Technical note

Project:	A428/A1303 Cambourne to Cambridge Better Bus Journeys	**To:**	LLF Technical Group
Subject:	Mini-MCAF: Assessing LLF's Response	**From:**	Andrew Bustin/Colin Young
Date:	9 August 2017	**cc:**	

1. Option Development

During October and November 2015, a public consultation for the Cambourne to Cambridge Better Bus Journeys project was undertaken. This was centred on six high-level options for bus infrastructure improvements between Cambourne to Cambridge. A general arrangement of the three different options taken to consultation for Area 1 and the three options for Area 2 are illustrated in Figure 1.

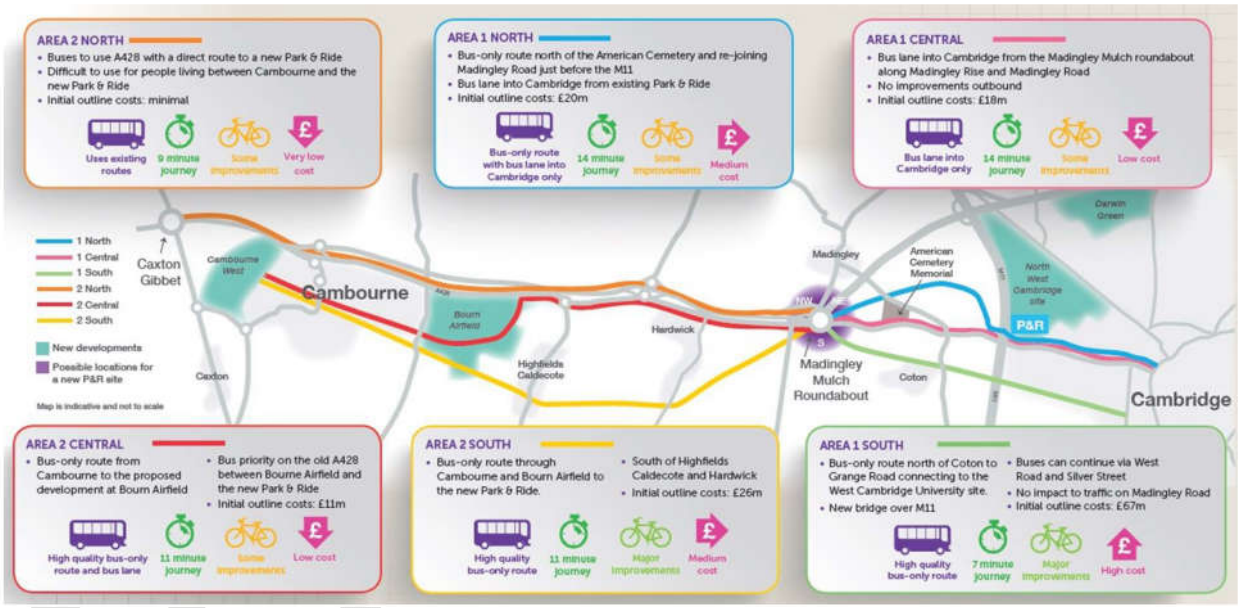

Figure 1. Options Published for Consultation

For Area 1, six bus link options were formulated along the corridor, comprising of four segregated guided busway options and two subsequent unsegregated bus lane options.

The options were presented in the Strategic Outline Business Case (SOBC) and two options were initially taken forward for further development. These were **Option 1** and **Option 3a**.

Option 1 is an online option that proposes no new infrastructure up to Madingley Mulch Roundabout, after which it provides:

- An Eastbound nearside bus lane along Madingley Road between Madingley Mulch and M11 bridge. Bus gate provided at the bridge, so buses run with general traffic up to High Cross. Existing carriageway retained and bus lane constructed adjacent, apart for a section where the alignment is smoothed to meet standards for ride quality.
- An Eastbound nearside bus lane along Madingley Road between JJ Thompson Avenue and Lady Margaret Road. Bus priority at Grange Road and bus gate at Lady Margaret Road. Narrowing of footway/cycleway in places.
- A Park and Ride site, currently located within the vicinity of Madingley Mulch.

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Option 1 is proposed to provide 9 buses an hour online on the A428 between Cambourne and Cambridge. 3 services will continue to Cambridge North Station. 6 services will access the City Centre of which 3 would continue to Addenbrooke's. Should the Western Orbital Scheme come forward the latter Addenbrooke's services would operate along the Western Orbital.

Option 3a takes the form of an offline Busway between Cambourne and the City Centre. At this stage, it is also assumed to have the same service pattern as Option 1. It includes a Park and Ride site, currently located within the vicinity of Madingley Mulch.

