capacity Created	None	69-114 MVA*	45-90 MVA*
Capacity Reserved for GCP Developments	None	61 MVA	41 MVA
Growth Enabled/Accelerated	None	5700 New Homes + 270,000m ² Employment Space	5000 New Homes + 110,000m ² Employment Space
Future Revenues (Via ECCR Recovery**)	N/A	~ £20.5M***	~£10.4M
<p>* Depends on detailed design and transformer ratings</p> <p>** Subject to actual growth uptake</p> <p>*** Also subject to regulatory review if ECCR legislation is amended</p>			

There are also environmental co-benefits of enhancing the energy grid infrastructure in Greater Cambridge sooner rather than later, as the added grid capacity will enable further development of schemes involving electric vehicle charging and 'degasification' or the electrification of heating within existing housing. Further work to assess these benefits in full, including the influence on the local carbon budget, is proposed at the Full Business Case stage.

3.2.2 Preferred Option

Based on the initial cost/benefit appraisal, the preferred option of the short-listed options outlined in Section 3.2 above is Option 2 where both Cambridge East Grid and Trumpington Primary are delivered to maximise the possible benefits and minimise the risk of the GCP being asked to undertake such an intervention again in the near future. At this stage, there is an indication that preferred delivery route for this option is via UKPN as the local DNO, but there are other options available to the GCP and these are discussed in Section 4.2.

4 The Commercial Case

This section is the Commercial Case which aims to provide evidence on the commercial viability of a proposal and the procurement strategy that is used to engage the market.

4.1 UKPN Grid Connections Offers

In August 2021, the GCP received formal “Grid Connection Offers” from UK Power Networks (UKPN) as the Distribution Network Operator (DNO) for the Greater Cambridge area. These ‘Offers’ form the basis of the Commercial Case as it is the DNO who determines the works required to create the required grid capacity. This is true for all potential delivery routes.

The connection offer for Cambridge East Grid is summarised in Table 4.1 and the connection offer for Trumpington Primary is summarised in Table 4.2.

Table 4.1 Cambridge East Grid Connection Offer Summary

Name and Reference of Offer	GCP Cambridge East Project CB22 3AB UKPN Reference Number: 8600022405	
Name of Contracted Party	Cambridgeshire County Council	
Connection Offer Date	05 th August 2021	
Connection Offer Expiry Date	14 th December 2021	
Total Capacity Secured	41,000kVA of demand capacity, including an initial 500kVA connection. The remainder of the 41,000kVA of capacity is reserved for a period of 10 years and effectively “ring-fenced” for developments that fulfil the objectives of the GCP.	
Point of Connection & connection arrangement	The new Cambridge East Grid substation will be connected to Fulbourn Grid at 132kV. An initial 500kVA connection at Babraham Park and Ride will be connection to the local 11kV network supplied from Radnor Primary. This initial connection will be facilitated by the capacity created at the East Grid capacity and will allow UKPN to apply the ECCR recovery mechanism to the costs of this scheme.	
Total Budget Connection Costs <i>Subject to detailed design and procurement process</i>	Option A: (UKPN delivers all works) £11,495k + VAT	Option B/C: (UKPN delivers only the Non-Contestable works, an independent contractor delivers the remainder) £3,258k + VAT + ICP costs (see Figure 4.2.)
Acceptance Cost	A deposit of £100k+VAT is required upon acceptance of the UKPN Offer. This will cover the early stages of design and feasibility work. An additional payment will be required to prior to detailed design.	
Connection Timescale	UKPN have indicated the connection works should be completed on or before 30 th June 2025. This is an indicative date only.	

Table 4.2: Trumpington Primary Connection Offer Summary

Name and Reference of Offer	Offer Letter - GCP Trumpington Project CB2 9FT UKPN Reference Number: 8600022404	
Name of Contracted Party	Cambridgeshire County Council	
Connection Offer Date	05 th August 2021	
Connection Offer Expiry Date	14 th December 2021	
Total Capacity Secured	20,000kVA of demand capacity, including an initial 500kVA connection. The remainder of the 20,000kVA of capacity is reserved for a period of 10 years and effectively “ring-fenced” for developments that fulfil the objectives of the GCP.	
Point of Connection & connection arrangement	The new Trumpington Primary substation will be connected to the new Cambridge East Grid substation, as well as the existing UKPN 33kV network. The initial 500kVA connection will be fed directly from Trumpington primary substation.	
Total Budget Connection Costs <i>Subject to detailed design and procurement process</i>	Option A: (UKPN delivers all works) £11,002k + VAT	Option B/C: (UKPN delivers only the Non-Contestable works, an independent contractor delivers the remainder) £333k + VAT + ICP costs (see Figure 4.2.)
Acceptance Cost	A deposit of £100k+VAT is required upon acceptance of the UKPN Offer. This will cover the early stages of design and feasibility work. An additional payment will be required to prior to detailed design.	
Connection Timescale	UKPN have indicated the connection works should be completed on or before 31 st October 2025. This is an indicative date only.	

4.2 Procurement and Delivery Options

For the Electricity Grid Reinforcement project, there are various aspects of the works involved which may require different procurement or delivery strategies. This section aims to explain the breakdown of the works involved and the delivery route options available.

4.2.1 Contestable and Non-Contestable Works

The Connection Offers received from UKPN for both substations are split down into contestable elements (the “Contestable Works”) and non-contestable elements (the “Non-Contestable Works”) as defined in Figure 4.1.

Non-Contestable Works

Can only be completed by UK Power Networks. Includes:

- Final connection onto UKPN existing network
- Upstream reinforcement (where applicable)

Contestable Works

Can be completed by either **UKPN** or an **ICP**.

Can be adopted by either **UKPN** or an **IDNO**.

Includes:

- All customer driven works downstream of a suitable point of isolation

Figure 4.1 Definitions of contestable works and non-contestable works

Figure 4.2. outlines the split between the Contestable Works and the Non-Contestable Works, as set out in the UKPN connection offers for Trumpington and Cambridge East. Most of the works are classed as contestable and can be completed by either UKPN or an ICP. Of the total £22.5m estimate from UKPN for both substations, approximately £19m is contestable.

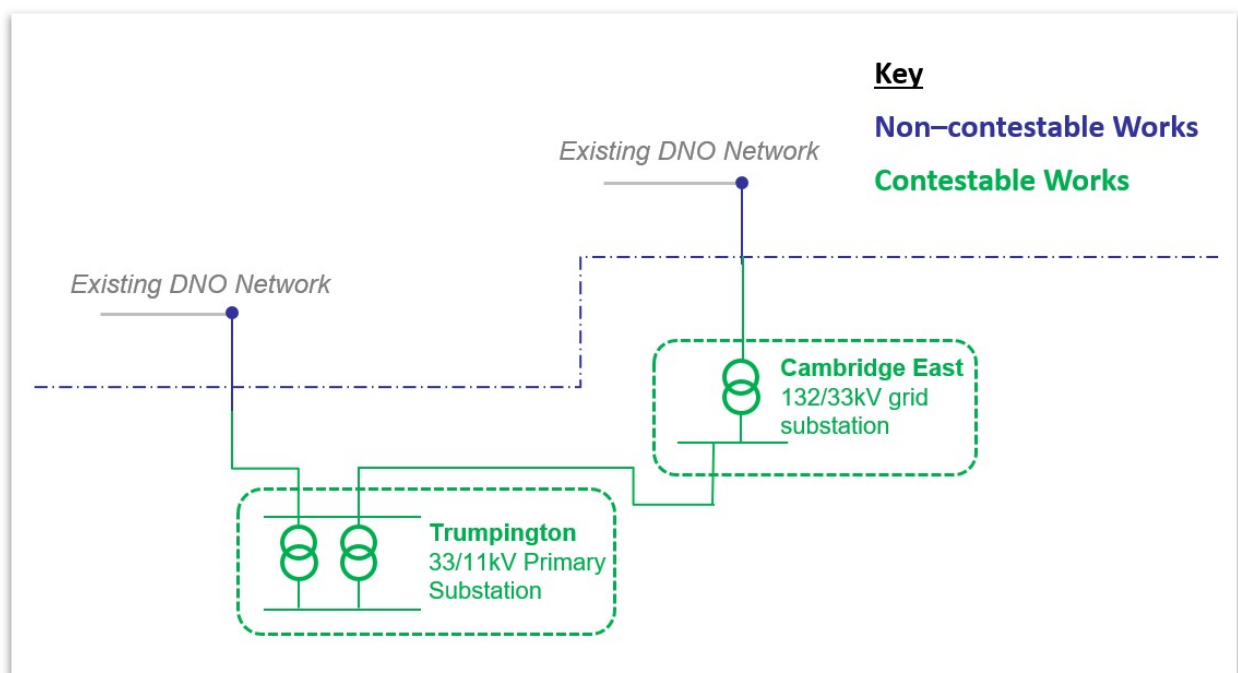


Figure 4.2 Schematic showing scope of Contestable and Non-Contestable works for Cambridge East and Trumpington substations.

What's an ICP? An Independent Connections Provider is a private company who is suitably accredited to build new electricity network assets to the DNO's standards. A list of accredited companies is held by the Lloyds Register (<https://www.lr.org/en-gb/utilities/ners/search/>)

What's an IDNO? An Independent Distribution Network Operator is also an accredited company that can own, maintain, and operate new electricity networks once they are complete. IDNOs are licensed by Ofgem and must meet many of the same standards of performance as the DNO. IDNOs do not usually construct assets themselves but will adopt assets built by an **ICP**.

4.2.2 Delivery Options

GCP has considered the following delivery options in relation to the Connection Offer:

OPTION 1: UKPN delivers ALL works (i.e., both the Non-Contestable Works and the Contestable Works). This is illustrated in Figure 4.3.

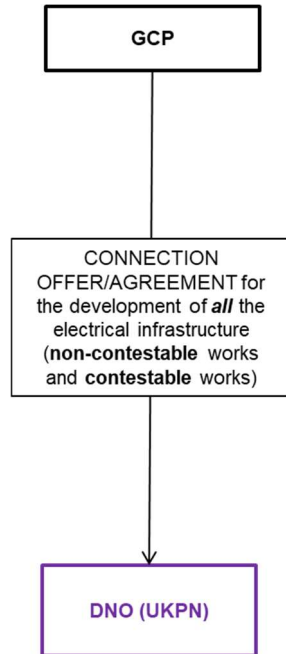


Figure 4.3 Diagram representing the DNO delivery route

OPTION 2: UKPN delivers the Non-Contestable Works and an ICP undertakes the Contestable Works, which UKPN adopts upon completion (via the Adoption Agreement). This is illustrated in Figure 4.4.

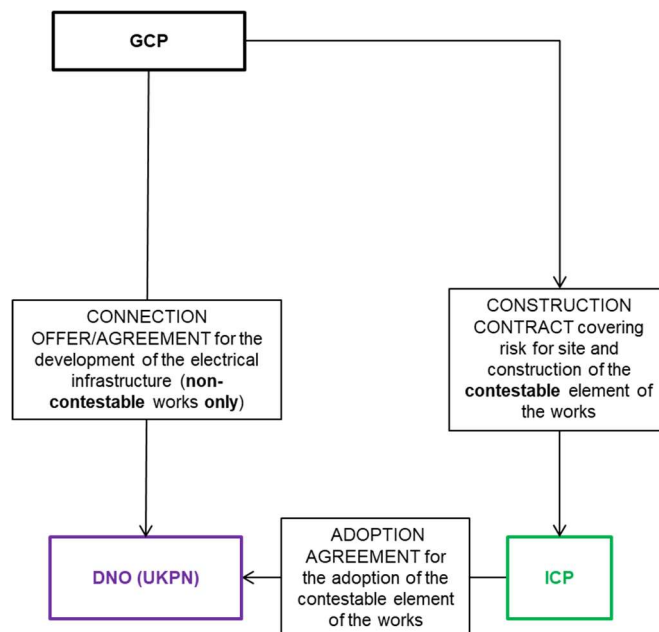


Figure 4.4 Diagram representing the DNO and ICP delivery route.

OPTION 3: UKPN delivers the Non-Contestable Works and an ICP undertakes the Contestable Works, which an IDNO adopts upon completion (via the Adoption Agreement). A Bilateral Agreement would be entered into between the IDNO and UKPN in respect of the interface between the Contestable Works and the Non-Contestable Works. This is illustrated in Figure 4.5.

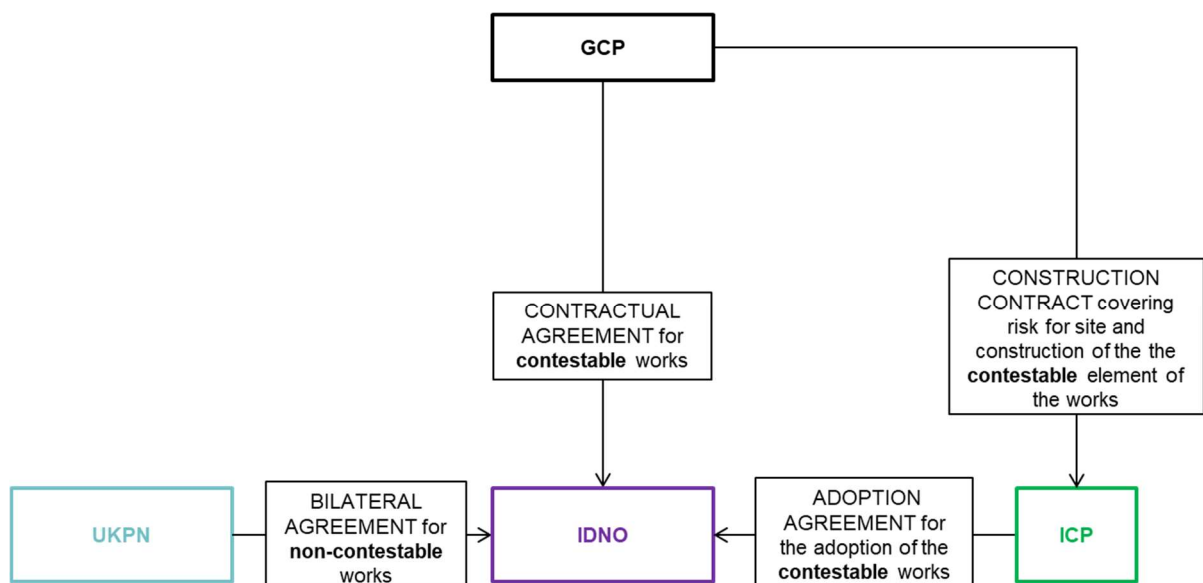


Figure 4.5 Diagram representing the DNO, ICP and IDNO delivery route.

They key risks associated with each option are outlined in Table 4.3 below. Generally, the Option 1 (DNO-only) delivery route offers the lowest delivery risk on the basis that a DNO is a highly regulated entity.

However, for both Option 1 and Option 2 (where the assets constructed by the ICP are ultimately adopted by the DNO), there is no design flexibility or operational flexibility, given that the DNO is very restricted in the assets that it is permitted to adopt and operate under its licence conditions.

Alternatively, Option 3 and the use of an ICP and IDNO in combination can offer much greater flexibility in these areas, with IDNOs typically adopting connection works with more innovative design elements adapted to the customer's specific needs. Given the more complex contractual structure required for an ICP and IDNO connection, there is an increased delivery risk for this option.

In considering the options, the GCP should note that ICPs are often considered a more competitively priced route than a DNO-only approach. However, the cost savings in utilising an ICP are often diminished in the need to obtain legal and technical advice in drafting and undertaking the procurement of the ICP, and there is no guarantee that a saving will be made.

The DNO will often outsource the works to an ICP, where this is the case and because the DNO is a regulated utility and subject to procurement restrictions, the DNO will have procured this ICP as part of a broader procurement competition to obtain best price in its construction and supply chain delivery, therefore the GCP would obtain the benefit of the procured position which UKPN has achieved in the marketplace. Under the DNO's distribution licence, it is also legally obliged to (a) offer the lowest cost connection scheme and (b) charge only a statutory 4% margin on all costs. This gives comfort that GCP would be achieving value for money if it decided to pursue Option 1. In practice, a local authority will often have the contestable works carried out by the DNO and appoint a consultant to contract manage the costs on an open book basis to ensure transparency.

Table 4.3 Summary of the risks for each delivery route.

Delivery Route	Delivery Risk	Cost Risk	Design Flexibility	Operational Flexibility
DNO only UKPN Deliver ALL works	Low	Medium		
DNO + ICP <ul style="list-style-type: none"> UKPN builds N/C works ICP builds contestable works. UKPN adopts all works 	Medium	Medium		
ICP + IDNO <ul style="list-style-type: none"> UKPN builds N/C works ICP builds contestable works. IDNO adopts contestable works 	Medium / High	Medium		

4.2.3 Procurement Options

As a contracting authority, GCP is required by the Public Contracts Regulations 2015 (PCR) (or the Utilities Contracts Regulations 2016 (UCR), if applicable) (collectively, the Regulations) to put out to tender public works contracts valued above £4,733,252, unless an exemption applies under the Regulations.

4.2.3.1. Non-Contestable Works

A direct award would be justifiable (under Regulation 32(2)(b)(ii) PCR or Regulation 50(1)(c)(ii) UCR) where the public works contract can only be carried out by a particular economic operator because “competition is absent for technical reasons”. As UKPN is the incumbent Distribution Network Operator (DNO) for Greater Cambridge, due to statutory restrictions and licence requirements, it is the only economic operator that is permitted to carry out the Non-Contestable Works. On that basis, the GCP should be able to award a contract for the Non-Contestable Works to UKPN without having to carry out a competitive tender process under the Regulations. Officers from the GCP will work closely with Cambridgeshire County Council colleagues in the procurement team to ensure this can be delivered in this way.

4.2.3.2. Contestable Works

The contestable element of the Works can be opened up to competition and could be undertaken by an ICP either:

- to the design of the DNO, in which case the works could be adopted by UKPN after commissioning; or
- to the relevant design of an independent DNO (IDNO) for adoption by the IDNO upon completion.

On that basis, it would not be possible to make an argument that competition is absent for technical reasons for the purpose of the test in Regulation 32(2)(b)(ii). Noting that the value of the Contestable Works component in respect of both the Trumpington and Cambridge East projects exceeds the financial threshold of £4,733,252, the Regulations require that the contract(s) be opened up to competition in accordance with rules set out in the Regulations.

However, if the GCP wishes to use only UKPN as the DNO, then the works may be covered under the exemption in Article 34 of the UCR, which provides an exemption from the UCR for contracts which are “intended to enable those entities to carry out electricity generation or electricity supply in England, Scotland and Wales”.

For the avoidance of doubt, running a light-touch (i.e., non-regulated) tender process which does not comply with the requirements of the Regulations (e.g., the requirement to publish the opportunity on Find a Tender and to adhere to the rules of a valid tender procedure as set out in the Regulations), would not be sufficient to discharge GCP's obligations under the Regulations (even if the light-touch process does help to demonstrate that GCP is achieving value for money).

If the contract(s) is not awarded in accordance with the Regulations, there is a risk of an aggrieved party bringing an action seeking to have the contract(s) declared "ineffective" – if the Court were to make such a declaration, this would have the effect of terminating the parties' respective rights and obligations under the contract from the time of the decision. The Court would also impose a civil financial penalty on the GCP, and it may make an order dealing with the respective rights and obligations of the parties (unless GCP and the contractor in question have entered into an agreement before the declaration of ineffectiveness which deals with such matters).

A challenge seeking a declaration of ineffectiveness can be brought at any time within six months of the date following the day on which the contract is signed. Whilst a challenger might also seek damages (normally within 30 days of actual or constructive knowledge of the breach of the Regulations), in any such action it would be relatively difficult for a challenger to succeed given that it would have to overcome the very challenging obstacles of demonstrating that it would have had a real chance of being awarded the contract if a tender process had been carried out. In practical terms, the risk of a challenge brought by an aggrieved party is likely to be low. This is principally because the market of ICPs capable of carrying out the work required at 132kV, 33kV and 11kV at Trumpington and Cambridge East is small.

4.3 Initial Market Testing

In supporting the analysis of the procurement options outlined above in Section 4.2.3, an initial market testing exercise was undertaken to enable a preliminary assessment of the competitive market.

4.3.1 Independent Connection Provider (ICP) Market Analysis

As discussed in the Section 4.1, the GCP has the option to consider having the "contestable works" constructed by an ICP instead of UKPN as the DNO. Therefore, to compare the expected costs of the two possible routes a market testing exercise was conducted with several ICPs. A full summary of the market testing is included as Appendix 3.

Table 4.4 Summary of the cost estimates from the ICP market testing exercise.

Metric	East Grid Cost Estimate	Trumpington Cost Estimate
Highest Estimate	£ 12,325,834.00	£ 12,325,834.00
Lowest Estimate	£ 5,569,119.00	£ 5,735,520.00
Range	£ 6,756,715.00	£ 6,168,077.00
Mean Average	£ 8,254,140.60	£ 8,333,822.20
Average + UKPN Costs	£ 10,968,146.78	£ 8,666,541.85

There were 21 companies asked to participate in the market test, with indicative cost estimates provided by total of 8 companies. Of these 8 companies, only 5 cost estimates were reviewed as accurate by the supporting consultants and these 5 estimates have been used for the purposes of comparing the construction costs with the UKPN offers. A summary of the results is provided

in Table 4.2. The “non-contestable works” which must be constructed by UKPN, have been factored into the calculation in the final row. It is important to note that the figures in Table 4.2 account for the direct construction costs only, and do not consider project management time, land acquisition or other costs which have been analysed in Section 3.2.

4.3.2 Independent Distribution Network Operator (IDNO) Market Analysis

Market testing was also conducted with IDNOs to assess capabilities within the market to handle the proposed project instead of UKPN. The initial market testing exercise generated responses from 2 companies only, indicating that there may not be the necessary capability within the market. A further exercise would be needed to confirm the initial findings.

Unlike the ICP market testing exercise, the IDNO market testing exercise does not have an impact of the capital costs of the project. However, the IDNO is able to make an Asset Value (AV) contribution which is explained further in Section 4.4.2.

Appendix 3 provides the full summary of the soft market testing exercise carried out.

4.4 Cost Recovery Strategies

There are two principal options for GCP to recover its investment in the reinforcement of the grid at Trumpington and Cambridge East. The two options are summarised in Figure 4.6.

The first and primary option is provided by a piece of regulation called The Electricity (Connection Charges) Regulations 2017 (ECCR). This is also referred to as the Second Comer Regime and is described in Section 4.4.1.

The second option is an Asset Value (AV) payment mechanism which is described in Section 4.4.2.

4.4.1 Electricity (Connection Charges) Regulation (ECCR)

The ECCR was brought into force in order to ensure that there is a fair sharing of costs between a party (Party A) who pays to upgrade and reinforce the electricity network, and those who subsequently connect to and benefit from it. It provides that subsequent connectees must reimburse Party A with a fair proportion of the costs that were originally incurred by Party A to reinforce the network.

The ECCR applies to DNOs and IDNOs equally. Subsequent connectees are required to make a reimbursement payment to Party A for a period of 10 years from the date of Party A's initial connection.

It is the responsibility of the DNO, in this case UKPN, or, if applicable, the IDNO who adopts the network, to administer the ECCR payments. Appropriate reimbursement costs are added to the Connection Offers received by subsequent connectees when they apply to connect to the network. These costs are then passed through to the first connectee, in this case GCP, by UKPN (or the IDNO), typically net of a small administration fee.

It is important to note that Party A cannot profit from the reinforcement or ‘over recover’ its initial costs in reinforcing the network via the ECCR. Reimbursement payments will therefore cease once those costs have been fully recovered. Similarly, the GCP's role in ECCR recovery is purely passive, as it receives payment via the DNO or IDNO and is not responsible for calculating or recovering those payments, which is done by the DNO or IDNO in accordance with the then-current legislation.

The capacity granted to the GCP under the connection offer is for infrastructure capacity only, and it is not possible for the GCP to sell or grant capacity to a developer, as the grid connection regime is heavily regulated and the authority to grant capacity sits solely with the DNO. Whilst in theory GCP could enter into contractual arrangements with developers to allow them to “reserve”

part of that infrastructure capacity to be used for a future end connection to a development, developers are not incentivised at this early stage to enter into such arrangements when the ECCR exists to allow subsequent connections in return for payment of a fair proportion of the reinforcement costs. GCP would therefore find it difficult to contract with developers to require them to pay more than what is deemed their “fair share” under the current legislation.

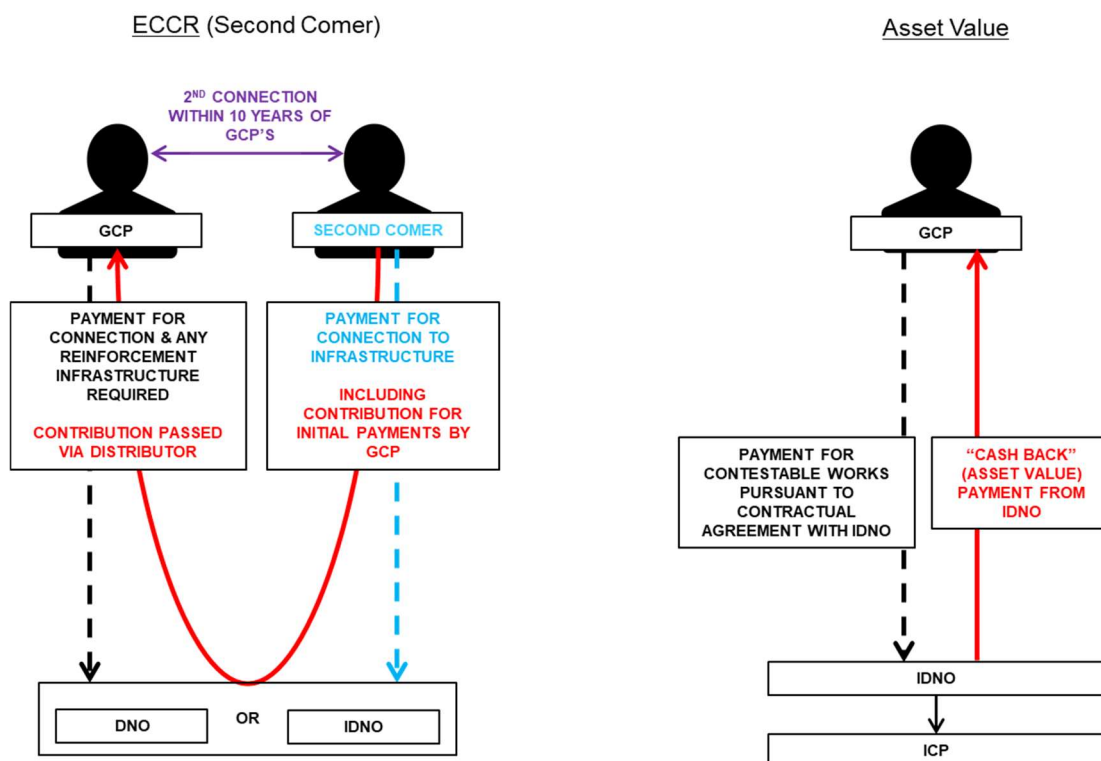


Figure 4.6 Diagram comparing Connection Charges and Asset Value Payments.

The ECCR is currently the subject of a consultation by Ofgem in relation to proposed amendments to the legislation. Please see Section 6.5.2 (Financial Risks) for more details.

Asset Value (AV) payments are *only* available if the GCP opts for an IDNO to adopt the assets at Trumpington and/or Cambridge East. DNOs, including UKPN, will not offer an AV payment, therefore the AV payment option is only available to the GCP if it chooses delivery route option 3 with an IDNO adopting and operating the infrastructure.

An AV payment is a capital contribution to the cost of the network infrastructure adopted by the IDNO. The AV payment is typically paid as metered connections are energised (unlike an ECCR payment which is made at the point of connection) although this can vary, and it is possible for an AV payment to be a lump sum paid upfront.

The AV payment is typically paid to the ICP and is then factored into the ICP’s offer to design and build the network. Alternatively, and depending on when the IDNO was appointed, the AV payment may be made directly to the GCP. Table 4.5 provides an indication of the amount of AV payment that may be offered by an IDNO (for non-gas-heated residential dwellings). Industrial or commercial connections have not been taken into account here, however they would also give rise to AV payments.

Table 4.5 Summary of possible AV payments for different types of dwelling.

	132kV PoC	33kV PoC
1 bed flat	£480 ea	£460 ea
2 bed flat	£570 ea	£550 ea
2 bed terrace house	£590 ea	£570 ea
3 bed semi-detached house	£770 ea	£740 ea
4 bed detached house	£900 ea	£850 ea

4.4.2 Comparison of the Strategies

Table 4.4 sets out the applicable cost recovery strategies for each of the delivery route options discussed above in Section 4.2.2. Moreover, Figures 4.7 – 4.9 demonstrate how each strategy would work in practice.

For Options 1 and 2, where the DNO is ultimately adopting the infrastructure following completion of the works, no capital contribution is paid to the GCP. However, the GCP would be able to recover some of the costs incurred in carrying out the reinforcement works from “second comer” charges through ECCR. Such recovery through ECCR would be limited to the initial 10-year period following the grid substations being energised as described in Section 4.4.1.

Delivery Route	ECCR / Second Comer	Asset Value/ “Cash Back”
DNO only		
UKPN Deliver ALL works	✓	✗
DNO + ICP		
<ul style="list-style-type: none"> • UKPN builds N/C works • ICP builds contestable works. • UKPN adopts all works 	✓	✗
ICP + IDNO		
<ul style="list-style-type: none"> • UKPN builds N/C works • ICP builds contestable works. • IDNO adopts contestable works 	✓	✓

Table 4.6 Investment cost recovery strategies available depending on delivery route option.

The benefit of Option 3 in terms of cost recovery is that it allows the GCP to recover the asset value of the installed infrastructure from the IDNO via the AV payment, and to recover the cost of carrying out the reinforcement works from any “second comer” charges. Under the ECCR, direct costs associated with UKPN’s quotation are fully recoverable, whilst the works carried out by an ICP may be subject to the interpretation of on-costs and management time would not be included.

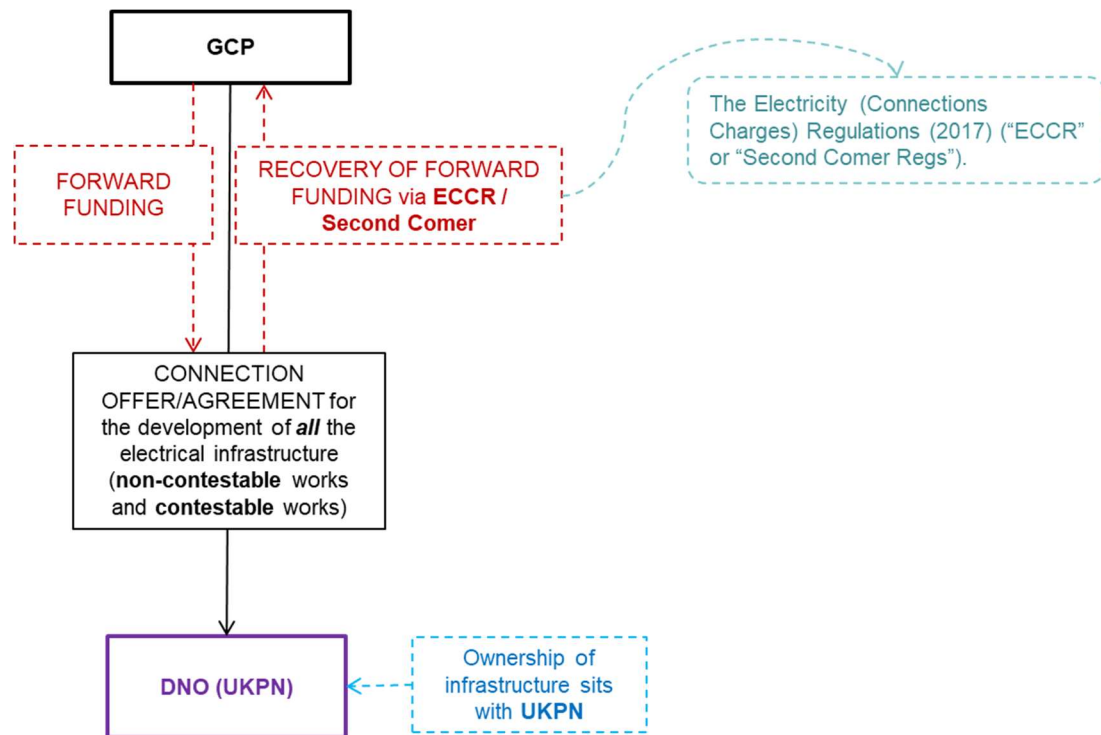


Figure 4.7 Diagram showing the cost recovery mechanism under delivery route option 1 using UKPN (the DNO) only

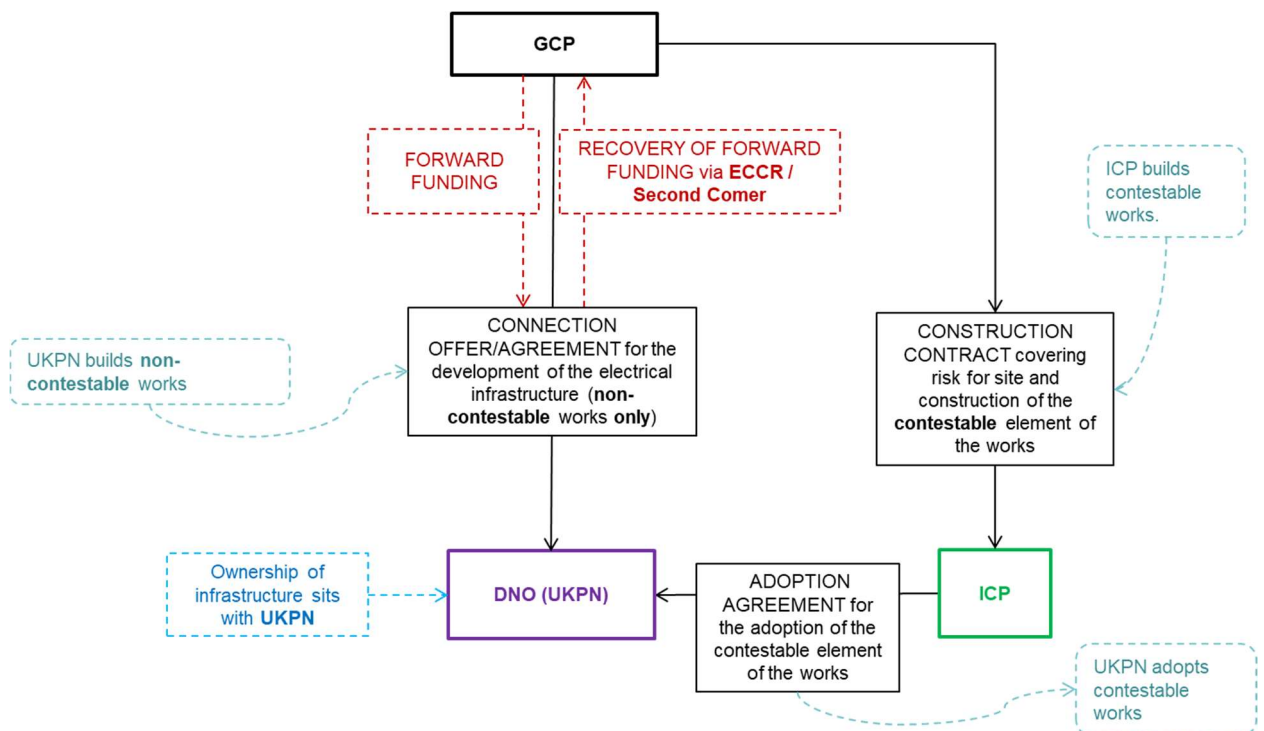


Figure 4.8 Diagram showing the cost recovery mechanism under delivery route option 2 using UKPN (the DNO) and an ICP.

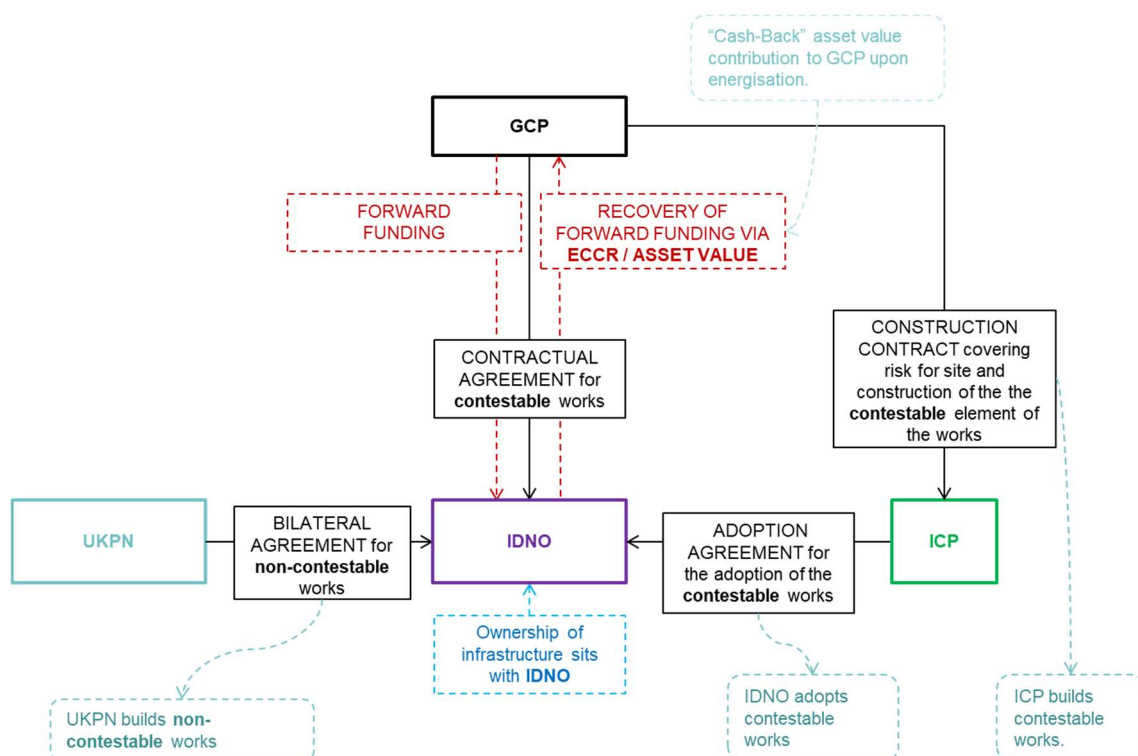


Figure 4.9 Diagram of the cost recovery mechanism under delivery route option 3 using the DNO, an ICP and an IDNO. This is the only option where Asset Value (AV) payments can be utilised as well as ECCR or connection charges.

4.5 Subsidy Control

This section will discuss how subsidy control(s) is applied to this project proposal.

4.5.1 Applicable Law

With the end on 31 December 2020 of the Implementation Period following withdrawal of the United Kingdom from the EU, EU State aid law, as set out in Articles 106 to 108 of the Treaty on the Functioning of the European Union (TFEU), no longer applies to financial assistance granted by public bodies in the UK² unless the financial assistance in question could have an effect on trade in goods or electricity between Northern Ireland and the EU³ or derives from EU sources such as the European Regional Development Fund (ERDF).⁴

However, under Chapter 3 of Title XI of Part 2 (the "Subsidy Control Chapter") of the Trade and Co-operation Agreement between the European Union and the United Kingdom (the "TCA"), the UK undertook to implement an effective subsidy control regime in its territory.

As a temporary measure, the Subsidy Control Chapter, along with other relevant provisions of the TCA, has been incorporated into domestic law by Section 29 of the European Union (Future Relationship) Act 2020.

However, on 30 June 2021, a Subsidy Control Bill was introduced in Parliament. The Bill was debated at a second reading on 22 September 2021 and has now been sent to a Public Bill Committee, which will scrutinise the Bill. The committee is scheduled to report by 18 November 2021. This Bill sets out the proposed workings of the new UK subsidy control law and is expected

² Though EU State aid law will continue to apply to any aid granted pursuant to funding agreements entered into before 31 December 2020.

³ See Article 10 of the Northern Ireland Protocol to the EU:UK Withdrawal Agreement.

⁴ See Article 138 of the EU:UK Withdrawal Agreement.

to enter into force later this year. Until this legislation takes effect, the UK subsidy control system will exist only in outline.

However, this will only be relevant where a given intervention meets the definition of a subsidy in the first place.

That definition is contained in Article 363(1)(b) of the TCA and, in somewhat modified form, in clause 2(1) of the Subsidy Control Bill where it is as follows:

“financial assistance which:

- (a) is given, directly or indirectly, from public resources by a public authority,*
- (b) confers an economic advantage on one or more enterprises,*
- (c) is specific, that is, is such that it benefits one or more enterprises over one or more other enterprises with respect to the production of goods or the provision of services, and*
- (d) has, or is capable of having, an effect on—*
 - (i) competition or investment within the United Kingdom,*
 - (ii) trade between the United Kingdom and a country or territory outside the United Kingdom, or*
 - (iii) investment as between the United Kingdom and a country or territory outside”*

Importantly, clause 3(2) of the Subsidy Control Bill provides that:

“Financial assistance is not to be treated as conferring an economic advantage on an enterprise unless the benefit to the enterprise is provided on terms that are more favourable to the enterprise than the terms that might reasonably have been expected to have been available on the market to the enterprise.”

In other words, a transaction between an enterprise and a public authority that is on market terms will not be seen as conferring a financial advantage, and therefore a subsidy, on that enterprise. This is a domestic implementation of the well-known market economy operator principle (“MEOP”) from EU State aid law.

It will be seen that, as with the definition of “State aid” under Article 107(1) TFEU, there are four elements to the definition of “subsidy” under the Subsidy Control Bill:

- Part 1: financial assistance from public resources by public authority;
- Part 2: which confers a specific *economic advantage*;
- Part 3: on one or more *enterprises*;
- Part 4: which has, or could have, an effect on: (i) competition and investment within the UK; or (ii) trade or investment between the UK and the EU.

These elements are referred to below as the “Four Part Test”.

Where a subsidy has been granted to an “enterprise” that does not comply with the Subsidy Control Principles, it may be subject to recovery from the beneficiary with interest. In addition, interested parties may initiate actions against the body that awarded the subsidy in the Courts for damages and/or other relief.

As a procedural matter, clause 33 of the Subsidy Control Bill envisages that a “transparency” obligation will be placed on public bodies giving subsidies such that details of the subsidy must be entered into a database maintained by the Department for Business, Energy, and Industrial Strategy (BEIS) within six months of the decision to award the subsidy. Publication of such details would, however, start time running against any would-be challenger of the subsidy.

However, it should be noted that, under clause 36 of the Subsidy Control Bill (which applies Article 364(4) of the TCA) there is an exemption from the Subsidy Control Bill for “*Minimal Financial Assistance*” – which applies where the total amount of financial assistance given to a particular enterprise has not exceeded £315,000 over the current financial year and the two previous ones.

4.5.2 Application to this Project

In principle, there could be three beneficiaries, or categories of beneficiary, of a subsidy under this project.

1. the DNO (or any IDNO) – which will become the owner of new/reinforced electricity distribution infrastructure paid for by public funds;
2. third party contractors appointed to construct those part of the utilities upgrades that are contestable (“Contractors”); and
3. any developer (“Developers”) building on sites benefitting from the upgraded infrastructure that were relieved from charges that they would otherwise have had to bear.

Pinsent Masons have applied the Four Part Test below at high level to each of those categories of beneficiary:

Part 1 – State Resources / Public Authority

The GCP is a public body and its funds are State resources. Part 1 of the Test would clearly be met.

Part 2 – Specific Economic Advantage

There are two aspects to this element of the Test: (i) is an economic advantage conferred on an “enterprise”; and (ii) is that advantage specific?

As set out above, an economic advantage arises where a public body confers a financial benefit on an enterprise that it would not have received under normal market conditions. Conversely, a transaction that is on market terms will not confer an advantage, and therefore a subsidy, on the counterparty.

In this case, any advantage would clearly be specific hence this element of the Test centres on the question of whether an economic advantage would be conferred. This point is considered in further in detail below.

Part 3 – Beneficiary is an Enterprise

Under clause 7(1)(a) of the Subsidy control Bill, an “enterprise” is defined as:

“a person who is engaged in an economic activity that entails offering goods or services on a market, to the extent that the person is engaged in such an activity”.

The DNO and any IDNO, Contractors and Developers will clearly be enterprises, hence this element of the Test will be met.

Part 4 – Effect on Trade

In the absence of any detailed guidance from BEIS or the Competition and Markets Authority (“CMA”) which will oversee the UK subsidy control regime, it is difficult to apply Part 4 of the Test which requires an assessment of whether any subsidy to any of the above parties could have an effect on either: (i) competition and trade within the UK; or (ii) trade or investment between the UK and the EU.

