ATKINS
Member of the SNC-Lavalin Group

# Technical Note

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## Client signoff

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# 1. Introduction

Atkins have been commissioned by Greater Cambridge Partnership (GCP) to conduct an independent review of the WSP, Mott MacDonald and i-Transport documents regarding the Shelford Rail Alignment (SRA) developed as part of the Cambridge South East Transport Study (CSETS). This technical note provides GCP with an opinion on the recommendations made by the consultants in relation to the SRA and recommends likely next steps.

Atkins review is based upon the contents of the documents provided only and does not provide advice on the technical feasibility of any SRA route.

# 2. Review of Documents

As part of Atkins' independent review, the four documents listed below have been reviewed and analysed. It should be noted that only the Mott MacDonald (2020) report and the i-Transport (2021) report were analysed in detail and provide the main background for our overall review. The documents are as follows:

- Cambridge-Haverhill Corridor Study Draft Rail Viability Technical Note (2015) – WSP;
- CSET Phase 2 Shelford Railway Alignment: Design Development and Feasibility Assessment (2020) – Mott MacDonald;
- Cambridge South East Transport Phase 2: Alternative Shelford Railway Alignment (2021) – i-Transport; and
- Shelford Railways Alignment (2021) – Mott MacDonald.

### 2.1.1. Cambridge-Haverhill Corridor Study Draft Rail Viability Technical Note (WSP, 2015)

The WSP report was produced to assess the viability of reopening the former Cambridge to Haverhill railway line. This was an initial assessment, undertaken as part of the A1307 Haverhill to Cambridge Corridor Study commissioned by Cambridgeshire County Council (CCC), to assist in determining whether the reopening should move forward to a more detailed study. The assessment included the following:

- Identifying the strategic rationale for rail;
- A high-level desktop assessment to identify the current physical status of the former alignment and potential solutions;
- Identifying potential station locations, including identifying the scope for park-and-ride at each potential station;
- Identifying an assumed service/stopping pattern, along with the potential passenger capacity, journey times and potential operating arrangements;
- Capital cost estimation; and
- High level economic appraisal, which included appraisal of a bus rapid transit (BRT) alternative on the disused rail corridor.

The report concludes that the reopening of the disused rail line would not be viable as part of the current A1307 Haverhill to Cambridge Corridor Study, but that a Cambridge-Haverhill railway line could ultimately form part of a more strategic rail link in the future.

### 2.1.2. CSET Phase 2 Shelford Railway Alignment: Design Development and Feasibility Assessment (Mott MacDonald, 2020)

This report is one of the key documents forming the basis of this review. Mott MacDonald were commissioned by GCP to provide support for the CSET Phase 2 project. The 2020 report provides design development and feasibility assessment for an alternative alignment via the former Haverhill - Cambridge railway at Great

Shelford and Stapleford. Section 3 of this Technical Note summarises the key points taken from Mott MacDonald's report.

### 2.1.3. Cambridge South East Transport Phase 2: Alternative Shelford Railway Alignment (i-Transport, 2021)

i-Transport were commissioned by the Parish Councils of Great Shelford and Stapleford to provide a review of the strategy and process undertaken by Mott MacDonald within their 2020 report and to provide a technical feasibility report for an alternative SRA. Section 3 of this Technical Note summarises the key points taken from i-Transport's report.

### 2.1.4. Shelford Railways Alignment (Mott MacDonald, 2021)

This report was produced by Mott MacDonald in response to the findings of the 2021 i-Transport report. Mott MacDonald reviewed the following aspects:

- Review of SRA options, including overall alignment, design constraints and assessment of the impact on residential and commercial properties;
- Assessment of cost differences for SRA design options developed by i-Transport and Mott MacDonald;
- Assessment of the benefits of SRA options and likely implication on Benefit Cost Ratio (BCR); and
- Assessment of CSET scheme consultation exercises relating to SRA themes and comments.

The assessment suggests that the i-Transport proposed alternative would still be subject to engineering challenges and could incur increased costs due to the construction costs associated with the demolition of the Anglian Water pumping station and reconstruction of the Shelford station building. The scheme cost for the alternative rail alignment by i-Transport will be £163.4m, against the £159.1m estimated for the Mott MacDonald alignment. Considering all of the findings from i-Transport, the report concludes that the SRA, via the former Haverhill railway through Shelford, would not be a viable alternative to the preferred route.

# 3. Independent Review of SRA Findings

A summary of the key findings from Mott MacDonald and i-Transport has been outlined in this section. The independent review comments are provided under the following headings for ease of reference:

- Journey Time;
- Non-Motorised User Provision;
- Environmental Assessment;
- Visual Impact;
- Noise;
- Biodiversity;
- Green Belt;
- Engineering Feasibility – Highway;
- Engineering Feasibility – Junction with Granham's Road;
- Engineering Feasibility – Highway alignment around Chaston Road;
- Engineering Feasibility – Mill Court building frontages;
- Engineering Feasibility – Junction with Station Road;
- Engineering Feasibility – Structure;
- Engineering Feasibility – Rail interface;
- Public Consultation/Stakeholder Comments;
- Land Acquisition;
- Construction Impact;
- Scheme Cost; and
- Wider Economic Benefits.

| | Mott MacDonald (2020) Findings | i-Transport Findings | Atkins Independent Review |
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| | | Transport User Benefits | |
| Journey Time | In order to assess the changes in Perceived Journey Time (PJT) to and from Cambridge between the Brown Route and the Rail Alignment Route an elasticity approach was adopted. This simulates the potential change in the demand following change in the PJT. The assessment identifies a substantial reduction of approximately 10 minutes for journeys from/to Great Shelford for the Rail Alignment Route, based on a reduction in access distance of 700m.<br><br>The results indicate that an alternative alignment via the railway potentially generates the following responses:<br>• Great Shelford demand increases due to improved accessibility and reduction in overall PJT;<br>• Sawston and Stapleford show small or no changes in demand; and<br>• Travel Hub demand reduces more significantly than the demand increases across the Local Corridor Catchment Area (LCCA), that includes Sawston, Stapleford and Great Shelford.<br><br>The route alignment of the Rail Alignment Route Option through Great Shelford would be expected to lead to increased demand for the service from the village itself.<br><br>However, the demand reduction at the Travel Hub site outweighs this extra demand. | i-Transport state that the journey time savings vary between 6 and 8 minutes (comparing CSETS Phase 2 and On-Route PT) when considering those passengers using the whole route i.e. from the Travel Hub Site to/from Cambridge.<br><br>However, when considering those in the settlements along the route the journey time savings are considerably greater ranging from 15 minutes in the inter-peak to 25-29 minutes in the peak periods. This is due to the reduction in wait times and the increase frequency in services, when compared to the existing Citi7 Bus Service.<br><br>Whilst this may account for some of the difference in journey time saving, this is countered by the increased walk times to the stops on the edge of the settlements, which range from 13 to 22 minutes compared with the assumed walk time at the Travel Hub Site of 0 minutes. | Both parties acknowledge that demand from the travel hubs decreases due to the increase in journey time for the alternative alignment via the railway.<br><br>i-Transport highlight the useful methodology used by Mott MacDonald to understand the PJT but state that this is not a robust comparison as the demand is not properly modelled and rather benchmarked against the Brown Route.<br><br>This is agreed in that forecast demand for the rail alignment has been calculated based on modelled forecast demand for the Brown Route, but the walk times and in-vehicle times were adjusted based on the distances of the location from the proposed stop.<br><br>i-Transport also highlight that only a 2% reduction in passenger demand between the preferred Brown Route and the alternative Rail Alignment is noted in the Mott MacDonald findings, that this is not considered significant and that little weight should be attributed to the difference resulting in further assessment being recommended.<br><br>Atkins agrees that a 2% reduction in passenger demand is not significant however this is the total demand difference only – the % difference ranges from -3% to +8% difference in demand at various stop locations. |