Although it is noted that the bar for the equivalent element of the test for State aid law was set very low in general, guidance the EU Commission’s guidance stated that, in appropriate circumstances, there might be an argument that financial assistance to utilities (such as the DNO)

would not be capable of affecting competition or inter-State trade given that these entities enjoy a monopoly in their respective distribution areas, hence they are not in competition.

On the other hand, given the possibility of IDNOs operating, that monopoly position is not absolute. In addition, Contractors and Developers are clearly exposed to competition, potentially on a cross-border basis, hence there is no reason that Part 4 of the Test could not be met in relation to them. Consequently, it seems prudent for present purposes to assume that Part 4 of the Test would also be met.

On that basis, it is considered that Parts 1, 3 and 4 of the Four Part Test would be met here. The question is therefore whether Part 2 (specific economic advantage) would also be met.

4.5.3 Specific Economic Advantage

As set out above, an economic advantage arises when an economic actor receives a State-funded benefit which could not have been obtained under normal market conditions.

4.5.3.1 *The DNO*

In this case, the proposed grid reinforcement works will include a substantial extension to the existing electricity distribution network in the area.

Under normal market conditions, a DNO would not be provided with State-funded infrastructure which they would be free to commercially exploit. To that extent, the provision of the funding could, on the face of it, result in a selective economic advantage to the DNO.

However, under normal market conditions, a developer whose development requires upgrades to the local distribution network will have to pay for those upgrades, subject to the application of the ECCR.

Accordingly, if under the Recovery Strategy, the GCP were reimbursed in this way, that would go a long way to eliminating any advantage at the level of the DNO, particularly, if any excess capacity on the upgraded network were reserved to the GCP for it to make available on a commercial basis.

However, it might nevertheless be impossible to exclude the possibility of a subsidy at the level of the DNO entirely, in which case, it would be necessary to consider whether any remaining residual subsidy satisfied the relevant conditions for lawfulness.

4.5.3.2 *Developers*

Provided that Developers pay the usual charges that would accrue under the ECCR, there should be no economic advantage, and therefore no subsidy, to them.

4.5.3.3 *Contractors*

In line with what is stated above, there will be no economic advantage, and therefore no subsidy, to Contractors if they are paid the market rate for the job.

To demonstrate this, one of the following would normally be required:

1. appoint the Contractor following a competitive procurement process, for example under the relevant public procurement regulations;
2. benchmark the costs of the Contractor against those of comparable operators on comparable projects; or
3. via an expert review of the Contractor's costs.

Following one of these three approaches should eliminate any subsidy at the Contractor level.

5 The Financial Case

This section is the Financial Case which outlines the affordability of the options. This case also presents the investment cost recovery estimate in more detail.

5.1 Scheme Costs

The overall delivery costs for Cambridge East Grid, and Trumpington Primary are laid out separately in the tables below. This includes the design, construction, and delivery of the electrical infrastructure, based on the quotations received from UKPN, as well as estimates for the cost of land (acquisition or lease), project management, and external technical and legal advice.

It is noted that the costs are budgetary only at this stage and will be subject to detailed design and procurement activities.

Costs incurred to date have been left out at this stage as sunk costs should not affect future investment decisions.

5.1.1 Cambridge East Grid Substation Costs

A summary of the anticipated costs for Cambridge East Grid is provided in Table 5.1 below.

Table 5.1. Analysis of substation costs for Cambridge East

Stage of work	Type of cost	Description	Total Costs
Unrecoverable costs			
Consultancy	Fee	Legal & Technical	£115,774
Consultancy	Fee	Technical project management	£137,560
Development Cost	Fee	GCP Project management	£73,936
Design	Fee	Assessment & Design charges non-contestable	£8,446
Construction	Construction	500kVA connection contestable	£236,317
Construction	Construction	500kVA connection non-contestable	£4,297
Land	Fee	Costs incurred to support purchase	£201,386
Costs recoverable with any connection			
Land	Asset value	Purchase cost / valuation	£70,000
Connection	Construction	Miscellaneous contestable	£967,728
Construction	Construction	Miscellaneous non-contestable	£436,340
Costs recoverable from future 33 kV connections			
Connection	Construction	33kV underground mains contestable	£1,766,971
Construction	Construction	132/33kV grid 90MVA substation contestable	£2,783,406
Construction	Construction	132kV underground main contestable	£3,026,234
Connection	Construction	132kV non-contestable	£2,264,924
Total			£12,093,318

5.1.2 Trumpington Primary Substation Costs

A summary of the anticipated costs for Trumpington Primary Grid is provided in Table 5.2 below.

Table 5.2 Analysis of substation costs for Trumpington

Stage of work	Type of cost	Description	Total Costs
Unrecoverable costs			
Consultancy	Fee	Legal & Technical	£74,182
Consultancy	Fee	Technical project management	£89,182
Development Cost	Fee	GCP Project management	£58,477
Design	Fee	Assessment & Design charges non-contestable	£8,446
Construction	Construction	500kVA connection contestable	£85,131
Construction	Construction	500kVA connection non-contestable	£5,202
Land	Fee	Costs incurred to support purchase	£201,386
Costs recoverable from future 11kV connections			
Land	Asset value	Purchase cost / valuation	£20,000
Connection	Construction	Miscellaneous contestable	£1,568,071
Construction	Construction	Miscellaneous non-contestable	£71,368
Connection	Construction	HV contestable	£1,767,605
Construction	Construction	EHV contestable	£7,248,078
Construction	Construction	EHV non-contestable	£247,704
Total			£11,444,831

5.2 Cost Recovery

As outlined in Section 4.4., the expected basis for receiving reimbursement of costs incurred by the first developer (in this case the GCP) is the Electricity (Connection Charges) Regulations 2017 (ECCR). The ECCR sets out the basis under which “second comers” contribute towards the costs of the grid reinforcement project that provided the capacity the second comer is using. The Regulations have been applied in a financial model in order to predict how much of contribution would be required from “second comers”, based on the demand forecast from Roadnight Taylor.

5.3 Investment Appraisal

A typical commercial business case for an energy project would consider the expected financial return based on a number of assumptions. Risks would normally relate to these assumptions and a sensitivity analysis would consider the potential impact of these risks triggering.

Essentially the same sort of sensitivity analysis applies to this project. The difference is that the project is expected to cost money, rather than make money, but the need to consider the potential financial impact of risks remains the same. The analysis below discusses the potential impact of risks in order to facilitate a cost/benefit analysis of the value of proceeding. The financial model also includes sensitivities showing the impact of changes to assumptions such as capital costs, interest rates and inflation.

The investment appraisal of each option is given in Table 5.3. below, based on the scheme costs outlined above, and a baseline recovery scenario, which makes the following key project assumptions:

- Demand uptake is as per the initial high level demand figures from Roadnight Taylor’s demand report for Cambridge East and Trumpington.
- Demand growth up to 2030 is included, based on public planning registers and the 2018 local plan. Demand growth up to 2035 could still result in investment recovery for the

GCP (10-year recovery period post-energisation in 2025) but has not been included in this analysis.

- The cost per unit (£/kVA) ECCR contribution from future connections is subject to confirmation from UKPN. At this stage it is an estimate from technical advisor's Roadnight Taylor. There could be significant change the amount recovered.

The business case model is also based on the following financial assumptions:

- *Loan* – the interest rate used for the loan is the current value for 25-year equal instalments of principal loan from the Public Works Loan Board (PWLb).
- *Net Present Value (NPV)* – the calculation uses the XNPV formula within Excel, with cash flows being deemed to occur on 30th June in each year. The discount factor of 3.72% used in the calculation is the multiple of the inflation rate assumed of 2% (which is the government target for inflation) and the PWLB interest rate of 1.69%.

Table 5.3. Summary of the costs and benefits of the grid substations.

Option	Capital Cost	NPV	New homes enabled	Commercial Developments enabled
1) Do Nothing	£0	N/A	None	None
2) GCP fund delivery of Cambridge East Grid and Trumpington Primary Substations	£23,540,000	-£91,000	5,700 new homes	270,000+ sqm new floorspace
3) GCP fund the delivery of Cambridge East Grid only	£12,090,000	-£182,000	5,000 new homes	110,000+ sqm new floorspace

5.4 Risks and Sensitivities

The investment appraisal has been conducted in line with the above assumptions and has also acknowledged a number of risks and sensitivities which are outlined below. Further details of the risks have been included in Section 6.5 and the risk register has also been included as Appendix 4.

5.4.1 Demand Projection Sensitivities

The commissioned demand analysis work from both Roadnight Taylor and WSP, appended as Appendices 1 and 2, are similar in relation to the extent of the energy demand expected from future commercial developments. However, in relation to future residential developments, the Roadnight Taylor study assumes that the increased future demand to service heat pumps and electric vehicle charging will be roughly double that used by WSP. As these technologies are still relatively scarce in the UK, there is a wide range of assumptions being used in the market and at this stage the final outcome is uncertain. The financial model presented here is based on the Roadnight Taylor forecasts. Therefore, if WSP figures were used instead, the cost recovery expected would be reduced by roughly 25%.

Furthermore, the demand analyses carried out by Roadnight Taylor and WSP assess current planning applications, which should mean that the majority of projects expected up to 2030 have been included, however there will be other projects expected beyond that, but still within the 10-year window for applying the ECCR (which would be expected to be applicable up to 2035). The base model has not included this potential additional demand.

However, the sensitivity within the model shows the impact if the Roadnight Taylor demand figures are supplemented in order that the expected demand in years 6 - 8 post-energisation (which would otherwise be low) equals half the average expected demand in years 1 - 5. Reducing the future expected demand to below current levels recognizes that there may be some projects which stack-up due to the constraints on electrical capacity and that not all projects currently in the planning process will necessarily be delivered. No additional demand is shown for years 9 – 10, as developers at this stage may be inclined to delay the start of projects to avoid the need for an ECCR contribution. A more detailed study of expected demand should be undertaken if the business case is progressed to the next stage.

The sensitivity in the model, including this additional demand in years 6-8, would improve the NPV for the project from -£0.1m to +£1.3m. The reason why a positive NPV is possible, despite the ECCR restricting recoveries in cash terms, is that funding is assumed to be made through a loan and cash will be recovered in advance of loan repayments being made.

On the other hand, if it were expected that demand for the new capacity would fall well short of the amount of capacity provided, one alternative would be to reduce the initial capacity being built into the grid. This reduction would mean that any new connections would be a greater proportion of the capacity being funded by the GCP, hence the proportion of cost recovered would be higher.

This issue is complicated because it is not yet clear on what basis UKPN would determine transformer capacity at Cambridge East, where the proposal is to use a single transformer with a maximum rated capacity of 90MVA. Normally, where two transformers are proposed, as with the two sets of 24MVA transformers at Trumpington, the capacity of only one of them would be considered when operating under network constraints. With the single transformer at Cambridge East, the base financial model assumes that UKPN will do a similar calculation and assume the constrained capacity is 45MVA. However, if the maximum capacity figure of 90MVA were used recovery would be reduced by half. In this case a discussion with UKPN would be needed to facilitate the use of physically smaller transformers in order to keep recovery at a high level.

Taking the capacity for the recovery calculation as 114MVA instead 69MVA would reduce NPV from -£0.1m to -£4.6m.

5.4.2 Costs incurred and recovered

The definition of the costs covered by the ECCR is subject to interpretation. The law defines the first connection costs, and therefore the amount recoverable, as “any expenses reasonably incurred by a person in providing any electric line or electric plant for the purpose of making the first connection”. In principle this definition would appear to cover all project costs. However, the understanding is that in practice, UKPN will only allow costs that directly contribute to the ongoing asset value. Thus, the GCP’s project management costs would not be recoverable. Land value would be recoverable, but not the ancillary costs incurred in acquiring the land.

The same lack of recovery would be expected for many other costs as well, such as traffic management during construction. However, these costs are not separately identified within the cost proposal UKPN have provided and the current understanding is that UKPN would allow all costs within their quote to be recoverable, with the exception of the costs specifically relating to the first connection. Further clarification is awaited on the expected treatment from UKPN.

The financial model shows the sensitivity if all project costs were recoverable as first connection costs, which would improve the NPV from -£0.1m to +£0.9m.

Operational costs have also not been accounted for within this business case, as it is intended that the connection would be used commercially to power electric vehicles for example. At this stage it is assumed that a small surplus could be generated, and this should be assessed during the development of the Full Business Case.

There also needs to be confirmation from UKPN as to the likely voltage level of future connections as this will influence the recovery of the initial investment. For example, it is common practice for

UKPN to charge so that 11kV connections pay for 11kV and 33kV reinforcement works, whilst 33kV connections pay for 33kV and 132kV but not 11kV. The costs of the new substation include a mix of reinforcement at 33kV and 132kV, which means that the costs which can be recovered will depend on the mix of proposed connections. If the model is developed further, it would make individual assumptions about the voltage each potential connection would be made at. At this stage though all connections are assumed to be at the 11kV for connection into Trumpington, and at 33kV for connection into Cambridge East.

5.4.3 ECCR Revenue Considerations

There are currently a number of uncertainties about how the regulations will be interpreted in practice which may impact upon the recovery of the investment. However, some of these uncertainties may be mitigated as a result of further investigation or advice if the business case is developed in more detail. The risk register appended as Appendix 4 contains the full details of all the risks and uncertainties identified to date, but as a summary the following will need to be considered further in any future calculations of the possible recovery via ECCR:

- Whether future connections will be made directly to the new substation(s) or to elsewhere in the network which connects into the new substation(s)
- Whether additional revenue is possible from generation connections (e.g., solar PV schemes)
- Whether repayments would still be made on any unused element of the original capacity if further reinforcement works were carried out which replaced the new substation(s)

5.4.4 Future Legal and Regulatory Change

There are risks associated with future changes to the legislation which governs the ECCR. These risks have been summarised in Section 6.5.2 and further details can be found in the risk register appended as Appendix 4.

The main concern which would influence the financial model and investment appraisal conducted here, is the Ofgem Significant Code Review for which launched a consultation in June 2021. The outcome of the consultation expected to be published in early 2022. The proposed changes to the ECCR would mean that the GCP would be unable to charge most “second comers” for reinforcement costs after April 2023. However, the level of uncertainty at this stage makes it difficult to provide meaningful sensitivity calculations beyond saying that the GCP could receive little or no future reimbursement from second comers in the worst-case scenario.

The potential difficulty outlined above has been communicated to Ofgem through the consultation process and they have indicated a willingness to discuss this further with us. It is possible that the final proposals will include some form of exemptions or transitional proposals, but this has still to be determined.

6 The Management Case

6.1 Project Plan

Figure 6.1 illustrates the key project milestones for the Electricity Grid Reinforcement project and the expected delivery timescale.

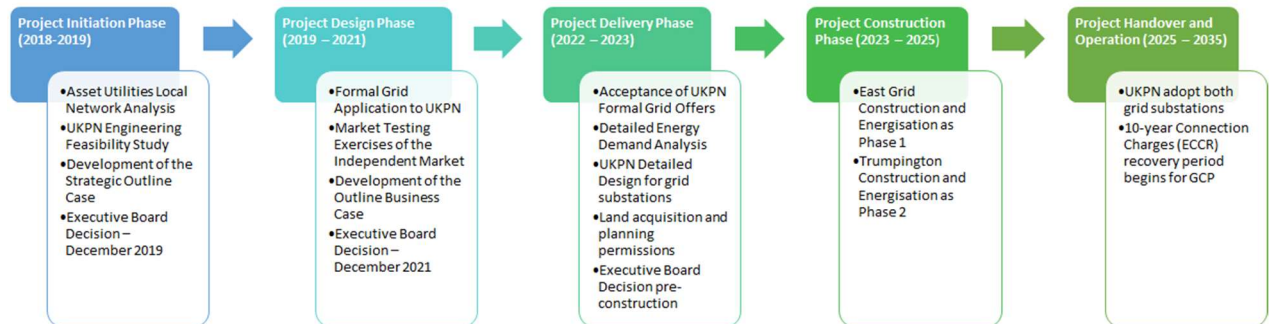


Figure 6.1 Key project milestones for the Energy Grid Reinforcements project from inception to completion.

The project plan provides an approximate outline of the programme of works, with the next steps for the project being:

- Acceptance of the UKPN Formal Grid Offers by December 2021, at this stage the GCP will enter into a contract with UKPN for the delivery of the grid substations.
- Following offer acceptance, UKPN will conduct a detailed design study and provide the GCP with a notification of any adjustments required to the cost estimates and/or timescales provided in the initial offers.
- Detailed demand analyses to be completed by early 2022.
- Land must be provided by the GCP before UKPN can begin to deliver any of the works, therefore land will need to be acquired or leased by 2023.

6.2 Project Governance

The Greater Cambridge Partnership (GCP) operates as a Joint Committee, under powers delegated by its three local authority partners. It is led by a decision-making Executive Board which coordinates the overall strategic vision and drives forward the partnership's programme of work. The Electricity Grid Reinforcement Works project will be managed by the GCP under this governance structure.

The GCP is the local delivery body for the Greater Cambridge City Deal agreed with Central Government, bringing powers and investment worth up to £1 billion over 15 years. Among other things, the City Deal seeks to support and accelerate the creation of 44,000 new jobs and 33,500 new homes.

The GCP is a partnership of councils, businesses and academia which seeks to work together to grow and share prosperity and improve quality of life for the people of Greater Cambridge. The GCP is made up of representatives from 4 partner organisations:

1. Cambridgeshire County Council
2. Cambridge City Council
3. South Cambridgeshire District Council

4. University of Cambridge

The GCP has two layers of governance; the Executive Board and the Joint Assembly. The Executive Board consists of voting members, who are elected members from each of the three Councils and non-voting members who are representatives from the University and the Local Enterprise Partnership.

The Joint Assembly is similarly configured, serving as a forum for discussion with a wider range of members and stakeholders, and a joint advisory committee to the Board. Figure 6.2 summarises the governance structure of the GCP as described in the Greater Cambridge City Deal Assurance Framework⁵.

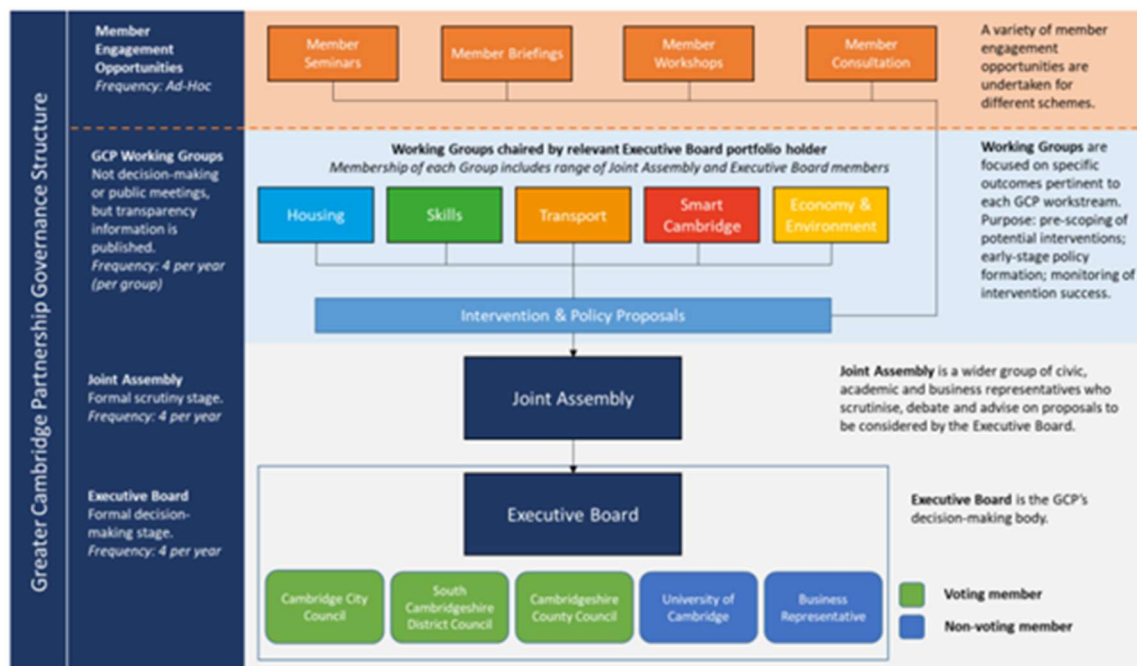


Figure 6.2 The governance structure of the Greater Cambridge Partnership as set out in the Local Assurance Framework 2021.

6.2.1 Local Assurance Framework

The core driving principle of the Greater Cambridge City Deal is to unleash the economic growth potential of the Greater Cambridge area by relieving the transport, housing and skills constraints that currently prevent effective development and growth.

As part of the City Deal delivery, GCP partners agreed to prioritise projects that deliver against four strategic objectives:

1. Nurture the conditions necessary to unlock the potential of Greater Cambridge to create and retain the international high-tech businesses of the future.
2. Better target investment to the needs of our economy by ensuring those decisions are informed by the needs of businesses and other key stakeholders such as the Universities.
3. Markedly improve connectivity and networks between clusters and labour markets so that the right conditions are in place to drive further growth.
4. Ease the labour market by investing in transport and housing, in turn allowing a long-term increase in jobs emerging from our internationally competitive clusters and more University spinouts.

⁵ Greater Cambridge City Deal Assurance Framework, 2021. <https://www.greatercambridge.org.uk/asset-library/About-GCP/Governance/Governance-Assurance-Framework-2021.pdf>

The Electricity Grid Reinforcement project aims to deliver against each of these criteria, with a primary focus on Objective 1 and unlocking barriers to growth.

6.3 Project Level Management

The Electricity Grid Reinforcement Project Delivery Team is accountable to a Project Board and ultimately the GCP Executive Board. The Project Delivery Team reports to the Project Board monthly/bi-monthly through the production and presentation of a Project Status Report (PSR). The PSR is the main input to the Project Board and summarises progress and change on the project. The following is the format of the PSR:

- Activities and achievements in report period;
- Serious issues and actions required by governance body;
- Key activities in the forthcoming period;
- Key milestones update;
- Key risks; and
- Budget update.

It is the Project Delivery team who will manage the delivery of the grid reinforcement works. The Project Management Team will be responsible for the day-to-day delivery of the scheme and will ensure technical and financial control. The team coordinates inputs from technical advisors responsible for the delivery of the key workstreams in pursuit of the agreed programme, including:

- Design development;
- Procurement;
- Business Case development;
- Land and Planning; and
- Communications.

The Project Delivery Team structure is illustrated in Figure 6.3 below.



Figure 6.3 Diagram depicting the likely Project Delivery Team structure

6.4 Procurement Strategy and Contract Management

The Public Contracts Directive 2014 issued by the European Union was implemented in the UK through the Public Contracts Regulations 2015. Cambridgeshire County Council (CCC) as the

public authority responsible for procurement on behalf of the GCP, are required to comply with these Regulations as summarised in Section 4.2.3.

Any procurement activity in relation to this scheme will be conducted in accordance with the relevant regulations. There are various possible procurement options for the construction aspect of the project which have been outlined in Section 4.2 in line with legal advice provided by Pinsent Masons. For all other elements of the project, the usual procurement process will be followed where one of the below methods is utilised, depending on the value of the contract and/or the type of goods, services or works being procured:

1. **Direct Award** – *contract value is under £5,000 or the contract is for specialist goods/works/services where there are limited providers/suppliers.*
2. **Quotation** – *contract value is between £5,000 and £100,000 or the contract is for specialist goods/works/services where there are limited providers/suppliers.*
3. **Tender** – *contract value exceeds £100,000*

After procurement, any contracts awarded with a value over £5,000 will then be recorded on the CCC Central Contract Register in accordance with the 2015 Local Government Transparency Code⁶.

6.5 Risk Management

Risk management is an integral element of project management and is crucial to the achievement of objectives, the realisation of any opportunities, and the avoidance of delivery issues. In support of this, the prime goal of the risk management and mitigation strategy is to identify uncertainties as early as possible, and to create a reasonable solution ahead of time.

A full risk register for the project has been appended to this report as Appendix 4, however it is important to note that the risk register is a live document and therefore the risks captured are relevant at the time of writing, November 2021.

6.5.1 Risk Classification and RAG Rating

For the Electricity Grid Reinforcement project risks have been identified through an initial risk workshop meeting and subsequent meetings with the Project Board and Project Delivery Team. The risks identified have been broadly classified as Legal, Technical and Financial Risks.

Risks have been scored by assessing their likelihood and impact ratings and combining these scores to prioritise actions. Parameters for assigning Red, Amber and Green (RAG) ratings to likelihood and impact of risks are based on of likelihood values, and consideration of the impact as a proportion of the scheme cost estimate.

Likelihood has been specified using a score of 1-5 as shown in Table 6.1, where the parameters for each band are also linked to a percentage probability.

Table 6.1 Risk likelihood rating descriptions

Risk Likelihood Ratings:

Description	Descriptor	Percentage Probability	Scale
May only occur in exceptional circumstances, highly unlikely	Very Low	5%	1
Is unlikely to occur in normal circumstances, but could occur at some time	Low	10%	2

⁶ [Local government transparency code 2015 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/local-government-transparency-code-2015)

Likely to occur in some circumstances or at some time	Moderate	25%	3
Is likely to occur at some time in normal circumstances	High	50%	4
Is highly likely to occur at some time in normal circumstances	Very High	90%	5

Impact has been specified using a score of 1-5 as shown in Table 6.2, a more detailed description of each rating has been used where a more specific parameter has not been identified.

Table 6.2 Risk impact rating descriptions

Risk Impact Ratings:

Description	Descriptor	Scale
Insignificant disruption to internal business or corporate objectives Little or no loss of front line service No environmental impact No reputational impact Low financial loss (proportionate to budget involved)	Negligible	1
Minor disruption to internal business or corporate objectives Minor disruption to front line service Minor environmental impact Minor reputational impact Moderate financial loss (proportionate to budget involved)	Marginal	2
Noticeable disruption to internal business and corporate objectives Moderate direct effect on front line services Moderate damage to environment Extensive reputational impact due to press coverage Regulatory criticism High financial impact (proportionate to budget involved)	Significant	3
Major disruption to corporate objectives or front line services High reputational impact – national press and TV coverage Major detriment to environment Minor regulatory enforcement Major financial impact (proportionate to budget involved)	Critical	4
Critical long term disruption to corporate objectives and front line services Critical reputational impact Regulatory intervention by Central Govt. Significant damage to environment Huge financial impact (proportionate to budget)	Catastrophic	5

The overall RAG Ratings have been assigned as the likelihood score multiplied by the impact score, where the following ratings apply:

- Green = 0 to 4
- Amber = 5 to 9
- Red = 10+

6.5.2 Summary of the Risks

In accordance with the risk management requirements for the project, a risk register has been developed appended as Appendix 4. It is important to note that the risk register is a live document, therefore subject to change. A short summary of the main risks has also been included here.

As previously mentioned, the risks have been categorised into 3 main categories with subsections where necessary.

Technical Risks

The technical risks summarised here as best described as the threats to project delivery. These risks focus on issues around project management, land, and planning.

- The UKPN formal grid offers are subject to the availability of space at the existing Fulbourn Grid to facilitate the East Grid works. To mitigate this risk, a detailed design study will be conducted by UKPN post-offer acceptance, and a formal notification of any adjustment(s) will be issued.
- The UKPN offers are also subject to change depending on the suitability of the land at the proposed locations for planning and acquisition. Again, to mitigate this risk, a detailed design study will be conducted by UKPN post-offer acceptance, and a formal notification of any adjustment(s) will be issued.
- Both schemes require new cable circuits to be laid in public highways, and potentially third-party land. As the design is progressed, it will need to be confirmed whether any additional easements or wayleaves are required.
- If the option to use an IDNO and ICP is pursued, then the GCP would be forging a new path for a Local Authority with no similar projects to compare to and/or use as learning.
- If the option for an IDNO to adopt the assets is pursued then this delivery route would also require a revision to the UKPN offer for Trumpington, as this is currently dependent on UKPN adopting the assets built at the East Grid.

Financial Risks

The financial risks summarised here as best described as the threats to the project budget. These risks focus on issues relating to the capital costs of the project.

- Although several demand analyses have been undertaken, there remains a level of uncertainty over demand uptake. To mitigate this risk further work is proposed at next stage of the project. Then, if demand is lower than initially expected there is an option for the GCP to reduce the initial grid capacity being built to better match the expected demand.
- At present, the Electricity Connection Charges Regulation (ECCR) is under review. Ofgem's consultation closed at the end of August 2021, but a decision has not yet been published. The proposed changes do not affect the East Grid but could reduce cost recovery on the Trumpington Primary substation which is currently classified as reinforcement works. To mitigate this risk, there is ongoing engagement with both Ofgem and BEIS around the proposed regulatory changes.

- The costs of the new substation include a mix of reinforcement at 33kV and 132kV, which means the amount that can be recovered will depend on the mix of proposed connections. The base financial model shows the impact if connections were all at 33kV which is likely to be the case at Cambridge East. However, connections at Trumpington could be lower at 11KV.

Legal Risks

The legal risks summarised here as best described as the threats to project viability. These risks focus on issues around legislation and regulations.

- There is a risk that any payment made to GCP under the ECCR could be the subject of a future legal challenge on the grounds that ECCR does not properly apply to GCP in relation to the connection works. This is mitigated to some extent by the fact that any application of the ECCR must be made in accordance with the relevant legislation and connection charges methodology statement, which is agreed with Ofgem as regulator. The highly regulated nature of the process therefore mitigates the risk of challenge. This risk is also mitigated by the fact that a developer is very unlikely to challenge the application of ECCR to the connection works as a developer would benefit from GCP triggering the reinforcement works.
- As noted above, the current subsidy control law in the UK exists only in embryonic form, and there is therefore a risk that UK law in this area, once implemented, will look different to the regime set out in this report, which may impact on the delivery route taken and applicability of State Aid rules. However, assessment by Pinsent Masons has found that, given that it appears to be intended that the UK regime will be less restrictive than EU State aid law, an approach which is compatible with EU State aid law should also be compatible with UK subsidy control law.

6.5.3 Contractual Liability and Termination Rights

If the GCP chooses to accept the formal grid offers from UKPN as outlined in Section 4.1, the GCP will retain the right to terminate the contract after offer acceptance. This is a key point as it allows the schemes to be progressed, with limited spend initially, whilst the detailed design is firmed up and additional information about the risk of regulatory reform is sought.

The UKPN terms and conditions mean that by accepting the offers, the GCP agree to cover any costs that UKPN have spent up until the point that you terminate. UKPN operate on a cash-positive basis, meaning they won't spend money that the customer hasn't paid them yet. The initial payment for both schemes is limited to a £100k acceptance payment.

7 Conclusions and Recommendations

This Outline Business Case has detailed the project proposal for the Electricity Grid Reinforcement Works project and outlined that there are various options available to the Greater Cambridge Partnership (GCP) for the delivery of this project.

In summary, at this stage the GCP can choose to build none, or up to 2 of the 3 short-listed grid substations as discussed in Section 3.2 of this report. The third of the short-listed grid substations, Cambridge West Grid, has not yet been investigated in the same amount of detail as the Cambridge East and Trumpington Primary grid substations, and therefore it is recommended to not progress the West Grid substation further at present.

The preferred option has been identified as Option 2 where both Cambridge East Grid and Trumpington Primary are delivered to maximise the possible benefits by increasing the current electricity demand capacity by 28%, adding 69MVA to the existing capacity. This additional capacity could unlock the development of approximately 5,700 homes as well as 270,000sqm of commercial, clinical or research and development floorspace, allowing further economic growth in the Greater Cambridge area.

This report has also discussed that the GCP also has the option to deliver the grid infrastructure either entirely through the Distribution Network Operator (DNO) or in part through the independent market via an Independent Network Operator (IDNO) and/or an Independent Connection Provider (ICP). Initial market testing has been undertaken to explore each of these options as discussed in Section 4.2 of this report. Currently, there is an indication that delivery through the DNO may be preferable due to the increased certainty around timescales and costs under this route.

As discussed in Section 2.5, UKPN are simultaneously including the two grid substations proposed here in their Business Investment Plan sent to Ofgem as part of the RIIO ED-2 price control review period. Therefore, it has been recommended in this report that in order to balance the risk of delay against the risk of public funding being used in place of the established DNO funding mechanism, the GCP will progress with the preferred option until the final outcome of UKPN's funding negotiations with Ofgem is complete. This is considered to be the least regret option, as it minimises the 'at risk' investment, without delaying the energisation of the substations.

Appendix 1 – Roadnight Taylor Demand Analysis 2021

The report can also be accessed here:

www.greatercambridge.org.uk/asset-library/GCP-Cambridge-Electricity-Demand-Requirements-Redacted-for-publication.pdf

South Cambridge Future Electricity Demand Requirements (Greater Cambridge Partnership)

28/10/2021

REPORT

South Cambridge Future Electricity Demand Requirements

Author: Catherine Cleary

Revision: **Redacted for Publication**

Date: 28 October 2021

Summary

Greater Cambridgeshire Partnership are looking to contract with UK Power Networks (UKPN) to develop suitable electrical distribution infrastructure to remove the barriers to housing and commercial growth that currently exist in south Cambridge.

The purpose of this report is to assess the level of demand in the South Cambridge region for both residential and commercial developments in the next 10 years to inform the application(s) that GCP will make to UKPN.

The results of the high-level demand calculations are summarised below. It is noted that these are *estimates* only. There is considerable uncertainty around future demand requirements. Many factors influence these results, including the speed at which developments build out, the technologies used to heat homes, the uptake of electric vehicles.

The assumptions contained in this report are designed to present a credible scenario but cannot capture all potential future energy scenarios.

Demand Area	NEW Residential Demand	NEW Commercial Demand*	Total demand figure for GCP Grid Application
Cambridge East	19.3MVA	22.1MVA*	41 MVA
Trumpington	2.7MVA	17 MVA*	20 MVA
Cambridge West	17.8MVA	24.6 MVA	42 MVA
* Excludes demand from developments which are already in contract with UKPN			

GCP may decide not to submit applications for all 3 areas. This decision will be informed by the funds available, cost of works for each area, and the immediate need for intervention. For example, current discussions with UKPN suggest that the need for intervention in Cambridge West may be less imminent.

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Input Data

GCP and the Greater Cambridgeshire Planning Service have provided planning register and housing trajectory data to allow Roadnight Taylor to identify future residential and commercial demands.

This data has been provided geographically for the whole greater Cambridge region, and we have used a radius of interest around each proposed new grid substation to identify the “Development Area of Interest” shown in Figure 1.

The shaded development area represents a 5km radius from:

- Cambridge West Grid
- Cambridge East Grid
- Trumpington Primary

The shaded development area also includes sites within a 4km radius of the following existing UKPN substations in central Cambridge which will be interconnected to the new substations:

- Maddingley Rd primary
- St Anthony St primary
- Addenbrookes primary

Within this area, it is expected that new large-scale developments are likely to be supplied from the new Cambridge East, Trumpington and Cambridge West grid upgrades.

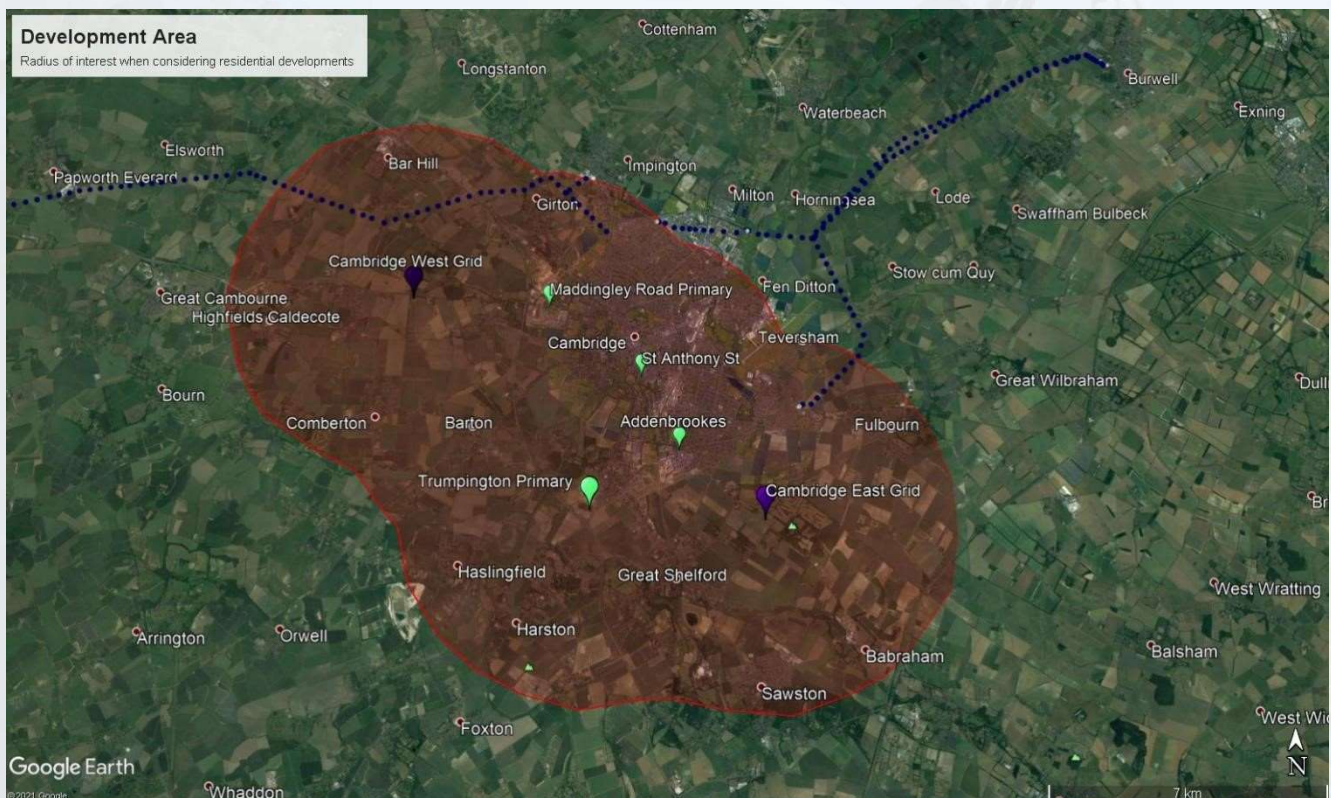


Figure 1: Definition of the Development Area of Interest

1 Key Assumptions

1.1 Residential Demand Assumptions

The residential power demands for new homes have been calculated using an average ADMD (after diversity maximum demand) of **3.9kVA per dwelling**.

This value corresponds to the “Gone Green” demand growth scenario considered in the UKPN feasibility assessment¹ is supported by UKPN’s own design standards for LV residential connections².

There are a number of assumptions which underpin this ADMD figure:

- It is assumed all new housing has fully electric heating (mix of heat pumps and other electric heating)
- It assumed a proportion of all new dwellings have an EV charging point (Gone Green assumption is roughly equivalent to 30% of homes having a 7kW charger, with a diversity of 0.3 applied))
- It assumes the new housing mix is as follows:

no. of bedrooms per home	% new homes
2	15%
3	40%
4	30%
5	15%

This average demand figure has been discussed with a number of stakeholders. Table 1 shows how the 3.9kVA figure compares to other reports and studies being undertaken in the region. We have tried to take a reasonable view that takes into account the need for future housing to de-carbonise heating but without taking an extreme view that might lead the over-engineering of the grid upgrades.

Table 1: Comparison of Demand Assumptions with other relevant studies

Report	Demand Assumptions	Comments
UKPN Feasibility Assessment	3.0 – 3.9kVA per dwelling	Considered Moderate, High and Gone Green scenarios
North East Cambridge Energy Masterplan (WSP)	1.33kVA per dwelling (excludes EV charging)	High density so not typical of many other lower density developments
GCP Local Network Analysis (Asset Utilities)	5.5kVA – 10.5kVA per dwelling	4 scenarios considered. 10.5kVA assumes all properties have EV charger + heat pump.
This Report	3.9kVA per dwelling	

¹ Feasibility Report - Cambridge Southern Fringe - 8600015882 Final

² EDS 08-2000 LV Network Design

2 Results

Using the assumptions and methodology described, Roadnight Taylor have calculated the additional power demands for future residential and commercial developments within the area surrounding each substation.

Table 3: Total New Demand requirements at each Substation

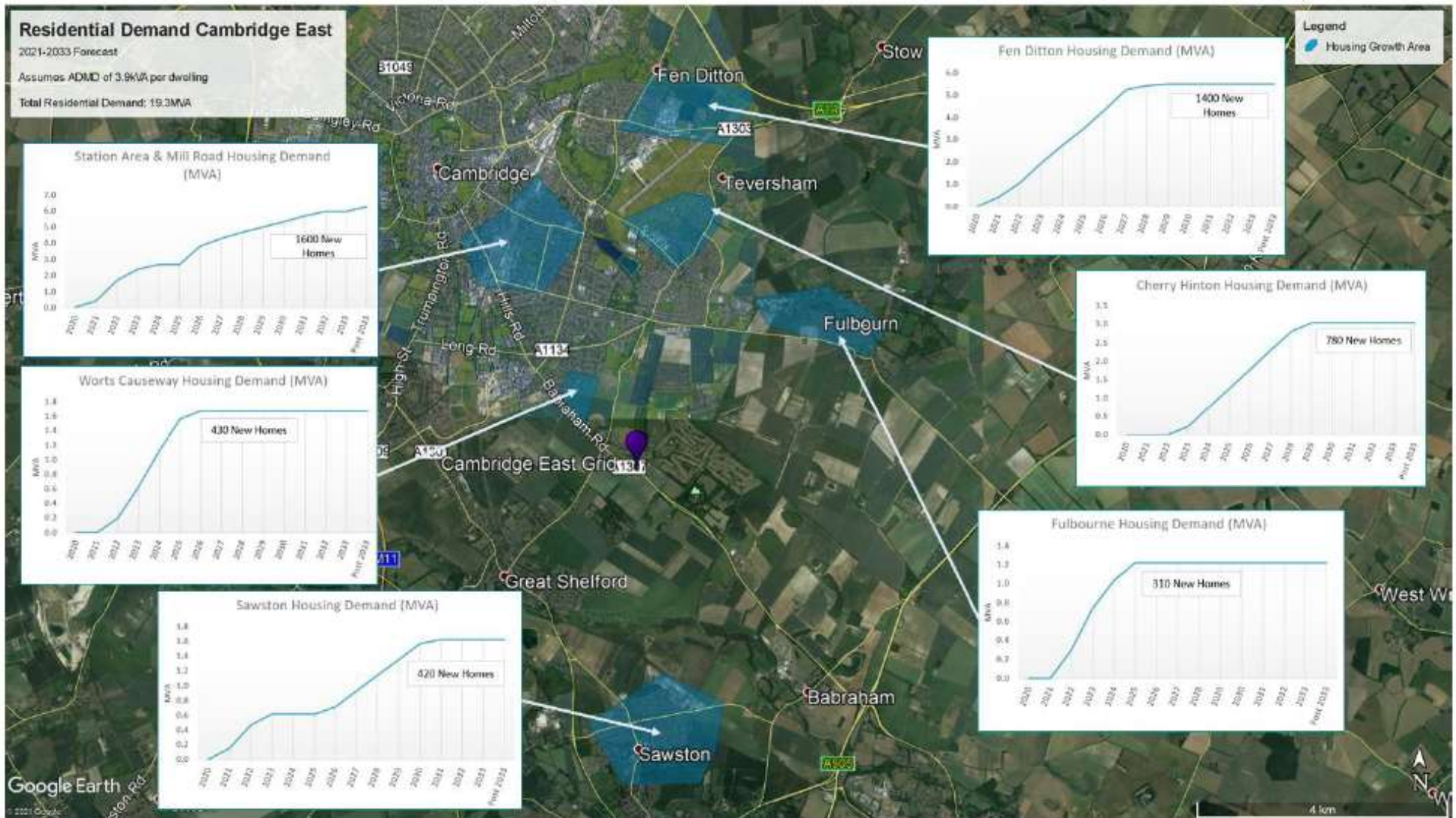
Demand Area	Number of new homes	NEW Residential Demand	NEW Commercial Demand	Total demand figure for GCP Grid Application
Cambridge East	5000	19.3MVA	22.1MVA*	41 MVA
Trumpington	700	2.7MVA	17 MVA*	20 MVA
Cambridge West	7000	27.3MVA	24.6 MVA (TBC)	42 MVA (TBC)
* Excludes demand from commercial developments which are already accounted for by UKPN. (We have not yet received this information for Cambridge West)				

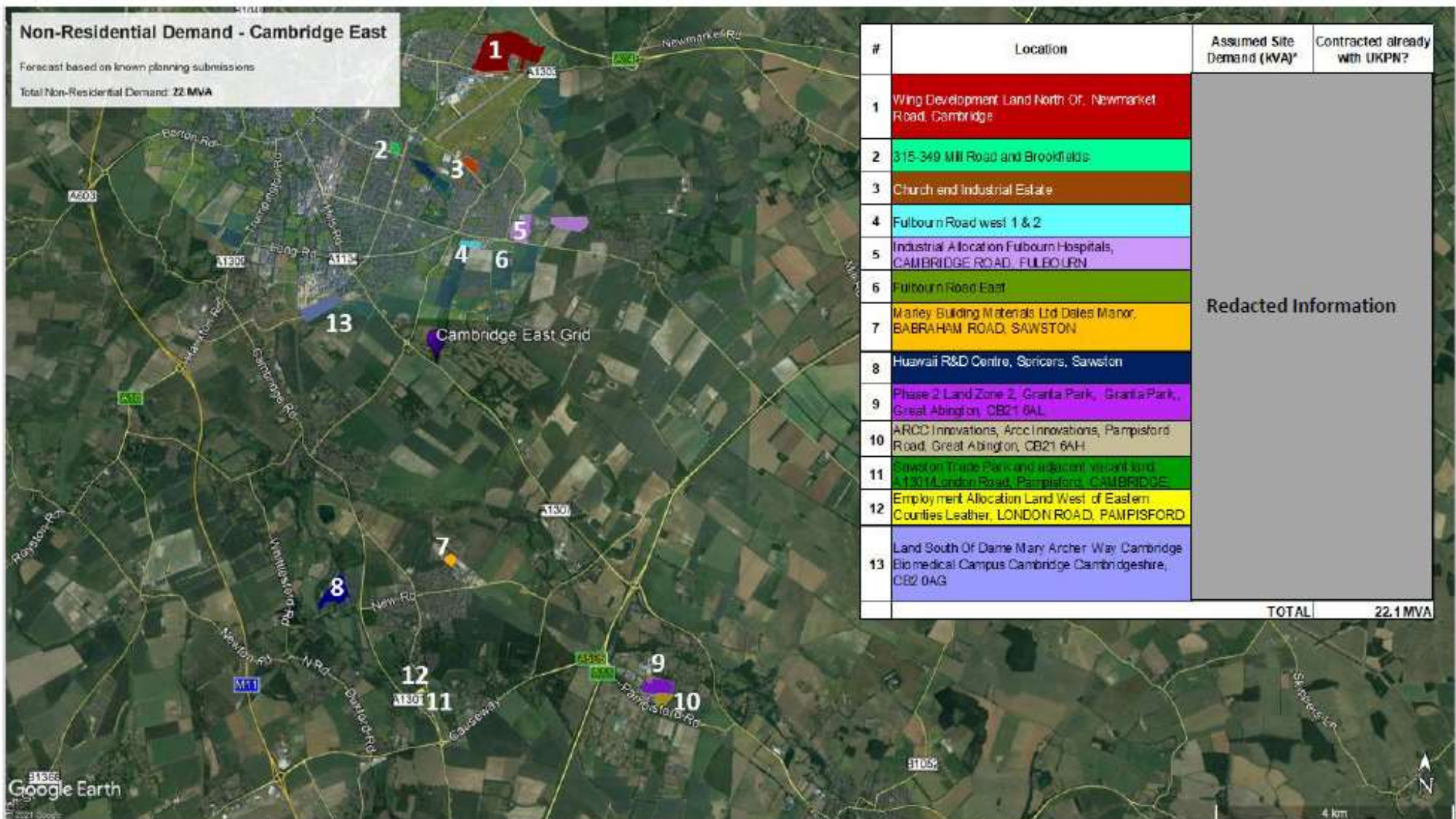
These demand figures will be used to inform the application(s) that GCP intends to make to UKPN.