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| | | | **Overall, Atkins consider the methodology used by Mott MacDonald to weight the walking and in-vehicle times to be robust.** |
| Non-Motorised User (NMU) provision | The NMU provision varies along the CSET route. As demonstrated in Appendix C of the 2020 Mott MacDonald report, alternative routes have been identified to utilise the existing road network, away from the main busway corridor, to address some of the land availability constraints.<br>The scheme design presented in the 2020 Report Appendix D illustrates that the NMU corridor is largely running parallel with the busway alignment across Great Shelford, with the exception of the Cambridge Road overbridge where the NMU route has been diverted to overcome the horizontal cross section challenge imposed by the bridge arch. | Section 7.2.11 of the 2021 i-Transport report suggests that a 13.8m corridor, instead of a 14.3m corridor, is sufficient to provide the minimum corridor footprint.<br>As illustrated in Figure 11.1 of the report, i-Transport identified a short diversion of the NMU corridor, via Hinton Way between Chaston Road and Shelford Station, to address the cross section constraints between the Mill Court frontages and the existing station platform.<br>The design will need to be further developed to clearly map out the intended highway alignment to manage the conflicting demand between northbound bus movement, vehicular movement and the new NMU provision at the northern section of Chaston Road. | Both parties acknowledge that a flexible approach is required to implement the busway alignment to address localised pinch-point issues. Compromises will need to be made to provide appropriate NMU facilities along this CSET corridor.<br>As presented by i-Transport, it is a reasonable approach to reduce the minimum corridor footprint based on the Cambridgeshire Guided Busway (CGB) standard. This would help the designer to navigate some, but not all, of the constrained locations. However, it is noted that the GCP requirements for the corridor may differ from the CGB standard.<br>Based on the information provided by both parties, it is clear that an engineering solution could be explored and alternative routing options could be considered to provide a high quality NMU corridor that meets the scheme objectives.<br>**Atkins considers the concepts presented by both parties to be reasonable, however further feasibility design would be required and would need to be subject to Stage 1 Road Safety Audit review.** |
| | | Environment | |
| Environmental Assessment | A desk-based approach, supported by an environmental walkover of the route, has been undertaken. The qualitative assessment has been carried out using INSET scoring for scheme appraisal purposes. The Railway Alignment | Para 13.3.8, and Paras 13.3.18 to 13.3.22 of the 2021 i-Transport report question the accuracy and appropriateness of the INSET assessment. The report suggests that the visual impact, biodiversity and impact on | The high-level qualitative assessment prepared by Mott MacDonald was based on a desk-based study and was supported by an environmental walkover of the route. |

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| | INSET Scoring Assessment has been provided in Appendix D of the 2020 Mott MacDonald report. | Green Belt should be less severe with the alternative alignment. | Detailed analysis for each area of concern raised by i-Transport is provided in four separate headings below. |
| Visual Impact | The report concludes that the impact on landscape character of the area would be limited as the route runs along existing transport infrastructure. An INSET score of -2 has been given. | Para 13.3.21 of the Report suggests the INSET analysis for the visual impact for the alternative alignment to be -1, not -2 as stated by Mott MacDonald. | Based on the analysis provided in the 2020 Mott MacDonald Report, the visual impact of the alternative alignment is likely to be marginal due to the route following the route of the existing and disused rail track. **Atkins consider that it is not unreasonable to score this aspect -1, as suggested by i-Transport.** |
| Noise | The report suggests that the alternative alignment could bring adverse noise impacts due to the number of receptors in close proximity. An INSET score of -2 has been given. | Para 13.3.18 of the 2021 i-Transport report suggests that the noise level along the alternative alignment could have limited impact as the route follows an existing railway line along the Great Shelford section.<br>However, the i-Transport alignment design requires removal of the existing mature trees along Chaston Road, which function as acoustic barrier. An INSET score of -2 has been given. | Based on the analysis provided in the 2021 i-Transport report, a negative noise impact of -2 would be expected if the existing mature trees along the Chaston Road residential area are removed as suggested. |
| Biodiversity | Moderate adverse impact is expected due to habitat loss along the proposed route and the fragmentation of habitats used by badgers, bats, great crested newts and reptiles. An INSET score of -2 has been given. | The report makes no formal comment on the findings and suggests the INSET analysis for the biodiversity for the alternative alignment to be -1, not -2 as stated by Mott MacDonald. | Based on the analysis provided in the 2020 Mott MacDonald report, moderate adverse impact is expected due to the loss of habitat. **Atkins consider that -2 is an appropriate score to reflect the scheme impact on the biodiversity along this corridor.** |
| Green Belt | As documented in the Railway Alignment INSET Scoring Assessment, all options have an equal weight of -2. | Para 13.3.21 of the 2021 i-Transport report suggests that the alternative alignment will have a lesser impact on the Green Belt as that route follows a disused railway. A score | Based on the analysis provided in the 2021 i-Transport report, Atkins consider that it is not unreasonable to score this aspect **-1 as suggested by i-Transport.** |