The demand calculations have been undertaken for all 3 demand areas, however GCP may decide not to submit applications for all 3 areas – this decision will be informed by the funds available, cost of works for each area, and the level of immediate need for intervention. For example, current discussions with UKPN suggest that the need for intervention in Cambridge West may be less imminent.

Appendices 1, 2 and 3 provide further detail for each demand area, including the geographic spread of the developments that have been included and the build out timeframes for the new homes in each area. These maps will be submitted to UKPN alongside the demand application(s).

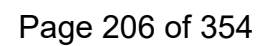
Appendix 1: Cambridge East Demand Maps

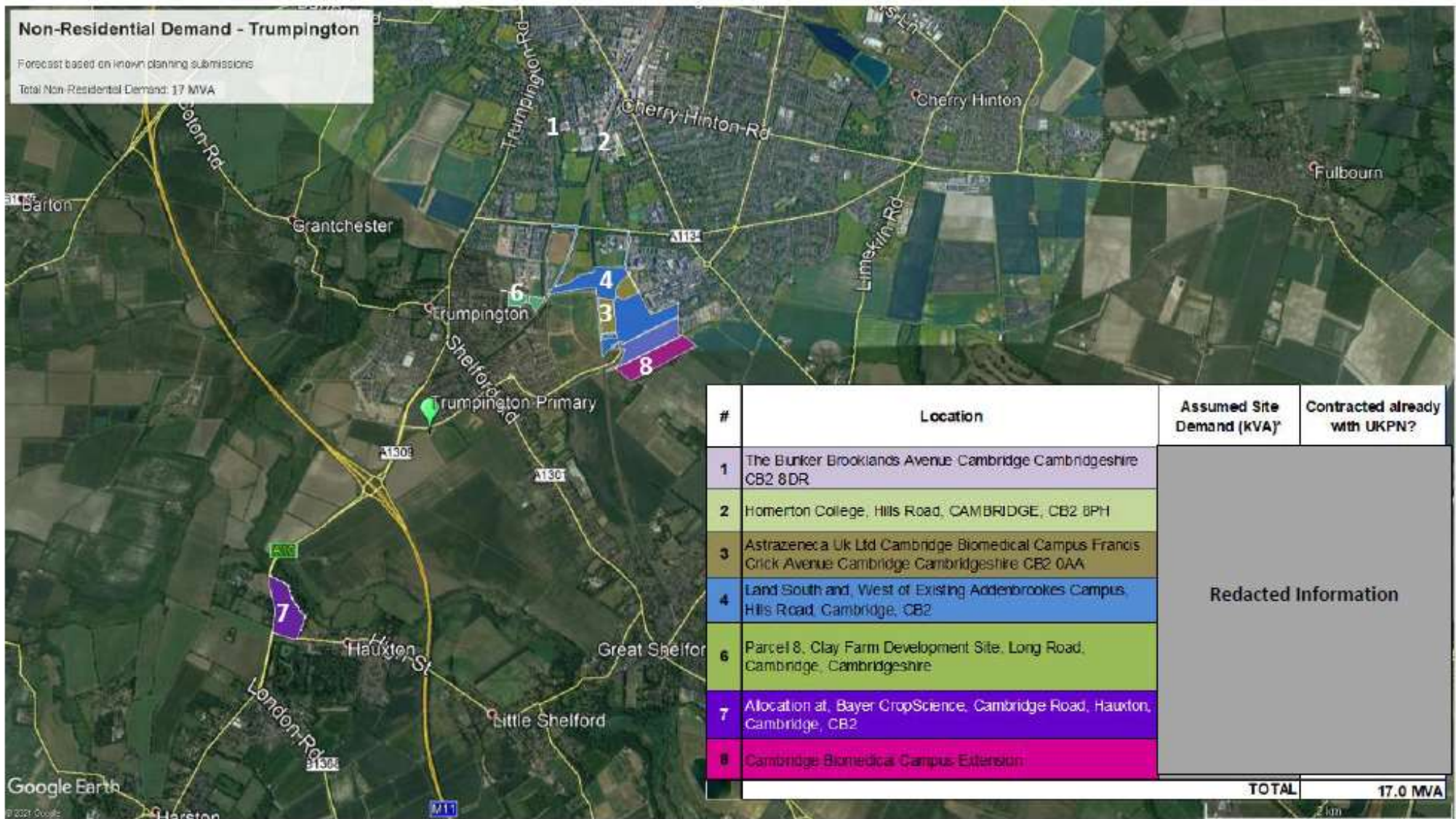




Cambridge East Commercial Demand Calculations

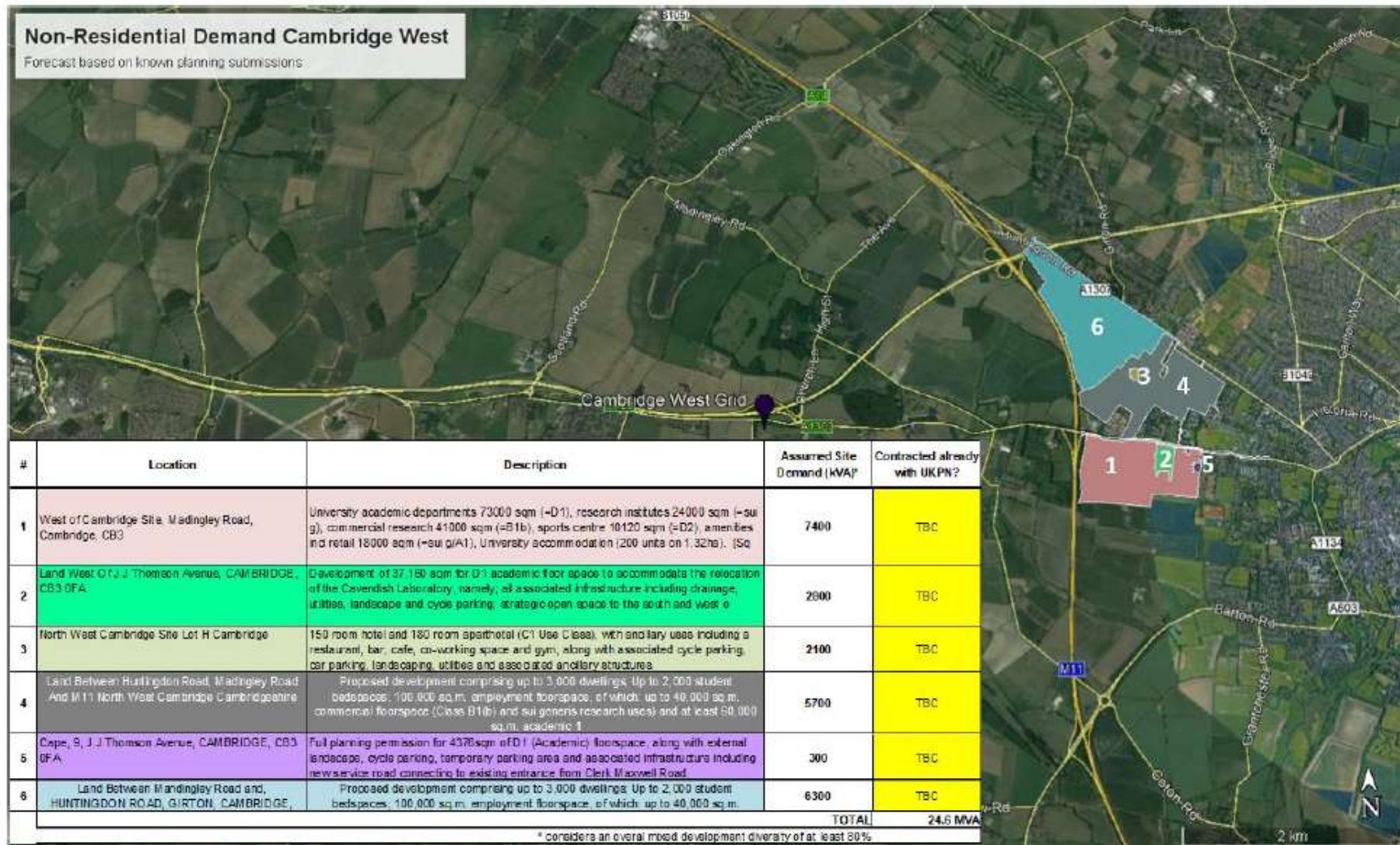
#	Location	Planning Status	Development Type	Primary Use	m2 floorspace	Assumed kVA/m2	Site Demand (kVA)*	Assumed Site Demand (kVA)*	Contracted already with UKPN?
1	Wing Development Land North Of, Newmarket Road, Cambridge	Reserved Matters	New Build	A3 - Restaurants / Cafes D1 Suis Generis Retail - Convenience	176 428 856 983	0.15 0.1 0.1 0.2	21.12 34.24 52.48 154.08	Redacted Information	
2	315-349 Mill Road and Brookfields	Local Plan Allocation	New Build	Unknown Offices	1500 3405	0.1 0.1	120 272.4		
3	Church end Industrial Estate	Local Plan Allocation	Redevelopment (Non Housing)	B2 - Manufacturing	2432	0.2	389.12		
4	Fulbourn Road west 1 & 2	Local Plan Allocation	New Build	B1b - R&D	11084	0.22	1950.784		
5	Industrial Allocation Fulbourn Hospitals, CAMBRIDGE ROAD, FULBOURN	Local Plan Allocation	New Build	Offices	14000	0.1	1120		
6	Fulbourn Road East	Local Plan Allocation	New Build	Offices	22645	0.1	1811.6		
7	Marley Building Materials Ltd Dales Manor, BABRAHAM ROAD, SAWSTON	Full	Redevelopment (Non Housing)	B1c - Industrial B2 - Manufacturing B8 - Storage	4088 4088 4088	0.2 0.2 0.05	650.88 650.88 162.72		
8	Huawei R&D Centre, Spricers, Sawston		New Build	B1b - R&D	50445	0.22	8878.32		
9	Phase 2 Land Zone 2, Granta Park, Granta Park, Great Abington, CB21 8AL	Outline	New Build	B1b - R&D	32490	0.22	5718.24		
10	ARCC Innovations, Arco Innovations, Pampisford Road, Great Abington, CB21 8AH	Full	Extension (Non Housing)	B1b - R&D	1683	0.22	296.208		
11	Sawston Trade Park and adjacent vacant land, A1301/London Road, Pampisford, CAMBRIDGE	Outline Full	Rebuild (Housing) Change of Use	B1a - Offices Business	13147 8686	0.1 0.1	1051.76 534.88		
12	Employment Allocation Land West of Eastern Courties Leather, LONDON ROAD, PAMPISFORD	Local Plan Allocation	New Build	B2 - Manufacturing	6078	0.2	972.48		
13	Land South Of Dame Mary Archer Way Cambridge Biomedical Campus Cambridge Cambridgeshire, CB2 0AG	Outline	New Build	Restaurants / Cafes Pubs and Bars Takeaways Education Education Retail R&D labs	500 500 500 500 500 500 64012	0.15 0.1 0.1 0.15 0.15 0.2 0.22	60 40 40 60 60 80 11266.112		
								TOTAL	22.1 MVA
* considers an overall mixed development diversity of at least 80%									



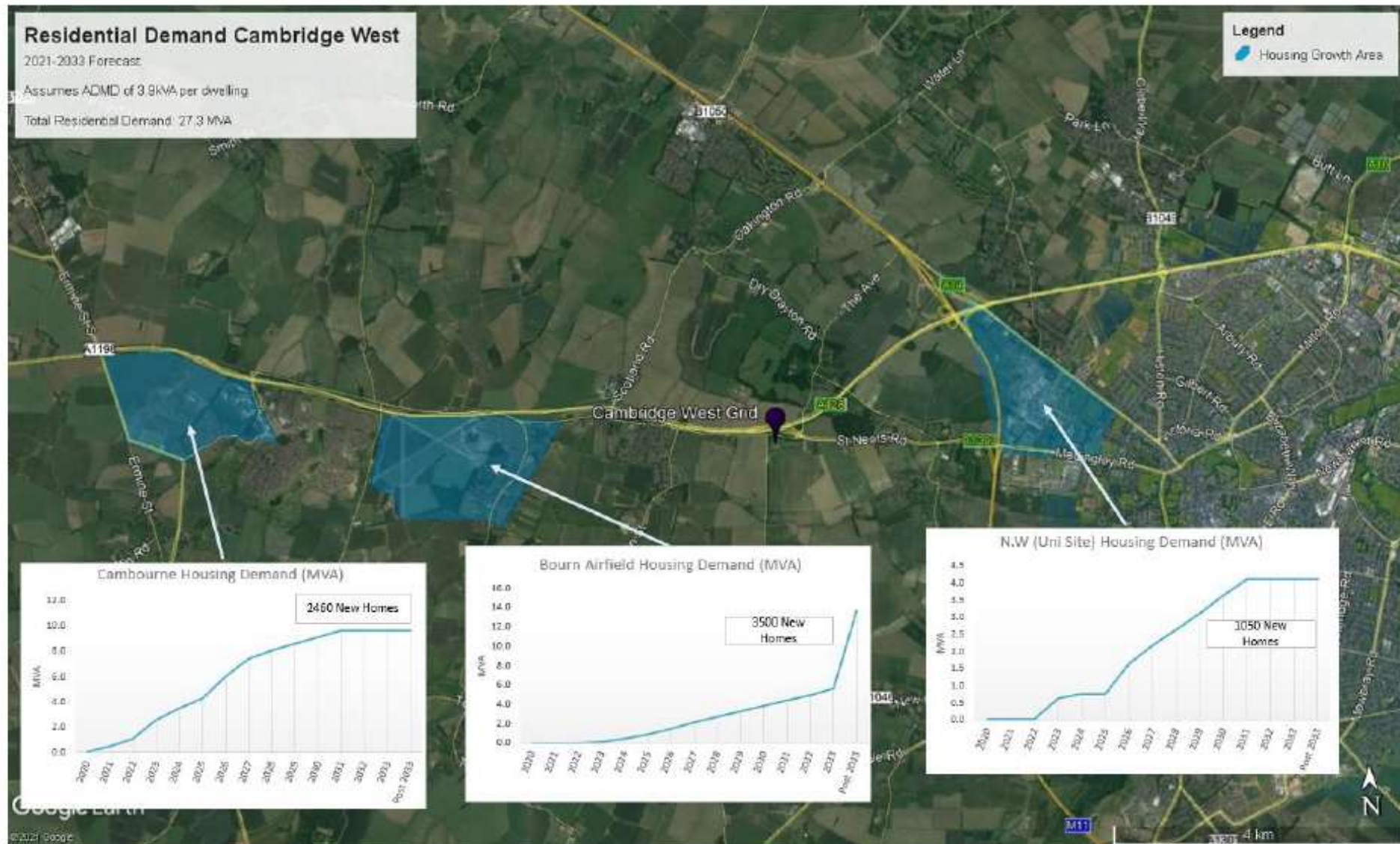


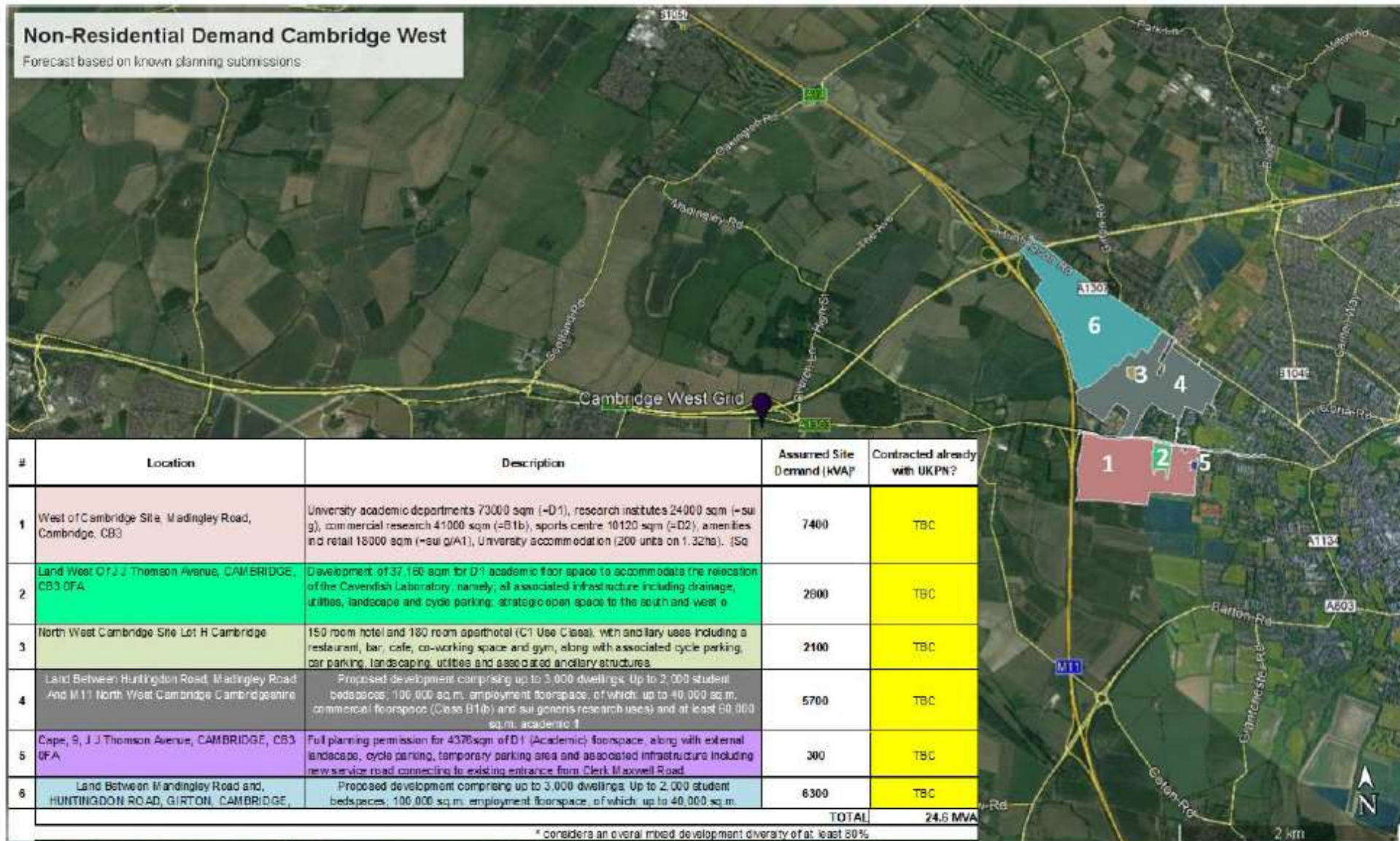
Trumpington Commercial Demand Calculations

#	Location	Planning Status	Development Type	Primary Use	m2 floorspace	Assumed kVA/m2	Site Demand (kVA)*	Assumed Site Demand (kVA)*	Contracted already with UKPN?
1	The Bunker Brooklands Avenue Cambridge Cambridgeshire CB2 8DR	Full	Change of Use	Museums	3424	0.1	273.92	Redacted Information	
2	Homerton College, Hills Road, CAMBRIDGE, CB2 8PH	Full	New Build	Education	620	0.15	74.4		
3	Astrazeneca Uk Ltd Cambridge Biomedical Campus Francis Crick Avenue Cambridge Cambridgeshire CB2 0AA	Reserved Matters	New Build	Amenities hub	3261	0.1	260.88		
				R&D labs	13917	0.22	2449.392		
4	Land South and West of Existing Addenbrookes Campus, Hills Road, Cambridge, CB2	Outline	New Build	R&D labs	13062	0.22	2298.912		
				Clinical / Hospital	62800	0.22	11052.8		
6	Parcel 8, Clay Farm Development Site, Long Road, Cambridge, Cambridgeshire	Reserved Matters	New Build	Retail	152	0.2	24.32		
				Restaurants / Cafes	201	0.56	90.048		
				Retail	609	0.2	97.44		
7	Allocation at, Bayer CropScience, Cambridge Road, Huxton, Cambridge, CB2	Local Plan Allocation	New Build	Retail	250	0.2	40		
				R&D labs	4000	0.22	704		
8	Cambridge Biomedical Campus Extension	Local Plan Allocation	New Build	B1b - R&D	30666	0.22	5400.56		
TOTAL									17.0 MVA



Appendix 3: Cambridge West Demand Maps





Cambridge West Commercial Demand Calculations

#	Location	Planning Status	Development Type	Primary Use	m2 floorspace	Assumed kVA/m2	Site Demand (kVA)*	Assumed Site Demand (kVA)*	Contracted already with UKPN?
1	West of Cambridge Site, Madingley Road, Cambridge, CB3	Outline	New Business Development	D1	7755	0.10	620.4	7400	TBC
				Retail - Unknown	13791	0.20	2206.56		
				Suis Generis	17501	0.10	1400.08		
				B1b - R&D	17788	0.22	3130.336		
2	Land West Of J J Thomson Avenue, CAMBRIDGE, CB3 0FA	Full	New Build	D1	35200	0.10	2816	2800	TBC
3	North West Cambridge Site Lot H Cambridge	Full	New Build	C1 - Hotels	17890	0.15	2122.8	2100	TBC
4	Land Between Huntingdon Road, Madingley Road And M11 North West Cambridge Cambridgeshire	Outline	New Build	D2	450	0.10	36	5700	TBC
				Retail - Convenience	508	0.20	80.96		
				D1	935	0.10	74.8		
				B1b - R&D	31200	0.22	5491.2		
6	Cape, 9, J J Thomson Avenue, CAMBRIDGE, CB3 0FA	Full	New Build	D1	3238	0.10	259.04	300	TBC
7	Land Between Madingley Road and, HUNTINGDON ROAD, GIRTON, CAMBRIDGE,	Outline	New Build	B1b - R&D	8800	0.22	1548.8	6300	TBC
				D1	60000	0.10	4800	4800	
	TOTAL								24.6 MVA
* considers an overall mixed development diversity of at least 80%									

Appendix 2 – WSP Demand Analysis 2021 Executive Summary

The full report and its appendices can be accessed here:

www.greatercambridge.org.uk/asset-library/210705-GCP-Energy-Demand-Assessment-Report-WSP-Final-Version.pdf



Greater Cambridge Partnership

ENERGY DEMAND ASSESSMENT



Greater Cambridge Partnership

ENERGY DEMAND ASSESSMENT

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

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1 EXECUTIVE SUMMARY

Background

The Greater Cambridge Partnership (GCP) is responsible for delivery of the Cambridge City Deal with an aim to support new jobs, homes, and skills over 15 years. The local plan for the area of Cambridge and South Cambridgeshire proposes a supply of 33,500 homes and 44,000 jobs up to 2031. This, along with electrification of heating and vehicles in existing development will increase the electrical demand and need for electrical supply infrastructure.

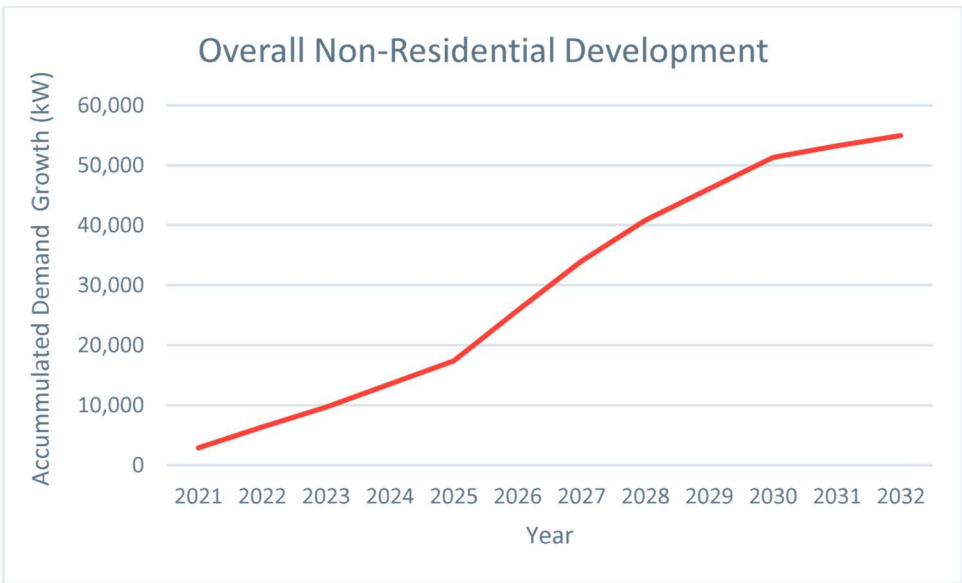
It is important this infrastructure is in place to ensure that economic growth, housing growth and decarbonisation goals can be achieved. GCP is considering investing in this infrastructure ahead of demand to increase confidence for investment and accelerate development. A number of studies have looked into this issue, and this project will build on the work previously undertaken.

Three substations are currently being proposed in order to support growth in this area, with two of them, Trumpington and Cambridge East, having received formal offers from UKPN.

New Development Projections

The new development growth assumptions from the Roadnight Taylor study were taken as a baseline. These include 7,000 homes in Cambridge West, 700 in Trumpington and 5,000 in Cambridge East. In addition, non-residential developments include six developments (215,000 m²) in the Cambridge West area, eight developments (141,000 m²) in the Cambridge East area and another eight developments (129,000 m²) in the Trumpington area.

Phasing of non-domestic projects was estimated, in order to understand what levels of additional demand will come online for each year. This was based on planning information provided by GCP and input from the Greater Cambridge Shared Planning team. A summary of overall additional demand per year can be seen in the figure below, with a more detailed breakdown included in the report and in Appendix B (of that report).



Increased Electrical Demand Analysis

The ADMD (After Diversification Maximum Demand) for new homes has been calculated from reviewing a number of trials, studies, and technical standards. Based on this, 1.4 kVA of demand per new home has been assumed.

	Gas-Fired Dwelling (Bedrooms)					Heat Pump Dwelling (Bedrooms)				
DNO	1	2	3	4	Ref	1	2	3	4	Ref
Scottish and Southern	1.2	1.8	2	2.25	Link					
SP Energy Networks	1	1	1	1.5	Link	2	2.4	2.8	4	Link
Electricity North West	1	1	1	1.4	Link					
Northern Powergrid	1.3	1.3	1.3	1.3	Link	1.4*	1.4	1.4	1.4	Link
Western Power	0.9	1.3	1.7	2	Link	1.9	2.7	3.5	4.5	Link
UK Power Networks	1.2	1.2	1.5	1.8	Link					

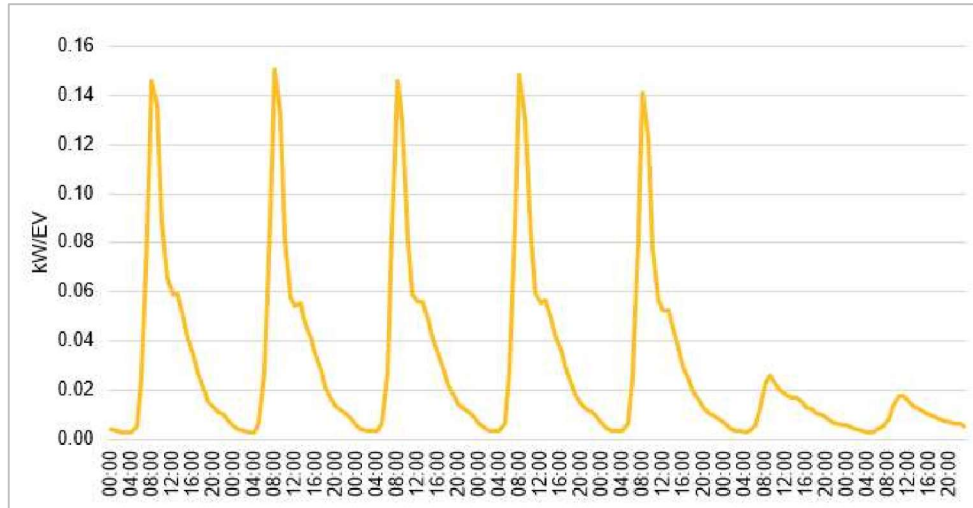
*. At 1,000+ dwellings

In addition, the non-domestic demand assumptions used by Roadnight Taylor were used and refined by WSP. These can be seen below:

Primary Use	Assumed kVA/m2	WSP kVA/m2	Reference
Storage	0.050	0.017	BSRIA Rules Of Thumb (ROT) plus internal data
Amenities hub	0.100	0.087	BSRIA ROT 5th ed
Business	0.100	0.087	BSRIA ROT 5th ed
Museums	0.100	0.087	BSRIA ROT 5th ed
Offices	0.100	0.087	BSRIA ROT 5th ed
Pubs and Bars	0.100	0.225	BSRIA ROT 5th ed
Suis Generis	0.100	0.100	No additional evidence
Takeaways	0.100	0.225	BSRIA ROT 5th ed
Unknown	0.100	0.100	No additional evidence
Education	0.150	0.070	Bespoke education projects
Restaurants/ Cafes	0.150	0.225	BSRIA ROT 5th ed
Industrial	0.200	0.088	No reference given
Manufacturing	0.200	0.176	Rolls Royce Hucknall dataset.
Retail	0.200	0.160	No reference given
Clinical/ Hospital	0.220	0.087	BSRIA ROT assumed office
R&D labs	0.220	0.176	Rolls Royce Hucknall dataset
Hotels	0.150	0.150	Not additional evidence

The EV charging, assumed to take place in all new homes (as agreed with the client), was also

analysed in order to understand what levels of additional demand it will result in. The main sources include a UKPN study from 2013 and the National Grid Future Energy Scenarios 2019. These resulted in 0.3 kVA and 0.4 kVA of increased peak demand, respectively. An increase of 0.5 kVA was assumed in this study, reflecting concerns expressed by UKPN around increasing charging speeds during our engagement session.



For non-domestic charging, it has been assumed that 60% of journeys are undertaken by private vehicle, that there is one parking space per 20m² in office type facilities and one parking space per 40m² in other facilities to account for an approximate 50% parking provision. As such, 0.15 kVA per parking space is assumed for non-domestic charging, as per NG's Future Energy Scenario Findings.

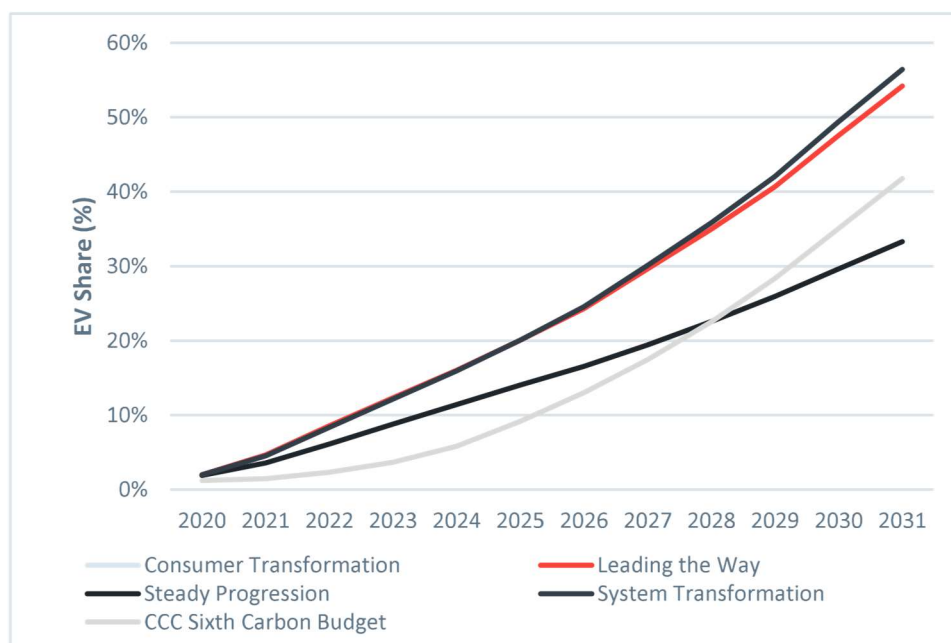
Existing Development

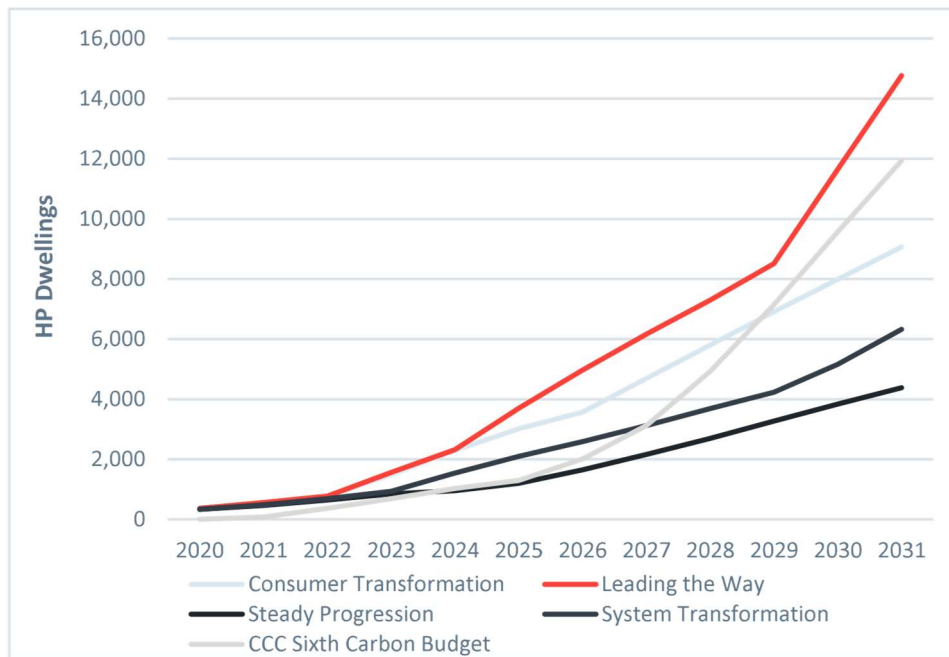
The number of residential dwellings covered in the GCP area was determined using property data at a LSOA level, and GIS shapefiles of LSOAs and the GCP area. This resulted in a figure of 84,200 dwellings. The most common types of dwelling were a 3-bed semi-detached house (14,090 dwellings) and a 3-bed detached house (12,470).



The uptake of electric vehicles (and associated EV charging) and heat pumps was estimated based on UKPN's Future Energy Scenarios, which include modelling and projections for EV and heat pump uptake up to 2050 based on a number of assumptions and scenarios. This is importantly broken down at a LSOA level, which allows for a tailored approach to the GCP area and the LSOAs within it.

The projected EV share and heat pump installation projections can be seen in the following graphs:





This resulted in the estimate of about 45,000 EVs (55.3%) by 2031 and 14,800 heat pumps (17.5% of properties) by 2031.

EV charging was assumed to cause the same additional demand than for new domestic development. Heat pumps in existing development were assumed to cause 1 kW of additional peak demand, as per the findings of the same trial which was used for new domestic development.

Discussion with UKPN

A meeting was held with UKPN and GCP to show the main findings of the study, particularly around the ADMD figures for heat pumps and EVs and the substations' coverage area assumptions from Roadnight Taylor's study. The feedback from UKPN was mainly of agreement with the assumptions underpinning the analysis, whilst also providing some feedback on elements where further work may be beneficial, such as refining the substations' coverage area or highlighting non-typical non-residential energy uses which may drive up demand from developments.

Results

The overall demand calculations resulting from the analysis are shown below:

Sector	Total Cars	Site Demand	EV Charging	Total
West Cambridge	Domestic	9,800 MVA	3,500 MVA	13,300 MVA
	Non-Domestic	19,600 MVA	2,200 MVA	21,800 MVA
	Total	29,400 MVA	5,700 MVA	35,100 MVA
Trumpington	Domestic	980 MVA	350 MVA	1,330 MVA

	Non-Domestic	13,500 MVA	1,900 MVA	15,320 MVA
	Total	14,480 MVA	2,250 MVA	11,830 MVA
East Cambridge	Domestic	6,900 MVA	2,500 MVA	9,400 MVA
	Non-Domestic	18,100 MVA	2,100 MVA	20,300 MVA
	Total	25,000 MVA	4,600 MVA	29,700 MVA
Total	-	68,880 MVA	12,550 MVA	81,430 MVA

The results from existing development are shown below:

Type	Number	Additional Demand
Heat Pumps	14,800	14,800 MVA
EV Charging	45,000	22,500 MVA

A number of further steps have been identified throughout this study, which will be included in a further iteration of this report:

- The growth assumptions should be sense-checked by liaising directly with developers. This is already underway but has not been possible to complete by the end of this study.

- The GCP area should be refined based on information provided by UKPN. This will require further investigation to understand what other developments may be taking place in the revised area, as well as the calculations related to existing development.

		Demand growth scenarios (values in MVA)		
		Moderate	High	Gone Green
Residential	Home supply	96.41	96.41	96.41
	Electric Vehicles	5.15	27.04	40.82
	Heating	64.65	71.80	78.99
	Supporting services (e.g. schools, supermarkets)	8.25	8.95	10.38
Σ		174.46	204.20	226.60
Transport	Electrification of existing private vehicle stock	11.96	35.87	71.74
	Public transport (bus depots, taxi ranks, CAM Metro)	6.57	7.23	8.26
	Park and Ride	1.04	2.15	4.35
	Council-run car parks	0.81	1.76	3.56
	Fuel stations	1.03	2.01	3.04
	Retail parks / shopping malls	0.06	0.19	0.39
Σ		21.48	49.21	91.34
Heat	Heat pump conversions	0.70	3.49	6.98
Σ		0.70	3.49	6.98
Commercial and R&D developments (based on history of enquiries and discussions with local authorities)		64	64	64
SUBTOTAL		260.64	320.90	388.92
CAPACITY ALREADY CONTRACTED WITH UK POWER NETWORKS		52.1	52.1	52.1
GRAND TOTAL (MVA)		208.54	268.80	336.82

Appendix 3 – Soft Market Testing (ICP + IDNO)

SUMMARY OF RESULTS OF ICP SOFT MARKET TESTING EXERCISE

SECTION	QUESTION	ICP	RESPONSE	COMMENTARY
Section B: General	Do you have any geographic limits to your operations that would affect your interest or ability in constructing network assets in Cambridgeshire?	Respondent 1	No	7 of the 8 respondents demonstrated relevant experience and held suitable accreditations to undertake the contestable works. All respondents were also used to working with IDNOs to adopt network assets.
		Respondent 2	No	
		Respondent 3	No	
		Respondent 4	No	
		Respondent 5	No	
		Respondent 6	No	
		Respondent 7	No	
		Respondent 8	No	
Section C: Technical Experience	Please confirm your organisation holds up to date Lloyds NER accreditations for the works outlined above (in Scope of Works). Partial accreditation is considered if you are progressing towards full accreditation.	Respondent 1	Full Accreditation Confirmed	
		Respondent 2	Full Accreditation Confirmed	
		Respondent 3	Full Accreditation Confirmed	
		Respondent 4	Full Accreditation Confirmed	
		Respondent 5	Full Accreditation Confirmed	
		Respondent 6	Full Accreditation Confirmed	
		Respondent 7	Partial Accreditation for 33kV and 132kV	
		Respondent 8	Full Accreditation Confirmed	
	Previous experience designing and installing comparable substation projects at EHV (132kV & 33kV) and HV (11kV)?	Respondent 1	Relevant experience provided at EHV & HV	
		Respondent 2	Relevant experience provided at EHV & HV	
		Respondent 3	Relevant experience provided at EHV & HV	
		Respondent 4	Relevant experience provided at EHV & HV	
		Respondent 5	Relevant experience provided at EHV & HV	
		Respondent 6	Relevant experience provided at EHV & HV	
		Respondent 7	Only experience at 11kV	
		Respondent 8	Relevant experience provided at EHV & HV	
		Respondent 1	£3,700,000	

SECTION	QUESTION	ICP	RESPONSE	COMMENTARY
Budget Quotations	Budget Estimate for the Contestable Works required for Cambridge East Substation	Respondent 2	£6,000,000	Not all respondents provided a budget price, and some prices were surprisingly low, suggesting that the full scope of works had not been included. In total there were deemed to be 5 credible responses, but these still provide a wide range of costs and further procurement activity would be required to refine the cost saving opportunity from using an Independent Connections Provider to deliver either substation.
		Respondent 3	£7,500,000 - £9,000,000	
		Respondent 4	£12,325,834	
		Respondent 5	£2,923,750	
		Respondent 6	£5,569,119	
		Respondent 7	£8,375,750	
		Respondent 8	not provided	
	Budget Estimate for the Contestable Works required for Trumpington Substation	Respondent 1	£2,500,000	
		Respondent 2	£7,450,000	
		Respondent 3	£9,000,000 - £10,000,000	
		Respondent 4	£12,325,834	
		Respondent 5	£4,838,000	
		Respondent 6	£6,157,757	
		Respondent 7	£5,735,520	
		Respondent 8	not provided	

SUMMARY OF RESULTS OF IDNO SOFT MARKET TESTING EXERCISE

SECTION	QUESTION	ECLIPSE	VATTENFALL	COMMENTARY
Section B: General	Geographic limits to operations.	No	No	<p>Note that other than Vattenfall having a smaller number of demand customers (domestic and non-domestic) and generation customers than Eclipse, Eclipse and Vattenfall otherwise provided identical answers to these sections and have broadly similar levels of experience.</p> <p>Vattenfall is a newer market entrant than Eclipse and this is likely behind the difference in connected customer numbers.</p>
	Experience of connecting domestic demand customers.	Yes	Yes	
	Experience of connecting non-domestic demand customers.	Yes	Yes	
Section B: Technical	Experience of adopting and operating EHV networks in the UK.	Yes	Yes	
	Experience of adopting and operating HV networks in the UK.	Yes	Yes	
Section C: General	Approx. number of domestic demand customers	10,000	1,500	
	Approx. number of non-domestic demand customers	428	174	
	Experience of connecting generation customers	Yes	Yes	
	Approx. number of generation customers	5	2	

SECTION	QUESTION	ECLIPSE	VATTENFALL	COMMENTARY
Section C: Technical	Level of experience of adopting and operating networks at 132kV in the UK	Limited (1 adopted and 3 in-build)	Significant (50MW solar farm)	<p>The “Limited” or “Significant” responses here are subjective – based on the details provided we (RT) would perhaps want to explore Vattenfall’s claim that they have ‘significant’ experience here, particularly given that they have a smaller number of customers than Eclipse. At the very least it would be useful to have a sense of scale regarding their operations at each voltage level, rather than one particular example.</p> <p>Overall it would appear that Eclipse actually has slightly more experience at EHV, and potentially significantly more experience at 11kV.</p> <p>Both parties can clearly demonstrate that they have met the qualification criteria that they declared in Section B.</p>
	Level of experience of adopting and operating networks at 33kV in the UK	Limited (2 in-build)	Significant (1500 units mixed use development, 15 MVA load capacity)	
	Level of experience of adopting and operating networks at 11kV in the UK	Significant (70 11kV networks)	Significant (commercial development with 259 kVA capacity)	
	Relationships with ICPs	Yes (named)	Yes (no examples given)	<p>Both note they are happy to work with any ICPs and responses are largely written assuming GCP would contract separately with the ICP.</p> <p>This is something GCP may wish to discuss with the IDNOs at the next stage</p>

SECTION	QUESTION	ECLIPSE	VATTENFALL	COMMENTARY
Commercial Approach	Recovery strategy	<p>Second comer payments:</p> <ul style="list-style-type: none"> made as new connections are energised paid out as a ratio of capacity taken vs. total capacity. 	<p>Asset value payment:</p> <ul style="list-style-type: none"> payable on (within 30 days of) energisation payment schedule dependent upon energisation of project phases and on the required capacity reserved. 	<p>Further details are needed here to really understand Eclipse and Vattenfall's cost recovery strategies.</p> <p>Eclipse have not referenced asset value payments directly here, although it is clear from the supporting information that they have provided that this is something that they would expect to offer.</p> <p>Vattenfall's response does not directly touch on ECCR, and it may be that they have not dealt with this type of recovery elsewhere.</p>
	Reservation of Capacity	Subject to the DNO. Up to 12 years suggested.	Indefinite	Eclipse take a more cautious approach to reservation of capacity than Vattenfall. We would need to understand if these positions are theoretical, or if they have been successfully tested in practice.
	Proposals to 'future proof' the network.	By integrating renewable generation and technologies to enable demand response. Also designing the network to meet max. expected peak capacity.	Asset value payments would apply to future extensions. Generation and EV charging connections could be adopted.	Eclipse provide detailed information in their supporting documents on their capabilities regarding the development of smart grids and 'future proofing'. We would need to obtain more information on Vattenfall's capabilities in this area.
	Any experience with community ownership structures.	No, but working to develop community ownership solutions for 'several' potential projects.	No, but happy to accommodate.	