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| | | of -1 is suggested, not -2 as stated by Mott MacDonald. | |
| | | Deliverability | |
| Engineering Feasibility - Highway | Feasibility design drawings have been provided in Appendix B of the 2020 Mott MacDonald report to demonstrate the required bus corridor footprint. Four areas of concerns have been raised:<br>• The junction with Granham's Road is in close proximity to existing pumping station;<br>• The highway alignment around Chaston Road where the available cross-section is constrained by the rail track and residential frontages;<br>• The limited cross-section available between the station platform and Mill Court building frontages; and<br>• The junction with Station Road is in close proximity to the existing Shelford station building. | Section 11 of the 2021 i-Transport report outlines the proposed alternative arrangements to address the four areas of concerns with a different approach.<br>It is noted that no concept design drawings have been provided to illustrate the design detail. | Both parties demonstrate different approaches to address the highway constraints to implementing the alternative rail alignment corridor.<br>**Atkins consider the concepts presented by both parties to be reasonable, however further feasibility design would be required and subject to Stage 1 Road Safety Audit review.**<br>Detailed analysis for each area of concern is provided in four separate headings below. |
| Engineering Feasibility - Junction with Granham's Road | Mott MacDonald's design incorporates a new set of traffic signals to regulate the N-S bus corridor movements, which is located approximately 60m from the existing level crossing.<br>This layout design avoids the existing Anglian Water sewage pumping station; however impacts on the residential property south of Granham's Road. | i-Transport's concept provides a more direct and simplified crossing arrangement.<br>This highway alignment avoids the residential property south of Granham's Road; however does impact on the existing Anglian Water sewage pumping station. | Both Mott MacDonald's and i-Transport's designs would require land acquisition in some form. From a scheme delivery perspective, it may be less sensitive to the general public to relocate the existing Anglian Water pumping station, rather than affecting the residential property.<br>**Atkins consider that it is important to liaise with Anglian Water to understand the timescales and cost associated with the proposed pumping station relocation.** |

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| Engineering Feasibility - Highway alignment around Chaston Road | Mott MacDonald's design incorporates a new set of traffic signals to manage the vehicular access to residential dwellings and an off-street parking facility.<br>This layout design requires the acquisition of a third-party residential property to provide a fully segregated NMU corridor. | i-Transport's concept utilises the existing quiet street feature along Chaston Road to provide a shared-use surface and minimise land acquisition requirements for resident properties.<br>This design will need to be further developed to clearly map out the intended highway alignment to manage the conflicting demand between northbound bus movements, vehicular movement and the new NMU provision across this section. | Mott MacDonald and i-Transport demonstrate different approaches to addressing the cross-section constraints between the operational rail track and residential frontages.<br>Both design concepts will impact on the vehicular access arrangement to the off-street residential parking along the northern section of Chaston Road.<br>Atkins recommend engagement with the affected property owner in order to facilitate the option development process. |
| Engineering Feasibility - Mill Court building frontages | The design concept presented by both parties would require loss of parking spaces between the station platform and Mill Court building frontages. Currently, no design drawings have been provided to demonstrate the engineering feasibility. | | Atkins consider that the cross-section across this part of the corridor should be examined in more detail. **Taking the requirement for 3.5m clearance from the overhead line equipment (OLE) as a minimum, it is important to maintain the required busway corridor and allow pedestrian access to the buildings.** The NMU provision along this section should also be carefully considered. |
| Engineering Feasibility - Junction with Station Road | Mott MacDonald's design incorporates a new set of traffic signals to regulate the bus corridor movements, which is located approximately 40m from the existing level crossing.<br>This layout design avoids the Shelford station building, however, impacts on a number of resident properties to the south of Station Road. | i-Transport's concept provides a more direct and simplified crossing arrangement.<br>The highway alignment avoids the resident properties, however, there is a greater impact on the Shelford station building which is owned by Network Rail. | Both designs would require land acquisition of a different nature. From a scheme delivery perspective, it is less sensitive to the public to relocate the station building, rather than affecting the residential properties to the south of Station Road.<br>**As noted under the Rail Interface section, it is important to understand the feedback from Network Rail regarding the timescale and cost associated with the relocation of the Shelford station building.** |