Appendix 4 – Risk Register (November 2021)

No.	Risk	Category	Inherent			Mitigation	Controls <i>(Actions to reduce either the likelihood of the risk occurring and or/its potential impact. Control measures may be either already in place, or additional ones considered necessary to manage the risk)</i>
			Likelihood Score	Impact Score	RAG Rating		
R01	Ofgem 'minded to' consultation on ECCR may lead to significant changes to the amount of the initial investment into this project which is recoverable. Consultation was concluded in August 2021, the results of which are awaited in early 2022.	Financial	3	4	12	Escalate	GCP and Roadnight Taylor provided responses to the consultation, also had an initial meeting with Ofgem to discuss the main issues with the proposed changes. Continue engagement with Ofgem and the Dept. for Business, Energy and Industrial Strategy (BEIS) around the possible changes to the legislation and regulation. Further technical and legal advice ongoing also.
R02	Inability to fully recover costs due to demand being lower than expected. Although several demand analyses have been undertaken, there remains a level of uncertainty over demand uptake.	Financial	3	3	9	Treat	Further demand analysis work at the next stage of the project to refine the expected demand figures even further. If demand is deemed to be lowered than thought initially when the grid applications were submitted it may be possible to reduce the capacity being created by using physically smaller transformers, this will need to be discussed with UKPN.

R03	Possibility that UKPN will fund the projects through the next Electricity Distribution price control (RIIO-ED2) which will start in April 2023.	Technical	2	3	6	Tolerate	UKPN are simultaneously pursuing a bid to Ofgem, in which case the GCP would not necessarily need to fund the project. However, this could mean the substations are delayed by between 2 and 7 years, meaning energisation in 2027 at the earliest rather than 2025.
R04	Possibility that cost recovery is lower if future connections are not made directly to the new substation. UKPN may not connect customers to our new capacity directly, as one impact of the new capacity will be to allow them to reduce the capacity margin needed on neighbouring substations, i.e. allowing more people to connect to those.	Financial	2	3	6	Tolerate	UKPN have indicated that they feel this would still meet the ECCR requirements and they could charge second comer costs under the ECCR even to people not connecting to the substation that the first comer costs were calculated on. While this is thus a risk, it may well be possible to mitigate the potential impact, e.g. by agreeing with UKPN that they would not connect to other substations in this way if this issue was raised by potential customers.
R05	Project overruns at planning, design, and/or construction stage therefore costs more than expected or budgetted. This is more of a risk if using an ICP and IDNO.	Technical	3	3	9	Treat	Close project management and continued engagement with the contractors appointed on the project.

R06	Possible future legal challenge to the applicability of ECCR. The regulation does not allow for reinforcement costs to be charged to new connections, for that to happen the costs must be linked to a first connection. There is a potential legal challenge on the basis it is unfair for a second comer to have to pay towards this type of excess capacity.	Legal	3	3	9	Treat	To mitigate this risk the project proposal has included a 0.5MVA connection at each P&R site alongside the reinforcement works. The regulations do not require that there be a close relation between the size of the first connection and the capacity of the reinforcement. Further technical and legal advice will be sought throughout the project development however, the risk associated with this challenge is very small in our project as the existing grid capacity is fully utilised – hence any new connection would have to pay directly for reinforcement if that had not already been added (which would almost certainly be a greater cost than the pro-rata second comer charge).
R07	If grid capacity were further increased in future, as a result of additional reinforcement work, it is not clear whether the GCP would still receive contributions for any unused element of our original capacity. Though unlikely, this may occur if for example, UKPN were to entirely scrap and replace our substation as a result of a request for a large capacity connection (such as a major solar facility), which outstripped the remaining spare capacity.	Financial	2	3	6	Tolerate	This situation would not normally be expected to happen as UKPN will not put in additional capacity until the existing capacity is fully utilised and someone then requests more capacity. However, it would be theoretically possible. Continued engagement without UKPN throughout the project should ensure this risk is minimised.

R08	Cost recovery could be lower than expected if the voltage level of the connections does not match that which has been used in the demand forecast. UKPN practice is to charge connections for reinforcement works (i.e. any works which expand available capacity – as opposed to extension works, which just extend the reach of the Grid infrastructure) relating to the voltage being connected at and the next higher voltage level. Thus 11kV connections will pay for 11kV and 33kV reinforcement works, whilst 33kV connections will pay for 33kV and 132kV (but not 11kV). This project is a mix of 33kV and 132kV works.	Financial	3	3	9	Treat	The current financial model assumes all connections into the Cambridge East Grid will be made at 33kV. It is possible that 11kV connections could be made at Cambridge East Grid which would only lead to cost recovery against the 33kV works and not the 132kV works. The likely connection voltage levels need to be confirmed with UKPN and ongoing engagement will be required..
R09	Future demand could be much higher than anticipated and the capacity built may not be enough, which could lead to the GCP being approached to do a similar project again. The demand forecasts are currently correct until approximately 2031 but there could be upcoming projects that it has not been possible to include because they are not in the Adopted Local Plans or the current planning register.	Technical	2	4	8	Treat	Further demand analysis work to be undertaken at the next stage of the project to refine the expected demand figures even further. If demand is deemed to be higher than anticipated it may be possible to add further capacity to the existing proposals rather than starting again in a few years time. Close work with UKPN will be needed to ensure the demand capacity is sufficient for the expected developments between 2025 and 2035.

R10	Possible legal issues under subsidy control laws. The current subsidy control law in the UK exists only in embryonic form, and there is therefore a risk that UK law in this area, once implemented, will look different to the regime set out in this report, which may impact on the delivery route taken and applicability of State Aid rules.	Legal	2	3	6	Tolerate	Assessment by Pinsent Masons has found that, given that it appears to be intended that the UK regime will be less restrictive than EU State aid law, an approach which is compatible with EU State aid law should also be compatible with UK subsidy control law. Continued work with legal advisors throughout the project will mitigate this risk.
R11	The UKPN offers are issued with the condition that the applicant must provide the land for the works. Land availability and acquisition dependant on being able to identify land owners and negotiate purchase or use of land.	Technical	2	4	8	Treat	Current land parcels identified for possible use are owned by Cambridgeshire County Council and sit on or next to existing Park and Ride sites. UKPN need a long-term lease and do not require ownership of the land parcel. Ongoing engagement between GCP and CCC to resolve land issues.
R12	If the IDNO route is selected, GCP would be forging a new path, and taking on that unknown risks and opportunities.	Technical	3	3	9	Tolerate	If chosen, this would have to be tolerated and risks/opportunities constantly reviewed. This route is not currently being recommended as part of the outline business case.
R13	Complexity risk of managing the number of relationships involved in the project, particularly if the DNO + ICP + IDNO route is selected.	Technical	2	3	6	Tolerate	Ongoing engagement with key stakeholders and procurement of a technical project manager is suggested. If the DNO + ICP + IDNO route is selected additional project management time and technical support will be needed on the project. Currently this route is not being recommended in the outline business case.

R14	Land parcels currently identified for use for the works are at existing park and ride sites identified and could have multiple land uses competing.	Technical	3	3	6	Treat	Detailed design at the next phase of the project and engineering feasibility work by UKPN or an IDNO should address this risk. Continued engagement with CCC as the landowner and other stakeholders will also be required.
R15	Lack of market interest in project from IDNOs and/or ICPs or lack of capability in the market to deliver.	Technical	3	2	6	Treat	The procurement strategy will continue to be developed depending on the delivery route chosen. Further market testing or a request for quotation process is suggested for the next stage of the project. It may be that due to the high voltage level only UKPN can deliver the project and/or adopt the assets but this will need further investigation.
R16	UKPN formal grid offers could expire before internal governance processes can be completed.	Technical	3	4	12	Escalate	Initial offer acceptance deadline was 2 nd November 2021. An extension was granted by UKPN until 14 th December 2021. Another extension may not be possible but further engagement with UKPN is needed on this. If the offers expire, the project will be set back by 3 months minimum.
R17	Risk that planned developments are withdrawn or do not progress due to issues with the grid and the possibility of large upfront costs to pay for a grid connection.	Financial	3	3	9	Tolerate	It is possible that not all planned developments will go ahead if developers fear they will have to pay for the reinforcement works as part of their connection into the grid. This is par of the issue which this project is aiming to address (hence the tolerate rating) by delivery additional capacity in advance of need, and the system charges through the ECCR should be much lower and more attractive to developers than the large upfront costs of reinforcement.

R18	Supply chain risks at construction stage, including increased cost of materials due to impacts of Brexit and Covid-19 pandemic.	Technical	2	3	6	Tolerate	This risk will need to be managed closer to the construction phase; however the risk is mitigated slightly as UKPN are obliged under the regulations to provide the lowest costs possible to deliver the scheme.
R19	Internal resource within the GCP and possible need for a Project Manager and Assistant Project Manager full time	Technical	2	3	6	Tolerate	This risk will need to be reviewed at the next phase of the project and if needed a PM and APM to be hired.
R20	Partnership working and support from CCC and Greater Cambridge Shared Planning Service	Technical	2	3	6	Tolerate	Continue engagement and partnership working, then where necessary PPAs to be put in place. This risk will be greater at the next project phase when land and planning agreements will need to be progressed.



GREATER
CAMBRIDGE
PARTNERSHIP

Greater Cambridge Partnership – Local Network Analysis

Final report – February 2019

Report authors: Marc Wynn & Mark Bramah

Greater Cambridge Partnership – Local Network Analysis

Final report

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CHAPTER 1 – BACKGROUND, CONTEXT AND METHODOLOGY

1. Background and strategic Drivers

- 1.1 The Government's Smart Systems and Flexibility Plan published in July 2017 points out that the energy system is changing. With a greater density of low carbon generation producing different amounts of electricity depending on factors like the time of day or the weather. New technologies such as storage are emerging and the costs of many of these technologies are falling rapidly. *"If we take advantage of the opportunities this provides, we can create new businesses and jobs, empower consumers and help people save up to £40bn off their energy bills in the coming decades"*¹.
- 1.2 Many of the issues identified by the Government are reflected in the challenges faced by Greater Cambridge:
- an electricity grid which was designed for a centralised generation, transmission and distribution network and is heavily constrained across much of England;
 - the effect of intermittent renewable generation on the existing network;
 - the increased demand requirement for electricity driven by needs such as the electrification of transport;
 - the overall system costs, who pays and how to ensure equity; and
 - the potential impact on growth and development of failing to act.
- 1.3 In Greater Cambridge, economic growth has outpaced UK growth by 13% over the last 15 years. Local political and business leaders have high ambitions to support continuing growth and have planned significant investment in housing, jobs and transport infrastructure through the Greater Cambridge City Deal, the Cambridge and South Cambridgeshire Local Plans and more broadly the Cambridgeshire and Peterborough Devolution Deal.
- 1.4 The high growth already experienced across Greater Cambridge has put significant pressure on the local electricity distribution network. This is compounded by Government's ambitions to deliver clean (low carbon) decentralised energy, the shift from fossil fuels and the electrification of transport. Together, these have resulted in major challenges to the local distribution network. Solving current network connection challenges and transforming it at the same time to a smart, dynamic and efficient system for the future will require significant investment, integration of new technologies, new ways of collaborating and changes to our regulatory system.
- 1.5 The 'City Deal' agreed between Government and Greater Cambridge in 2014 was intended to allow Greater Cambridge to maintain and grow its status as a

¹ BEIS Upgrading Our Energy System Smart Systems and Flexibility Plan July 2017

prosperous economic area. The deal which covers the period up to 2031 has some clear objectives and targets to:

- create an infrastructure investment fund with an innovative Gain Share mechanism;
- accelerate delivery of 33,480 planned homes;
- enable delivery of 1,000 extra new homes on rural exception sites;
- deliver over 400 new Apprenticeships for young people;
- provide £1bn of local and national public sector investment, enabling an estimated £4bn of private sector investment in the Greater Cambridge area;
- create 45,000 new jobs;
- create a governance arrangement for joint decision making between the local councils.²

1.6 In 2016 a devolution deal was also agreed between the Government and the seven local authorities covering the Cambridgeshire and Peterborough Local Government area and the Greater Cambridge Greater Peterborough Local Enterprise Partnership, to devolve a range of funding, powers and responsibilities. As a result of this, the Cambridgeshire and Peterborough Combined Authority was created, with its first mayor directly elected in May 2017.

1.7 The devolution deal³ sets out a vision for increasing economic output *“by nearly 100% over the next 25 years. Underpinned by a strong economic and productivity plan GVA will increase from £22bn to over £40bn.”* It also includes a commitment to a low carbon knowledge-based economy; a commitment to the delivery of new homes and sustainable communities; transforming public service delivery; achieving a skills base to match business needs and; providing world class connectivity and transport systems fit for the 21st Century.

1.8 The Cambridgeshire and Peterborough Independent Economic Review (CPIER) was set up to create a single strategic position to help the Cambridgeshire and Peterborough area consider the case for greater fiscal devolution and powers to unlock the delivery of major infrastructure. It highlighted the challenges to growth both specifically within Greater Cambridge and the wider Cambridgeshire and Peterborough area as follows:

“The growth seen in Cambridge and South Cambridgeshire seems very unlikely to be sustained in the future without further and significant investment in infrastructure. Businesses are already noting this as a major concern. A failure

² Greater Cambridge City Deal – Cambridge City Council, Cambridgeshire County Council, South Cambridgeshire District Council, Greater Cambridge/Peterborough Enterprise Partnership, University of Cambridge (2014)

³ <http://cambridgeshirepeterborough-ca.gov.uk/assets/Uploads/Cambridgeshire-and-Peterborough-Devolution-Deal.pdf>

to invest in the development of infrastructure in and around Cambridge is the single biggest endogenous risk to growth facing the area.⁴

- 1.9 Given that Cambridge/Greater Cambridge contributes 67% of the economic output of Cambridgeshire and Peterborough⁵, challenging targets for economic growth together with jobs and housing under the devolution deal for the CA and the city deal for the GCP, are unlikely to be met without significant investment in future infrastructure including the electricity network.
- 1.10 The CPIER report also identified the constraints relating to the electricity network that were a barrier to growth. This was in two key respects:
- firstly, without significant grid reinforcement works to the existing network by UKPN there were capacity problems across the Greater Cambridge area; and
 - secondly, constraints on the grid also impacted severely on localised generation of energy through Combined Heat and Power, renewable energy from microgeneration to solar farms and the installation of Electric Vehicle charging.
- 1.11 The CPIER report made the following observation and recommendation:
- “local government, Ofgem, and UKPN...start seriously planning for the new energy future, where individuals will buy and sell energy from one another in local grid systems independent of the main grid..... more thought is needed as to how the transition from the traditional grid to smart grids will actually take place, as some degree of co-ordination will be required”⁶*
- 1.12 The issues relating to grid constraints in Greater Cambridge were also highlighted in the Local Energy East Tri-LEP energy strategy⁷. This referred to the lack of grid capacity in North West Cambridge and West Cambridge developments which meant that the University has faced some restrictions on the use of photovoltaic panels and may not be able to switch on its Combined Heat and Power unit until additional capacity within the grid can be supplied.
- 1.13 It also identified the additional power requirements for the Southern Cluster Cambridge employment site which included development at Addenbrooke's Hospital, the Cambridge Biomedical Campus and other research parks in South Cambridgeshire. The anticipated upgrade to the grid would take at least 3 years to develop and deliver and this could only take place once applications to connect have been submitted. The report stated that *“all of this adds additional*

⁴ Cambridge and Peterborough Independent Economic Review (CPIER) Final Report Sept 2018 5.1 Infrastructure Investment p.79

⁵ Presentation to Challenge Workshop on 7 November 2018

⁶ CPIER Final Report Sept 2018 p.87

⁷ Local Energy East Strategy: An Energy Strategy for the Tri-LEP area (May 2018)

time, costs and risk to this strategically important development and harms the competitiveness of our region”⁸.

- 1.14 This sets the important strategic context for the present study. Without addressing the serious network constraint issues identified above it is unlikely that GCP will achieve challenging targets agreed as part of the city deal and in the longer-term this could prove a drag on economic growth and housing development.

2. Why was this study needed?

- 2.1 There are many anecdotal stories around the impact of the constrained local electricity network on projects and how this has prevented projects being developed. However, this is insufficient evidence to provide decision makers with a clear description of the problems and how this impacts the strategic growth agenda. This study aims to help decision makers understand the impacts on key growth targets and the costs associated with the problem.

3. Purpose of the report

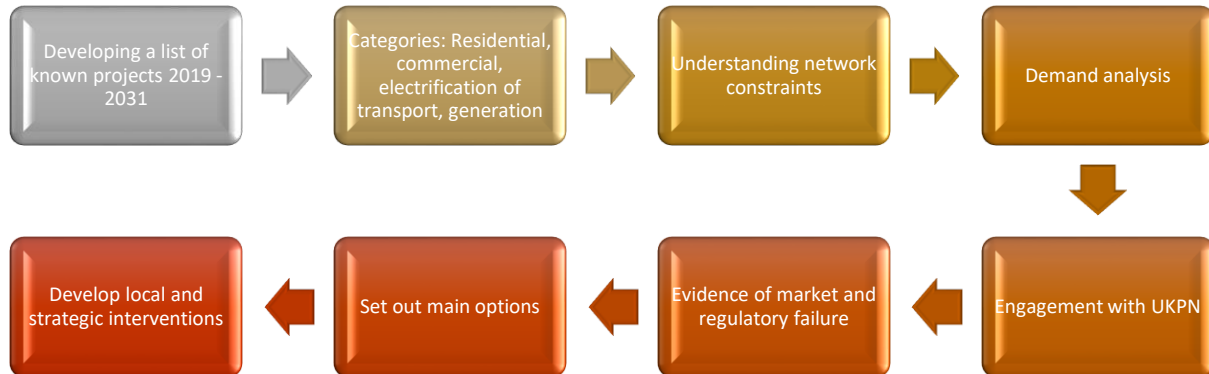
- 3.1 To present the findings of the study undertaken into the constraints of the local electricity network; to provide an analysis of the types and levels of constraints on the local distribution network in Greater Cambridge and how this impacts on the delivery of housing, jobs, clean energy projects; and the electrification of transport.
- 3.2 To set out recommendations on the most effective local and strategic interventions that the Greater Cambridge Partnership (GCP) could facilitate, and, or, invest in to deliver a modern energy system that unlocks immediate barriers to, and supports clean growth.
- 3.3 A separate Executive summary including key findings and recommendations from the study has been prepared to accompany this report.

4. Study methodology

- 4.1 The diagram below shows the methodology utilised for undertaking the study:

⁸ Local Energy East Strategy p.22

Diagram 1 – study methodology



- 4.2 A list of all known developments and projects has been identified covering the public and private sectors over the short (2018-2021), medium (2022-2025) and longer term (2026-2031). This was developed to understand the additional demand and generation that would be required to connect to the network. Given the timescales for completion of the project it was agreed to focus on developments over a certain size, as these developments were more likely to trigger significant grid reinforcement requirements than smaller scale developments. The authors do, however, acknowledge that smaller scale developments may still face costs for grid reinforcements and the recommendations put forward in Chapter 3 of this report will be important to help unlock all scales of development.
- 4.3 Projects were categorised into four development scenarios including **residential, commercial, electrification of transport and clean energy generation** projects. These scenarios reflect the increased electricity demand being driven by Government's Industrial and Clean Growth Strategies and transport agenda. By adding up the requirements across all the developments, the total cumulative demand for the network could be quantified.
- 4.4 UK Power Networks manages five 132-kV grid substations supplying the GCP area and these are Histon, Arbury, Burwell, Fulbourn and Melbourn. To understand the cost impact of grid reinforcements it is important to know the constraints at the 132-kV level of the network as these impact demand and generation capacity at the 33-kV network and 11-kV network supplying the end customer. To determine the effect and cost of future connections on the network a layered approach has been developed considering the different levels of the network.
- 4.5 An **analysis of current and future network capacity and growth constraints** was developed for a range of scenarios, together with a list of projects and this was shared with UK Power Networks for their input on the existing network to determine which developments are at greater risk of delay and how this impacts

the delivery of homes, jobs, EV charging and clean energy projects. The demand analysis is described in **Chapter 2** of the report with an accompanying **Appendix 4** containing the full analysis.

- 4.6 A number of options/solutions arising from the issues identified in the demand analysis were then developed as part of the work programme and an initial appraisal of those options is set out in **Chapter 3**. The options appraisal includes interventions which are classified as **‘business as usual’**: conventional grid reinforcement measures some of which are already planned or proposed interventions by UKPN; and **‘public sector led’**: which are either policy led or require decision by GCP with regard to feasibility and future business cases where they potentially involve investment decisions.
- 4.7 Following on from the options appraisal the key local and strategic interventions which it is recommended that GCP consider with a view to unlocking network constraints in order to meet its strategic goals are described in **Chapter 3** together with how these interventions could be implemented in a staged approach.
- 4.8 A review of the policy and regulatory framework was also undertaken to identify how this supported the transition to a new energy system for Greater Cambridge and where working with BEIS and OFGEM would be needed to support clean growth in the area. This is summarised in **Chapter 4** of the report together with some possible actions which could be taken by GCP. The actions are also reflected in strategic interventions set out in **Section 9** of **Chapter 3** of this report.
- 4.9 The consultants have reviewed a number of important background documents which provide context for the study and feed into the network analysis. A list of the documentation considered is shown at **Appendix 2 – Documentation review and stakeholder contacts**.
- 4.10 The consultants have also met with key people within UKPN and engaged with officers from the GCP, CA, Cambridgeshire County Council, Cambridge City Council, South Cambridgeshire District Council, the University of Cambridge, National Grid Electricity System Operator and the Energy Networks Association which are also listed in **Appendix 2**.

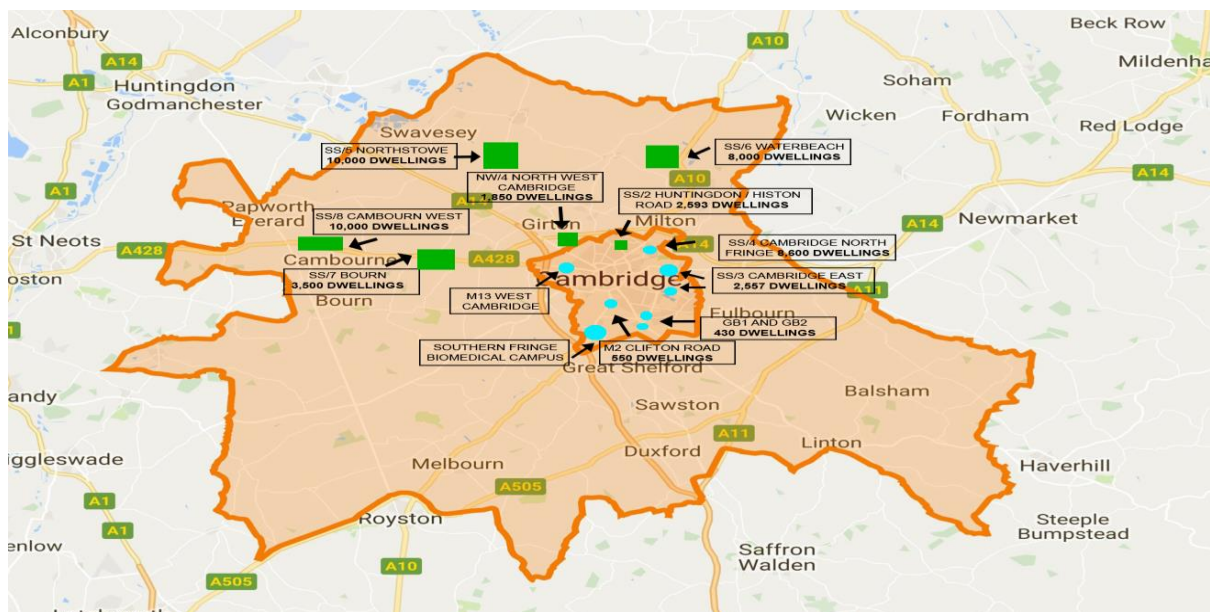
5. The current Grid position locally

- 5.1 Electricity is fed into UKPN’s network from National Grid. In **Figure 1** below, the dotted blue lines represent the 400-kV network operated by National Grid that introduces electricity into UKPN’s network at 132 kV grid substations known as Grid Supply Points (GSP). For GCP area these include Burwell 132 kV from the east, Eaton Socon 132 kV in the west and via Melbourne 132 kV in the south.

(agreed with GCP), principally residential and commercial in relation to the five identified 132 kV substations. By understanding the individual constraint issues, timescales for reinforcement etc. at each 132-kV substation, the implications on each future development become clearer.

- 5.4 In terms of grid connection timescales, it is advisable that formal grid applications are made to UKPN at least 18 months and possibly 24 months before the connection is required. This extended timescale allows for any connection issues to be discussed with UKPN and a workable solution negotiated.

Figure 3 – Key developments with 132-kV locations



- 5.5 A conference call followed by a workshop with UKPN was undertaken to determine the issues relating to each 132-kV grid substation and the present status (or not) of grid applications of the residential and commercial projects in the demand analysis.
- 5.6 Notes were produced from the workshop, which were circulated to UKPN for verification that the information was correct and is attached as **Appendix 3 – UKPN: Issues with the 132kV Network**.
- 5.7 From these notes, the following UKPN comments were noted about each of the 132Kv primary grid substations, and in particular the amount of demand capacity that was available at each. This is summarised at **Table 1** below:

Table 1: 132kV primary substations – demand capacity

132kV Primary Grid	Available Capacity	Comments
Histon Grid	Import and export at capacity.	<p>Histon has seen much of generation capacity being applied to solar PV developments.</p> <p>Up to 90 MVA being made available as part of reinforcement works on the 132kV network</p> <p>The majority of the reinforcement works at 11kV and 33kV being met by UKPN (circa £4m) and will be re charged as part of new connections at approx. £50,000-£100,000 /MVA</p> <p>Anticipated completion timescale 2023</p> <p>Works scoped and in design. Overhead cable works at an advanced stage.</p> <p>As reinforcement works are staged, some capacity may become available</p>
Arbury Grid	Similar issues to Histon except less export issues.	<p>Less than 10 MVA demand presently available. This capacity has been offered to SS/4 for developments close to Cambridge North Railway Station.</p> <p>Envisaged reinforcement will apply from 2021, which might be postponed due to new capacity (90 MVA) being available from Histon.</p>
Fulbourn Grid	Demand capacity of 2 MVA available	<p>Demand capacity of 2 MVA available, with larger amounts triggering 33 kV reinforcement works</p> <p>Switchgear works to complete in 2021</p> <p>This will provide benefits to Sawston primary. UKPN's Current strategy is to install a 3rd circuit from Fulbourn to Sawston in anticipation of the future 3rd transformer. No dates for the transformer works as this is dependent on developments in this area</p> <p>These works are to support future developments (science parks etc) near Hinxton, Babraham, Abington and Chesterford.</p>
Burwell	Demand to 10 MVA is available	<p>No ongoing works</p> <p>4th super grid transformer being built for future solar pV farms supporting 240 MVA of export</p> <p>Demand to 10 MVA is available subject to confirmation</p>
Melbourne	Low amount of capacity available	Low amount of capacity available

CHAPTER 2 – RESULTS/FINDINGS OF THE STUDY

6. Analysis of current and future network capacity and growth constraints

6.1 As referred to in 4.5 above, an **analysis of current and future network capacity and growth constraints** was developed to determine the impact of increased demand/generation on the existing network capacity. The analysis is shown at **Appendix 4**. This section of the report provides a summary of the outputs contained in the demand and generation analysis and the key findings. Data and information utilised in the demand analysis are taken from the South Cambridgeshire and Cambridge City local plans 2018-31.⁹

6.2 The demand and generation analysis has been divided into four types in order to determine the following:

- the projects which already have an accepted electricity grid connection offer and are therefore vulnerable;
- which projects can connect to the grid due to presently available electricity capacity and;
- which projects are unable to connect to the grid at an economically affordable grid connection cost and are therefore at risk of being delayed until grid reinforcements are put in place.

6.3 The demand and generation analysis considers all projects and developments (both public and privately funded) within the following four types:

- Type 1: Residential Projects
- Type 2: Commercial Projects
- Type 3: Electrification of Vehicles
- Type 4: Generation Projects

6.4 Each Types includes a tab¹⁰ to show which projects are unable to connect to the grid, the anticipated timescale to connect the project to the grid and amount of demand or generation of electricity.

6.5 Type 1 - Residential Projects

6.5.1 The South Cambridgeshire and Cambridge local plans¹¹ identified a required total housing target of 38,080 dwellings between 2011-2031, of which 4,932 and 3,970 dwellings have been constructed in the Cambridge and South

⁹ <https://www.scambs.gov.uk/planning/local-plan-and-neighbourhood-planning/the-adopted-development-plan/south-cambridgeshire-local-plan-2018/> and <https://www.cambridge.gov.uk/local-plan-2018>

¹⁰ The reference to 'tabs' in the report refers to the individual tabs set out at **Appendix 4 – Analysis of future network capacity and growth constraints**

¹¹ Cambridge and South Cambridgeshire Local Plan Proposed Modifications 2017 Joint Housing Land Supply Update (RD/AD/500) joint housing trajectory 2011-31

Cambridge areas respectively. Therefore, the revised target of dwellings to be construct to 2031 totalled 29,178.

6.5.2 UKPN were able to confirm that formal grid offers had been accepted for sites SS/5 Northstowe (10,000 dwellings) and SS/6 Waterbeach (8,000 dwellings), leaving a revised target of 11,178 dwellings. These are summarised in Section 1 of the Residential Demand analysis shown at **Appendix 4**.

6.5.3 Section 3 of the analysis considered sites that would be able to connect to the grid from 2023 and as such were then considered 'not' to be vulnerable. These included SS/2 Huntingdon/Histon Road (2,593 dwellings) and NW/4 North West Cambridge - Eddington (1,850 dwellings). These developments were excluded from those considered vulnerable, which reduced the dwelling revised target to 6,735 dwellings.

6.5.4 **Table 2** below summarises the strategic sites that will require significant reinforcement in order for development to progress.

Table 2: Demand issues and strategic sites without grid connectivity

	Demand Issues	Connection Issues with Residential Developments and associated jobs	Connection Issues with Commercial Developments
Histon 132kV Substation	<p>Up to 90 MVA being made available as part of reinforcement works and will be re charged as part of new connections at approx. £50,000-£100,000 /MVA</p> <p>Anticipated completion timescale 2023</p>	<p>SS/4 Cambridge Northern Fringe East¹²:</p> <ul style="list-style-type: none"> - 8600 dwellings - Unknown <p>SS/7 - Bourn Airfield</p> <ul style="list-style-type: none"> - 3500 dwellings - 2800 jobs <p>SS/8 - Cambourne West</p> <ul style="list-style-type: none"> - 2,350 dwellings - Jobs in SS/7 	

¹² Includes Cambridge Local Plan allocation for Cambridge Northern Fringe East under Policy 15 of the Cambridge Local Plan 2018

	Demand Issues	Connection Issues with Residential Developments and associated jobs	Connection Issues with Commercial Developments
Arbury 132kV Substation	<p>Less than 10 MVA demand presently available.</p> <p>Envisaged reinforcement will apply from 2021, which might be postponed due to new capacity (90 MVA) being available from Histon.</p>		
Fulbourn 132kV substation	<p>Demand capacity of 2 MVA available, with larger amounts triggering 33 kV reinforcement works</p>	<p>GB1 and GB2</p> <ul style="list-style-type: none"> - 430 dwellings - Unknown jobs <p>M2 Clifton Road</p> <ul style="list-style-type: none"> - 550 dwellings - Unknown jobs 	<p>Agritech</p> <p>Babraham Research Campus</p> <p>Cambridge City Council</p> <p>Cambridge Biomedical Campus (CBC)</p> <p>Cambridge University Hospital (CUH)</p> <p>GB1 and GB2</p> <p>Jesus College Research Park</p> <p>TWI Granta</p> <p>Sawston Trade</p> <p>Spicers Site Sawston</p> <p>Wellcome Genome Campus</p>
Burwell 132kV Substation	<p>Demand to 10 MVA is available subject to confirmation.</p> <p>4th super grid transformer being built for future solar pV farms supporting 240 MVA of export</p>		
Melbourne 132kV substation	<p>Low amount of capacity available.</p>		

6.5.5 In the above table the potential loss of new jobs is shown as an impact if the developments are not built.

6.5.6 In order to determine the grid connection challenge for projects in scenario 2 and 4, as summarised in **Table 3** below, different assumptions were considered for the demand that would be required per dwelling.

6.5.7 The standard present assumption for a dwelling is 2kVa, in other words 2MW of demand would be required for 1,000 homes. However, due to possible changes in planning requirements, the following considerations set out in **Table 3** were made:

Table 3: Scenarios for potential residential demand

	REQUIREMENTS	DEMAND per dwelling - kVa
SCENARIO 1	Assumes present level of demand of 2kVa per dwelling only	2
SCENARIO 2	Assumes present level of demand of 2kVa per dwelling PLUS, an electric vehicle connection at 7kW Note: UKPN diversity factor of 50% applies to the EV connection	5.5
SCENARIO 3	Assumes present level of demand of 2kVa per dwelling PLUS, an electric vehicle connection at 7kW PLUS, a renewable obligation of 10% i.e. 10% of all properties would require a 3 kWp solar PV array Note: UKPN diversity factor of 50% applies to the EV connection	5.5 Plus, generation of 3kWp for 10% of the dwellings
SCENARIO 4	Assumes present level of demand of 2kVa per dwelling PLUS, an electric vehicle connection at 7kW PLUS, a renewable obligation of 10% i.e. 10% of all properties would require a 3 kWp solar PV array PLUS, a heat pump (estimated) at 5kW Note: UKPN diversity factor of 50% applies to the EV connection : it has been assumed that there is ZERO generation as the electricity is consumed by the heat pumps and within the house	10.5 Plus ZERO generation

6.6 TYPE 2 - Commercial Projects

6.6.1 This type of the demand and generation analysis summarises all known commercial projects within the following three sections.

6.6.2 **Section 1: Grid Connection Secured** - There was one development identified within this section, West Cambridge (M13) which has received and accepted a formal grid offer for 9.6 MW.

- 6.6.3 **Section 2: Formal Offer to be Issued** - There was one development identified within this section, Cambridge Northern Fringe SS/4 and a formal offer was due to be issued by UKPN in December 2018. It has been assumed that the formal offer will have acceptable terms and as such, this development was excluded from being at risk.
- 6.6.4 **Section 3: Grid Issues Restricting Developments** - This section provides a summary all commercial developments that are at risk of being delayed or, if reinforcement costs are significant, facing viability issues. Due the geographical locations of these commercial developments, the main grid issue relates to the lack of any capacity at the Fulbourn 132kV grid primary substation.
- 6.6.5 The developments affected include Southern Fringe - Biomedical Campus and the estimated demand profiles for each company have been provided by Northmore Consulting from previous work completed. A total new additional demand 106.5MW has been assumed. The potential impact on new jobs from the developments being delayed or, in a worst-case scenario, failing to proceed due to capacity issues are unknown.
- 6.6.6 The University of Cambridge have provided their expected demand profile to 2030, that shows their present demand profile of 16 MW increasing to 58 MW. The University has completed an assessment and an estimated £30m is required to fund grid works to enable them to complete all developments to 2030.¹³
- 6.6.7 The University's main connection point to the grid is the Histon Grid Primary (132kV), which is presently part of an upgrade programme works. UKPN have advised that these works will be finalised by 2023 and will release "*up to 90 MW) of additional electrical demand into the grid*". This in theory means that there should be enough capacity to meet the University's future electrical requirements. However, on the basis that this new capacity will only be available from 2023 leaving a four-year capacity issue and the uncertainty of other projects reserving the capacity, it was felt prudent to include the University within the demand analysis.
- 6.6.8 Estimated demand have also been included for other known developments to produce the demand profile in **Table 4** below:

¹³ University of Cambridge - extract from a review of options for provision of new power supplies to cover needs across the West and North West developments

Table 4: Type 2 - Commercial - Demand Profile

	Short term period			Medium Term Period				Long Term Period					
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Demand (MW)	47.3	27.9	40.2	33.9	20.9	22.9	16.9	9.9	2.9	0	0	0	0

6.7 Section 3: Electrification of Vehicles

6.7.1 Within this section of the demand analysis, consideration has been given to all known developments and the ability to obtain financially viable electric vehicle (EV) grid charging connections. Each type has also been assessed to determine the 'Probability of Non-Connection' as a low, medium or high risk. This is shown at **Table 5** below:

Table 5: Electric Vehicle charging requirement

TYPE	COMMENT	Probability of non-connection
Cambridge City Council's Taxi EV Connections	Presently providing considerable issues with excessively high grid connection costs for 50 kW chargers, which are also out with the funding secured.	High
Park and Ride Projects	A report was completed by Capita/Skanska that obtained budget estimates in March 2018 for grid connection for seven park and ride projects. All the quotations received offered excessively high connection costs. St Ives connecting to Histon Grid Primary in 2019 Trumpington connections to Fulbourn Grid Primary 2021 Babraham connecting to Fulbourn Grid Primary in 2020 Milton connecting to Milton Grid Primary in 2023 Newmarket connecting to Burwell Grid Primary in 2023 It is also noted that there will be solar PV generation at each of these projects. If any of that generation is required to be exported to the grid, this may cause additional connection issues and costs.	High (possibly from 2021) High High Unknown Unknown
Electric Buses	A report was completed by Capita/Skanska that obtained budget estimates in March 2018 for grid connection for the five bus depots. All the quotations received offered excessively high connection costs. We note that the bus project is to be live in 2023 and apart from connections in the Histon Grid Primary area, we are unaware of any UKPN solutions that will ease the grid connection issues.	High

TYPE	COMMENT	Probability of non-connection																
Metro Scheme	<p>Four possible locations have been suggested for a single depot connecting to the grid from 2021. It has extremely likely that, based on current grid connection issues, that each location will offer future challenges with excessively high grid connection costs.</p> <p>A further six sites are due to provide charging facilities during the day from 2021. Day time importing of electricity of the grid causes more grid connection issues than during the early off-peak hours of the morning and it is anticipated that these locations will offer future challenges with excessively high grid connection costs.</p>	<p>High</p> <p>High</p>																
EV Connections for Council's Car Parks	<p>As much as there is uncertainty over the future sales growth of EV vehicles, the following assumptions have been made in conjunction with the Council to produce an assessment on future electricity demand for EV chargers:</p> <p>1. The number of EV's on the road as a percentage of all cars will be</p> <p>5% in 2020</p> <p>15% in 2025</p> <p>30% in 2030</p> <p>2. The number of council car parking spaces will increase by 30% to 2030 to 3,345 spaces.</p> <p>3. The assumed number of EV charging points required is as follows</p> <p>30% of all spaces will require a 7kW charger</p> <p>In addition:</p> <p>- 20% of the number of 7kW chargers will be required to charge at 22kW</p> <p>- 10% of the number of 7kW chargers will be required to charge at 50kW</p> <p>This equates to 1,305 chargers or 39% of all car parking spaces having an EV charging point</p> <p>4. The growth in the required charging points over the Council's short (2018-2021), medium (2022-2025) and long term (2026-2031) periods is then directly linked to growth in EV's on the road in Point 1.</p> <p>5. The calculated number of EV chargers required in each period can be summarised as:</p> <table><thead><tr><th></th><th>2020</th><th>2025</th><th>2030</th></tr></thead><tbody><tr><td>7kW</td><td>167</td><td>335</td><td>502</td></tr><tr><td>22kW</td><td>33</td><td>67</td><td>100</td></tr><tr><td>50kW</td><td>17</td><td>33</td><td>50</td></tr></tbody></table> <p>Producing a collective total of 1,305 chargers installed.</p> <p>6. UKPN have advised that a diversity factor of 80% can be applied to reduce the amount of load onto the grid.</p> <p>7. This results in the required 'additional' demand for each period as follows:</p> <p>Short (2018-2021) - 2.2 MW</p> <p>Medium (2022-2025) - 4.4 MW</p> <p>Long term (2026-2031) - 6.6 MW</p> <p>A total demand of 13.2 MW to 2030.</p>		2020	2025	2030	7kW	167	335	502	22kW	33	67	100	50kW	17	33	50	<p>7kW chargers should be a low a LOW risk</p> <p>22kW and 50kW may present a HIGH risk</p>
	2020	2025	2030															
7kW	167	335	502															
22kW	33	67	100															
50kW	17	33	50															
EV Connections for Existing Private Car Parks	<p>The same logic has been applied as per the council's car park, except that no increase in spaces has been applied to the existing 41,962 car parking spaces.</p> <p>The calculated number of EV chargers required in each period can be summarised as:</p> <table><thead><tr><th></th><th>2020</th><th>2025</th><th>2030</th></tr></thead><tbody><tr><td>7kW</td><td>2,098</td><td>4,196</td><td>6,294</td></tr><tr><td>22kW</td><td>420</td><td>839</td><td>1,259</td></tr><tr><td>50kW</td><td>210</td><td>420</td><td>629</td></tr></tbody></table> <p>Producing a collective total of 16, 365 chargers installed.</p>		2020	2025	2030	7kW	2,098	4,196	6,294	22kW	420	839	1,259	50kW	210	420	629	<p>7kW chargers should be a low a LOW risk</p>
	2020	2025	2030															
7kW	2,098	4,196	6,294															
22kW	420	839	1,259															
50kW	210	420	629															

TYPE	COMMENT	Probability of non-connection
	This results in the required 'additional' demand for each period as follows: Short (2018-2021) - 27.5 MW Medium (2022-2025) - 55.1 MW Long term (2026-2031) - 82.6 MW A total demand of 165 MW to 2030.	22kW and 50kW may present a HIGH risk
Private Businesses	John Lewis's and Marks & Spencer have experienced expensive grid connection costs for future EV connections. Although no details are available on their exact requirements, we understand the costs are prohibitive for the EV connections to be made.	High
EV Charging Locations for Heavy Goods Vehicle charging stations	No consideration has been made for a commercial EV charging location on future road networks	High
Private Home Owners	UKPN has confirmed that existing residential home owners can have access to a 7kW charging point without additional connection costs.	Low

6.8 Total demand for electricity

6.8.1 The impact of the assessment in 6 above in terms of additional demand is summarised in **Table 6** below:

Table 6: Impact assessment – demand for additional electricity

	Short-Term 2019-2021	Medium-Term 2022-2025	Long-Term 2026-2031	Total Additional Demand
Additional Electricity Demand (MW)	60.4	63.4	89.2	213

6.8.2 This is a significant level of new demand for electricity for which there is no current planned infrastructure to meet this requirement. It also represents an 89% increase in the present level of electricity demand.

6.8.3 It is also worth noting that formal applications to UKPN for projects should be submitted at least 12 months prior to any project requiring to be energised. This due to the grid constraints and timescale required to work with UKPN to produce formal offers and workable solutions.

6.9 Section 4: Generation Projects

6.9.1 Included with the assessment of generation projects at risk are the park and rides on the basis that each would have solar generation. However, it was

agreed with GCP that the sites were likely to have no export to the grid as the generated electricity would be consumed on site via the EV's or stored within the batteries. Also, each of these sites is also included within the sites at risk for imported electricity within Section 3: Electrification of Transport.

6.9.2 Based on the present grid constraints, the projects shown at **Table 7** below were rated in terms of the probability of non-connection (high/medium/low):

Table 7: Projects – Probability of non-connection

TYPE	COMMENT	Probability of non-connection
University	Present grid constraint issues mean that the University is unable to export electricity or connect the CHP system that has been constructed. Furthermore, the University has completed an assessment and an estimated £30m is required to fund grid works to enable them to complete all developments to 2030.	High
University of Cambridge Solar PV farm (location South Cambridgeshire)	A connection is required from 2021, possibly from the Histon Grid Primary for a 20 MW solar PV farm. If Histon Grid Primary is the UKPN point of connection, the reinforcement works will not be completed until 2023.	High
Cambridge West M13	A connection for a ground source heat pump is required, which will require demand from the grid. As this will be subject to the works at Histon Grid Primary, no connection is available until 2023.	High
Waterbeach - waste to energy plant	Anticipated connection for 24.4 MW of exported electricity from 2024. UKPN have confirmed that Waterbeach residential development is connected via the Histon Grid Primary, so it has been assumed that this project will following the same connection route. Works at Histon will be complete by 2023 but is unknown what local 33 kVa primary substation works will be required to support export from this project.	Medium
Northstowe - CHP town centre	This project was included, although no details are available for inclusion within this report	Not applicable
Cambridgeshire County Council - Schools solar PV	Included in the assessment is a programme of solar PV installations at 20 kWp per school from 2020. If the current grid issues of exporting electricity remain, a consideration should be for the installations to be sized in conjunction with a battery so that no export of electricity is required. This would allow the schools to achieve their 10% renewable energy targets without any grid connection issues.	Low/Medium

TYPE	COMMENT	Probability of non-connection
Cambridge City Council - Guildhall solar PV	A 3 kWp system is proposed from 2019. Although no assessment has been completed within this report, it is anticipated that all generated electricity should be consumed by the building. If there are grid export issues, a suitable sized battery could ensure that no there is no export requirement.	Low
Private Sector - solar PV on commercial buildings	Insufficient data is available to assess the amount of risk. The same comments should also apply for these buildings that a suitable sized battery would mitigate any export of electricity (if that was a grid issue) to allow the solar PV installation to proceed.	Low

6.10 Summary

6.10.1 This section provides a summary of the key challenges to growth:

<p>Key challenges to growth</p> <p>Cost of grid reinforcements - With the current position that the '1st comer' pays the cost of grid reinforcement this could bring problems if the costs are significant to some private developers or smaller scale developers</p> <p>Delays to delivery - Planning and designing the grid upgrades can only take place once outline planning has been granted. This can delay projects coming forward and may impact on housing land supply.</p> <p>Impact on Section 106 negotiations - The cost of the significant grid reinforcements could lead private developers to request reductions in other policy requirements from new developments e.g. reduction in number of affordable homes supplied</p>

6.10.2 A summary of the projects that are vulnerable and may not be developed is shown in **Table 8** below.

Table 8: Projects and developments that are vulnerable

TYPES	VULNERABLE PROJECTS OR DEVELOPMENTS
Type 1: Residential	SS/3 Cambridge East (airport) 2,557 dwellings SS/4 Cambridge Northern Fringe East 8,600 dwellings SS/7 Bourn Airfield 3,500 dwellings SS/8 Cambourne West 2,350 dwellings GB1 and GB2 430 dwellings M2 Clifton Road 550 dwellings

TYPES	VULNERABLE PROJECTS OR DEVELOPMENTS
Type 2: Commercial	Southern Fringe - Biomedical campus GB3 & GB4 Peterhouse Technology Park Northstowe Enterprise Zone SS/4 Cambridge Northern Fringe East - Science Park Only University
Type 3: Electrification of Transport	<p>Park & Rides</p> <ul style="list-style-type: none"> - St Ives - Trumpington - Babraham - Milton - Newmarket <p>Council Funded Taxi Project - 50kW chargers Council Bus Electrification Project Council Metro Project Council Car Parks - 22kW and 50kW chargers</p> <p>Private Car Parks - 22kW and 50 kW chargers Private Companies - John Lewis and Marks & Spencer</p>
Type 4: Generation	<p>University of Cambridge solar PV farm M13 Cambridge West ground source heat pump Waterbeach - Waste to Energy Northstowe - CHP town centre</p> <p>Excluded are the council's solar PV projects as they can be installed with limited or no access to the grid</p>

6.10.3 By combining Types 1 to 3, a demand profile can be created that summarises the projected additional electricity demand from the grid.

6.10.4 For the purposes of this table, Type 3: Electrification of Transport had large demand profile for each of the time periods, which have been average over the years for that period i.e. the medium term was 60 MW, which is now 15 MW per year.

6.10.5 The total **additional** demand required equal 470 MW.

Table 9: Total Additional Demand Profile

	Short Term Period			Medium Term Period				Long Term Period					
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Type 1: Residential (scenario 2)	13	5	14	67	0	0	0	0	0	0	0	0	0
Type 2: Commercial	23	24	29	19	11	24	10	6	3	0	3	4	0
Type 2: Electrification of Transport	1	40	20	15	19	15	15	15	15	15	15	15	15
TOTAL	37	69	63	101	30	39	25	21	18	15	18	19	15

6.10.6 Type 4: Generation has created an **additional** generation requirement equal 45 MW. The generation profile is shown in **Table 10** below:

Table 10: Total additional generation profile

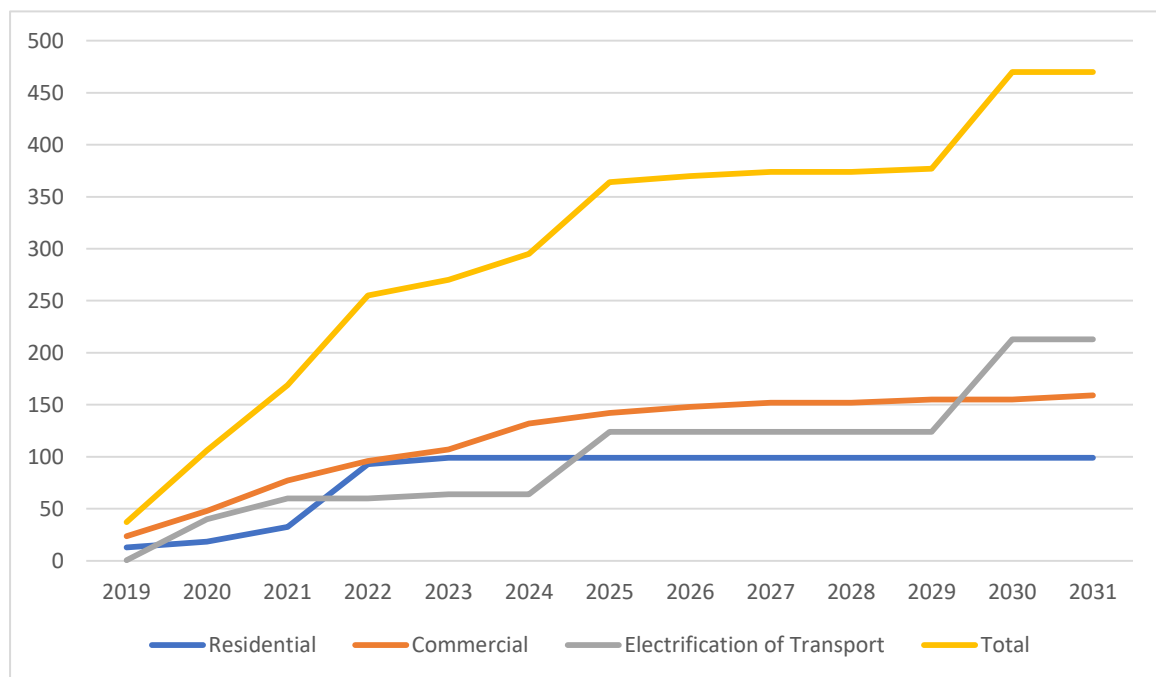
	Short Term period			Medium Term Period				Long Term Period					
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Type 4: Generation	0.03	0.04	20	0.08	0.08	24	0.12	0.12	0.14	0.14	0.14	0	0
TOTAL	0.03	0.04	20	0.08	0.08	24	0.12	0.12	0.14	0.14	0.14	0	0

6.10.7 It is worth noting that UKPN have advised that the present demand capacity for the Cambridge area is 240 MW. This would mean the total demand requirement for the Cambridge area would be 710 MW.

6.10.8 The total additional demand includes the calculated demand for 7kW, 22kW and 50kW chargers. UKPN have confirmed that there will be no additional connection charges for the 7kW as they have in effect been allowed for within UKPN's future demand allowances.

- 6.10.9 However, 77% of all new chargers are 7kW and UKPN where asked what the potential implications would be if (say) 2,000 7kW chargers in car parks connected over the next 10 years, on the basis that this would represent 11.2 MW of additional demand i.e. $2,000 \times 7\text{kw} \times 80\%$ diversity factor.
- 6.10.10 UKPN's response was that this might result in greater connection costs with reinforcement works at 11kV substations. This therefore means that there could also be issues installing 7kW chargers as presently being experienced with the Council's 50kW taxi project.
- 6.10.11 One way of starkly illustrating the demand profile for Greater Cambridge is by taking the total cumulative demand shown on tab 2 of the demand analysis and putting this into a line chart. The chart below shows the cumulative additional demand profile by type together with the total cumulative demand profile from 2019-2031.

Chart 1 – GCP Total additional demand profile by type 2019-2031 in MW



7. Demand analysis questionnaire – Response of UKPN

- 7.1 The role of UKPN as the Distribution Network Operator (DNO) is a legacy of the privatisation of the gas and electricity industry in the late 1980's and early 1990's. The regulatory framework was designed primarily to govern an industry based on large scale 'fossil fuel' generation (coal, gas and oil), high voltage transmission systems and a regional distribution network with responsibility for connecting homes and businesses to the grid. The electricity industry is divided into generation, transmission, distribution and supply. The National Grid are

- responsible for generation and transmission; UKPN (the DNO) for distribution; and a range of other businesses who supply electricity to homes and businesses. This structure is regulated by the Office of gas and electricity markets (Ofgem) an independent economic regulator overseen by Parliament.
- 7.2 DNOs, including UKPN, are private companies and are structured to be reactive and respond to new formal applications as and when they are submitted. As much as they have Long Term Development Statements (Regional Development Plans - RDP) that provide their plans to Ofgem on network improvements and upgrades over a future 8-year period, there is little consideration or input from the public or private sector on future demand.
- 7.3 From the production of the demand analysis discussed in **Section 6** above, a questionnaire was produced to engage with UKPN to obtain the grid connection solutions to the future anticipated electricity demand. The document was entitled Assessing Future Demand and Generation Profile for the Cambridge Area.
- 7.4 UKPN were provided with the questionnaire and demand analysis for their comments. The questionnaire was structured to mirror the demand analysis by asking a series of questions divided into Residential, Commercial, Electrification of Transport and Generation Types.
- 7.5 UKPN responded to the initial questionnaire by providing a series of answers. The questionnaire was returned with further comment and questions which UKPN have answered. A summary of the key answers and conclusions from the questionnaire are included at **Appendix 5**.
- 7.6 UKPN provided a comprehensive input into each section of the demand analysis as follows:
- 7.6.1 **Residential Section** - UKPN advised that due to the constraints on the grid that formal applications would be required for all the highlighted projects before comment could be provided. This was in part due to the actual amount of demand, which was unknown that would be required for each development. For example, the demand per dwelling is presently 2kW, but if an EV charging point was required, the demand would increase to 5.5kW. This would increase the total demand per 1,000 dwellings from 2MW to 5.5MW, which represents a significant increase.
- 7.6.2 UKPN also commented that they were preparing a submission to Ofgem as part of RIIO-ED2 in 2021 (see **Chapter 4, Section 16**. Network regulation and price controls – the RIIO model). If the Council instructed the engineering study as required for the new 132kV grid primary substation (strategic intervention highlighted in **Chapter 3 Section 10.11**), this could be used to shape the RIIO response by considering a more proactive solution that could accommodate how sufficient demand could be provided for all projects.

- 7.6.3 **Commercial Section** - UKPN advised that due to the constraints on the grid that formal applications would be required for all the highlighted projects before comment could be provided.
- 7.6.4 Specifically in relation to the Southern Fringe Biomedical Campus, UKPN confirmed that the number of applications had been received, but capacity requested was significantly less than what is forecast (in the demand analysis).
- 7.6.6 UKPN further commented that the creation of a new grid substation to the West of Cambridge, potentially released further capacity to these developments. However, it was unknown how much capacity would be available to meet the estimate 106.5 MW of additional demand.
- 7.6.7 UKPN again advised that if the Council instructed the engineering study as required for the 132kV grid primary substation, it would provide the necessary answers, which could be included in their submission to Ofgem as part of RIIO-ED2.
- 7.6.8 **Electrification of Transport** - UKPN responded by saying that each project within the demand analysis would have its own individual impact on the grid and formal applications were required to make the necessary impact assessments.
- 7.6.9 Furthermore, UKPN said that there was a possibility that a large number of 7kW chargers could have a negative impact on the 11kV network resulting in reinforcement being required. This would then result in connection costs for 7kW, 22kW and 50kW increasing.
- 7.6.10 **Generation Section** - UKPN were unable to comment due to each location having a different impact on the grid but did advise that having both import (for battery storage) and export (for the likes of solar PV) were likely to trigger reinforcement costs. In relation to solar PV being added to Council buildings, UKPN did advise that further capacity could be accommodated without network impact if connected via an active management system (AMS).

CHAPTER 3 – OPTIONS APPRAISAL & RECOMMENDATIONS

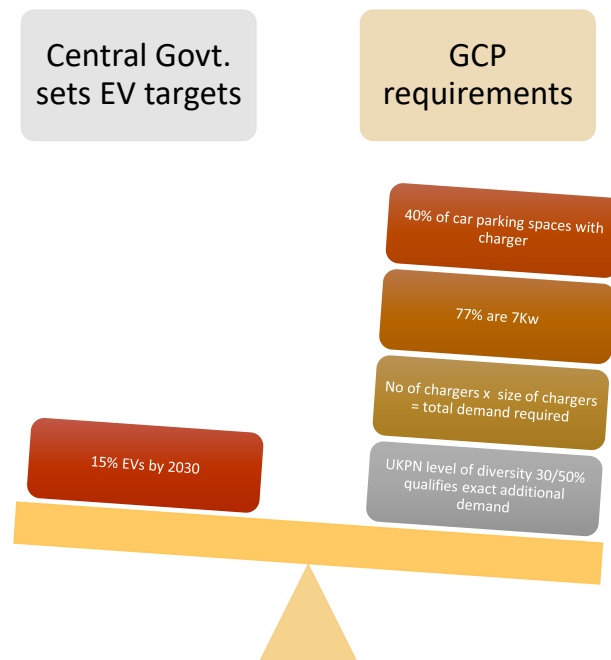
8. Options Appraisal

- 8.1 The CPIER report¹⁴ identified significant capacity and constraint issues relating to the electricity grid in Greater Cambridge. This includes:
- The substantial levels of investment into upgrading the grid needed for the electrification of transport;
 - the impact on employment growth and commercial development particularly in relation to the Fulbourn Grid which supplies energy to the ‘southern cluster’
 - the limitations on the localised generation of energy due to the grids inability to receive it;
 - the regulatory framework which prevented the DNO from putting electricity capacity into a site until planning permission has been granted; and
 - the need to start seriously planning for the new energy future, where individuals will buy and sell energy from one another in local ‘Smart grids’ independent of the main grid.
- 8.2 **Chapter 2** of this report identifies the impact of a constrained electricity network on residential and commercial development; the total expected demand for electricity driven primarily by electrification of transport; and the impact of grid constraints on distributed energy and renewable generation projects. This validates and provides quantifiable data to substantiate the findings of the CPIER report.
- 8.3 The following sections of the report set out the options and potential local and strategic interventions that can both mitigate the problems caused by lack of grid capacity and support the transition to a smarter, distributed and cleaner energy system for Greater Cambridge.
- 8.4 The demand analysis prepared by Asset Utilities as a basis for discussion with UKPN with regard to remedial works to reinforce the Grid or other mitigating actions, has identified a potential additional demand by 2031 covering new residential and commercial developments and the electrification of transport of 470MW. In addition to this the projected generation profile produces a further 45MW of distributed generation onto the system.
- 8.5 UKPN have advised that the present demand capacity for the Cambridge area is 240 MW. This would mean the total demand requirement for the Cambridge area would be 710 MW.
- 8.6 This raises serious concerns about the capacity of the network to accommodate such significant increases in demand and generation up to 2031; and this is a

¹⁴ Cambridge and Peterborough Independent Economic Review (CPIER) Final Report Sept 2018

cumulative effect over a number of years. The network imbalance can be illustrated by the diagram below:

Diagram 2: How it works at the moment? Cumulative demand for Electric Vehicles and charging in GCP area



- 8.7 Following on from the **analysis of current and future network capacity and growth constraints** (see **Chapter 2, Section 6**) and the responses from UKPN to the demand and generation requirements set out at (**Chapter 2, Section 7**) a number of options/solutions for alleviating network constraints have been developed and these are described in more detail at **Appendix 6** and are summarised in **Table 11** below:

Table 11 - Summary of options for improving the network

Option	Description
Option 1: Business as Usual - UKPN delivers reinforcement works funded by private sector	<p>Reinforcement works can typically take 2-6 years depending on the amount of upstream reinforcement works required. The reinforcement costs at 11kV are met in full by the initial applicant accepting the formal offer from UKPN. At 33KV the costs are partially shared with the Distribution Network Operator (DNO) and costs are fully met by the DNO at 132kV level. The problem is that for the DNO to trigger upgrades at the 132KV the private sector must have accepted the reinforcements on the 11KV. Often the 11KV costs are too high and not accepted which in turn means the 132 KV upgrades don't happen.</p> <p>It is important to note that the first comer pays all the 11kV costs (and a proportion of the 33kV works). If the 11kV costs are too high to be accepted, there is no first comer, which then results in there being no reinforcement works being undertaken.</p>

Option 2: Business as Usual - but using IDNO¹⁵ to build new 33 kV substations	<p>This option is dependent on a private developer accepting the costs to upgrade the 11KV system. If the cost is not accepted upgrades to the 33KV system cannot proceed. If the 11KV system has been upgraded the timescale is typically 2-3 years to upgrade the 33KV network and is dependent on suitable land being provided to UKPN at no cost, planning approval and enough upstream capacity on the 132KV. The cost of a new 33 kV substation is met in full by the initial applicant. If they only require a proportion of the new 33KV substation they can recoup some of the investment during the first 10 years.</p>
Option 3: Business as usual - Battery solutions introduced to stabilise grid	<p>This option is a function of engineering assessments completed by the DNO to identify where a battery solution would negate the requirement for reinforcement works to be undertaken. This option is also more about achieving greater efficiencies in the network rather than delivering an increased amount of electrical demand. Where UKPN have previously recognised this as a solution, they have invited bids from battery markets orchestrated in a similar way as the governments auction for Firm Frequency Response (FFR) and Enhanced Frequency Response (EFR) income.</p>
Option 4: Public Sector fund future grid reinforcements requirements and recoup investment from projects	<p>The current regulatory framework allows for the reinforcements works at 400 kV to be funded by National Grid. Reinforcement works at 132kV are met by the DNO, with 33kV reinforcement works apportioned between DNO and applicant and 11kV met entirely by the private sector making formal applications.</p> <p>An option is for the public sector to fund grid reinforcements and recoup the costs from projects being spreading the cost across a range of projects. It also allows for a profit to be made. This will particularly benefit smaller projects which would otherwise not proceed as grid reinforcements could not be paid. An example of such an approach is the provision of the Addenbrookes Access Road, which was originally funded by Cambridgeshire Horizons via a rolling investment fund.</p>
Option 5: Public sector funds new 132 kV grid substation to service southern fringe e.g. Ebbsfleet Development Corporation but at 132kv not the 33KV	<p>Building on the concept of the rolling fund above, a first project for investment could be an investment into a new 132 kV grid substation to serve the southern fringe. This would provide demand at 90 MVA (120 MVA in the summer) with two transformers and 180 MVA (240 MVA in the summer) with three transformers provide guaranteed capacity to an area which is key to economic growth.</p> <p>Timescales could be typically 5 years to deliver and the capital cost is a function of land being provided (land requirement: 60m x 40. Assuming a new Grid substation, 8km from an existing 132kV overhead line and 14km of 33kV underground cable to connect to existing circuits, the cost would be in the region of £25m plus the cost of the land.</p>

¹⁵ IDNO – Independent Distribution Network Operators develop, operate and maintain local electricity distribution networks.

Option 6: Smart Grid with Local Authority ESCO as the utility provider	<p>A proactive mechanism to ensure smart energy infrastructure in place for new developments is to set up a public sector energy services company.</p> <p>The public sector ESCO takes responsibility for organising and negotiating the utility infrastructure for residential and commercial developments and provides the private sector developers with access to utilities. The ESCO takes responsibility for the delivery (via third parties) of all aspects of the utilities network, which may include energy generation, battery storage and Combined Heat and Power plant and operation.</p> <p>The benefits are:</p> <ol style="list-style-type: none"> 1. Carbon and energy policy can be delivered at the standards needed to deliver carbon budgets and a new energy system 2. Infrastructure is in place when developments need it, allowing growth 3. Operating an energy services company can bring revenue benefits <p>The council can set with confidence the renewable energy and CO2 reduction targets for the development with each dwelling having solar PV and a battery as its own micro grid</p> <p>The ESCO benefits financially from a fee levied on each dwelling connection and from the selling of heat and electricity. These profits could be redistributed to future energy projects.</p> <p>The ESCO could also offer home owners a finance package on an electric vehicle to promote green energy. Each house would automatically have its own EV charger.</p>
Option 7: Building Standards	<p>Local Plan policies and building standards are improved to achieve greater energy efficiency and reduce carbon. For example, some local authorities are developing an evidence on carbon reductions in new developments and buildings to support the UK to meet our Climate Change commitments and carbon budgets. Working back from 2050 targets to identify what is required today for carbon reductions is proving a powerful evidence base for policy change.</p>

8.8 The options have been assessed in relation to risk on a scale high/medium/low using the assessment criteria:

- Demand analysis – Impact on strategic sites
- Financial viability
- Timescales
- Regulatory and market constraints
- Technological requirements

8.9 **Table 12** below summarises the impact/risk of each option against the criteria in 9.8 above:

Table 12 - Options appraisal - risk assessment against key criteria

Assessment Criteria (Risk: High/Medium/low)	Demand analysis - Impact re: strategic sites	Financial viability	Timescales	Regulatory and market constraints	Technological requirements
Options					
Option 1: UKPN to deliver reinforcement works funded by private sector	High Risk because for the development to proceed, a 'first comers' is required for UKPN undertake the reinforcement works.	High Risk because each development can only proceed with an acceptable grid connection cost and any reinforcement may make the scheme unviable	High Risk if there is no 'first comer'. It might also be high risk if the timescale to complete any reinforcement works precludes any other development work from proceeding	Low Risk where there is a first comer. But otherwise a High Risk to strategic sites if sites cannot be developed because of prohibitive network costs	Low Risk as reinforcement works are apply existing hardware components
Option 2: IDNO to build new 33 kV substations	High Risk because a 'first comer' is required to meet the full capital costs and source suitable land for the substation.	Medium to Low Risk as capital costs is known and factored into development costings	Medium Risk at 2-3 years	Low Risk as existing new 33kV substations have been built by IDNOs	Low Risk as existing hardware already exists
Option 3: Battery solutions introduced to stabilise grid	High Risk as battery solutions are intended to support grid efficiencies rather than introducing additional demand to support new developments	Medium Risk as the battery developer will know the level of income required to support capital costs and financial modelling	Medium Risk at 2-3 years	Low Risk as the DNO has supporting powers to promote battery requirements with Ofgem agreement	Low Risk as existing technology supports this solution
Option 4: Public Sector/Combined Authority to step in and fund all present/future requirements	Medium to High Risk as there needs to be confidence that the capital costs can be reclaimed from future connections. Could be considered a Low Risk if it ensured new developments and job creation was able to proceed, rather than be lost.	Medium to Low and is a function of the benefits achieved from new developments proceeding	Medium to Low Risk due to some reinforcement works be concluded in a short term (say 1-2 years) and some in medium term of (say) 3-5 years	Low Risk as this is an arrangement directly with the DNO	Low Risk as existing hardware already exists
Option 5: GCP/CA to fund new 132 kV grid substation to service southern fringe	Low Risk if there is a defined demand from existing employers requiring additional demand and from new employers looking to construct new developments to protect jobs	Medium to high risk if the capital costs are unable to be reclaimed when new connections are made to the infrastructure	Medium Risk at approximately 5 years	Low Risk as this is an arrangement directly with the DNO	Low Risk as existing hardware already exists

Option 6: Smart Grid with Local Authority ESCO as the utility provider	Medium Risk as the master developer arrangement already exists and would support stranded developments from proceeding	Medium Low risk as the viability of a connection cost per house will be agreed with the developer and financial modelling of the ESCO will be predetermined	Medium to Low Risk with ESCO and infrastructure available in approximately 3 years	High Risk due to electrical private wire requirement per dwelling	Medium to High Risk as an assessment of energy demand is required that can be supported by a CHP system working with battery storage
Option 7: Building Solutions	Will have an immediate impact on the demand analysis and delivering projects	Low Risk as the software will demonstrate the financial viability before any investment is made	Low risk as solutions can be installed immediately	Low risk as they are inapplicable	Low risk as the technologies already exist and are operational

- 8.10 **Options 1 and 2** are based primarily on the developer pays principle which guides most network reinforcement work undertaken by UKPN. Connection costs could be prohibitive, but subject to a ‘first comer’ agreement this could resolve and at least mitigate some of the network constraints. However, it does not significantly impact on the wider demand and generation requirements across Greater Cambridge.
- 8.11 **Option 3** would deliver grid efficiencies but has no impact on the overall demand and generation profile in the demand analysis. Again, this requires specific developer/market led initiatives since DNOs are precluded from ownership or operation of energy storage due to the market distortions that could result from such activity.
- 8.12 **Option 4** would require the public sector to step in to fund network improvement and grid reinforcement works. A key risk here is the scale of the potential investment and how the public sector would secure a return on its investment. Any such approach would need to be based on a robust business case(s) and long-term planning.
- 8.13 **Options 5 and 6** are a variant to **Option 4**, in that the public sector would step in to fund significant investment and/or development to improve the network, but this would be based on specific interventions to deal with identified geographic needs where there are no other available solutions. Both of these options would need to be based on detailed discussions with the relevant authorities and UKPN together with the preparation of detailed business cases. However, they would have the advantage of (a) providing significant new infrastructure to alleviate network constraints for which there are no other available solutions; and (b) in the case of option 6 potentially being an innovative solution which would provide a new template for developing a Smart grid to support the transition of the energy system towards decarbonisation and decentralisation.

- 8.14 **Option 7** does not require any significant grid reinforcement costs or infrastructure investment. This option is primarily targeted at a local authority's own building stock and schools in terms of meeting targets of CO2 reductions.
- 8.15 From the above options appraisal options 5, 6 and 7 are considered to be interventions of a local and strategic nature which meet the wider objectives of GCP. These options together with the process for implementation are described more fully in the next section of the report.

9. Local and Strategic Interventions

- 9.1 The Town and Country Planning Association (TCPA) and the Royal Town Planning Institute (RTPI) published a report in May 2018 entitled '*Planning for Climate Change – A guide for local authorities.*' Of relevance to electricity infrastructure, the guide identifies some of the barriers to effective local plan action and suggested the following framework for local action:

- the need for effective strategic co-operation and using 'statements of common ground' under the NPPF for dealing with the strategic aspects of climate change;
- the planning system has an important role in managing the deployment of renewables and other forms of sustainable generation;
- what can local planning can do with regard to energy performance following the cancellation of the zero carbon homes commitment?

- 9.2 The guide makes the following recommendations with regard to assessing renewable energy generation, distribution and storage:

"Development management should not prevent, delay or inhibit proposals for renewable and low-carbon energy, and associated infrastructure, which could be permitted....."

*Decision-makers should recognise that energy technologies are changing, and they should be prepared to deal positively with the implications of new transport and energy technologies, such as battery storage and infrastructure for electric vehicles."*¹⁶

- 9.3 Much of this approach is already embedded within the climate change strategies, local plans and policies of local authorities within GCP. The difficulty arises when the local planning system comes up against the economic constraints of private developers and the network constraints of the DNO (UKPN).

¹⁶ P.42 section 5.3 Planning for Climate Change: A guide for local authorities, TCPA/RTPI, May 2018

9.4 The options appraisal identified seven options that could introduce additional demand from the grid to support economic growth and job creation. From these options, three represent strategic interventions that provide the opportunity to take proactive action and include:

- **Strategic Intervention 1:** *Construction of a new 132kV Grid Substation and Possible Other Reinforcement Works*
- **Strategic Intervention 2:** *Smart Grid with Local Authority ESCO as the utility provider*
- **Strategic Intervention 3:** *Building Standards*

9.5 A fourth strategic intervention has been identified from the review of market and regulatory barriers (see **Chapter 4** below) which is a policy led approach to Government, Ofgem and the industry, to secure changes and/or support for innovative local solutions designed to improve network capacity and resilience including the transition to a smarter and more flexible local energy system.

9.6 Each of the four strategic interventions offers a different set of benefits. These are demonstrated in **Table 13** below:

Table 13 - Evaluation the Benefits of The Strategic Interventions

Intervention	Job Creation	Mitigation of Jobs	10% Renewables	CO2 Reduction	Housing growth
Strategic Intervention 1: Construction of a new 132kV Grid Substation and Possible Other Reinforcement Works	Yes	Yes	No	No	Yes
Strategic Intervention 2: Smart Grid with Local Authority ESCO as the utility provider	Yes	No	Yes	Yes	Yes
Strategic Intervention 3: Buildings Solution - solar/battery/energy efficiency	No	No	Yes	Yes	No
Strategic Intervention 4 : Market and regulatory failure	No	No	No	No	No

9.7 Even though Strategic Intervention 4 shows no directly attributed benefits, it may indirectly support the other interventions improving their impact.

- 9.8 A strategic intervention is a coordinated approach to actions by specific parties to create further actions that resolve issues that allow pre-defined events to take place. In this case the 'events' relate to residential and commercial developments, electrification of transport and generation projects to connect to the grid at financially viable grid costs.
- 9.9 In terms of identifying key 'pinch points' and where strategic interventions should be directed the following types in **Table 14** were identified:

Table 14 – Key areas for strategic interventions

Type	Rationale
Type 1: Southern Fringe and Biomedical Campus	Included due to the commercial demands of 107MW and impact on present and future jobs should the public sector be unable to make affordable grid connections
Type 2: Residential Development West of Cambridge (SS/7 Bourn and SS/8 Cambourne West)	Included due to the excessive reinforcement costs delaying these developments from commencing, which impacts devolution targets and creation of jobs
Type 3: Electrification of Transport	Included because the excessive grid connection costs may seriously impact the delivery of the transport policy with the likes of the electrification buses, tram, park and rides and charging points in council car parks. Such costs may also hinder the private sector from delivering charging points in their car parks creating a supply and demand issue for the charging of electric vehicles.

- 9.10 A summary of each strategic intervention is shown below with recommendations on the steps required for a successful facilitation.

9.11 Strategic Intervention 1: Construction of a New 132kV Grid Substation and Possible Other Reinforcement Works

- 9.11.1 A new 132kV substation can offer 90MW with two transformers or 180MW with three transformers of new demand and would offer a solution to the anticipated requirements for the commercial demand requirements for the Southern Fringe and Biomedical Campus.
- 9.11.2 The location of the substation should be considered as there would be an opportunity to engage with UKPN so that additional capacity could be released to support the residential developments to the West of Cambridge and Addenbrookes Hospital.
- 9.11.3 This intervention has been discussed with UKPN who would initially need to undertake a 'detailed engineering study' which would take 2 to 3 months and cost £7,000 to £10,000 depending on the options required. UKPN would also consider the location of the existing network and balance individual options on the cost for 132kV extension and cost for connecting to existing/future 33kV network.

9.11.4 For example the following options were discussed with UKPN:

- (a) Extending the 132kV network from Fulbourn (West of Cambridge to the South/South West of Cambridge);
- (b) Extending the 132kV network from Little Barford (North East of Cambridge) to the West/South West of Cambridge;
- (c) Extending the 132kV network from Pelham (South East) to the South West of Cambridge;
- (d) Creating a 132kV ring with option a) b) c) to provide capacity at 132kV and support the expansion of Cambridge in all directions

9.11.5 In terms of the capital cost to deliver the new 132kV grid substation, the following metric is provided:

- **Land** - the cost has been excluded from the figures below, as it is an unknown factor. Either UKPN will source the land, the cost to be met by the applicant or to be provided by the applicant. An area of 60m x 40m is required.
- **Capital Costs** - An indication of the different elements of the capital costs include:
 - (1) Grid substation equipped with 2x 90/120MVA 132/33kV transformers, 12 panel indoor switch room and various other associated works would be in the region of £9m;
 - (2) 132kV underground circuits in the region of £1m per km;
 - (3) 132kV connection to existing overhead line in the region of £1m;
 - (4) 33kV underground circuits in the region of £500k per km;

9.11.6 Assuming a new grid substation, 8km from an existing 132kV overhead line and 14km of 33kV underground cable to connect to existing circuits would be in the region of £25m - figures provided by UKPN.

9.11.7 **Timescale** - This is subject to which one of the four connection options A-D (in terms of servicing other areas of the network) is chosen and a reasonable assumption is 5 years to become operational.

9.11.8 The Next Steps would be as follows:

(1) UKPN Workshop - The initial recommendation is a workshop with UKPN that is designed to focus on all aspects of the demand analysis and the grid connection challenges. The intention is to holistically consider the entire network and create a formulated plan that supports:

- delivery of the residential developments
- electrification of transport policy

- delivery of demand and generation for the University of Cambridge

This will in part be achieved through discussion of the construction of the new 132kV grid substation and possibly through other reinforcement works that could be funded by the council/combined authorities to support key developments/projects.

The workshop should also focus the mechanism by which the applicant will recoup the capital investment from those seeking to connect to the new substation.

Other discussions would include UKPN's innovation projects, smart grid, support for Open Networks etc. and other mechanisms, ideas and programmes to make the electricity network more efficient.

(2) Engagement with UKPN - This represents a formal instruction to UKPN to commence work on a detailed engineering study for the 132kV grid substation and possibly other supporting actions

(3) Consideration of Results from Detailed Engineering Study - UKPN will require 2 to 3 months to complete the study and ongoing dialogue may be required to consider the benefits of different options during this period. This stage is considering the capital cost, timescale and implications (planning etc.) of proceeding with the study and construction of 132kV substation and possible other works.

(4) Instruction to Commence Works - This is the final stage and internal ratification within the Council(s) to support the agreed works.

9.11.9 This strategic invention also includes 'possible other reinforcement works' due the amount of additional demand that would be required from Electrification of Transport. In discussions with UKPN they made the following comment about the new demand expectations:

"This is a key aspect as 241MVA of forecast EV charging capacity would equate to a new National Grid Super Grid Transformer (rough cost £8 to £10m for the transformer connection alone).

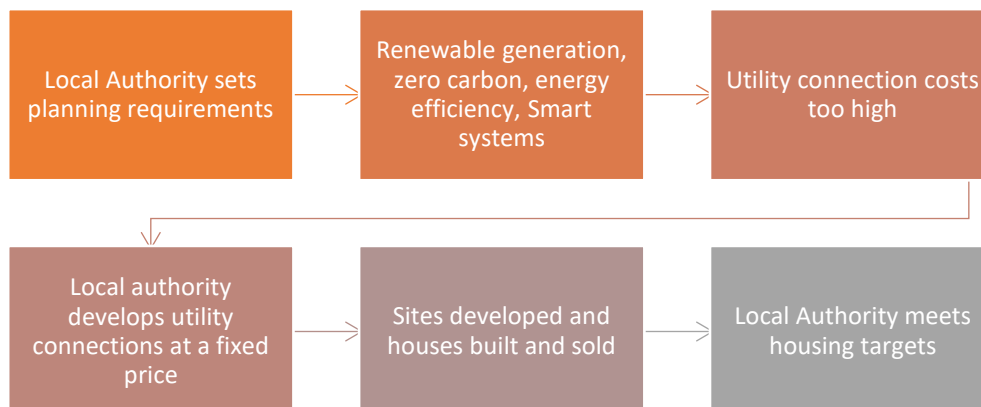
*This is one of the questions that electricity DNOs are investigating. Most studies and literature come from abroad, particularly Europe due to larger volume of EVs but there is always a regional element to this. **I believe this presents an opportunity for GCP to be at the forefront of the UK in terms of regional EV use** as for example there is a natural coordination between residential charging (say at the new developments of Northstowe, Waterbeach and wider region), workplace charging (city centre, science parks) and fleet charging (buses, taxis, council vehicles)."*

- 9.11.10 It is for this reason that this strategic intervention should fully engage with UKPN to look at and consider all aspects of the grid and how they could be structured or restructured to support future demand expectations.
- 9.11.11 The main challenge that must be resolved prior to any formal instruction to UKPN to commence work a new 132kV grid substation is the mechanism for the applicant to receive their capital investment refunded as new developments/projects connect into the additional capacity.
- 9.11.12 UKPN have advised that Ebbsfleet Development Corporation faced this same situation and discussions are ongoing between UKPN and Ebbsfleet about a 'framework' agreement to achieve a refund on capital invested.

9.12 Strategic Intervention 2: Smart Grid with Local Authority ESCO as the utility provider

- 9.12.1 This strategic invention applies particularly for stranded residential developments where the private developer is unable to proceed with the development due to excessively high grid connection costs. In this instance the local authority would become the utility provider and negotiate all the utility packages in the same way a master residential developer would for a large residential development. The approach is illustrated in the flow chart below:

Diagram 3 – Local authority as utility provider



- 9.12.2 The exception being that the local authority's aim is to use the utility services to meet (or exceed) its own renewable energy generation and CO2 reduction targets for the development, whilst generating a profit from its services that can be redistributed to support other energy projects.
- 9.12.3 Due the lack of available electrical capacity for the development, one possible option for the utility infrastructure plan would be to work on the following basis:

- a mains gas supply would power CHP (with supporting biomass for CO2 reduction targets) with the generated electricity stored in central batteries;
- houses would be heated from a heat network as opposed to individual gas connections;
- the local authority would own and operate an ESCO for the heat network;
- houses would receive their electricity from a private wire connection, with electricity billing operated by the ESCO;
- each house would have an agreed amount of solar PV with a battery for self-generation and storage. The ESCO electricity connection would in effect be topping up each house's demand requirements, which can include storage in the battery during the night period;
- each house would have an EV connection and therefore meet all the sustainability targets and ambitions held by the council;
- the ESCO would also provide the water networks via an inset license, which opens the opportunity for lower pricing to the house owner as it is Ofwat requirement that water rates are at least 5% lower than the incumbent water companies. The ESCO would also receive a financial reward in the form of an 'asset payment' per property from the company operating the inset license;
- there may be the possibility for further generation (wind, solar PV farm) in close proximity to the development for additional storage in the main batteries;
- there would need to be a connection to the grid as a back-up, but if there are grid connection issues it may be that any power drawn is only at agreed off peak times. There may be the possibility, due to the grid connection issues to have an export connection for agreed times as well; and
- customers would receive their heat and electricity bills from a council ESCO where the pricing can be shown to be more competitive than the industry's 'big six'.

9.12.4 In terms of the relationship with the main developer, it would work as follows.

- the ESCO would be able to provide the utility connections (heat, electricity, water and fibre) for an agreed fixed sum per house, as per the present system negotiated by a master residential developer;
- if the arrangement is negotiated with a single developer who is intending to resell parcels of land to secondary residential developers, a condition is included in the land purchase agreement that the ESCO is the nominated utility services provider;
- the ESCO would engage with ICP's (Independent Connection Providers) who hold the appropriate licenses to deliver the gas, electricity, heat and water networks
- included in the fixed connection cost per house would be a profit element per ESCO for negotiating the utility packages. A £200 (say) profit element per dwelling connected would produce £200,000 profit per 1,000 houses

- In practice, when the housing developer needed a number of houses connected, they would pay the connection cost per house upfront and the appointed utility contractors would complete the work. This arrangement could either be: (1) direct with the ESCO who would coordinate the services between ICPs and developer; or (2) the ESCO could provide a services package to the developer who coordinate themselves. The second option is present common method with a master developer arrangement.
- 9.12.5 The ESCO could provide additional optional services to the home owners, such as a funding package for an electric vehicle.
- 9.12.6 Within the development, an area for the fast charging of EVs could be provided to generate additional fees for the ESCO.
- 9.12.7 In terms of challenges with this strategic intervention there are two:

Challenge 1: Main Developer 'Buy-in'

- If the grid constraints meant that the developer was unable to meet its principle function of selling houses and making a profit, this strategic intervention would represent the only option available to the developer.
- As this strategic intervention requires the home owner to purchase heat (instead of gas) and electricity from a council run ESCO (instead of the open market), the developer would need to support this approach.

Challenge 2: Regulatory Private Wire Agreement

- Presently home owners must have access to an open market where they can choose their electricity and gas provider. This strategic intervention promotes generated electricity via private wire connection where the customer buys directly from the ESCO.
- Regulatory support from Ofgem would be required to support this approach.

- 9.12.8 The next Steps are as follows:

(1) Discussion with Main Developers

- The initial stage is the engagement with the main developer to obtain an in-principle agreement.
- As this strategic intervention particularly focuses on the Council achieving its renewable energy and CO2 reduction targets, the discussion would also involve the requirement for the developer to

include (the likes) of an agreed amount of solar PV plus a battery in each property.

- The quid pro quo is that agreement from the developer for the solar and battery inclusion would also create a smoother transition through the planning process and ultimately quicker sale of houses for the developer.

(2) Discussions with Ofgem

- Consultation with Ofgem will be required for the necessity for a private wire with justification (as a suggestion) that the pricing mechanism offered better value than presently available in the market.

(3) Technical Viability Study

- This intervention is a function of sizing the CHP to provide the necessary amounts of heat and electricity as and when required by the end consumers, together with batteries as the storage mechanism.
- A technical design study will be required to verify how the energy operating model can be built in stages to support the timing and development of the houses. This technical study is also the commence point for understanding the financial modelling and operation of the ESCO.