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| Engineering Feasibility - Structure | Two structures would be affected, as set out in Section 2.3 of the 2020 Mott MacDonald report:<br>• The former overbridge structure by Cambridge Road provides limited vertical and horizontal clearances for a fully segregated busway and active travel corridor; and<br>• The A1301 London Road bridge poses a similar challenge with respect to the headroom clearance and possible alignment of the active travel provision.<br>The report states that there is lack of data to ascertain the likely impact on the affected structures. The following information is required to evaluate the impact:<br>• Topographic survey;<br>• Ground Investigation; and<br>• Structural Assessment. | As documented under Para. 7.2.13 to 7.2.17, the i-Transport report acknowledges the challenges with the following commentaries:<br>• The former overbridge structure by Cambridge Road could accommodate a busway corridor, subject to a level review and engineering check; and<br>• At the A1301 London Road bridge, a busway could be provided between the eastern abutment and central pier, subject to a level review and engineering check.<br>However, similar to the original assessment undertaken in 2020 by Mott MacDonald, the suggested measures would require further site investigation to evaluate the impact on the constructability, cost and programme. | Atkins consider that the preliminary analysis by both parties appears to be proportionate at this feasibility stage. **Both reports conclude that the bridge structures are key design constraints to implementing the alternative corridor.**<br>It is important to understand the engineering parameters to ascertain the likely impact, in terms of cost and programme, on the affected structures. The following information is required to evaluate the impact:<br>• Topographic survey;<br>• Ground Investigation;<br>• Structural survey; and<br>• Historic structure investigation report. |
| Engineering Feasibility - Rail interface | As stated in the 2020 Mott MacDonald report, Network Rail have been consulted but no response was provided.<br>A number of key rail interface constraints have been outlined in Section 2.2 of the report, which set out the rail interface design advice by Mott MacDonald's rail specialist, covering:<br>• Track;<br>• Vehicle Containment;<br>• Overhead Lines;<br>• Signals and Telecoms;<br>• Level Crossing;<br>• Network Rail Access; and<br>• Approval and construction requirements. | As outlined in Section 10 of the Report, i-Transport acknowledges that Network Rail approval is required to resolve any rail interface challenges. It is suggested that an engineering solution could be explored and agreed with Network Rail through liaison to deliver this alternative alignment.<br>As with Mott MacDonald's findings, no Network Rail engagement has been undertaken to date to understand the implication on the scheme deliverability. | Both parties set out the key considerations required if the alternative alignment is to be taken forward; however, no detailed assessment or engagement with Network Rail has been undertaken. Based on the information provided, Atkins consider that there is insufficient information to draw a conclusive recommendation.<br>**Either scheme may be 'feasible' from the engineering perspective; however, it is important to understand the feedback from Network Rail about the timescale and cost associated with this initiative to confirm the deliverability to the scheme.** |