(4) Infrastructure Costing Exercise

- The present master developer model provides each end residential developer with a fixed sum per property for the connection of the utility services.
- A costing exercise would be required that that determines:
 - the Point of Connection (POC) costs to supply gas and water to the site boundary; and
 - the cost per property to supply connections for electricity (via a private wire), heat, water (via an inset license) and fibre.
- This exercise is important as the 'services cost per property' must be similar to the cost presently being paid by a developer to maintain the game profit equilibrium.

(5) ESCO Formation

- Consideration for the ESCO formation can commence in line with Next Steps 1-4, with final instructions to proceed being made once the financial viability has been confirmed.

9.13 Strategic Intervention 3: Building Standards

- 9.13.1 This strategic intervention is targeted at the Council's own building stock in terms of meeting targets of CO₂ reductions.
- 9.13.2 Software is available that allows the building owner to produce an internal assessment of the size of solar PV array that can be installed with a suitably sized battery to consider financial returns in the following formats:
- Maximise the internal rate of return (IRR)
 - Maximise net present value (NPV)
 - Lowest payback period
 - Maximum CO₂ reduction
- 9.13.3 The software can calculate when the generated electricity is consumed by the building, when any excess is stored within the battery and when any surplus electricity is be exported to the grid.
- 9.13.4 Many buildings, particularly including schools may experience all generated electricity being either consumed or consumed and stored with there being no export requirement. This is important because if there are export grid constraints with UKPN that make any grid connections financially unviable, this software would permit the installation to proceed with either no export requirement or an export requirement under UKPN's Active Management System.
- 9.13.5 This strategic intervention offers the Council a proactive and cost-efficient method of assessing its building stock to produce a priority list of buildings to form an installation programme that supports its renewable energy and CO₂ targets. The next stage is to identify the most suitable software.

9.14 Strategic Intervention 4 – Market and regulatory failure

- 9.14.1 This proposed strategic intervention is policy led and involves co-ordinating responses to and lobbying Government, the regulator Ofgem and the industry using the findings from the demand analysis exercise which sets out the scale of the local network challenges; together with utilising existing mechanisms such as the Open Networks Project to support other local and strategic interventions described above which are designed to increase network capacity and move towards a smart and flexible local energy system.

(1) Lobbying and representation

GCP and its partners should set up meetings with BEIS, Ofgem and UKPN to discuss the constraint issues identified in the demand analysis and the

challenges to the local economy and growth targets set through the 'City Deal'.

(2) Stakeholder input to policy/regulatory developments

GCP should make formal representations to Government in its development of energy policy through the forthcoming white paper. GCP should also input via the various stakeholder forums/mechanisms into the regulatory code reviews set up by BEIS/Ofgem. This could be through stakeholder events organised by BEIS or through bodies such as the Charging Futures Forum set up by Ofgem as part of its SCR process.

(3) Innovation funding and support for local strategic interventions in the electricity network

GCP should also undertake initial dialogue with UKPN and The ENA Open Networks Project to discuss issues identified through the demand analysis and to consider whether any of the strategic interventions proposed above could be used as innovation projects for delivering a smart and flexible local energy system.

10. Conclusions and next steps

10.1 Impact and scale of constraint challenges

10.1.1 Despite planned reinforcement works by UKPN there is limited capacity within the existing 132-kV primary sub-station network. The problems are particularly acute at Histon, Arbury and Fulbourn. If available capacity is used up, then there will be little available capacity for future projected demand or generation.

10.1.2 The **analysis of current and future network capacity and growth constraints** which is described in **Chapter 2 - Section 6** of the report sets out the nature and scale of the network constraints in Greater Cambridge. The assumptions and calculations set out in the demand analysis have been discussed in detail with UKPN and a demand profile has been created that summarises the projected additional electricity demand from the grid. It shows that:

- the total additional demand for residential/commercial developments and the electrification of transport required equated to 470 MW;
- the projected increase in generation capacity creates an additional generation requirement equal to 45 MW; and
- UKPN has advised that the present demand capacity for the Cambridge area is 240 MW and this would mean the total demand requirement for the Cambridge area would be 710 MW (additional demand capacity of 470MW plus present demand 240 MW).

- The total additional demand includes the calculated demand for 7kW, 22kW and 50kW chargers. UKPN have confirmed that there will be no additional connection charges for the 7kW as they have in effect been allowed for within UKPN's future demand allowances.
- However, 77% of all new chargers are 7kW and UKPN where asked what the potential implications would be if (say) 2,000 7kW chargers in car parks connected over the next 10 years, on the basis that this would represent 11.2 MW of additional demand i.e. $2,000 \times 7\text{kW} \times 80\%$ diversity factor.
- UKPN's response was that this might result in greater connection costs with reinforcement works at 11kV substations. This therefore means that there could also be issues installing 7kW chargers as presently being experienced with the Council's 50kW taxi project.

10.2 Barriers to growth

10.2.1 Based on the analysis in the demand analysis and the response of UKPN this has shown that important developments across Greater Cambridge will be unable to progress or face significant delays which impacts significantly on targets for residential and commercial development; the electrification of transport; and generation projects as shown in **Table 15** below:

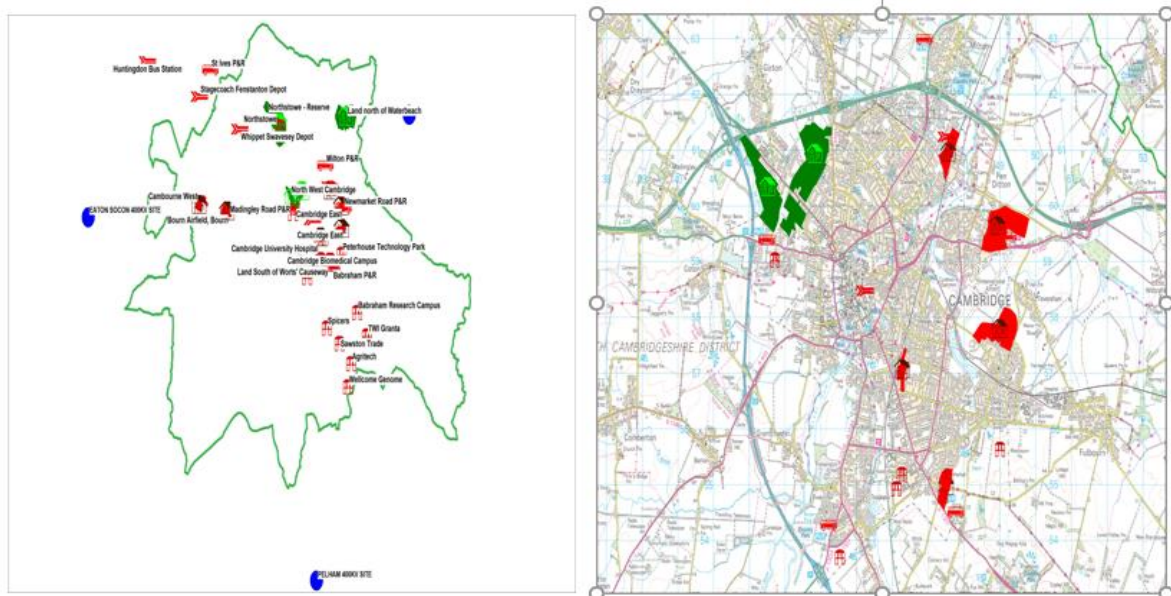
Table 15 – List of all vulnerable developments/projects

Types	Projects or developments that are vulnerable
Type 1: Residential	SS/3 Cambridge East (airport) SS/4 Cambridge Northern Fringe East SS/7 Bourn Airfield SS/8 Cambourne West GB1 and GB2 M2 Clifton Road
Type 2: Commercial	Southern Fringe - Biomedical campus GB3 & GB4 Peterhouse Technology Park Northstowe Enterprise Zone SS/4 Cambridge Northern Fringe East - Science Park Only University
Type 3: Electrification of Transport	Park & Rides - St Ives; Trumpington; Babraham; Milton; Newmarket Council Funded Taxi Project - 50kW chargers Council Bus Electrification Project Council Metro Project Council Car Parks - 22kW and 50kW chargers Private Car Parks - 22kW and 50 kW chargers Private Companies - John Lewis and Marks & Spencer
Type 4: Generation	University of Cambridge solar PV farm M13 Cambridge West ground source heat pump Waterbeach - Waste to Energy Northstowe - CHP town centre

- 10.2.2 This represent a challenge for GCP to meet growth targets set out in the city deal. It has not been possible to quantify the total number of jobs at risk. However, by way of illustration, if strategic sites such as Bourn airfield are unable to proceed or faced significant delays while waiting for grid reinforcement to take place this has a potential impact on up to 2800 jobs.
- 10.2.3 Given the importance of understanding the impacts of network constraints on future developments, the electrification of transport and renewable generation projects, initial work has been carried out by the consultants with GCP to develop a GIS infrastructure/development map as a planning tool for elected members, and officers. A GIS map with appropriate layers can provide a clear visual representation of the critical issues in the network and therefore is an aid to local decision making about priorities and solutions.
- 10.3 Creating a Geographical Information System (GIS) template and layers
- 10.3.1 A useful way of representing the issues identified in the **analysis of current and future network capacity and growth constraints** in **Chapter 2, Section 6** which can also be utilised for planning purposes is through the development of a GIS mapping tool. This would allow GCP to produce maps and other graphic displays of geographic information for analysis and presentation. With these capabilities a GIS is a valuable tool to visualise spatial data or to build decision support systems.
- 10.3.2 There is a web portal under construction called the energy data hub¹⁷, containing information and analysis on the energy landscape in four local enterprise partnership jurisdictions: Greater Cambridge & Greater Peterborough, New Anglia, Hertfordshire and Lincolnshire. The energy map uses drop-down menus under 'features' to select up to five layers to display on the map. The analysis section provides some summaries and additional information to supplement the mapping tool.
- 10.3.3 It is proposed that utilising a similar methodology, GCP should develop a GIS infrastructure development map for the Greater Cambridge area. **Appendix 7** sets out the various GIS layers which would form a template for the energy map.
- 10.3.4 The completion of the GIS infrastructure planning map would provide a visual tool for elected members, local authority and GCP/CA officers and the Universities in order to understand the impact of network constraints on growth targets and where effective interventions would have the greatest impact.
- 10.3.5 GCP has already commenced work on developing the GIS layers and this is illustrated in **Figure 4** Below:

¹⁷ <http://www.energy-data-hub.com>

Figure 4 – Illustration of GIS layers for GCP infrastructure planning map under development



Note: Sites at risk are shown in red in the illustration above.

10.4 Evidence of market and regulatory failure

- 10.4.1 Both the Government and Ofgem have recognised that the current regulatory and operational framework governing the transmission and distribution network is not fit for purpose in supporting the transition from a centralised energy system to a distributed system with a high penetration of renewable energy generation, storage, heat networks, DSR and smart systems integrated at a local level.
- 10.4.2 The Government's own *cost of energy* review undertaken by Professor Dieter Helm of Oxford University identified an energy system that was not fit for purpose and made some far-reaching proposals for the future of the transmission and distribution network. The Government's response by the Secretary of State for Business, Energy and Industrial Strategy in November 2018 set out how the energy system was evolving and announced that there would be a forthcoming white paper on energy in 2019.
- 10.4.3 As part of the evolution of the energy system BEIS published the *Smart Systems and Flexibility Plan* in July 2017 together with an update on progress in November 2018 which sets out a road map for the transition to a Smart energy system. A major aspect of the road map involves the changing role of the National Grid Electricity System Operator (ESO) and the DNOs becoming Distribution System Operators (DSOs).
- 10.4.4 The Government has also charged Ofgem with a major overhaul of the regulatory framework governing the distribution network and has set up both a joint review with Ofgem of the network codes which are considered to be

slow and unresponsive to the challenges facing the network. In addition, Ofgem has also announced the terms of reference for its own Significant Code Review (SCR) which will publish its initial working papers in summer 2019.

- 10.4.5 Whilst these are far reaching reviews, they are unlikely to reach any significant conclusions for up to 2 years, although there are opportunities for stakeholders such as GCP to make representations to the reviews and influence the outcome.
- 10.4.6 The transition of National Grid and the DNOs towards the system operator and distribution operator model has already begun with the separation of the transmission and system operator roles by National Grid and the formation of National Grid ESO from March 2019. The Energy Networks Association (ENA) has also with the support of BEIS, set up the *Open Networks Project* to support DNOs moving to a new DSO model. The *Open Networks Project* is designed to support the move from a traditional role of delivering power from centralised power plants to supporting distributed and smart energy systems. The difficulty is that this is an industry led initiative and could take up to 12 years to realise the changes to the system which are envisaged.
- 10.4.7 However, the *Open Networks Project* can support innovative programmes and solutions being developed by network operators and stakeholders to move towards a smarter electricity grid and distribution network. This is also an opportunity for GCP to work with the DNO (UKPN) on options and solutions to resolve some of the grid constraint issues in the Greater Cambridge area which cannot be undertaken through traditional grid reinforcement measures.
- 10.5 Who should be responsible for strategic interventions?
- 10.5.1 GCP should consider the proposed local and strategic interventions set out above, with a view to developing a business case approach to delivering local solutions.
- 10.5.2 The proposed local and strategic interventions are as follows:
- **Strategic Intervention 1:** *Construction of a New 132kV Grid Substation and Possible Other Reinforcement Works.*
 - **Strategic Intervention 2:** *Smart Grid with Local Authority ESCO as the utility provider.*
 - **Strategic Intervention 3:** *Building Solutions.*
 - **Strategic Intervention 4:** *Market and regulatory failure – representations to Government, Ofgem and the industry using the demand analysis as an evidence base with a view to supporting interventions 1-3 above.*
- 10.5.3 Given the challenges faced by GCP and its partners in terms of the local electricity network and the ambitions to deliver a clean energy infrastructure for Greater Cambridge, a work programme together with the internal and

external resources needs to take forward the strategic interventions. The following **Table 16** is summary of the possible parties/organisations who could take responsibility for the actioning of each strategic intervention.

Table 16 – Who could take responsibility for taking action?

Intervention	Private Sector	UKPN	GCP	Combined Authority	Councils Individually	BEIS	OFGEM
Strategic Intervention 1: Construction of a new 132kV Grid Substation and Possible Other Reinforcement Works Cost: £25million plus land costs	No - note 1	No - note 2	Possibly - note 3	Possibly - note 3	Possibly - note 3	Possibly	No
Strategic Intervention 2: Smart Grid with Public Sector ESCO as the utility provider Cost: Set up cost £500k Starting costs to run the company: £150K in first year approx. Capital costs: Dependent on size of the developments	No - note 1	No - note 2	Possibly - note 4	Possibly - note 4	Possibly – Note 6	Possibly	No
Strategic Intervention 3: Higher buildings standards policy Cost: Staff time	No - note 1	No - note 2	No	No – Note 7	Yes	Yes	No
Strategic Intervention 4: Market and regulatory failure Cost: Recruit skills directly to GCP to work with Government on regulatory barriers or use the Greater South East Energy Hub	No - note 1	No - note 2	Possibly	Possibly	Possibly	Yes	Yes

The rationale behind the responsibilities is summarised in the following notes:

Note 1 - Private Sector

Strategic Intervention 1: the private sector has funded 33kV substations and will do so where they have a vested interest such as requiring all, or most of the additional capacity being created. It is conceivable that a group of commercial organisations join forces and collectively fund the capital costs. However, this is also extremely unlikely as it would involve some 15 or so commercial organisations all committing funding to a project 5 years before it was due to be energised.

Strategic Intervention 2: private residential developers are predominantly interested in selling houses on one development and then moving to the next. This strategic intervention means they would be required to set and manage an ESCO in perpetuity with liabilities such as heat network remaining on their books

Strategic Intervention 3: this is because the buildings are owned by other organisations.

Strategic Intervention 4: a similar answer to Intervention 2, where the developers are only interested in the profits from selling houses.

Note 2

Strategic Intervention 1: UKPN react to acceptance of formal applications by allocating capacity and reinforcing the 11kV, 33kV and 132kV network where required.

Strategic Intervention 2: this is outside the remit of the DNO.

Strategic Intervention 3: this is because the buildings are owned by other organisations.

Strategic Intervention 4: this is outside the remit of the DNO

Note 3 - Strategic Intervention 1: *Although individual councils could possibly support this intervention, it is unlikely as the companies/organisations benefiting are in different geographical boundaries.*

Note 4 - Strategic Intervention 2: *Once formed, the ESCO could work in different geographical areas and provide services, advice etc. to other UK councils. As such this is deemed more beneficial for GCP or Combined Authority.*

Note 5 - Strategic Intervention 4: *GCP, combined authorities and individual councils would all benefit and as such could support this intervention.*

Note 6: *This Strategic Intervention make include councils individually due to the geographical location of the projects.*

Note 7: *This would be the responsibility of each council to apply the necessary policy requirements.*

- 10.5.4 A further consideration as to which organisation should take responsibility for each intervention might be considered a function of who would be accountable if, for example, a target was missed or a policy (such as transport) was either never delivered, delivered late, or delivered over budget.
- 10.5.5 The next stage is for the proposed interventions with their next steps to be considered and for GCP to define a further programme of actions and works. This would also require decisions being made defining who would be responsible for pursuing each strategic intervention.
- 10.5.6 One thing is clear. The electricity network as designed, is unable to meet the future electrical demand requirements or the changing face of technology (EV connections) in the Cambridge area.
- 10.5.7 Therefore, a coordinated approach is required that protects current jobs, supports future residential and commercial developments (and associated job creation), whilst providing a flexible solution that allows the delivery of the Electrification of Transport and generation projects.
- 10.5.8 In the short (2019-2021) and medium (2022-2025) terms, there is clear focus on building new infrastructure to match the identified demands in the demand analysis. During this period energy efficiencies, small scale renewable energy and CO2 reductions can be achieved on existing building stock with Strategic Intervention 2.

10.5.9 However, in the medium (2022-2025) to long (2026-2031) term, the focus must be on delivering sustainable smart or even micro grids (Strategic Intervention 2), as a cross over and move away from the traditional electricity network. For this to happen, the building blocks must start to be put placed in the next 1 to 2 years for delivery to be achieved in the medium term.

CHAPTER 4 – OVERVIEW OF MARKET AND REGULATORY CHANGE TAKING PLACE

11. The market and regulatory framework governing electricity

- 11.1 The current energy market is a legacy of the privatisation of the gas and electricity industry in the late 1980's and early 1990's. The regulatory framework was designed primarily to govern an industry based on large scale 'fossil fuel' generation (coal, gas and oil), high voltage transmission systems and a regional distribution network with responsibility for connecting homes and businesses to the grid. The supply of energy is based on a 'supplier hub' model with supply businesses acting as the core intermediary between the energy system and the customer.
- 11.2 As the gas and electricity industries' regulatory body, Ofgem's primary duty is to protect the interests of consumers, where possible by promoting competition. As an independent economic regulator, it is answerable to the Public Accounts Committee (PAC) of the House of Commons. It is a Non-Ministerial Department, governed by a board known as the Gas and Electricity Markets Authority (GEMA), which makes all major decisions and sets policy priorities. Ofgem's budget is recovered from gas and electricity licence holders. Ofgem's powers are derived from the Gas Act 1986 and the Electricity Act 1989, as amended. It also has enforcement powers under the Competition Act 1998.¹⁸
- 11.3 Although amended by subsequent legislation, this is essentially the same framework that has been inherited from the privatisation of the industry. Its primary purposes are:
- promoting value for money
 - promoting security of supply and sustainability, for present and future generations of consumers, domestic and industrial users
 - the supervision and development of markets and competition
 - regulation and the delivery of government schemes.¹⁹
- 11.4 Privatisation created 'vertically integrated' energy businesses with a predominant position in the marketplace. Changes to the regulatory framework to, for instance, allow greater competition in the supply market, have not impacted on the basic structure of the energy market in the U.K.
- 11.5 The key problem is that the role of the regulator is primarily about managing competition and market regulation not transitioning the industry to a distributed and clean energy system. It is a reactive body as opposed to a proactive one. In the case of the transformation of the energy system there will always be an

¹⁸ https://www.ofgem.gov.uk/sites/default/files/docs/2014/12/corporate_strategy_0.pdf

¹⁹ <https://www.ofgem.gov.uk/about-us/who-we-are>

element of the regulator catching up with radical changes which disrupt the energy system as opposed to leading the change.

12. Barriers and criticisms

12.1 In responding to criticisms about the high costs of energy and slow progress in the energy transition, the Government set up an independent review in August 2017 under Professor Dieter Helm, one of Britain's leading energy experts.

12.2 The Helm Cost of Energy Review was published on 25 October 2017 and made some far-reaching recommendations about transforming the current energy system in the U.K. The introduction states:

*"Within electricity, the traditional characteristics of passive demand and little storage have shaped the vertically integrated companies that have served us for the last century. This is changing: batteries, storage and smart systems are transforming both demand and supply, driving down the cost of intermittency and increasing energy efficiency through smart energy services. The whole-system costs are being transformed. The corporate structures and policies designed for the 20th-century world no longer work well."*²⁰

12.3 It is worth noting some of the key recommendations made by Helm in relation to the transmission and distribution networks as follows:

- an independent national system operator (NSO) and regional system operators (RSOs) in the public sector, with relevant duties to supply, and take on some of the obligations in the relevant licences from the regulated transmission and distribution companies.
- the NSO and the RSOs should, where practical, open up the various functions and enhancements to the networks to competitive auctions and, at the local level, invite bids for network enhancements, generation and storage, and demand-side response (DSR) from energy service companies.
- the separate generation, supply and distribution licences, at least at the local level, should be replaced by a simpler, single licence.
- as a result of the above changes, the role of Ofgem in network regulation should be significantly diminished.²¹

12.4 Helm argued that:

"Not to implement these recommendations is likely to perpetuate the crisis mentality of the industry, and these crises are likely to get worse, challenging the security of supply, undermining the transition to electric transport, and weakening the delivery of the carbon budgets. It will continue the unnecessary high costs of the British energy system, and as a result perpetuate fuel poverty,

²⁰ The Cost of Energy Review, Dieter Helm CBE, 25 October 2017 p.27

²¹ The Cost of Energy Review, Prof. Dieter Helm, 25 October 2017, key findings and recommendations p.16

weaken industrial competitiveness, and undermine public support for decarbonisation.”²²

12.5 The Secretary of State for Business, Energy and Industrial Strategy, Rt. Hon Greg Clarke M.P. responded to the Helm Review in a major speech on energy policy on 15 November 2018²³. Announcing the end of the ‘energy trilemma’ and the future of ‘green power’ he set out 4 guiding principles which would govern future energy policy:

- The use of market-based mechanisms wherever possible;
- That government must be prepared to intervene and provide insurance given the “intrinsic uncertainty” over future technologies;
- That regulation must be agile and responsive if it is to respond effectively to opportunities created by smart and digital technologies, and;
- No ‘free riding’, with all consumers paying their fair share of system costs.

12.6 A detailed White Paper setting out the Government’s plans is expected in the early part of 2019.

12.7 A number of the changes identified by the Secretary of State are already in process and were set out in the BEIS/Ofgem Smart Systems and Flexibility Plan (July 2017).

“A key change in addressing this is the continued evolution of distribution network operators (DNOs) to become more active in managing their networks as a system—implementing innovative techniques and exploring market-based solutions as alternatives to network reinforcement. This mode of operation would see the DNOs operating as distribution system operators (DSOs) and means that if storage, demand-side response, energy efficiency, use of heat networks, or other actions can deliver better value to consumers than traditional reinforcement, the DSO should pursue these solutions.”²⁴

13. System design and market reform

13.1 The most important changes impacting on the network relate to the changing role of the National Grid Electricity System Operator (ESO) and the DNOs becoming Distribution System Operators (DSOs).

13.2 National Grid ESO

13.2.1 The electricity system operator (ESO) is to become a legally separate company within the National Grid Group in April 2019 thereby separating out the transmission business of National Grid from its system operator role. The National Grid ESO is already working with stakeholders and has published its Forward Plan for 2018/19.

²² The Cost of Energy Review, p.22

²³ <https://www.gov.uk/government/speeches/after-the-trilemma-4-principles-for-the-power-sector>

²⁴ Upgrading Our Energy System, Smart Systems and Flexibility Plan (July 2017) p.18

- 13.2.2 The role of National Grid ESO is to support the transition to a more decentralised, low carbon electricity system.²⁵ The ESO is supposed to work with stakeholders on a whole system approach to harness the opportunities of decarbonisation, decentralisation and digitisation of the energy system.
- 13.2.3 National Grid ESO is working with innovation partners to adapt to changes in the energy system. New energy technologies and more renewables means the need to operate the grid in new and different ways and their strategy outlines innovation opportunities which the ESO wants to solve in partnership with stakeholders.
- 13.2.4 There are a range of projects funded through a Network Innovation Allowance (NIA), but none of these appear to involve local authorities or devolution bodies such as the GCP/CA with specific targets for economic growth/housing/jobs or where network constraints are jeopardising long-term ambitions for clean growth.
- 13.2.5 Having spoken to National Grid ESO with regard to potential support for innovation projects, it was suggested that a more appropriate route would be through the Energy Networks Association (ENA) Open Networks Project where stakeholders can make representations and discuss issues through advisory group meetings and potentially look for support in terms of innovation and system flexibility.

13.3 Distribution System Operators (DSOs)

- 13.3.1 The process of changing DNOs like UKPN to Distribution System Operators (DSOs) has already begun. Whilst it is a long-term change (by 2030) it is nonetheless important and has been described as a ‘game changer’. The Government and Ofgem’s *Smart Systems and Flexibility Plan*²⁶ set out an action that:

“DNOs must make more efficient use of new technologies, providers and solutions, as part of their evolution to distribution system operators (DSOs).”

- 13.3.2 A fully functioning energy market at the distribution level should enable a wide range of services, adding value to the system through more intelligent management of renewables; and enabling more renewable connections to be made. However, transition decisions are to be made by the network operators themselves, rather than the Government setting a long-term strategic vision for future network development and operation. This means that DNO/DSOs set their own timescales and decide for themselves what can and can’t be achieved on individual networks.²⁷

²⁵ <https://www.nationalgrideso.com/about-us/future-electricity-system-operator>

²⁶ BEIS/Ofgem Upgrading our Energy System: Smart Systems and Flexibility Plan (July 2017)

²⁷ University of Exeter Energy Policy Group, Policy and Regulatory Barriers to Local Energy Markets in Great Britain, Working Paper (May 2018)

13.3.3 This is problematic and whilst the evolution of the ESO/DSO model is highlighted in the Government's *Smart Systems and flexibility Plan: Progress Update* published in October 2018²⁸ this is still very much a piece of work in progress which is far from complete and is linked to the Industry's own 'Open Networks Project'.

14. BEIS/Ofgem energy network codes review

14.1 Ofgem launched a Targeted Charging Review (TCR): Significant Code Review (SCR) in August 2018, the purpose of which was to:

- consider reform of residual charging for transmission and distribution, for both generation and demand, to ensure it meets the interests of consumers, both now and in future; and
- keep the other 'embedded benefits' that may be distorting investment or dispatch decisions under review.²⁹

14.2 This is primarily due to concerns that the current regulatory framework may lead to 'inefficient behaviours' by some network users and have adverse impacts on other users and consumers.

14.3 The consultation on the TCR has now closed and Ofgem have set up a committee (the Charging Futures Forum) to discuss and oversee changes.

14.4 Ofgem through its charging futures programme is launching a review of costs for connecting to and using the Distribution Network which aims to address ministerial concerns of projects 'islanding' themselves from the network.

14.5 *Significant Code Review (SCR)* – On 18 December 2018 Ofgem launched the next stage of the Electricity Network Access and Forward-Looking Charging Review³⁰ which is a wholesale review of the industry codes with the objective of "ensuring that electricity networks are used efficiently and flexibly, reflecting users' needs and allowing consumers to benefit from new technologies and services while avoiding unnecessary costs on energy bills in general". This is also referred to by Ofgem as the 'Electricity Network Access Project'.

14.6 This review forms part of a wider programme of work by Ofgem and Government to help enable the transition to a low-carbon, smart and flexible energy system and ensure efficient networks and wholesale markets.

14.7 The timeline for this review is 18 months up to Autumn 2020.

²⁸ Smart Systems and flexibility Plan: Progress Update BEIS/Ofgem (October 2018) p.43

²⁹ <https://www.ofgem.gov.uk/publications-and-updates/targeted-charging-review-significant-code-review-launch>

³⁰ <https://www.ofgem.gov.uk/ofgem-publications/145170> Forward looking charges are elements of network charges that signal to users how their actions can either increase or decrease future network costs in different locations and it includes connection charges and elements of use of system charges.

- 14.8 Other matters have been excluded from the SCR and it is the view of Ofgem that the ESO and network companies should take this forward separately including:
- a review of aspects of allocation of access rights, including improved queue management and the scope for trading; and
 - a review of balancing services charges.
- 14.9 There is an opportunity for GCP to influence the review and to make appropriate stakeholder representations through stakeholder events and the Challenge Group, but this is unlikely to lead to any significant recommendations for change for up to 2 years.
- 14.10 Energy Network Codes Review – Also on 18 December 2018, the Government and Ofgem announced that they would be conducting a joint review into the codes which govern our energy system. The review aims to deliver a consultation on changes to the existing arrangements that will create a regulatory framework capable of delivering the transition to a clean, smart, and consumer led energy system. It will also look at how these changes can be made, including through legislation if necessary.
- 14.11 The Terms of Reference for the review sets out the main criticisms of the existing system that it is:
- **Slow** to take decisions, with even simple decisions taking many years.
 - **Reactive** to existing problems, rather than forward-looking in preparing the energy system for future changes.
 - **Overly complex**, with the entirety of the codes estimated to run to over 10,000 pages and weighing 50kg. This is a barrier to new entrants and to innovation.
 - **Resource-intensive**, leading to a lack of representation from smaller and/or newer parties.
 - **Lacking coordination** between the different code bodies.
 - **Fragmented**, with a large number of code panels and bodies which provides for a complex institutional landscape, making it difficult to take forward systemic changes to the rules.³¹
- 14.12 Whilst it is not anticipated that there will be any outputs from this review until the summer of 2019, a process of consultation with stakeholders is due to commence with stakeholder events scheduled for January and February.

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https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765898/energy-network-codes-review-terms-of-reference.pdf

15. Network regulation and price controls – the RIIO model

- 15.1 Because network companies are effectively monopoly providers, Ofgem sets price controls – a ceiling on the amount companies can earn from charges to use the networks. Ostensibly this to protect consumers and ensure they get value, and to also make sure companies operate the network efficiently and sustainably, while they make a return.
- 15.2 The price control framework is called RIIO³² and is performance-based framework to set price controls. The price control framework is set for 8 years although Ofgem has suggested that the next price control period from 2021 should be for 5 years.
- 15.3 Innovation through RIIO is directly funded through a Network Innovation Allowance (NIA) and a Network Innovation Competition (NIC). Together these two schemes fund DNOs to conduct research and run network-related trial projects for transitioning to a low carbon economy.
- 15.4 The problem with the RIIO price control framework as pointed out by Professor Dieter Helm is that it is being rapidly overtaken by technological change which means that predicting costs 8 – 10 years ahead is impractical.
- 15.5 RIIO directly impacts on the forward plans of the DNOs. It has been suggested that network operators effectively ‘game the system’ in setting their revenues and that innovation projects are seen as ‘add-ons’ rather than core business. One proposal is that the transition from DNO to DSO should be incentivised through RIIO to focus on distributed generation and Smart systems.³³

16. Open Networks Project

- 16.1 A significant industry led initiative is the Open Networks Project launched by the Energy Networks Association (ENA) in January 2017.³⁴ The Open Networks Project arose from the BEIS and Ofgem Smart Systems Flexibility Plan in 2017 and is designed:

*“to enable the UK’s local distribution networks to move from their traditional role of simply delivering electricity in one direction from centralised power plants to our homes and communities, to one where they act as a smart platform that enables a whole range of new energy technologies that generate, consume and manage electricity”.*³⁵

³² RIIO Revenue=Incentives+Innovation+Outputs

³³ University of Exeter Energy Policy Group, Policy and Regulatory Barriers to Local Energy Markets p.77

³⁴ ENA Open Networks Project Factsheet,

<http://www.energynetworks.org/assets/files/CURRENT%20Open%20Networks%20Factsheet%20v2.pdf>

³⁵ <http://www.energynetworks.org/assets/files/CURRENT%20Open%20Networks%20Factsheet%20v2.pdf>

- 16.2 It aims to oversee progress and industry consensus on:
- connecting to the Distribution network;
 - transmission-Distribution network interfaces;
 - charging mechanisms;
 - communication; and
 - the transition from 'Distribution Network Operators (DNOs), to Distribution System Operators (DSOs)'.
- 16.3 The ENA is an effective trade body for the transmission and distribution network operators and is led by the industry itself. Whilst it is aiming for wholesale change to the grid and distribution network to reflect the shift to distributed energy and Smart systems, there is again an element of the industry regulating itself and this comes with a degree of scepticism about how far reaching the changes will be.
- 16.4 There is an opportunity to influence the Open Networks Project through stakeholder engagement in various workstreams and UKPN is collaborating on a smart grid project with National Grid as a step towards it becoming a Distribution Systems Operator (DSO).
- 16.5 NG and UKPN are working on a new framework that allows generators to connect to the grid without the need for reinforcements on a region of the transmission network, from Bolney in Sussex to Canterbury in Kent. This is part of a regional development programme for the South East Coast area of England. The aim of the programme is to maximise the opportunities for further efficient deployment of distributed resources and reduce overall system costs for energy consumers.³⁶
- 16.6 Flexibility Commitment - On 13 December 2018 the ENA announced its 'Flexibility Commitment' where all of Britain's local electricity grid operators have committed to opening up requirements for building significant new electricity network infrastructure to include smart flexibility service markets as part of their day-to-day operations³⁷.
- 16.7 The flexibility commitment means that DNOs such as UKPN are committed to:
- Opening up requirements for building significant new electricity network infrastructure to include smart flexibility service markets as part of day-to-day operations. This covers all new relevant projects of significant value, where local electricity operators face congestion in grid infrastructure that results from increased electricity demand and/or distributed energy projects being connected to the grid.

³⁶ <https://www.nationalgrideso.com/insights/whole-electricity-system/regional-development-programmes>

³⁷ <http://www.energynetworks.org/assets/files/ENA%20Flex%20Committment.pdf>

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- Openly test the market to compare relevant reinforcement and market flexibility solutions for all new projects of any significant value.
 - Working with Ofgem and other stakeholders to develop the forthcoming RIIO-2 price control framework to ensure that the financial incentives that network companies receive are fully aligned with the greater use of flexibility services and do not favour the building of new infrastructure where these services are more efficient.
- 16.8 There may be an opportunity under this flexibility commitment for GCP to engage with the ENA Open Networks Project in order to address issues relating to grid constraints in the Greater Cambridge area.
- 17. BEIS – Funding streams to support Smart systems**
- 17.1 Across the Government, Innovate UK, Research Councils and BEIS there is the potential investment of around £265 million in smart systems research, development and demonstration up to 2021 to reduce the cost of electricity storage, advance innovative demand response technologies and develop new ways of balancing the grid. As part of this commitment within the BEIS Innovation Programme, they expect to invest up to £70m to 2021 in smart energy innovation and BEIS has launched innovation competitions on larger scale storage, domestic and commercial DSR applications, vehicle-to-grid technologies and approaches to value and trade flexibility at a local level.
- 17.2 In addition, in the Budget 2017 the Industrial Strategy Challenge Fund was announced, which supports collaborations between business and the UK's science base. The first wave of challenges included £246 million for the *Faraday Battery Challenge*, which sought to help the UK become a world leader in the research, design, development and manufacture of electric vehicle batteries.
- 17.3 The second wave of Industrial Strategy Challenge Funds includes £102.5 million for *Prospering from the Energy Revolution Challenge*, which aims to develop world-leading local smart energy systems that deliver cheaper and cleaner energy across power, heating and transport, while creating high value jobs and export capabilities, and prove their use at scale.
- 18. Local Energy Markets (LEM)**
- 18.1 The cumulative effect of the initiatives and changes described above is a to move towards the development of Local Energy Markets (LEM) designed to build a local marketplace platform for the network to request, and the market to provide flexible demand, generation and storage to help optimise capacity on the local grid.
- 18.2 There is already a project underway in Cornwall and the Isles of Scilly which is supported through the European Regional Development Fund (ERDF) to look at developing local flexible energy markets where the grid is heavily

constrained and where there are significant renewable energy resources available which means that there is too much generation and not enough network capacity to accommodate the export of energy.

- 18.3 Together with other local and strategic interventions including traditional grid reinforcement measures, the GCP should explore opportunities for the development of LEM in Greater Cambridge working with UKPN the DNO/DSO for the region.

19. Summary and actions

- 19.1 From the above description of the existing market and regulatory system governing the electricity network and the various reviews and initiatives that are currently taking place, there are a number of initial conclusions:

- whilst there is scope for a radical shake up of the existing regulatory framework governing the industry, the network codes review is being led by Ofgem the regulator itself and it is unlikely that there will be any significant changes announced for up to 2 years;
- GCP should still use the demand analysis including the impact of network constraints on clean growth targets and ambitions to make appropriate representations to both BEIS and Ofgem about how regulation can better support the energy transition and remove existing barriers;
- such representations could form part of consultations on future government policy included in the forthcoming energy white paper or through the various mechanisms set up by Ofgem/BEIS for stakeholder engagement on the network codes reviews;
- the transition already underway in National Grid towards an Electricity System Operator (ESO) and the DNOs becoming Distribution System Operators (DSOs) in order to support the decarbonisation and decentralisation of the energy system is an important development in the transformation of the energy system; and
- this is an industry led transition which needs to fully reflect the radical changes taking place in the energy system at a local level. There are opportunities through the ENA Open Networks Project for GCP to engage with the industry around innovation projects and to identify appropriate support and funding to enable local innovation to take place in the energy system.

- 19.2 One of the proposed strategic interventions set out at **Chapter 3, Section 10.14** relates to market and regulatory failure and proposes a strategy of which includes lobbying and representation at a Government and industry level, input into policy and regulatory developments and consideration of funding streams to support innovation and change at a local level.

Appendix 1 – Acronyms

BEIS – The Department for Business, Energy and Industrial Strategy
CA – Cambridgeshire and Peterborough Combined Authority
CCC – Cambridgeshire County Council
CCiC- Cambridge City Council
CFF - Charging Futures Forum
CHP – Combined Heat and Power
CO₂ – Carbon Dioxide
CPIER – Cambridgeshire and Peterborough Independent Economic Review
DNO – Distribution Network Operator
DSO – Distribution System Operator
DSR – Demand Side Response
ESCO – Energy Services Company
ESO – Energy System Operator
ENA – Energy Networks Association
ERDF – European Regional Development Fund
GCP – Greater Cambridge Partnership
GEMA – Gas and Electricity Markets Authority
ICP – Independent Connection Provider
IDNO - Independent Distribution Network Operators
IRR – Internal Rate of Return
kV – A unit of potential energy equal to 1000 volts
MVA – Megavolt amperes
NPPF – National Policy Planning Framework
NPV – Net Present value
NSO – National System Operator
Ofgem – Office of Gas and Electricity Markets the industry regulator
PAC – Public Accounts Committee
POC – Point of Connection
PV – Photovoltaic
RDP – Regional Development Plan (by the DNOs)
RSO – Regional System Operator
RTPI – Royal Town Planning Institute
SCDC – South Cambridgeshire District Council
SCR - Significant Code Review
TCPA – Town and Country Planning Association
TCR – Targeted Code Review
UKPN – U.K. Power Networks (the DNO for the South East including Greater Cambridge)

Appendix 2 - Documentation review and stakeholder contacts

Documents & reports

1. Cambridge & Peterborough Independent Economic Review (CPIER) interim report (May 2018) and final report (September 2018).
2. Greater Cambridge City Deal document (2014).
3. Cambridgeshire & Peterborough Devolution deal (2016)
4. Cambridge Local Plan: final draft for adoption (March 2014)
5. South Cambridgeshire Local Plan Chapter 3: Strategic Sites; Chapter 7: delivering high quality homes & Chapter 8: Building a strong competitive economy (adopted September 2018)
6. Cambridge Transport Plan – map of key public transport routes.
7. Cambridge and South Cambridgeshire Local Plan: Proposed Modifications 2017 Joint Housing Land Supply Update (RD/AD/500)
8. Local Energy East Strategy: An energy strategy for the Tri-LEP area (May 2018)
9. North West Cambridge Area Action Plan: Inset Proposals Map October 2009.
10. Excel spreadsheets: Copy of Cambridge Business Commitments 2017 Summary; Copy of Cambridge Business Commitments 2017 Summary; Copy of Cambridge Housing Completions and Commitments 2017; Copy of Cambridge Retail and Town Centre Tables Summary; Copy of CCC - Demand analysis of Developments 31.10.18; Copy of City and SCDC student Commitments 2017; Copy of Housing Trajectory - v3; Copy of SCDC Final Commitments 2017; Copy of South Cambridgeshire Housing Trajectory 2017 FINAL 17.11.17 for AMR; Copy of Visitor Accommodation 2018 Trajectory Water Resource Planning.
11. Key development maps, Cambridgeshire County Council.
12. Smart Energy Grid Seminar, 13 September 2018 – Presentation by Sheryl French, Project Director, Energy Investment Unit, Cambridgeshire County Council.
13. Zero Carbon Cambridge: International and national commitments document.
14. Carbon Management Plan, Cambridge City Council 2016/21.
15. East of England Forecasting Model by Cambridge Econometrics on the Cambridgeshire Insight web pages.