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| Public Consultation/ Stakeholder Comments | A number of respondents to the public consultation stated:<br>• the proposed route should be via the centre of the villages due to:<br>- Providing better accessibility for residents; and<br>- Avoid the need for development in the green belt to the east of the villages. | As outlined in Para 15, the 2019 public consultation identified numerous comments for the preferred Brown Route, regarding:<br>• The negative impact the proposals would have on the environment, due to the use of Green Belt land;<br>• The negative impact that travel hub access routes and proposed stop locations would have on congestion along connected roads and in villages;<br>• The poor accessibility of the stop locations which were not well-located to settlements; and<br>• The possibility of using existing infrastructure (A1307 or former railway lines) in place of the proposed route. | Based on the information provided, it is **unclear whether responses have been received from key stakeholders including Anglian Water, Network Rail or the affected landowners.**<br>For a scheme of this nature, Atkins recommend having a clear stakeholder engagement strategy to identify key parties and understand the constraints from all parties. |
| Land Acquisition | The feasibility design, as illustrated in Appendix B of the 2020 Mott MacDonald report, requires demolition of residential and commercial properties and results in a negative score under the INSET Assessment.<br>The proposed Mott MacDonald alignment would have a greater impact on existing residential properties, whilst avoiding acquiring land from Anglian Water and Network Rail. | Section 8 of the i-Transport report provides a high-level assessment of the likely impact on properties.<br>Section 11 of the Report provides an alternative alignment to minimise the impact on residential properties, which instead impacts on:<br>• Anglian Water sewage pumping station; and<br>• Shelford station building (owned by Network Rail).<br>The alignment proposed by i-Transport would have a lesser impact on residential properties, but would have a direct impact on the Anglian Water pumping station and the Network Rail station building. | Both parties accept that land acquisition will be required to implement the alternative alignment corridor.<br>Whilst the quantity of land acquisition is reduced by i-Transport's suggested alignment, **Atkins consider that it is important to understand the feedback from Anglian Water and Network Rail regarding the timescale and cost associated with this initiative to confirm the scheme deliverability.** |

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| Construction Impact | As discussed in Section 2.2.8 of the 2020 Mott MacDonald report, the construction timescale is unknown and further liaison with Network Rail and the Office of Rail and Road (ORR) will be required.<br>A score of -3 for Impact on the Rail Network has been given in the INSET Assessment Deliverability Theme.<br>Further commentary has been provided in the 2021 Mott MacDonald report under Section 1.3.2.1 which sets out the challenges for implementing the design concept as presented by i-Transport, including:<br>• Rail interface issues;<br>• Requirement for Network Rail planning;<br>• Replacement of the Shelford rail station building;<br>• Liaison required with multiple parties; and<br>• Potential disruptions to the rail operation during construction. | The report acknowledges that the i-Transport design would have a greater impact on the rail network, however, a score of -1 is given in Table 13.4 for Impact on Rail Network criteria.<br>The report makes no formal comment about the construction timescale. | Based on the analysis provided by Mott MacDonald, **Atkins consider that it is not unreasonable to score this aspect -3, rather than -1 as suggested by i-Transport.**<br>**The scheme may be 'feasible' from an engineering perspective; however, it is important to understand the feedback from Network Rail about the timescale and cost associated with this initiative to confirm the scheme deliverability.** |
| Scheme Cost | • Preferred Option – £129.9 million total capital Infrastructure cost -(exclusive of any risk)- £103.9 million, additional £26 million estimated to cover risks at the P80 level; and<br>• Rail Alignment – £159.1 million total capital Infrastructure cost -(alternative alignment exclusive of any risk)- £127.3 million, additional £31.8 million estimated to cover risks at the P80 level. | As discussed under Para 5.1.9, i-Transport agrees that the cost estimates provided by Mott MacDonald are broadly in line with those estimated in 2017/18 and indicate that the original estimates were accurate and that the scheme has not materially changed.<br>No scheme cost audit has been carried out by i-Transport. It is acknowledged the land cost associated with the alternative rail alignment is one of the contributary factors for the scheme cost increase. | It is noted that i-Transport expressed concerns about the preferred Brown Route Scheme achieving a BCR of 0.81. Mott MacDonald are currently refining the BCR for the preferred Brown Route, as stated in their 2021 report.<br>**Atkins consider the scheme cost for the alternative rail alignment is likely to increase due to the complex rail interface requirement, together with the need for land acquisition, compare to the preferred Brown Route. We are unable to make an** |