16. Transport Strategy for Cambridge and South Cambridgeshire, March 2014.
17. University of Cambridge - extract from a review of options for provision of new power supplies to cover needs across the West and North West developments and a summary of generation requirements including general information about PV arrays and an outline of the potential generation from the currently installed CHP relating to Phase 1 of the University development only.
18. Technical note - West Cambridge Energy Strategy Addendum, version 1 June 2017.
19. Future deployment scenario 2020-29 for South Cambridge schools (excel spreadsheets).
20. Cambridgeshire County Council buildings in Cambridge/South Cambridgeshire with details of existing or planned solar PV (excel spreadsheet).
21. Cambridge non-residential parking study report by Mott MacDonald, November 2016.
22. Projected plug-in car local fleet size 2017-2050 (excel spreadsheet)
23. BEIS Upgrading Our Energy System Smart Systems and Flexibility Plan July 2017
24. The Cost of Energy Review, Prof. Dieter Helm, 25 October 2017
25. University of Exeter Energy Policy Group, Policy and Regulatory Barriers to Local Energy Markets in Great Britain, Working Paper (May 2018)
26. Smart Systems and flexibility Plan: Progress Update BEIS/Ofgem (October 2018)

GCP Officer and stakeholder contacts

1. Lewis Newbury, Strategy Manager, Greater Cambridge Partnership
2. Sheryl French, Project Director, Mobilising Local Energy Investment, Cambridgeshire County Council
3. Emma Davies Senior Sustainability Officer (Design and Construction) at Cambridge City Council/Greater Cambridge Shared Planning Service
4. Paul Bourgeois Head of Sustainability, Cambridge and Peterborough Combined Authority
5. Peter Blake, Transport Director, Greater Cambridge Partnership

6. Isobel Wade Head of Transport Strategy at Greater Cambridge
7. Daniel Clarke Smart Cities Programme Manager (Smart Cambridge Programme)
8. Debbie Bondi Interim Manager at Smart Cambridge
9. Daniel Thorp Interim Director at Cambridge and Peterborough Combined Authority
10. Jo Dicks, Environment, Quality & Growth Manager, Cambridge City Council
11. Neil Madgwick and Nuno De Fonsca, U.K. Power Networks (UKPN).
12. John Marsh BU UK Infrastructure (also known as Metropolitan).
13. Gavin J Heaphy, Construction Director, University of Cambridge.
14. Chris Parkin, Energy Projects Manager, Cambridgeshire County Council
15. Emily Bolton, Energy Projects Officer, Cambridgeshire County Council
16. Peter Northmore, Chair, Northmores Consulting
17. Ian Pashley, Business Lead, Whole Electricity Systems Networks, National Grid ESO
18. Randolph Brazier, Head of Innovation and Development, Energy Networks Association

Appendix 3 – UKPN: Issues with 132KV Network

Sub station	Comments
Burwell	No ongoing works 4th supergrid transformer being built for future solar pV farms supporting 240 MVA of export Demand to 10 MVA is available subject to confirmation.
Histon Grid	Import and export at capacity. Histon has seen much of generation capacity being applied to solar PV developments. Up to 90 MVA being made available as part of reinforcement works on the 132kV network The majority of the reinforcement works at 11kV and 33kV being met by UKPN (circa £4m) and will be re charged as part of new connections at approx. £50,000-£100,000 /pw Anticipated completion timescale 2023 Works scoped and in design. Overhead cable works at an advanced stage. As reinforcement works are staged, some capacity may become available. The example of West Cambridge development and Madingley Road substation 33 kV as a reference point.
Arbury	Similar issues to Histon except less export issues. Less than 10 MVA demand presently available. This capacity has been offered to SS/4 for developments close to Cambridge North Railway Station. Envisaged reinforcement will apply from 2021, which might be postponed due to new capacity (90 MVA) being available from Histon.
Fulbourn	Demand capacity of 2 MVA available, with larger amounts triggering 33 kV reinforcement works Switchgear works to complete in 2021 This will provide benefits to Sawston primary. UKPN: Current strategy is to install a 3 rd circuit from Fulbourn to Sawston in anticipation of the future 3 rd transformer. No dates for the transformer work as this is dependent on developments in this area) These works are to support future developments (science parks etc) near Hinxton, Babraham, Abington and Chesterford.
Melbourne	Low amount of capacity available

Appendix 4 – Analysis of future network capacity and growth constraints (also available as an excel spreadsheet)

Assumptions		
Key Assumption		
1	132 kV and Timing	1. As the Histon Grid 132 kV will have capacity from 2023, these assumptions EXCLUDE from the sites at risk SS/2 and NM/4, as they will be able to connect from 2023
2	Missing Information	Everything coloured yellow represents where there is missing information
3	Tab - SUMMARY - WORST CASE - TIMELINE	This tab is summary of each of the 'TIMELINE' tabs for the four areas. The residential area has four possible demand profiles based on different SCENARIOS.
4	Residential - ALL Projects	Highlights all the projects
	Residential - At Risk - Timeline	This tab shows only those projects that are at risk.
		SS/3 has been include in the sites at risk due to there being limited capacity at the 132 kV Fulbourne Grid, which could be accepted by another project(s).
		SS/4 Cambridge Northern Fringe East has been added
5	Commercial - ALL Projects	This tab shows only those projects that are at risk.
	Commercial - At Risk - Timeline	The demand figures applied for the Southern Fringe have been taken from Peter Northmore's figures and to due to possible future demand changes e.g. increases in EV, the optimum bias of 85% has been excluded. This produces a higher demand than the published 89 MW.
6	Electrification of Transport - ALL Projects	Additional tabs have been added to provide clarity on council and private car parking EV assumptions
		The actual amount of demand and generation required for each P & R is undetermined as there will be usage and storage on site that will reduce the demand and generation figures shown
	Electrification of Transport - At Risk - Timeline	It has been assumed that all projects are at risk due to present high grid connection costs.
	Number of EV chargers Assumptions	1. The number of car parks spaces has been calculated 2. TABLE 1 - The percentage of EV's on the road has been calculated for 2020, 2025 and 2030 3. TABLE 2 - By 2030 is is assumed that that 30% (to tie with percentage of EV's on the road) of all parking spaces will be a 7 kW charging point 3. It is then assumed that in addition to the 7 kW chargers there will be a demand of 20% (of the 7 kW chargers) for 22 kW chargers. These equates to 39% of all spaces having a charging point by 2030. 4. It is then assumed that in addition to the 7 kW chargers there will be a demand of 10% (of the 7 kW chargers) for 50 kW chargers. 5. This produces the total number of charging points at 2030 6. TABLE 3 - The number of charging points in 2020, 2025 and 2030 is the percentage of EV cars on the road times the present number of car parking spaces times 30% (to accommodate additional 20% 22kW and 10% 50kW extra chargers. 7. TABLE 4 calculates the number of chargers and amount of additional demand for each period using 77% of all chargers are 7 kW, 15% are 22 kW and 8% are 50 kW - as per table 2.
7	Generation	Areas shown in yellow show areas where further clarity is required

SUMMARY - WORST CASE - TIMELINE

		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031		
		MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW		Total
1. RESIDENTIAL																
SCENARIO 1 - TOTAL DEMAND (no EV or renewable provisions)	Demand	4.7	1.96	5	24.2	0	0	0	0	0	0	0	0	0		36
SCENARIO 2 - TOTAL DEMAND plus EV (no renewables)	Demand	13	5	14	67	0	0	0	0	0	0	0	0	0		99
	Cumulative	13	18	32	99	99	99	99	99	99	99	99	99	99		
SCENARIO 3 - TOTAL DEMAND plus EV plus GENERATION of 10% renewables	Demand	13	5	14	67	0	0	0	0	0	0	0	0	0		99
	Generation	1	0	1	4	0	0	0	0	0	0	0	0	0		5
SCENARIO 4 - TOTAL DEMAND plus EV plus GENERATION of 10% renewables plus HEAT PUMPS at 5 kW (TBC)	Demand	25	0	27	127	0	0	0	0	0	0	0	0	0		179
	Generation	0	0	0	0	0	0	0	0	0	0	0	0	0		0
2. COMMERCIAL																
Section 3																
Southern Fringe	Fulbourn Grid	23.65	13.95	14.95	16.95	10.45	11.45	8.45	4.95	1.45	0	0	0	0		106
Other Developments	Various	0	10	14.3	2	1	13	2	1	2	0	3	4	0		52
TOTAL DEMAND		23.65	23.95	29.25	18.95	11.45	24.45	10.45	5.95	3.45	0	3	4	0		159
	Cumulative	23.65	48	77	96	107	132	142	148	152	152	155	159	159		
3. ELECTRIFICATION OF TRANSPORT																0
TOTAL DEMAND		0.5	39.9	20.0	0	4.0	0	59.4	0	0	0	0	89.2	0		213
	Cumulative	0.5	40	60	60	64	64	124	124	124	124	124	213	213		
TOTAL DEMAND of 1. RESIDENTIAL (SCENARIO 2) PLUS 2. COMMERCIAL AND 3. ELECTRIFICATION OF TRANSPORT		37	69	63	86	15	24	70	6	3	0	3	93	0	0	470
	CUMMULATIVE DEMAND	37	106	170	255	271	295	365	371	374	374	377	470	470		
4. GENERATION																
TOTAL GENERATION		0.03	0.04	20.04	0.08	0.08	24.52	0.12	0.12	0.14	0.14	0.14	0	0		45
	Cumulative	0.03	0	20	20	20	45	45	45	45	45	45	45	45		

TYPE 1 : Residential - All Projects

RESIDENTIAL					
1) Residential Target	Joint Housing Trajectory	South C Local Plan 4-chapter-3-strategic-sites .pdf			
		Plan Period 2011-2031		38,080	
		Actual Completions	Cambridge Table C1	-4932	
			South Cambridge Table SC1a	-3970	
			Target balance	29,178	
Section 1	Grid Connection Secured		Dwellings		Running Target of Dwellings Required
		SS/5 - Northstowe	10,000		
		SS/6 - Waterbeach	8,000	18,000	11,178
Section 2	No Grid Issues - applications still to be made		Dwellings		
		SS/3 - Cambridge East (Airport)	2,557		8,621
Section 3	Grid issues solved from 2023		Dwellings		
		SS/2 - Huntingdon/Histon Road	2,593		
		NW/4 North West Cambridge - Eddington	1850	4,443	4,178
Section 4	Grid Issues restricting developments		Dwellings		
		SS/4 Cambridge Northern Fringe East	8,600		
		SS/7 - Bourn Airfield	3,500		
		SS/8 - Cambourne West	2,350		
		GB1 and GB2	430		
		M2 Clifton Road	550	15430	

TYPE 1 : RESIDENTIAL - Vulnerable Developments - Timeline

			132 kV	SHORT TERM			MEDIUM TERM				LONG TERM					
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
				MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
1. RESIDENTIAL	Dwellings	Connection per dwelling kV														
Section 2																
SS/3 - Cambridge East (Airport)	2,557	2	Fulbourn Grid			5										
Section 4																
SS/4 Cambridge Northern Fringe East	8,600	2	Histon Grid				17.2									
SS/7 - Bourn Airfield	3,500	2	Soton Eaton Grid				7									
SS/8 - Cambourne West	2,350	2	Soton Eaton Grid	4.7												
GB1 and GB2	430	2	Fulbourn Grid		1											
M2 Clifton Road	550	2	Fulbourn Grid		1											
	17,987															
SCENARIO 1 - TOTAL DEMAND (no EV or renewable provisions)		2	Amount of Demand	4.7	1.96	5	24.2	0	0	0	0	0	0	0	0	0
SCENARIO 2 - TOTAL DEMAND plus EV (no renewables)		5.5	Amount of Demand	13	5	14	67	0	0	0	0	0	0	0	0	0
Note - EV diversity at 50% of 7 kW per house																
SCENARIO 3 - TOTAL DEMAND plus EV plus GENERATION of 10% renewables		5.5	Amount of Demand	13	5	14	67	0	0	0	0	0	0	0	0	0
Note - 10% of all houses require a 3 kW solar PV array		3.0	Amount of Generation	1		1	4									
SCENARIO 4 - TOTAL DEMAND plus EV plus GENERATION of 10% renewables plus HEAT PUMPS at 5 kW (TBC)		10.5	Amount of Demand	25		27	127									
Note : it has been assumed that there is ZERO generation as the electricity is consumed by the heat pumps and within the house		0	Amount of Generation	0		0	0									

TYPE 2 : Commercial - All Projects					
COMMERCIAL					
1) Commercial			Nature of Development	Connection Comment	Grid Comment
Section 1	Grid Connection Secured				
		West Cambridge Development - M13	250,000 sq m of academic/ commercial research floor space	Formal offer for 9.6 MVA accepted mid October 2018. Unclear if this accounts relates to entire or part of the development. However, this only represents part of the entire development and the remaining element is included in Section 3	The offer triggered upstream reinforcement works at Histon Grid 132 kV. Mandingley Road substation current capacity of 23 MVA is increasing to 40 MVA following completion of reinforcement works. UKPN contribution of upstream costs being £2-3m New connections will meet a proportion of the upstream costs, which will be £50,000-£100,000 / MVA Timescale of 2 years to complete all reinforcement works.
Section 2	Formal Application submitted and being considered				
		SS/4 - Cambridge Northern Fringe	B1, B2, B3 plus commercial and residential	Formal application for 11.5 MVA to be issued Nov/Dec 2018	Capacity available at Arbury 11kV 10MVA and Milton Road 11kV 1.5MVA with connection requiring extension of the network from both substations.
Section 3	Grid Issues restricting developments				
		Southern Fringe - Biomedical Campus	Commercial development	The following amounts of increased demand taken from Peter Northmore's work, excluding 15% optimism bias	No available capacity
		Agritech		20	
		Babraham Research Campus		5	
		Cambridge City Council		2	
		Cambridge Biomedical Campus (CBC)		9	
		Cambridge University Hospital (CUH)		16	
		GB1 and GB2		2	
		Jesus College Research Park		16	
		TWI Granta		3	
		Sawston Trade		3	
		Spicers Site Sawston		17.5	
		Wellcome Genome Campus		13	
			TOTAL	106.5	
		M2 Clifton Road	Residential 550 dwellings plus employment plus M14 and M44	Amount of demand to be confirmed for the commercial element	No available capacity at Fulbourn Grid
		Northstowe	Enterprise Zone	3 MW	No capacity available for Gallaghers and UKPN to comment on possible additional available capacity when the stone Maisons light industrial site is closed and disconnected
		Cambridge Northern Fringe East SS/4	8,600 homes plus expansion of science park	3 buildings requiring 1.1 MW each for the science park expansion ie 3.3 MW	Connection to Histon Grid and subject to completion of reinforcement works in 2023. Residential element included in Residential section
		GB3 & GB4 Peterhouse Technology Park	New technology Park	2 buildings requiring 2 MW each	No available capacity at Fulbourn Grid
		University	Development to 2030	The University has identified an increase in demand from 16 MW to 58 MW	Connection to Histon Grid and subject to completion of reinforcement works in 2023. An element of this additional demand may also have been already included within the residential assumptions for NW/4 North West Cambridge - Eddington

TYPE 2 COMMERCIAL - Vulnerable - Timeline																	
			132 kV Grid	SHORT TERM			MEDIUM TERM				LONG TERM						
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
				MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	
2. COMMERCIAL																	
																	0
Section 3																	0
Southern Fringe - Biomedical Campus																	0
Agritech			Fulbourn Grid	4	2	2	3	2	3	2	2						20
Babraham Research Campus			Fulbourn Grid	2	1	1	1										5
Cambridge City Council			Fulbourn Grid	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2					2
Cambridge Biomedical Campus (CBC)			Fulbourn Grid	3	2	2	2										9
Cambridge University Hospital (CUH)			Fulbourn Grid	2	2	4	4	2	2								16
GB1 and GB2			Fulbourn Grid	0.5	0.5	0.5	0.5										2
Jesus College Research Park			Fulbourn Grid	2	2	2	2	2	2	2	1	1					16
TWI Granta			Fulbourn Grid	0.75	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25					2.75
Sawston Trade			Fulbourn Grid	2	1												3
Spicers Site Sawston			Fulbourn Grid	5	2	2	2	2	2	2	0.5						17.5
Wellcome Genome Campus			Fulbourn Grid	2	1	1	2	2	2	2	1						13
TOTAL DEMAND				23.65	13.95	14.95	16.95	10.45	11.45	8.45	4.95	1.45	0	0	0	0	106.25
Other Developments																	
M2 Clifton Road			Fulbourn Grid			Unkno wn											
GB3 & GB4 Peterhouse Technology Park			TBC			4											
Northstowe - enterprise zone			TBC			3											
SS/4 Cambridge Northern Fringe East - Science Park only			Histon Grid TBC			3.3											
University				0	10	4	2	1	13	2	1	2	0	3	4	0	42
TOTAL DEMAND				0	10	14.3	2	1	13	2	1	2	0	3	4	0	52.3
TOTAL DEMAND				23.65	23.95	29.25	18.95	11.45	24.45	10.45	5.95	3.45	0	3	4	0	158.55

TYPE 3 : Electrification of Transport								
Project		132 kV	Timescale	Project Detail	Battery Storage	Grid connection - Demand MW	Solar PV	Grid connection - Generation MW
Park and Rides	St Ives	Histon Grid	2019	1 MW solar PV car port	300 kWh	0.3	1.0	0.3
	Trumpington	Fulbourn Grid	2021	2.1 MW solar PV car port	3 MW	3.0	2.1	3.0
	Babraham	Fulbourn Grid	2020	1 MW solar PV car port	10 MW	10	1.0	10
	Milton	Milton Grid - TBC	2023	1 MW solar PV car port TBC	TBC	2	1.0	2
	Newmarket	Burwell	2023	1 MW solar PV car port TBC	TBC	2	1.0	2
Note	It has been assumed in the export will be the same as the demand to permit energy trading							
CCC	Taxi - 20 new chargers	CCC to advise	3 years to 2021	16 x 50 kW (20 planned with 4 already installed) 3 x 22 kW	n/a	0.966		Nil
	Council Operated car parks	Various	2020	See spread sheet for assumptions	n/a	2.2		Nil
		Various	2025	See spread sheet for assumptions	n/a	4.4		
		Various	2030	See spread sheet for assumptions	n/a	6.6		
	Electric Bus	Stagecoach Cowley Road Depot Cambridge	2023	2	TBC	2		Nil
		Stagecoach Fenstanton Depot by A14	2023	1.5	TBC	1.5		Nil
		Whippet Depot, Buckingham Business Park, Swavesey	2023	1	TBC	1		Nil
		Drummer Street Bus Station	2023	0.69	TBC	0.690		Nil
		Huntingdon Bus Station	2023	0.37	TBC	0.370		Nil
	University EV	Histon/Arbury Grid	Included in Demand		TBC	Unknown		Unknown
Mayor's metro scheme	Single depot of 3 MW in one of four possible locations 1. Whittlesford Depot 2. Waterbeach 3. Northstowe 4. Cambourn	One of these locations	2021	See first column	Unknown	3 MW		Assumed zero
	The following sites will provide day time charging at 2.25 MW each 1. Cambourn 2. St Ives 3. Waterbeach 4. Newmarket Road 5. Granta Park 6. Hauxton	As per the locations. 1. Soton Eaton. 2. ?? 3. Arbury ? 4. Burwell. 5. Melbourn. 6. Melbourn.	2021	See first column	Unknown	Each location requires 2.25 MW ie 13.5 MW		Assumed zero
Existing Private Car Parks		Various	2020	See spread sheet for assumptions	n/a	27.5		
		Various	2025	See spread sheet for assumptions	n/a	55.1		
		Various	2030	See spread sheet for assumptions	n/a	82.6		
Private Businesses	John Lewis			UNKNOWN AT PRODUCTION OF FINAL REPORT				
	M & S			UNKNOWN AT PRODUCTION OF FINAL REPORT				
Future Road Links	No allowance for new charging stop off points for heavy good vehicles has been included							
Private EV owners	Assume no allowance as charging at home covered by UKPN, on street by CCC							

Council Car Parks - EV requirement

TABLE 1		National Assumptions and Growth Forecasts								Assumed number of EV's of Total Cars on the Road				
Assumptions Data from SMMT		Current UK Cars on the road				32000000								
Predicted EV Uptake (High uptake scenario)				2020		1500000		4.7%				5.0%		
				2025		5000000		15.6%				15.0%		
				2030		10000000		31.3%				30.0%		
https://www.spenenergynetworks.co.uk/userfiles/file/Electric_Vehicle_Uptake_Forecasts.pdf														
TABLE 2		Number of EV chargers required based on number of spaces with a 30% uptake included												
				EV of spaces	30%	20%	10%	CCC assumption						
								TOTAL						
City Council Run Carparks		No. Of Spaces			7kw	22kw	50kw		Existing Chargepoints already 2x3kw		Total Chargers	7 kW %	22 kW %	50 kW %
Grafton East		874			262	52	26	341			341	77%	15%	8%
Grafton West		280			84	17	8	109			109	77%	15%	8%
Queen anne Terrace		570			171	34	17	222	Already 2x 22kw		222	77%	15%	8%
Park street		390			117	23	12	152			152	77%	15%	8%
Grand Arcade		953			286	57	29	372			372	77%	15%	8%
Gwydir		38			11	2	1	15			15	77%	15%	8%
Adam and eve		37			11	2	1	14	2x 50kw taxi only		14	77%	15%	8%
castle hill		112			34	7	3	44	2x 50kw taxi only		44	77%	15%	8%
Arbury Court		80			24	5	2	31	2x 50kw taxi only		31	77%	15%	8%
Riverside		11			3	1	0	4			4	77%	15%	8%
											1305			
Total	in 2030 with 30% increase	3345			1004	201	100	1305						
								39%	Of all car parking spaces have an EV charger					
TABLE 3		Forecast of the number of chargers to 2030												
		2020	2025	2030										
EVs on the road from TABLE 1		5.0%	15.0%	30.0%										
Assumed number of chargers as a percentage of total car spaces		167	502	1004										
Number chargers due with inclusions of 22 and 50kW using TABLE 2		217	652	1305										
Number of chargers for each period		217	435	652		1305								
TABLE 4		Demand Profile for New EV Chargers												
				2020	Total Demand MW	2025	Total Demand MW	2030	Total Demand MW					
Total Chargers				217		435		652						
Of which		7 kW	77%	167	1.17	335	2.34	502	3.51					
		22 kW	15%	33	0.74	67	1.47	100	2.21					
		50 kW	8%	17	0.84	33	1.67	50	2.51					
Total Chargers				217		435		652		1,305				
Total Demand MW for each period					2.7		5.5		8.2	16				
UKPN diversity factor		80%	Additional Demand		2.2		4.4		6.6	13				

PRIVATE Car Parks - EV requirement

TABLE 1		National Assumptions and Growth Forecasts						Private Car Parks - EV requirement				Assumed number of EV's of Total Cars on the Road				
Assumptions Data from SMMT		Current UK Cars on the road						32000000								
Predicted EV Uptake (High uptake scenario)		2020						1500000				4.7%				
		2025						5000000				15.6%				
		2030						10000000				31.3%				
https://www.spenergynetworks.co.uk/userfiles/file/Electric_Vehicle_Uptake_Forecasts.pdf																
TABLE 2		Number of EV chargers required based on number of spaces with a 30% uptake included														
				EV of spaces	30%	20%	10%									
Private Run Carparks		No. Of Spaces			7kw	22kw	50kw	TOTAL			Total Chargers	7 kW %	22 kW %	50 kW %		
											16365	77%	15%	8%		
Note : there is no increase to 2030 in the number of present car parking spaces																
Total		41,962			12589	2518	1259	16365								
								39%	Of all car parking spaces have an EV charger							
TABLE 3		Forecast of the number of chargers to 2030														
		2020	2025	2030												
EVs on the road from TABLE 1	5.0%	15.0%	30.0%													
Assumed number of chargers as a percentage of total car spaces	2098	6294	12589													
Number chargers due with inclusions of 22 and 50kW using TABLE 2	2728	8183	16365													
Number of chargers for each period	2728	5455	8183		16365											
TABLE 4		Demand Profile for New EV Chargers														
				2020	Total	2025	Total	2030	Total							
Total Chargers				2728	Demand MW	5455	Demand MW	8,183	Demand MW							
Of which		7 kW	77%	2098	14.69	4196	29.37	6294	44.06							
		22 kW	15%	420	9.23	839	18.46	1259	27.69							
		50 kW	8%	210	10.49	420	20.98	629	31.47							
Total Chargers				2728		5455		8,183		16,365						
Total Demand MW for each period					34.4		68.8		103.2	206						
UKPN diversity factor	80%	Additional Demand			27.5		55.1		82.6	165						

TYPE 3 : Electrification of Transport - Vulnerable - Timeline

		Demand Requirement	132 kV	SHORT TERM			MEDIUM TERM				LONG TERM						
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
		MW		MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	
3. EV Charging																	
Park and Rides	St Ives	0.3	Histon Grid	0.3													
	Trumpington	3.0	Fulbourn Grid			3.0											0
	Babraham	10.0	Fulbourn Grid		10.0												
	Milton	2.0	Milton Grid - TBC					2.0									
	Newmarket	2.0	Burwell					2.0									
Taxis - funded projects	50 kW - rapid	2019 - 4 x 50 kW. 2020 - 4 x 50 kW. 2021 - 8 x 50 kW	Various	0.2	0.2	0.4											
	22 kW - fast	2021 - 3 x 22 kW	Various			0.066											
CCC - operated car parks		See spread sheet	Various		2.2					4.4					6.6		13.2
Privately operated car parks		See spread sheet	Various		27.5					55.1					82.6		165.2
Electric Buses	Stagecoach Cowley Road Depot Cambridge	2 MW						2									
	Stagecoach Fenstanton Depot by A14	1.5 MW						1.5									
	Whippet Depot, Buckingway Business Park, Swavesey	1 MW						1									
	Drummer Street Bus Station	0.69 MW						.69									
	Huntingdon Bus Station	0.37 MW						.37									
Metro	Single depot of 3 MW in one of four possible locations 1. Whittlesford Depot 2. Waterbeach 3. Northstowe 4. Cambourn					3											
	The following sites will provide day time charging at 2.25 MW each 1. Cambourn 2. St Ives 3. Waterbeach 4. Newmarket Road 5. Granta Park 6. Hauxton					13.5											
Private Business EV Charging	John Lewis	UNKOWN AT PRODUCTION OF FINAL REPORT															
	Marks & Spencer	UNKOWN AT PRODUCTION OF FINAL REPORT															
Other projects	University EV		Histon/Arbury Grid														
REQUIRED DEMAND				0.5	39.9	20.0	0	4.0	0	59.4	0	0	0	0	89.2	0	213

TYPE 4 : Generation

GENERATION Projects		132 kV	Timescale	Battery Storage	Grid connection - Demand MW	Grid connection - Generation MW
University	Issues connecting CHP and solar PV - two emails have been sent and gareth/gavin have yet to reply		Assumed immediate	Unknown	See AREA 3	Unknown as sites may consumed generated electricity or stored in batteries
South Cambridgeshire University solar PV farm		Barton - possibly Melbourn/Histon Grid	2021	Unknown	Unknown	20 MW
Cambridge West ground source heat pump	M13 - Cambridge West			Unknown	Unknown	Unknown
Waterbeach - Energy from Waste		Water beach	2024	Unknown	Unknown	24.4
Northstowe - CHP town centre			2019	Unknown	Unknown	Unknown
CCC - schools	An assessment was completed by Chris Parkin and all schools assumed 20 kwp	Unknown due to geographical spread	See timeline	Unknown	Assumed zero until a decision on whether batteries are included	20 kW
CCC/SCDC - renewable projects	Emily Bolton suggest there is little PV opportunity for most of these sites as they are very small sites – mostly small branch libraries and family centres.		assumed zero for the purposes of this exercise	assumed zero for the purposes of this exercise	assumed zero for the purposes of this exercise	assumed zero for the purposes of this exercise
Sustainable parish partnership			assumed zero for the purposes of this exercise	assumed zero for the purposes of this exercise	assumed zero for the purposes of this exercise	assumed zero for the purposes of this exercise
CCC - Guildhall Solar PV			2019	Unknown	Unknown	30 kWh
CCC - Guildhall CHP	Assumes no import		Unknown	Unknown	Assumed	Unknown
Private sector buildings	What assumption do we make when the decision is with the tenant who has no financial vested interest and also then an additional burden on roof maintenance ?		Unknown	Unknown	Unknown	Unknown
Park and Rides	St Ives	Assumes all generation from Solar PV will be consumed on site and export equals demand for trading energy contracts				0.3
	Trumpington	As above				3.0
	Babraham	As above				10.0
	Milton	As above				2.0
	Newmarket	As above				2.0

TYPE 4 : Generation - Vulnerable - Timeline

			SHORT TERM			MEDIUM TERM				LONG TERM						
		132 kV	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
			MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	
4. GENERATION PROJECTS																
Park & Rides	St Ives	Histon Grid	0.3													
Assumes generation is equal to demand	Trumpington	Fulbourn Grid			3.0											
	Babraham	Fulbourn Grid		10.0												
	Milton	Milton Grid - TBC					2.0									
	Newmarket	Burwell					2.0									
On the basis that the above generation will consumed on site, these generation amounts have been excluded from the totals at the bottom of the page																
University	Issues connecting CHP and solar PV	Histon														
South Cambridgeshire University solar PV farm		Barton - possibly Melbourn/ Histon Grid			20											
M13 Cambridge West ground source heat pump	No details	Histon														
Waterbeach - Waste to Energy								24.4								
Northstowe - CHP town centre	No details															
CCC - schools	An assessment was completed by Chris Parkin and all schools assumed 20 kwp	Various		0.04	0.04	0.08	0.08	0.120	0.120	0.120	0.14	0.14	0.14			
CCC - Guildhall Solar PV			0.03													
Private Sector Buildings - solar PV installations	No details															
TOTAL GENERATION			0.03	0.04	20.04	0.08	0.08	24.52	0.12	0.12	0.14	0.14	0.14	0	0	

Appendix 5 - UKPN Questionnaire responses to the questionnaire on assessing the future demand and generation profile for the Greater Cambridge area.

TYPE 1: RESIDENTIAL		
	Question	Answer
1	Existing Dwellings and Solar PV Installations The amount of private solar installations has statistically been 3% and UKPN were asked if there were any grid issues should that figure increase to (say) 10% pa.	The question was asked because UKPN had said in previous conversations that there would be no issues with solar PV installations for existing domestic dwellings. UKPN felt the increased generation would be reduced by demand at each dwelling. There only possible concern would be if there was a significant aggregated increase in export.
2	SS/3 Cambridge East (Airport) 2,557 dwellings The question was asked if there were any grid connection issues for a 2021 grid connection requirement as there was only 2MW of available capacity in the grid.	UKPN's initial response was that this represented a low risk on the Fulbourn 132/11kV network, and a formal application should be made. A response was provided advising that if 2kVa was required for each property (Scenario 1 as opposed to 5.5 kiva in Scenario 2 with EV charging points per property) that 5MW would be required, which was greater than the 2 MW presently available. UKPN advised that a formal application would be required to determine the impact.
3	SS/4 Cambridge Northern Fringe East 8,600 dwellings The question was asked that if a connection was required in 2022, how could an economically liable grid connection be made available?	UKPN advised that a formal application would be required to determine the impact.

TYPE 1: RESIDENTIAL

	Question	Answer
4	<p>SS/7 Bourn Airfield 3,500 dwellings SS/8 Cambourn West 2,350 dwellings</p> <p>On the basis that the developers for these sites were unable to accept the grid connections due to their excessive costs, what was UKPN doing to make affordable grid connections available?</p>	<p>UKPN confirmed that existing electricity infrastructure to the west of Cambridge was only planned to support the current level of demand. UKPN was 'investigating overall strategic reinforcement options via the Regional Development Plan (RDP) to provide required capacity in the area for the period 2023-2031, aligned with the new regulatory framework defined as RIIO-ED2.</p> <p>This capacity, once realized, will enable further developments to the West of Cambridge, potentially release further capacity from existing substations like Histon and Fulbourn Grid to support the developments to the North and Southeast respectively.'</p> <p>In response, UKPN were asked when their study would be completed and how much additional new demand would be made available to service the commercial developments in the Southern Fringe.</p> <p>UKPN responded by saying they their submission to Ofgem as part of RIIO-ED2 was expected in 2021. However, if the Council instructed the engineering study as required for the 132kV grid primary substation, this could be used to shape the RIIO response by considering a more proactive solution that could also include SS/7 and SS/8.</p>
5	<p>GB1 & GB2 430 dwellings</p> <p>The question was asked that if a connection was required in 2020, how could an economically liable grid connection be made available?</p>	<p>UKPN's answer 1) overall comment was as SS/7 & SS/8 and implied that the lower number of dwellings could connect to the network.</p> <p>A response was provided asking for confirmation that capacity would be available under Scenario 2 and 5.5kVa per dwelling.</p> <p>UKPN advised that a formal application would be required to determine the impact.</p>
6	<p>M2 Clifton Road 550 dwellings</p> <p>The question was asked that if a connection was required in 2020, how could an economically liable grid connection be made available?</p>	<p>UKPN's answer 1) overall comment was as SS/7 & SS/8 and implied that the lower number of dwellings could connect to the network.</p> <p>A response was provided asking for confirmation that capacity would be available under Scenario 2 and 5.5kVa per dwelling.</p> <p>UKPN advised that a formal application would be required to determine the impact.</p>

TYPE 2: COMMERCIAL		
	Question	Answer
1	SS/4 Cambridge Northern Fringe East - expansion of the Science Park This represent 3 buildings and a total additional demand of 3.3MW from 2021.	UKPN advised that the reinforcement of Histon Grid enables transfer of demand from Arbury Grid and as such benefit this development. In response, we asked for clarity that a grid connection would be available from 2021. UKPN advised that a formal application would be required to determine the impact.
2	Waterbeach Enterprise Zone New demand of 3 MW is required, and South Cambridge Council had confirmed that there was no capacity available for Gallagher's to develop this site. The question was asked if future capacity would be become available when the light industrial unit closes.	UKPN were unable to comment.
3	GB3 & GB4 Peterhouse Technology Park This represent 2 buildings and a total additional demand of 4MW from 2021.	UKPN were unable to comment as further information is required to carry out an assessment first.
4	M2 Clifton Road This represent a total additional demand of TBC MW from 2021.	UKPN were unable to comment as further information is required to carry out an assessment first.

TYPE 2: COMMERCIAL

	Question	Answer
5	<p>Southern Fringe - Biomedical Campus</p> <p>This represent a total additional demand of 106MW from 2030, with commencement of additional demand from 2019.</p>	<p>UKPN confirmed that the number of applications received, and capacity requested is significantly less than what is forecast (in the demand analysis).</p> <p>UKPN further commented that the creation of a new grid substation to the West of Cambridge, potentially releases further capacity to these developments.</p> <p>In response, additional information was requested on how much potential additional capacity could be released plus further information confirming the timescale and cost for the construction of a new 132kV grid substation.</p> <p>UKPN responded by saying they their submission to Ofgem as part of RIIO-ED2 was expected in 2021. However, if the Council instructed the engineering study as required for the 132kV grid primary substation, this would provide the necessary answers.</p>

TYPE 3: ELECTRIFICATION OF TRANSPORT

	Question	Answer
1	<p>Park & Ride Sites</p> <ul style="list-style-type: none"> - St Ives - Trumpington - Babraham - Milton - Newmarket <p>Grid solutions were sought for these sites.</p>	<p>UKPN were unable to comment due to each location have different impact on the grid but import and export agreements for full requirements are likely to trigger reinforcement costs.</p>

TYPE 3: ELECTRIFICATION OF TRANSPORT

	Question	Answer
2	<p>Taxi Connections</p> <p>It was noted that UKPN were already assisting the Council in these connections.</p>	<p>UKPN were unable to comment in this questionnaire without exact information of each required connection.</p>
3	<p>CCC - EV connections in exiting car parks</p> <p>Based on a significant future demand and present issues with taxi EV connections, comment was sought on how these connections at 22kW and 50Kw could be solved.</p>	<p>UKPN were unable to comment in this questionnaire without exact information of each required connection.</p> <p>In response, it was mentioned that 43% of all chargers would be 7kW and confirmation was sort from UKPN that all this level of charging connections at 7kW could be accommodated.</p> <p>UKPN said that there was a possibility that a large number of 7kW chargers could have a negative impact on the 11kV network resulting in reinforcement being required.</p>
4	<p>Privately - EV connections in exiting car parks</p> <p>Based on a significant future demand and present issues with taxi EV connections, comment was sought on how these connections at 22kW and 50Kw could be solved.</p>	<p>UKPN raised the question about the actual amount when diversity factors were applied.</p> <p>In further correspondence, UKPN confirmed that a diversity factor of 80% would apply, meaning that overall demand figures would be 20% less. This diversity factor was then incorporated into later versions of the demand analysis calculations.</p> <p>In response, it was mentioned that 43% of all chargers would be 7kW and confirmation was sort from UKPN that all this level of charging connections at 7kW could be accommodated.</p> <p>UKPN said that there was a possibility that a large number of 7kW chargers could have a negative impact on the 11kV network resulting in reinforcement being required.</p>

TYPE 3: ELECTRIFICATION OF TRANSPORT

	Question	Answer
5	Electric Buses Depots Comment was sort for the anticipated connection date of 2023	UKPN confirmed that there had been correspondence with the customer. In response, UKPN were advised that the budget applications had been seen and welcomed comment from UKPN as to how long before 2023 should formal applications be made.
6	Private EV connections - John Lewis - Marks & Spencer It was noted that the amount of demand information would follow.	No answer was required from UKPN.
7	University EV connections It was noted that the amount of demand information would follow.	No answer was required from UKPN.
8	Mayor's Metro Scheme Although no exact location was able to be confirmed, it was noted that 3MW would be required.	UKPN were unable to comment in this questionnaire without exact information of each required connection. In response, UKPN were asked to how long before 2021 should formal applications be made.

TYPE 3: ELECTRIFICATION OF TRANSPORT

	Question	Answer
9	<p>- Existing Dwelling Charging Points</p> <p>Confirmation was sort that all these dwellings were able to connect without any additional connection costs.</p>	<p>UKPN referred their answer to published documents</p> <p>http://www.ukpowernetworks.co.uk/electriicty/electric-vehicle-charging-point</p> <p>In response it was commented that this link excluded any comments on domestic chargers and further comment was required.</p> <p>UKPN's response was as follows:</p> <ul style="list-style-type: none"> - UKPN allows all domestic customers a 100amp supply so if we need to upgrade the customers fuse or cut-out, we will do this free of charge - If for whatever reason this triggered reinforcement again there is a rule in our licence DC205 which means that for all domestic or business customers wanting a 100amp supply for the purposed of connecting low carbon technology, we will fund the reinforcement
10	<p>On Street EV Charging Points</p> <p>Confirmation was required that 3kW and 7kW chargers could be installed without additional connection charges.</p>	<p>UKPN referred their answer to published documents, which confirmed the position as correct.</p> <p>http://www.ukpowernetworks.co.uk/electriicty/electric-vehicle-charging-point</p>

TYPE 4: GENERATION

	Question	Answer
1	Park and Rides The question was asked as to how commercially viable connections would be made	UKPN were unable to comment due to each location have different impact on the grid but import and export agreements for full requirements are likely to trigger reinforcement costs. It should be noted that the demand analysis was then adjusted to assume that the generated electricity would be consumed on site (via EV chargers) or possibly stored in batteries and there would be no export requirement.
2	CCC - Schools An answer to how financially viable connections could be achieved considering the present high connection costs	UKPN advised that further capacity could be accommodated without network impact if connected via an active management system (AMS). In response, further information was sort on the AMS. The question was also asked if solar PV could be added with no export agreement if the generated electricity is either consumed or switched off if generation exceeds demand at any time? UKPN said this was possible and further AMS information was possible.
3	Other Projects No information was available	No necessary UKPN comment required.

Appendix 6 – Options appraisal

Options	Description
Option 1: UKPN to fund reinforcement works funded by private sector	An example of this type of private sector reinforcement is the network upgrade presently being undertaken at Histon Grid. It requires a private developer to accept a formal offer that has triggered reinforcement works to be completed. However, the amount reinforcement cost that would be attributed to the private developer could still make the connection cost prohibitive.
Option 2: IDNO to build new 33 kV substations	An IDNO (Independent Network Distribution Operator) would require the new 33kV substation to be funded by a single party or consortium of developers. In the former case, the capital cost would be refunded as new connections (for new developments are made) to the substation - on the basis that the primary funder had not reserved all the power. The capital cost would be the same as if built by the DNO, except for the IDNO being able to make 'asset payments' to the primary funder as new connections are made. The primary funder would be required to source suitable land and the timescale for development would be 2-3 years.
Option 3: Battery solutions introduced to stabilise grid	This option is a function of engineering assessments completed by the DNO to identify where a battery solution would negate the requirement for reinforcement works to be undertaken. This option is also more about achieving greater efficiencies in the network rather than delivering an increased amount of electrical demand. Where UKPN have previously recognised this as a solution, they have invited bids from battery markets orchestrated in a similar way as the government's auction for FFR and EFT income.
Option 4: Public Sector/Combined Authority to step in and fund all present/future requirements	This option is worth of consideration where the public sector/combined authority has a number of projects that each are all subject to excessively high grid connection costs due to a lack of electrical demand e.g. electrification of transport with buses, trams, park & rides and 22kW or 50kW vehicle charging projects. For example, if there were 10 projects that were each penalised by having grid offers (say) £100,000 more than the standard grid connection fee, it would make financial sense investing £1m into network infrastructure.
Option 5: GCP/CA to fund new 132 kV grid substation to service southern fringe	This is a proactive option where the public sector/combined authority acts as the 'first comer' and provides a financial commitment to UKPN to meet the full costs associated with an agreed reinforcement programme of works for a new 132kV grid substation. The two key considerations are 1) to ensure there is sufficient demand from the private sector to make new demand connections for the total new electrical demand being created and 2) that a framework agreement exists with the DNO for connection contributions to be received from private developers connecting to the funded works.

Option 6: Smart Grid with Local Authority ESCO as the utility provider	<p>This option applies particularly for residential developments where the private developer is unable to proceed with the development due to excessively high grid connection costs. In this instance the local authority would become the utility provider and negotiate all the utility packages in the same way a master residential developer would for a large residential development. The exception being that the local authority's aim is to use the utility services to meet (or exceed) its own renewable energy generation and CO2 reduction targets for the development, whilst generating a profit from its services that can be redistributed to support other energy projects. Due the lack of available electrical capacity the utility plan for a development would work on the following basis : 1) a mains gas supply would power CHP (with supporting biomass for CO2 reduction targets) with the generated electricity stored in central batteries 2) houses would be heated from a heat network as opposed to individual gas connections 3) the local authority would own and operate an ESCO for the heat network 4) houses would receive their electricity from a private wire connection, with electricity billing operated by the ESCO 5) each house would have an agreed amount of solar PV with a battery for self-generation and storage. The ESCO electricity connection would in effect be topping up each house's demand requirements, which can include storage in the battery during the night period. 6) Each house would have an EV connection and therefore meet all the sustainability targets and ambitions held by the council. 7) The ESCO would also provide the water networks via an inset licence, which opens up the opportunity for lower pricing to the house owner and the ESCO receiving a financial reward in the form of an 'asset payment' 6) There may be the possibility for further generation (wind, solar PV farm) in close proximity to the development for additional storage in the main batteries 7) There would need to be a connection to the grid as a back-up, but if there are grid connection issues, it may be that any power drawn is only at agreed off peak times. There may be the possibility, due to the grid connection issues to have an export connection for agreed times too. 7) Customers would receive their heat and electricity bills from a council ESCO where the pricing can be shown to be more competitive than the industry's big six. In terms of the relationship with the main developer, it would work as follows. 1) The ESCO would be able to provide the utility connections (heat, electricity, water and fibre) for an agreed sum per house, as per the present system negotiated by a master residential developer 2) Included in this connection cost per house would be a profit element per connection. A £200 (say) profit element would produce £200,000 profit per 1,000 houses 3) When the housing developer needed a number of houses connected, they would pay the connection cost per house upfront and the appointed utility contractors would complete the work. The ESCO could provide additional optional services to the home owners, such as funding package for an electric vehicle. Within the development, a fast charging of EVs could be provided to generate additional fees.</p>
Option 7: Buildings Standards - solar/battery/energy efficiency	<p>This strategic intervention is targeted at the Council's own building stock in terms of meeting 10% of energy being achieved from renewable sources and targets of CO2 reductions.</p> <p>Software is available that allows the building owner to produce an internal assessment of the size of solar PV array that can be installed with a suitably sized battery to consider financial returns in the following formats:</p> <ul style="list-style-type: none"> Maximise the internal rate of return (IRR) Maximise net present value (NPV) Lowest payback period Maximum CO2 reduction <p>The software is able to calculate when the generated electricity is consumed by the building, when any excess is stored within the battery and when any surplus electricity is be exported to the grid.</p>

APPENDIX 7 – GIS LAYERS SUMMARY

The purpose of this document is to summarise the layers for the GIS mapping exercise and the location of the information for each layer.

It is suggested that each icon should open a box that contains basis information for that project/development, such as jobs created.

Layer	Detail	Icon	Location of Information
1	Administrative area for GCP	Single line to show boundary	With GCP
2	Location of 132 kV grid substations	Circle is sufficient	Already on online energy data portal
3	Residential Developments - at no risk	House - green coloured	See table below - GCP to provide a postcode
4	Residential Developments - AT RISK	House - red coloured	See table below - GCP to provide a postcode
5	Commercial Developments - at no risk	Building - green coloured	See table below - GCP to provide a postcode
6	Commercial Developments - AT RISK	Building - red coloured	See table below - GCP to provide a postcode
7	Electrification of Transport - at no risk	An appropriate symbol - green coloured	See table below - GCP to provide a postcode
8	Electrification of Transport - AT RISK	An appropriate symbol - red coloured	See table below - GCP to provide a postcode
9	Generation Projects - at no risk	Possibly solar panel - green coloured	See table below - GCP to provide a postcode
10	Generation Projects - AT RISK	Possibly solar panel - red coloured	See table below - GCP to provide a postcode

LAYER 3 - Residential Developments - at no risk
SS/5 - Northstowe
SS/6 - Waterbeach
SS/2 - Huntingdon/Histon Road
NW/4 North West Cambridge - Eddington

LAYER 4 - Residential Developments - AT RISK

SS/3 - Cambridge East (Airport)

SS/4 Cambridge Northern Fringe East

SS/7 - Bourn Airfield

SS/8 - Cambourne West

GB1 and GB2

M2 Clifton Road

LAYER 5 - Commercial Developments - at no risk

West Cambridge Development - M13 - phase 1

SS/4 - Cambridge Northern Fringe - phase 1

LAYER 6 - Commercial Developments - AT RISK

West Cambridge Development - M13 - phase 2

Cambridge Southern Fringe - Projects

Agritech

Babraham Research Campus

Cambridge City Council

Cambridge Biomedical Campus (CBC)

Cambridge University Hospital (CUH)

GB1 and GB2

Jesus College Research Park

TWI Granta

Sawston Trade

Spicers Site Sawston

Wellcome Genome Campus

M2 Clifton Road
Northstowe - Enterprise Zone
Cambridge Northern Fringe East SS/4 - phase 2 science park extension
GB3 & GB4 Peterhouse Technology Park
M2 Clifton Road

LAYER 7 - Electrification of Transport - at no risk
Possibly include Councils 20 EV taxi charging points

LAYER 8 - Electrification of Transport - AT RISK
Park & Rides
St Ives
Trumpington
Babraham
Milton
Newmarket
Council Operated car parks - LOCATIONS REQUIRED
Electric Bus Depots
Stagecoach Cowley Road Depot Cambridge
Stagecoach Fenstanton Depot by A14
Whippet Depot, Buckingway Business Park, Swavesey
Drummer Street Bus Station
Huntingdon Bus Station
Mayor's Metro

Single depot from one of these four possible locations

1. Whittlesford Depot
2. Waterbeach
3. Northstowe
4. Cambourn

Existing Private Car Parks - include/exclude due to the vast number of locations?