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| | | | **assessment of the validity of costs provided by Motts or i-Transport.** |
| | | Social Impact (Quality of Life) | |
| Wider Economic Benefits | The 2020 Report states that the alternative alignment is not deemed to have benefits above the shortlisted alignment and therefore the scores remain unchanged.<br>This is because it is considered to have an equally positive impact on the commercial sites previously identified and is not expected to significantly alter the labour market catchment. | The i-Transport report does not highlight the Wider Economic Benefits scoring as being marginally worse when comparing the scores for the Rail Alignment and the preferred Brown Route.<br>Other themes included in the Mott MacDonald Investment Sifting and Evaluation Tool (INSET) were highlighted as being marginally worse when comparing the Rail Alignment and preferred Brown Route:<br>• Transport User Benefits (a difference of 0.47);<br>• Environment (a difference of 0.13);<br>• Deliverability (a difference of 0.36); and<br>• Social Impact (Quality of Life) (a difference of 0.12). | Atkins consider the INSET process used by Mott MacDonald to be a fairly robust assessment of themes that were derived from the process, using a standard -3 to +3 scoring system.<br>Within each main theme (7 main themes), there were additional subthemes that were derived and scored for each proposed route option. |

# 4. Independent Review Summary

## 4.1. Journey Times

Mott MacDonald and i-Transport both conclude that the route alignment of the alternative rail alignment through Great Shelford would be expected to lead to increased demand for the service from the village itself. However, the demand reduction at the Travel Hub site outweighs this extra demand from the village.

The demand data for the Mott MacDonald analysis was taken from the Cambridge Sub Regional Model (CSRM) based on the modelled patronage demand from the preferred Brown Route. This is due to there being no existing observed data available. The Perceived Journey Times (PJT) calculated by including the access/egress time to the stops, origin wait time and in vehicle time.

With cost coefficients based on TAG guidance M3-2 section 3 having been applied to ensure the relative importance of each component perceived by passengers is reflected, this approach allowed for the access/egress and wait time to be “weighted” within the assessment. Atkins considers the methodology used by Mott MacDonald to weight the walking and in-vehicle times to be robust when analysing the two options.

## 4.2. Non-Motorised User Provision

Atkins consider that neither Mott MacDonald nor i-Transport have clearly illustrated what can be achieved, therefore further feasibility design work is required (ideally including a concept design sketch for Chaston Road residential area and Mill Court frontage), which would be need to be subject to a Stage 1 Road Safety Audit.

Overall, Atkins consider that the proposed NMU provision can be provided, and although this will need to be compromised at pinch points to overcome cross-section constraints, it is not considered to be a ‘show stopper’ for the SRA alignment.

## 4.3. Environment

Mott MacDonald have undertaken a high-level qualitative assessment and Atkins consider the results of their assessment to be mostly acceptable. i-Transport have raised a number of minor queries; however, Atkins consider than none of these are of major significance to the option appraisal process.

## 4.4. Engineering Feasibility

### 4.4.1. Highway

Four areas of concerns have been raised by both parties, with Mott MacDonald and i-Transport demonstrating different engineering approaches to addressing the highway constraints to implement the alternative rail alignment corridor. Atkins consider the concepts presented by both parties to be reasonable, however further feasibility design and close liaison with Network Rail would be required through the design development stage. The highway alignment design would subject to Stage 1 Road Safety Audit.

### 4.4.2. Structure

Both Mott MacDonald and i-Transport conclude that the bridge structures are key design constraints to implementing the alternative corridor, however no conclusions can be drawn at this stage due to lack of sufficient information to ascertain the details (i.e. topo survey, GI, structural survey and historic structure investigation report required). Atkins consider this to be a major risk as the potential cost cannot be accurately assessed without further assessment work of the existing bridge structures being undertaken.

### 4.4.3. Rail Interface

Both Mott MacDonald and i-Transport outline the rail interface constraint and set out how this could be resolved by an engineering solution, however no detailed assessment or engagement with Network Rail has been undertaken. Therefore, based on the information provided, Atkins consider that there is insufficient information to draw a conclusive recommendation, other than that further liaison with Network Rail is required. Atkins consider this to be a major risk given the potential timescales and complexities of the Network Rail GRIP process.

## 4.5. Deliverability

### 4.5.1. Stakeholder Comments

It is understood that limited input from stakeholders such as Network Rail has been obtained at this early stage. According to the early feedback provided by GCP, Network Rail are unable to provide further design assistance due to the limited detail available at this project stage. Network Rail suggested additional design details, including the impact on level crossings, land ownership and East-West Rail, to be provided so that formal engagement can be carried out. It is understood that the requested information has not been prepared as the SRA was discounted at the option sifting stage. Also, no formal engagement has been carried out with the affected property owners. It is considered essential to understand the feedback from the affected parties if this scheme is to be progressed.

### 4.5.2. Land Acquisition

Mott MacDonald and i-Transport have set out different approaches; Mott MacDonald prefer to acquire residential properties, whilst i-Transport proposes to acquire land from Anglian Water and Network Rail and relocate infrastructure.

Atkins consider land acquisition to be a major risk as a scheme of this nature would be subject to public scrutiny from the affected property owners. Atkins also consider that it is important to understand the feedback from Anglian Water and Network Rail regarding the timescales and cost associated with i-Transport's proposal in order to confirm the scheme deliverability.

### 4.5.3. Construction Impact

No conclusion can be drawn at this stage due to lack of consultation with Network Rail and Anglian Water. Atkins consider this to be a major risk as the potential cost and programme impacts cannot be accurately assessed due to the engineering constraints discussed above.

### 4.5.4. Scheme Cost

It is noted that the BCR for the preferred Brown Route is 0.81, which is considered to be Poor under the Department for Transport (DfT) Value for Money Categories. Atkins understand that Mott MacDonald are currently reassessing the BCR for the preferred Brown Route, with an update on the BCR to be provided later in 2021.

Apart from the above, no BCR calculation is presented by both parties for this alternative rail alignment. Based on the scheme cost information provided by Mott MacDonald, it is likely that the BCR would be adversely impacted due to the increase in the scheme cost associated with this alternative rail alignment, with an increase from £129.9m to circa £160m. Scheme affordability should be considered by the scheme promoter to secure appropriate funding sources.

## 4.6. Wider Economic Benefits

A Multi-Criteria Assessment was conducted by Mott MacDonald, using their Investment Sifting and Evaluation Tool (INSET) analysis, to summarise and present evidence against the options. The INSET analysis is a tool based on the DfT Early Assessment Sifting Tool (EAST). The tool adopted a seven-point scoring system to assess how well options met the established thematic criteria, using a scale of -3 to +3, with -3 representing a very poor fit with criteria and +3 a very good fit. Seven key themes that were identified with additional sub-themes within each theme given a score. We have not been able to fully review the Mott MacDonald INSET as we have not been provided with the Option Assessment Report (OAR, reference 403394-MMD-BCA-00-RE-BC-0024), that provides details of the identification, appraisal, sifting and determination of the preferred option for the CSET Phase 2 Scheme.

Atkins consider the INSET process used by Mott MacDonald to be a fairly robust and proportionate assessment of themes that were derived from the process, using a standard -3 to +3 scoring system.

# 5. Conclusion

Atkins have been commissioned by GCP to conduct an independent review of the WSP, Mott MacDonald and i-Transport reports in relation to the SRA developed as part of the CSETS. Four documents have been reviewed, with the key focus on the analysis of the methodology and outputs from the 2020 Mott MacDonald report and the 2021 i-Transport report.

Atkins consider that the information presented in the 2020 Mott MacDonald report to be a fair assessment at feasibility stage. Based on the information presented in the documents, the SRA has been considered not to be a viable alternative relating to:

- Segregation;
- Land acquisition;
- Deliverability; and
- Cost.

Atkins consider that whilst segregation is one of the key scheme objectives, it is acknowledged that design compromise would be required at selected locations to overcome localised constraints and therefore it is not considered to be a 'show stopper' that rules out the feasibility of the SRA at this stage. Land acquisition, deliverability and cost are considered to be the major risks associated with the SRA, compared to the preferred Brown Route. The SRA would require the following:

- Land acquisition, which would be subject to third party agreement and public scrutiny; and
- Liaison with Network Rail and Anglian Water liaison, which could increase risk given the potential timescales and complexities of the Network Rail GRIP process.

Both Mott MacDonald and i-Transport are in agreement that scheme cost for the SRA would be higher than the preferred Brown Route due to the complex rail interface requirement, together with land acquisition costs.

In summary, the scheme may be 'feasible' from the engineering perspective; however, based on the information presented in both the Mott MacDonald and i-Transport reports, Atkins consider the risks associated with land acquisition, construction complexity and construction programme remain high and adversely impact on the scheme delivery. Further work would be required to properly understand the impacts of these elements on the SRA alignment.