University's EV

Private Sector EV - John Lewis, Marks & Spencer

LAYER 9 - Generation - at no risk

None included as demand analysis has been focusing on at risk projects. GCP may wish to add projects with grid connections that are proceeding

LAYER 10 - Generation - AT RISK

University

University of Cambridge solar PV farm

Cambridge West ground source heat pump

Waterbeach - Energy from Waste

Northstowe - CHP town centre

CCC - Schools - a list is available produced by Chris Parkin

Park and Ride

St Ives

Trumpington

Babraham

Milton

Newmarket

Quarterly Progress Report

Report to: Greater Cambridge Partnership Joint Assembly

Date: 18th November 2021

Lead Officer: Niamh Matthews – Assistant Director Strategy and Programme, GCP

1. Background

- 1.1 The Quarterly Progress Report updates the Joint Assembly on progress across the Greater Cambridge Partnership (GCP) programme.
- 1.2 The Joint Assembly is invited to consider the progress to be presented to the Executive Board.

2. 2021/22 Programme Finance Overview

- 2.1 The table below gives an overview of the 2021/22 budget and spend as of September 2021.

Funding Type	**2021/22 Budget (£000)	Expenditure to September (£000)	Forecast Outturn (£000)	Forecast Variance (£000)	Status*		
					Previous	Current	Change
Infrastructure Programme	44,026	13,593	34,456	-9,570	A	R	↓
Operations Budget							

* Please note: RAG explanations are at the end of this report. As part of an officer led review the RAG explanations have been revised to ensure continued accuracy as spend significantly increases. Forecast spend remains well within expected tolerance levels for a programme of such significant scale.

** 2021/22 Budget includes unspent budget allocations from the 2020/21 financial year, in addition to the allocations agreed at the March 2021 Executive Board.

3. GCP Programme – Strategic Overview

- 3.1 The GCP programme reached significant strategic milestones in the previous financial year (2020/21). In particular, in May 2020 the Government confirmed that the GCP passed its first Gateway Review, securing the next tranche (£200m) of investment into the programme; then, in December 2020, the Executive Board agreed a revised Future Investment Strategy (FIS), updating the GCP programme

in light of new evidence in order to maximise the benefits realised by the residents and businesses in Greater Cambridge through the delivery of the City Deal. The budget strategy agreed by the Executive Board in March 2021 has been designed to deliver the FIS. This includes the budget for this financial year (2021/22).

- 3.2 The 2020 Gateway Review recognised that Greater Cambridge is on the cusp of realising its most transformative infrastructure programme ever, unlocking the economic growth potential of Greater Cambridge over the coming decades. The GCP programme is also referenced in the Local Industrial Strategy (LIS), Local Transport Plan (LTP) and Local Economic Recovery Strategy (LERS) for Cambridgeshire and Peterborough.
- 3.3 Delivery of the Greater Cambridge City Deal supports sustainable economic growth and the accelerated delivery of the Local Plan, as well as enabling a broader transformation in the way Greater Cambridge moves and travels, supporting the transition to zero carbon and creating a more inclusive economy. The GCP's vision for a future travel network is particularly important to support a green recovery from Covid-19, with sustainable transport options vital to enable communities to access work, study and other opportunities the city-region has to offer.
- 3.4 Investments in 2021/22 are essential to progress and deliver the infrastructure required to transform connectivity, with the GCP investing:
- £18.75m to progress the GCP's four major corridor schemes, linking growing communities to the north, south east, east and west of Greater Cambridge. This year, a number of quick wins to improve road safety and sustainable travel options are being finalised on the Cambridge South East Transport scheme (CSET);
 - £7.7m on cycling and active travel schemes, including progressing the design of the Greenways routes and delivering Phase 1 of the Chisholm Trail; and
 - £12.1m on further schemes to improve public transport and sustainable travel options, including the now completed Histon Road scheme and investing £5m in specific public transport schemes and other measures to encourage sustainable travel through the City Access project.
- 3.5 Aside from investments in transport improvements, GCP investments in Skills, Smart, Housing and Economy and Environment projects (as detailed throughout this paper), totalling more than £2m in 2021/22, continues to alleviate barriers to economic growth and shared prosperity in Greater Cambridge. Particularly, the new Skills contract delivered by Form the Future, with Cambridge Regional College, is building on the delivery of new, high quality apprenticeships during the GCP's first five years of investment, providing local businesses with the skills they need to grow. The GCP continues to progress work to enhance energy grid capacity to sustain local growth and the Smart Cambridge programme is investing over £1m in projects to maximise the benefits of technological and digital innovation across the GCP programme.

4. Workstream Updates

- 4.1 This section includes key updates on progress, delivery and achievements across the GCP programme in the last quarter. Full reports for each workstream are attached to this report (Appendix 1-Appendix 5).

Transport

- 4.2 Over the last quarter, significant progress has been made on Transport schemes including the opening of the Histon Road project, construction on CSETS Phase 1 (Linton Greenway at Copley Hill and from Worts Causeway to Addenbrookes) and consultation on both City Access and the Eastern Access project.
- 4.3 In the next quarter a Transport Works Act Order (TWAO) for CSETS Phase 2 (subject to full Cambridgeshire County Council approval) is on schedule to be submitted and the next steps on Eastern Access and City Access, following the consultations, will be progressed. It is also expected that Cambridge South West Travel Hub will go to Planning Committee in February.
- 4.4 Three schemes within the GCP programme are RAG rated as red for expenditure. The first is the Chisholm Trail; the project is currently over-budget. A report on overall project overspend was submitted to the GCP Executive Board on 10th December 2020 where an additional budget of £6.582m was agreed for Phase 1 of the Chisholm Trail. The second is the West of Cambridge Package as the Cambridge South West Travel Hub was deferred at July's Planning Committee. The decision was deferred unanimously by the Committee until further information on Green Belt, demand and drainage is provided. The project is now aiming for a February 2022 Planning Committee. The delay will result in a reduction in the spend profile which is reflected in the forecast outturn variance. The third scheme with under spend this year is Cambridge South East Transport Phase 1, this is due to the delays to two key elements (land acquisition and planning permission – now due to be brought to CCC Highways and Transport Committee in December this year) of the project for Haverhill Road, Hildersham Crossroads, Bartlow Roundabout and the Babraham Park & Ride extension.
- 4.5 The full workstream report for Transport, including tables outlining delivery and spend information, is available in Appendix 1.

Skills

- 4.6 The Skills contract entered in to with Form the Future in 2019 came to a successful conclusion at the end of March 2021. All the KPI targets were exceeded. Given the continued impact of Covid-19 on the labour market, this is a significant achievement.
- 4.7 The new contract became operational in April 2021 and progress against targets is set out in Section 9.
- 4.8 The full workstream report for Skills is available in Appendix 2.

Smart

- 4.9 Smart signals infrastructure has now been installed at all four junctions which make up the trial area and data is now being captured and analysed. Further information is shown in Section 11.4.
- 4.10 A review of sensor technologies available in the market has been carried out and will inform the full procurement of the Strategic Sensing Network. This is a project being led by Smart and in collaboration with the County Council and Cambridgeshire & Peterborough Combined Authority (CPCA).
- 4.11 The full workstream report for Smart is available in Appendix 3.

Housing

- 4.12 The full workstream report for Housing is available in Appendix 4.

Economy and Environment

- 4.13 **Sectoral Employment Analysis:** As previously reported, the latest update from the Greater Cambridge Sectoral Employment analysis was released in July and gives some headline figures on the impact of Covid-19 on our sectors. At headline level the findings outline the strong performance of the Greater Cambridge corporate economy, with the impact of the first lockdown being mitigated by the resilience of KI (Knowledge-Intensive) companies, especially Life Science and ICT sectors. Non-KI companies showed modest employment growth but would have seen falls in employment without the support of the furlough scheme. More detailed findings can be found in Section 14. This will next be updated in the March 2022 report, with figures expected to be provided to GCP in November/December 2021.
- 4.14 **Energy Grid project:** The draft Outline Business Case (OBC) and covering report for the Energy Grid project has been completed and will be discussed at Agenda Item 9 of this meeting. The OBC includes information on the offers received by UKPN, the delivery routes available for construction and the cost recovery estimates based on the Electricity Connection Charges Regulation (ECCR).
- 4.15 The full workstream report for Economy and Environment is available in Appendix 5

5. Citizens' Assembly

- 5.1 The contributions of individual projects to the GCP's response to the Citizens' Assembly are contained in reports relating specifically to those items.

6. Financial Implications

- 6.1 At a strategic level the GCP has agreed to over-programme. Planned over-programming in this way is in place to provide future flexibility in programme delivery. Based on the budget agreed by the Executive Board in March 2021, the proposed over-commitment is £123m. This assumes that the GCP will be

successful in passing the second Gateway Review and will receive the third tranche of funding (£200m).

Have the resource implications been cleared by Finance? YES

Name of Financial Officer: Sarah Heywood

List of Appendices

Appendix 1	Quarterly Transport Workstream Report
Appendix 2	Quarterly Skills Workstream Report
Appendix 3	Quarterly Smart Workstream Report
Appendix 4	Quarterly Housing Workstream Report
Appendix 5	Quarterly Economy and Environment Workstream Report
Appendix 6	RAG Explanations
Appendix 7	GCP Completed Projects
Appendix 8	Executive Board Forward Plan

Background Papers

Source Documents	Location
None	-

APPENDIX 1: QUARTERLY TRANSPORT WORKSTREAM REPORT

“Creating better and greener transport networks, connecting people to homes, jobs, study and opportunity”

7. Transport Delivery Overview

7.1 The table below gives an overview of progress for ongoing projects. For an overview of completed projects, including their relation to ongoing projects, please refer to Appendix 7.

Project		Current Delivery Stage	Target Completion Date for whole Project	Forecast Completion Date for whole Project	Status		
					Previous	Current	Change
Cambridge Southeast Transport Phase 1		Construction	2022	2022	G	G	↔
Cambridge Southeast Transport Phase 2		Construction / Design	2024	2025	G	A	↓
Cambourne to Cambridge / A428 Corridor		Design	2024	2026	R	A	↑
Waterbeach to Cambridge		Early Design	2027	2027	G	G	↔
Eastern Access		Early Design	2027	2027	G	G	↔
Milton Road		Design (Reprofiled)	2023	2023	G	G	↔
City Access Project		Design	2024	2024	A	G	↑
Chisholm Trail Cycle Links	Phase 1	Construction	2020	2021	A	A	↔
	Phase 2	Design	2024	2024	G	G	↔
Histon Road Bus Priority		Construction	2022	2021	G	G	↔
West of Cambridge Package		Design	2024	2025	A	A	↔
Residents Parking Implementation		Implementation / Paused	2021	2021	R	A	↑
Waterbeach Greenway		Project Initiation	2024	2024	G	G	↔
Fulbourn Greenway		Project Initiation	2024	2024	G	G	↔
Comberton Greenway		Project Initiation	2025	2025	G	G	↔
Melbourn Greenway		Project Initiation	2025	2025	G	G	↔
St Ives Greenway		Project Initiation	2023	2023	G	G	↔
Barton Greenway		Project Initiation	2025	2025	G	G	↔
Bottisham Greenway		Project Initiation	2025	2025	G	G	↔
Horningsea Greenway		Project Initiation	2025	2025	G	G	↔

Sawston Greenway	Project Initiation	2025	2025	G	G	↔
Swaffhams Greenway	Project Initiation	2025	2025	G	G	↔
Haslingfield Greenway	Project Initiation	2025	2025	G	G	↔
Madingley Road (Cycling)	Design	2025	2025	G	G	↔

Key: R = Red, A = Amber, G = Green – see Appendix 6 for RAG explanations.

7.2 Whilst the forecast completion dates captured above are the anticipated opening dates for each project, delivery risks e.g. land acquisition timescales remain across the programme. Due to the significant scale of the programme its and associated spend, delivery risks, such as these, are expected and are being managed through appropriate mitigation strategies. As it currently stands, the top three risks across the transport programme can be identified as follows:

Risk	Mitigating Action
If projects are unable to secure land through negotiation, then schemes could be delayed and/or require Compulsory Purchases Orders	Project Managers are managing this within each project and raising issues with the Transport Director as required. Transport Director will raise with Executive Board by exception.
If the impact of Covid-19 is not understood or changes then it could have an impact on the deliverability of schemes due to increased cost and programme.	Project Managers continue to assess the impact of Covid-19 on cost and programme and reflect in budget and delivery timescales as required.
If the cost of building materials continues to rise then the cost of projects could increase	Each project maintains a risk budget appropriate with the stage of the project. Issues will be reflected in budget and delivery timescales as required. Value engineering will be adopted at every relevant stage of each project.

7.3 Since the last Quarterly Progress Report the following changes to the programme have been made:

- Cambridge South East Transport Study has been separated into two phases. The second phase date has been updated to reflect the timescales around the Transport and Works Act Order and the paper which went to the July 2021 Executive Board.
- Cambourne to Cambridge - the date has been updated to reflect the project being substantively paused following two interventions by the former Mayor of Cambridgeshire and Peterborough in 2018 and 2020. Following completion of an independent audit and agreement by the Executive Board, the project is now proceeding to the next stage of scheme development. This date reflects a more realistic completion date.
- City Access - The Executive Board approved a road map for taking forward the City Access project at their meeting in September 2021. The target and forecast dates have been updated to reflect this programme. It is anticipated that aspects of the project, for example the public transport improvements, will be delivered in advance of the final completion date.

- Linked to the City Access roadmap, officers had planned to bring a 'Two-years-on' report on progress implementing the response to the Citizens' Assembly to this Joint Assembly/Executive Board meeting cycle. As the Making Connections consultation is underway and a workshop with Citizens' Assembly members is planned, it is proposed that the report providing an update on progress will be brought to the Joint Assembly and Executive Board meetings in June 2022 instead.
- Residents Parking- This has been moved from RAG status Red to Amber as the project will be restarted subject to agreement by the Executive Board. A separate agenda item (6) is provided on this project.
- Chisholm Trail 2 - the dates have changed to reflect the delivery of all sections of Phase 2.
- Cambridge South West Travel Hub - the date has been updated to reflect the delay to the programme as a result of the deferral of the planning application.

8. 2021/22 Transport Finance Overview

- 8.1 The table below contains a summary of expenditure to September 2021 against the budget for the year.

Project	Total Budget (£000)	2021-22 Budget (£000)	2021-22 Forecast Outturn Sep 21 (£000)	2021-22 Forecast Variance Sep 21 (£000)	2021-22 Budget Status		
					Previous	Current	Change
Cambridge South East (A1307) – Phase 1*	16,950	11,550	6,500	-5,050	G	R	↓
Cambridge South East (A1307) – Phase 2*	132,285	2,988	2,660	-328	G	A	↓
Cambourne to Cambridge (A428)	157,000	2,663	1,663	-1,000	G	A	↓
Waterbeach to Cambridge	52,600	464	464	0	G	G	-
Eastern Access	50,500	1,500	600	-900	G	A	↓
West of Cambridge Package	42,000	2,750	1,439	-1,311	R	R	↓
Milton Road Bus, Cycle and Pedestrian Priority	23,040	12	50	+38	A	A	-
Histon Road Bus, Cycle and Pedestrian Priority	10,600	3,065	3,065	0	G	G	-
City Access Project	20,320	3,500	2,700	-800	G	G	-
FIS Allocation – Public Transport Improvements and Sustainable Travel	75,000	2,500	2,500	0	G	G	-
Whittlesford Station Transport Infrastructure Strategy (formerly Travel Hubs)	700	250	150	-100	G	G	-
Chisholm Trail – Phase 1	17,914	4,419	4,300	-119	R	R	-
Chisholm Trail – Phase 2	5,000	750	750	0	G	G	-
Madingley Road Cycling	993	580	580	0	A	A	-
Greenways Programme	76,000	3,000	3,000	0	G	G	-
Cambridge South Station	1,750	635	684	+49	A	A	-

Programme Management and Scheme Development	5,450	350	350	0	G	G	-
Total	688,102	40,976	31,455	-9,521	A	A	-

Key: R = Red, A = Amber, G = Green – see Appendix 6 for RAG explanations.

Commentary relating to each project is set out below. This includes an update on financial spend for this year.

8.2 Cambridge South East (A1307) – Phase 1

This year, the project has successfully delivered Variable Speed Cameras from Linton to Horseheath, Granhams Road and Worts Causeway Junction improvements and the Linton Greenway section at Copley Hill with construction currently ongoing from Addenbrookes to Granhams Road.

It is currently anticipated that the ongoing land acquisition and planning approval issues are likely to affect the delivery of the remaining Phase 1 projects planned for this financial year.

An evaluation of progress on these issues is ongoing, but with planning and permitted development approvals now delayed until December, this will cause a delay in spend this year as construction on some elements will not begin as early as previously expected.

8.3 Cambridge South East (A1307) – Phase 2

The scheme is following Cambridgeshire County Council's governance process for Transport and Works Act Order (TWAO) applications. Agreement from the full County Council is required in order to submit the TWAO, this is expected in December.

The programme for the scheme is reliant on the TWAO but it is currently anticipated to complete in 2025. Costs are currently being fully evaluated and will be reported as part of the Full Business Case sign off. Spend is slightly below target for this financial year due to the delay in submitting the TWAO.

8.4 Cambourne to Cambridge (A428)

At this stage, a year-end underspend of £1m is anticipated. This is due to the delay in the project following interventions by the previous Mayor. The scheme is now advancing following the decision by the Executive Board in July 2021. Consultants are working on the Environmental Impact Assessment (EIA) and preparation of the Transport and Works Act Order (TWAO) for the project, with a view to submission of the TWAO application in late 2022 following EIA consultation in Summer 2022.

8.5 Waterbeach to Cambridge (formerly A10 North study)

The project received approval from July's Executive Board to progress to the next stage, which includes delivery of the Outline Business Case.

Consultants have been commissioned through the Joint Professional Services Framework and have begun technical work and public engagement. At this stage, spend is on target for this financial year.

8.6 Eastern Access

Scoping works have now started following approval at July's GCP Executive Board. Consultation on short term improvements to Newmarket Road is currently underway and concludes later in December 2021. Work on the longer term off-road segregated public transport route is progressing whilst the allocation for development of the Airport site is consulted upon in the first draft of the Greater Cambridge Local Plan. The scheme is currently predicting an underspend this year due to a delay in commissioning of works. However, the scheme remains on track overall.

8.7 West of Cambridge Package

Cambridge South West Travel Hub was presented at July's County Planning Committee for determination. The decision was deferred unanimously by the Committee until further information on Green Belt, demand and drainage was provided. Other details, requested prior to the item being presented, included the possible impact on Trumpington Country Park, the number of Solar PV panels and charging points as well as specific detail on the proposed species and height of proposed vegetation. The Local Planning Authority has requested an extension of time for determination of the planning application until February 2022.

Officers are working with County colleagues to determine next steps. The delay will result in a reduction in the spend profile which is reflected in the forecast outturn variance.

Foxton Travel Hub engagement programme was delayed to September and has now been completed. The delay was to allow for further discussions with local councillors and parish councils - this revised timeline has led to a reduction in the spend profile which is reflected in the forecast outturn variance.

8.8 Milton Road bus and cycling priority

Construction of this project is on hold until Spring 2022 to allow a break following Histon Road's completion. This year's budget will cover the second Road Safety Audit, Traffic Regulation Order process and final tweaks to the design and procurement.

A slight in-year overspend is currently expected to cover additional design work on the Elizabeth Way roundabout, following receipt of the service diversion quotes from statutory undertakers and discovery of a large BT chamber in the centre of the roundabout.

8.9 Histon Road bus and cycling priority

Construction of the project is now complete (as of November 2021) therefore all of the 2021/22 budget has now been committed. Whilst the project was being progressed, the project team worked with the County Council to identify additional

maintenance requirements that could be undertaken through the construction contract. This resulted in approximately £1.4million of additional work such as full resurfacing, repairs to the binder course layers where required and improved drainage along the road. The cost of this work will be funded by the County Council. It is not anticipated that additional GCP funding will be required.

8.10 City Centre Access Project

The City Access budget funds multiple workstreams which focus on tackling congestion, improving bus services and the cycling network, addressing air quality issues and better management of parking.

In September 2021, the Executive Board agreed a road map to develop a final package of options for improving bus services, funding an expansion of the *cycling-plus* network and managing road space in Cambridge. Further work on budget implications is in hand and an initial allocation has been made at this stage which is reflected in the current budget forecast. This will be updated in due course.

8.11 Whittlesford Station Transport Infrastructure Strategy (formerly Travel Hubs)

Work on developing and delivering various projects included in the strategy has been held over to await the outcome of the Cambridge and Peterborough Combined Authority funded multi-modal study of the A505 which is being undertaken by the County Council. It is anticipated that design work on improvements to bus access to the station will commence once the implications of the A505 study are known.

8.12 Chisholm Trail cycle links – Phase 1 and Abbey-Chesterton Bridge (previously combined with Phase 2)

Final safety checks are currently taking place on Abbey Chesterton Bridge and jetty. Work is also starting on the safety improvements to Fen Road –this is expected to be completed by early December.

The project is in the final part of the construction programme and is due to complete by the end of 2021. However, significant time risks remain which are being carefully managed alongside budgets. A key risk is the Pain/Gain settlement with the Contractor at Completion. The contractor currently has a significant pain deficit.

The £1,086k underspend from 2019/20 was allocated to this financial year's budget and there is now an anticipated underspend of £119k for 2021/22. As the Executive Board has already agreed the total budget, no further agreement was required for this change.

8.13 Chisholm Trail cycle links – Phase 2

The Chisholm Trail Phase 2 is finalising design elements ahead of procurement for construction. Specifically, the Coldham's Junction works is completing detailed design for tendering purposes but is now also subject to the County's Experimental Traffic Regulation Order's (ETRO) consultation. The Great Eastern Street car park works are still under development and to be agreed with Cambridge City Council.

The GCP is currently waiting for the County to confirm the ETRO programme so at this stage there is no anticipated cost variance.

8.14 Madingley Road

The existing preliminary designs are currently being updated. Detailed design and final costs will be required to go to GCP Executive Board for approval.

It is currently anticipated that this project will come in on budget at year-end.

8.15 Greenways Programme

The outline budgets for all Greenways projects were allocated during 2020/21.

Consultants have been appointed to the Joint Professional Services Framework. The Greenways programme has been split geographically between the two consultants and work has now begun on the design of each scheme.

The expectation is that the budgeted £3m will be spent on delivering various early interventions across the Greenways this financial year. As part of this budget, £1.25m is expected to be spent on design and preparation.

8.16 Cambridge South Station

The Department for Transport has now drawn down on the budget although additional contributions may be required later in the year.

8.17 Programme Management and Scheme Development

This is anticipated to come in on budget at year-end.

APPENDIX 2: QUARTERLY SKILLS WORKSTREAM REPORT

"Inspiring and developing our future workforce, so that businesses can grow"

9. Update on Current Skills Delivery (2021-2025)

9.1 GCP's new skills and training contract began delivery on 1st April 2021 and Form the Future has provided the following information on progress against their targets.

Indicator	Target (2021-2025)	Progress (Aug to Sep 2021)	Previous (Apr to Jul 2021)	Progress (Apr to Sep 2021)	Status	
					Current*	Change
Apprenticeship and training starts in the region as a result of intervention by the service, broken down by sector and level of apprenticeship	600	6	14	20	G	↑
Adults supported with careers information, advice and guidance, broken down by sector where applicable	1520	30	29	59	G	↔
Early Careers Ambassadors/Young People Champions recruited, trained and active, broken down by sector	600	0	22	22	G	N/A
Employers supported to access funds and training initiatives, broken down by sector	450	17	13	30	G	↔
Students accessing work experience and industry placements, as a result of intervention by the service, broken down by sector	400	0	0	0	G	N/A
Careers guidance activities aimed at students aged 11-19 (and parents where appropriate) organised by the service and their impact	2,486	82	24	106	G	↔
All Primary Schools accessing careers advice activities aimed at children aged 7-11 (and parents where appropriate) organised by the service and their impact	73	0	3	3	G	N/A
Students accessing mentoring programme as part of this service	200	0	0	0	G	N/A

*The RAG status highlights whether the work to achieve these targets is on track rather than the current actual.

Key: R = Red, A = Amber, G = Green – see Appendix 6 for RAG explanations.

- 9.2 Monitoring data for the eight service KPIs is outlined in the table above. Data is reported as of the end of September 2021. Service data shows that Form the Future are continuing to make progress against most of the KPIs, with all indicators currently having a Green RAG rating.
- 9.3 The number of adults supported with careers information, advice and guidance has doubled since last quarter and between Form the Future (FtF) and Cambridge Regional College (CRC), this work will continue to be delivered in two strands with FtF focusing on career guidance through one-to-one sessions and CRC delivering an annual series of roadshows and events to reach different audiences. It is anticipated that provision will be delivered to a total of 235 adults in the first year, increasing to 420 in the second and third years, and 445 in the fourth.
- 9.4 Form the Future has so far been able to support 20 apprenticeship training starts, despite the fact that the summer months are generally a quiet period of the year, in addition to the continuing challenges of Covid-19. Once analysed, latest figures for September and October are likely to show a significant increase compared with the same period last year.
- 9.5 Since last quarter, an additional 17 employers have taken up support to set up their Apprenticeship Service Account and access funding.
- 9.6 Despite the challenges of Covid-19, careers guidance activities aimed at students aged 11-19 have increased from 24 to 106 since last quarter. Most planned workshops and careers guidance activity took place as projected, with some switching to virtual formats where necessary.
- 9.7 Other key points:
- Recruitment of Early Careers Ambassadors (ECAs)/Young People Champions (YPCs) - both FtF and CRC are on track for cohorts of ECAs and YPCs onboarding in November 2021;
 - Primary Schools accessing careers advice activities -12 digital and virtual Cambridge LaunchPad resources are now close to completion for delivery to schools with online library resources progressing;
 - 50 mentoring places have already been allocated for the first year (first tranche to start after October half-term).

10. Update on Apprenticeship achievements across Greater Cambridge

- 10.1 The following information provides a quarterly update (up to April 2021) on apprenticeship starts and achievements delivered across the Greater Cambridge area. The data is for information to give members an update as to general progress. Progress specially related to the GCP skills service can be found above in Section 9.1.
- 10.2 Apprenticeships
- Up to April 2021 (Quarter 3), there have been 1,665 apprenticeship starts across the Greater Cambridge area for the 2020/21 year. This is -6% less compared with the same period in 2019/20, when there were 1,763 apprenticeship starts. Nationally, apprenticeships starts were down by -7%

when comparing starts up to Quarter 3 to in 2020/21 to 2019/20. For context, Quarter 2 starts were -32% down compared to the same period in 2019/20 locally and -18% nationally which shows that the gap is closing as the year progresses.

- The largest proportion of starts remain in Level 3 apprenticeships (37%), however, there were higher proportions of starts in Level 4, 5 and 7 apprenticeships compared to what was observed nationally.
- Health, Public Services and Care accounted for 33% of all starts this quarter. The highest last quarter was Business Administration and Law.
- 860 (52%) were starts among 25+ year olds, 32% starts were among 19-24 year olds and those aged 19 and under accounted for 16% of starts. For context, 25+ made up 47% of Quarter 2 starts and those aged 19 years and under were 20%. This shows that there's been a further decrease in the younger age group and further increases in the older.

10.3 Achievements

- There have been 713 apprenticeship achievements across the Greater Cambridge area for the 2020/21 year. This is an increase of 86% from 383 in Quarter 2 (up to January).
- The largest proportion of achievements across Greater Cambridge were in Level 3 apprenticeships (41%).
- Business, Administration and Law continued to account for the highest proportion of apprenticeship achievements (36%) across the Greater Cambridge area.
- 50% achievements were among 25+ year olds, 28% were among 19-24 year olds and learners aged 19 and under accounted for 21% achievements. This demonstrates that there has been an increase in those aged over 25 and a decrease in the younger age groups.

APPENDIX 3: QUARTERLY SMART WORKSTREAM REPORT

“Harnessing and developing smart technology, to support transport, housing and skills”

11. Smart Programme Overview

11.1 The table below gives an overview of progress for ongoing projects. For an overview of completed projects, including their relation to ongoing projects, please

Project	Target Completion Date	Forecast Completion Date	Status		
			Previous	Current	Change
Behaviour Change: Scoping work for MaaS Pilot	Mar 2022	Mar 2022	G	G	
Smart Signals – Phase Two	Mar 2022	Mar 2022	G	G	↔
Smart Signals – Phase Three	Jun 2022	Jun 2022	N/A	N/A	
Strategic Sensing Network – Phase Two	Mar 2022	Mar 2022	G	G	↔

refer to Appendix 7.

Progress reported up to 31st July 2021

Key: R = Red, A = Amber, G = Green – see Appendix 6 for RAG explanations.

11.2 A revised forward plan of work is being developed to reflect requirements in the context of the increasing pace of delivery across all GCP workstreams.

11.3 Behaviour Change: Scoping work for MaaS Pilot

Work has been started to scope a Mobility as a Service (MaaS) pilot for Greater Cambridge. MaaS is a digital platform that offers users the ability to plan, book and pay for multiple types of mobility service through one digital platform. This encourages the use of more sustainable modes by reducing friction and enabling a smoother journey for the user.

The aim of this initial phase is to produce a report that will identify best practices and recommendations from other MaaS examples already in place around the world. The scoping exercise will also align the research objectives to the strategies, targets and policies of the GCP and Combined Authority. International research projects, as well as MaaS prototypes, will give insight and direction to ensure our solutions proposed are effective and beneficial to the authorities and users.

11.4 Smart Signals – Phase 2: Data Collection and Analysis

Phase Two of the project (data gathering, analysis and modelling) is progressing to schedule with the smart signals infrastructure on the Hills Road junctions, gathering data and analysing models and decisions since June 2021. On two occasions the Vivacity control “agent” has taken initial supervised control of the junction for limited time periods. The data and learnings from the supervised control periods are being

used to further develop the agent, ensuring a suitable baseline is established before any unsupervised control is implemented.

The equipment at the Robin Hood junction has now been installed following a slight delay (as explained last quarter) and data gathering will commence following the validation of the sensors later this month. Over the next three months (up to January 2022) the sensors will gather further data to be used to analyse current traffic trends and evaluate how effective decisions made by the machine learning would have been. This will be carried out before any switch to full use of the smart signal solution is approved.

This project is being run in collaboration with the City Access project and Cambridgeshire County Council's Signals team.

11.5 Strategic Sensing Network – Phase 2: Procurement

GCP's next Gateway Review is due in April 2025 and has the potential to unlock a further £200m of City Deal funding. The detail of the methodology by which GCP will be assessed has not yet been agreed with central government but it is imperative that GCP undertakes appropriate data collection to enable the impact of the investment to date to be demonstrated.

Further to the decision of the Board to support the GCP funded element of the network last quarter, a specification has been drawn up and a soft market test exercise undertaken. Potential suppliers attended workshops to provide information that will be used to improve and clarify the full specification ahead of the Invitation to Tender (ITT) being issued.

This work remains on schedule with the release of the ITT documentation in November 2021.

APPENDIX 4: QUARTERLY HOUSING WORKSTREAM REPORT

“Accelerating housing delivery and homes for all”

12. Delivering 1,000 Additional Affordable Homes

- 12.1 The table below gives an overview of progress for ongoing projects. For an overview of completed projects, including their relation to ongoing projects, please refer to Appendix 7.

Indicator	Target	Timing	Progress/ Forecast	Status		
				Previous	Current	Change
Delivering 1,000 additional affordable homes**	1,000	2011-2031	742 (approx.)	A	A	↔

*** Based on housing commitments as included in the Greater Cambridge Housing Trajectory (April 2021) and new sites permitted or with a resolution to grant planning permission at 30th September 2021 on rural exception sites and on sites not allocated for development in the Local Plans and outside of a defined settlement boundary.*

Key: R = Red, A = Amber, G = Green – see Appendix 6 for RAG explanations.

- 12.2 The methodology, agreed by the Executive Board for monitoring the 1,000 additional homes, means that only once housing delivery exceeds the level needed to meet the Cambridge and South Cambridgeshire Local Plan requirements (33,500 homes between 2011 and 2031) can any affordable homes on eligible sites be counted towards the 1,000 additional new homes.
- 12.3 The Greater Cambridge housing trajectory published in April 2021 shows that it is anticipated that there will be a surplus, in terms of delivery over and above that required to meet the housing requirements in the Local Plans, in 2022-2023. Until 2022-2023, affordable homes that are being completed on eligible sites are contributing towards delivering the Greater Cambridge housing requirement of 33,500 dwellings.
- 12.4 Eligible homes are “*all affordable homes constructed on rural exception sites and on sites not allocated for development in the Local Plans and outside of a defined settlement boundary*”.
- 12.5 The table above shows that on the basis of known rural exception schemes and other sites of 10 or more dwellings with planning permission or planning applications with a resolution to grant planning permission by South Cambridgeshire District Council's Planning Committee, approximately 742 eligible affordable homes are anticipated to be delivered between 2022 and 2031 towards

the target of 1,000 by 2031. In practice this means that we already expect to be able to deliver 74% of the target on the basis of currently known sites.

- 12.6 There have been no additional permissions granted in the last quarter that contribute towards this indicator.
- 12.7 Anticipated delivery from the known sites has been calculated based on the affordable dwellings being delivered proportionally throughout the build out of each site, with the anticipated build out for each site being taken from the Greater Cambridge Housing Trajectory (April 2021) or from the Councils' typical assumptions for build out of sites (if not a site included in the housing trajectory). When actual delivery on these known sites is recorded, more or less affordable dwellings could be delivered depending on the actual build out timetable of the affordable dwellings within the overall build out for the site and also depending on the actual delivery of the known sites compared to when a surplus against the housing requirements in the Local Plans is achieved.
- 12.8 Although anticipated delivery is below the target of 1,000 affordable dwellings by 2031, the latest housing trajectory shows that 37,226 dwellings are anticipated in Greater Cambridge between 2011 and 2031, which is 3,726 dwellings more than the housing requirement of 33,500 dwellings. There are still a further nine years until 2031 during which affordable homes on other eligible sites will continue to come forward as part of the additional supply, providing additional affordable homes that will count towards this target. Historically there is good evidence of rural exception sites being delivered and therefore we can be confident that the target will be achieved.

APPENDIX 5: QUARTERLY ECONOMY AND ENVIRONMENT WORKSTREAM REPORT

13. Greater Cambridge Implementation of the Local Economic Recovery Strategy (LERS) and Local Industrial Strategy (LIS)

- 13.1 As previously reported the GCP and the local authorities in Greater Cambridge (with engagement with the CPCA) collaborated to produce an Action Plan, designed to align ongoing local action with the five 'foundations of productivity' outlined in the LIS. The Action Plan identified 82 local actions, grouped under a series of objectives which blend local and regional priorities for growth.
- 13.2 Officers continue to identify progress against the actions outlined in the Action Plan. Of the 82 actions identified the majority continue to be well on track.
- 13.3 The LIS is due to be updated by the CPCA in the coming months. GCP officers will engage in that process to continue to ensure alignment in key policy areas.

14. Greater Cambridge Sectoral Employment Analysis

- 14.1 As previously outlined, this research programme is being undertaken by the Centre for Business Research (CBR) and is funded by the Greater Cambridge Partnership and Cambridge Ahead. The research will analyse the growth of employment in different sectors across Greater Cambridge, enabling local partners to have robust, timely data on local sectors and businesses. It will take the form of a series of updates, analysing data drawn from company accounts over time, designed specifically to understand the challenges facing specific local sectors over the coming months, in light of Covid-19.
- 14.2 The latest update, which was finalised in June, analysed data from accounting year ends between 6th April 2020 and 31st December 2020. The full report can be found at <https://www.greatercambridge.org.uk/asset-library/Future-Investments-Strategy/Research-and-Evidence/Greater-Cambridge-Employment-Update-June-2021-rev2.pdf>
- 14.3 This version reports that corporate employment growth has slowed down from 5.0% in 2018-19 to 3.9% in 2019-20 although it is noted that the latter is still a significant rate of growth considering the unprecedented challenges brought about by Covid.
- 14.4 Employment growth in Knowledge Intensive (KI) sectors (+6.9%) has been five times faster than in non-KI sectors (+1.3%). The fastest growing sectors during 2019-20 have been 'Life science and healthcare' (+10.6%), 'Information technology and telecoms' (+10.0%) and 'Wholesale and retail distribution' (+5.8%). A relatively large fall in employment has occurred in the 'Property and finance' sector (-1.5%) and 'Other services' (-0.8%) sector which includes hotels, pubs and restaurants.

- 14.5 The next update on this project will be in early December and will be reported to the Joint Assembly and Executive Board in early 2022.

15. Electricity Grid Reinforcement

- 15.1 Officers from the GCP have been developing proposals to forward fund electricity grid reinforcement works to remove a barrier to jobs and housing growth, with the intention of recouping the investment from developers. An outline Business Case and covering report will be discussed further at Item 9 of this meeting's agenda.

APPENDIX 6: RAG EXPLANATIONS

Finance Tables

- **Green:** Projected to come in on budget
- **Amber:** Projected to come in over or under budget, but with measures proposed/in place to bring it in on budget
- **Red:** Projected to come in over or under budget, without clear measures currently proposed/in place

Indicator Tables

- **Green:** Forecasting or realising achieving/exceeding target
- **Amber:** Forecasting or realising a slight underachievement of target
- **Red:** Forecasting or realising a significant underachievement of target

Project Delivery Tables

- **Green:** Delivery projected on or before target date
- **Amber:** Delivery projected after target date, but with measures in place to meet the target date (this may include redefining the target date to respond to emerging issues/information)
- **Red:** Delivery projected after target date, without clear measures proposed/in place to meet the target date

APPENDIX 7: COMPLETED GCP PROJECTS

Project		Completed	Output	Related Ongoing Projects	Outcomes, Monitoring & Evaluation
Transport projects					
Ely to Cambridge Transport Study		2018	Report, discussed and endorsed by GCP Executive Board in February 2018.	Waterbeach to Cambridge	
A10 Cycle Route (Shepreth to Melbourn)		2017	New cycle path, providing a complete Cambridge to Melbourn cycle route.	Melbourn Greenway	
Cross-City Cycle Improvements	Hills Road / Addenbrookes Corridor	2017	Range of improvements to cycle environment including new cycle lanes.	Cross-City Cycling	
	Arbury Road Corridor	2019	Range of improvements to cycle environment including new cycleway.	Cross-City Cycling	Impact evaluated by SQW in 2019 as part of GCP Gateway Review.
	Links to Cambridge North Station & Science Park	2019	Range of improvements to cycle environment including new cycle lanes.	Cross-City Cycling	Impact evaluated by SQW in 2019 as part of GCP Gateway Review.
	Links to East Cambridge and NCN11/ Fen Ditton	2020	Range of improvements to cycle environment including new cycle lanes.	Cross-City Cycling	

	Fulbourn/ Cherry Hinton Eastern Access	2021	Range of improvements to cycle environment including new cycle lanes.	Cross-City Cycling	
Greenways Quick Wins		2020	Range of cycle improvements across Greater Cambridge e.g. resurfacing work, e.g. path widening etc.		
Greenways Development		2020	Development work for 12 individual Greenway cycle routes across South Cambridgeshire.	All Greenways routes	
Cambridge South Station Baseline Study (Cambridgeshire Rail Corridor Study)		2019	Report forecasting growth across local rail network and identifying required improvements to support growth.	Cambridge South Station	
Travel Audit – South Station and Biomedical Campus		2019	Two reports: Part 1 focused on evidencing transport supply and demand; Part 2 considering interventions to address challenges.	Cambourne to Cambridge; CSETS; Chisholm Trail; City Access; Greenways (Linton, Sawston, Melbourn)	
Smart programme projects					
ICP Development – Building on the Benefits		2021	Data platform in operational use. Parking, Bus and Road Network datasets and analytic tools available for use.	Strategic Sensing Network CPCA Transport Data Platform	Better insight and information for the transport network is now available
Data Visualisation – Phase Two		2021	Visualisations of Automatic Number Plate Recognition (ANPR) data	Strategic Sensing Network CPCA Transport Data Platform	Enhanced insights extracted from 2017 ANPR survey

		Connectivity to County Council PowerBI services enabled.		
New Communities - Phase One (Extended)	2021	Three topic papers for North East Cambridge Area Action Plan (AAP) and input into Local Plan		Smart solutions and connectivity principles embedded in area action plan
Smart Signals – Phase One	2021	Installation of smart signal sensors at 3 junctions (Hills Road)	Smart Signals – Phase Two Smart Signals – Phase Three	Will be realised as part of the following phases
Strategic Sensing Network – Phase One	2021	Gathering requirements and developing specification	Strategic Sensing Network – Phases Two and Three	Will be realised as part of the following phases
C-CAV3 Autonomous Vehicle Project	2021	Successful trial of autonomous shuttle on the West Cambridge site. Development of safety cases for this trial and to support future work. Development of business cases for potential future opportunities in Greater Cambridge		Successful demonstration of the utilisation of autonomous vehicles as part of the future public transport system
Digital Wayfinding	2021	Upgrade of wayfinding totem at Cambridge station and development of walking routes map for display.		Improved wayfinding experience for travellers
Housing projects				
Housing Development Agency (HDA) – new homes completed	2018	New homes directly funded by the GCP have all been completed. 301 homes were completed across 14 schemes throughout Greater Cambridge.		

APPENDIX 8: EXECUTIVE BOARD FORWARD PLAN OF KEY DECISIONS

Notice is hereby given of:

- Decisions that that will be taken by the GCP Executive Board, including key decisions as identified in the table below.
- Confidential or exempt executive decisions that will be taken in a meeting from which the public will be excluded (for whole or part).

A 'key decision' is one that is likely to:

- a) Result in the incurring of expenditure which is, or the making of savings which are, significant having regard to the budget for the service or function to which the decision relates; and/or
- b) Be significant in terms of its effects on communities living or working in the Greater Cambridge area.

Executive Board: 9th December 2021	Reports for each item to be published 29th November 2021	Report Author	Key Decision	Alignment with Combined Authority
Electricity Grid Reinforcement: Update and Next Steps	To approve next steps and the Outline Business Case.	Rachel Stopard	No	N/A
Integrated Parking Strategy	To consider a draft Integrated Parking Strategy.	Peter Blake	No	CA LTP
Inclusive Access Study	An initial paper on improving accessibility for all looking at issues and options	Isobel Wade	No	CA LTP
GCP Quarterly Progress Report	To monitor progress across the GCP work streams, including financial monitoring information.	Niamh Matthews	No	N/A

Foxton Travel Hub	Request to submit planning application and confirmation of budget	Peter Blake	Yes	CA LTP
Executive Board: 17th March 2022	Reports for each item to be published 7th March 2022	Report Author	Key Decision	Alignment with Combined Authority
GCP Quarterly Progress Report	To monitor progress across the GCP work streams, including financial monitoring information.	Niamh Matthews	No	N/A
Update on Greenways Programme	To receive an update on the programme and agree next steps.	Peter Blake	No	N/A
Chisholm Trail Phase 2	To provide an update following consultation and an overview of the projected cost of the scheme.	Peter Blake	Yes	CA LTP
Milton Road	Acceptance of the Detailed Design and sign off of Full Business Case.	Peter Blake	Yes	CA LTP
Executive Board: 30th June 2022	Reports for each item to be published 17th June 2022	Report Author	Key Decision	Alignment with Combined Authority
Public Transport and City Access Strategy	To receive feedback on the City Access consultation and agree next steps.	Peter Blake	Yes	CA LTP Passenger Transport / Interchange Strategy
Cambridge South West Travel Hub	To sign off the Full Business Case and planning application	Peter Blake	Yes	CA LTP
GCP Quarterly Progress Report	To monitor progress across the GCP work streams, including financial monitoring information.	Niamh Matthews	No	N/A

Executive Board: 6th October 2022	Reports for each item to be published 26th September 2022	Report Author	Key Decision	Alignment with Combined Authority
GCP Quarterly Progress Report	To monitor progress across the GCP work streams, including financial monitoring information.	Niamh Matthews	No	N/A
Better Public Transport: Cambourne to Cambridge	To note public consultation outcomes and Environmental Impact Assessment and request County to review and submit Transport and Works Act Order application	Peter Blake	Yes	CA LTP Passenger Transport / Interchange Strategy

Executive Board meeting	Reports for each item published	Joint Assembly meeting	Reports for each item published
9 th December 2021	29 th November 2021	18 th November 2021	8 th November 2021
17 th March 2022	7 th March 2022	17 th February 2022	7 th February 2022
30 th June 2022	20 th June 2022	1 st June 2022	20 th May 2022
6 th October 2022	26 th September 2022	8 th September 2022	29 th August 2022