In September 2016 at the Joint Local Liaison Forum (LLF) for the A428 Cambourne to Cambridge Better Bus Journeys scheme, an additional option for an alternative bus link alignment was proposed by LLF members to facilitate a High Quality Public Transport (HQPT) service from Cambourne to Cambridge. The alternative option proposed guided busway provision along the existing A1303 Madingley Road corridor between the Madingley Mulch Roundabout and west Cambridge, utilising an unsegregated tidal bus lane aligned to the centre of the A1303 Madingley Road, referred to as Option 6.

Option 6 is also an online option. It is an alternative proposal to Option 1 and includes the following aspects:

- The same service pattern as Options 1 and 3a with stopping and express services;
- A Park and Ride site at Scotland Farm;
- A bus lane on the A428 eastbound off-slip approach to Madingley Mulch roundabout;
- Signals on Madingley Mulch roundabout to give bus priority;
- A central bus lane between Madingley Mulch roundabout and High Cross which is inbound only with an alternative scheme of a tidal lane.

2. Option Assessment

An initial high level comparative assessment relating to Options 1, 3a and 6 has been undertaken. It seeks to provide a relative assessment of the benefits and impacts of each of the options to inform the decision making and option development process in a consistent fashion. The assessment takes the form of an abridged and updated Multi-Criteria Assessment Framework (MCAF), based on that suggested by the LLF. It does not currently represent an assessment of the full costs and benefits / advantages and disadvantages of each scheme, nor does it apportion any relative importance or 'weight' in terms of the criteria used for assessment.

The criteria were set out and agreed with the LLF in a series of meetings with a view to broadly assessing each option against each other with respect to performance, service, cost, risk and impact. The assessment considers a range of criteria that have been quantified using either formal assessment or available evidence.

Each option was scored by SKANSKA and Atkins with respect to the criteria being assessed, some criteria scoring was based on modelled outputs and some on professional judgement. Relative scores from 1 to 5 were attributed to each metric, with 5 being the best performing and 1 being the worst performing, and 3 being neutral. This initial scoring was carried out at an Internal Atkins/Skanska workshop on 15th June 2015 by five members of staff with experience working on the A428 Cambourne to Cambridge Better Bus Journeys Scheme. Scoring is relative; it compares the relative performance of options against one another, for each metric. No prominence or importance of each criteria has been considered and as such scores have not been weighted.

The outcomes of the simple scoring system indicate that Option 3a comes out the best followed by Option 1 and then Option 6. It should be noted that the criteria used is considered a subset of the wider MCAF analysis that should be undertaken with respect to these options and that the simple scoring provides only an indicative result which should be treated as such. Further work will be required to incorporate additional modelling metrics and subsequently updating the overall relative scores for each scheme.

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Option 3A has a marginally higher score than Option 1 and a higher score than Option 6, reflecting high expected performance on HQPT metrics and low relative performance on costs and environmental impacts.

Option 1 has a higher score than Option 6, due to its low costs and relatively neutral performance across a range of criteria.

Option 6 has a lower score than both Option 1 and 3a due to neutral performance across a range of criteria, it's relatively higher delivery risk in terms of construction compared to Option 1 and lower expected levels of modal shift.

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3. MCAF

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			Option 1			Option 6			Option 3a		
Criteria	**Notes / Data**	**Details / Metrics**	**Metric**	**Score**	**Rationale**	**Metric**	**Score**	**Rationale**	**Metric**	**Score**	**Rationale**
Journey Times	Journey times have been calculated based on existing on-board real-time bus data for buses on Madingley Road, on the Cambridgeshire Guided Busway and on bus lanes. The assessment assumes an allowance for acceleration and deceleration between stops. Inbound and outbound journey times have been assessed separately. If there was an express service for all options which travelled between Cambourne a Park and Ride Site, West Cambridge and Grange Road the journey times in the AM peak inbound are likely to be as follows: Option 1 = 22mins, Opt 6 = 21, Opt 3a = 17 mins.	Inbound – AM/PM Peak (Stopping)	30	3	Options 1 and 6 have journey times within two minutes of one another. It has been concluded that there is insufficient perceivable difference in the journey time for this stage of assessment. They are therefore considered neutral.	28	3	Options 1 and 6 have journey times within two minutes of one another. It has been concluded that there is insufficient perceivable difference in the journey time for this stage of assessment. They are therefore considered neutral.	20	5	Option 3 offers a significant (highly perceivable) reduction in journey times compared to Options 1 and 6. The journey time is considered 'very good'.
		Outbound – AM/PM Peak (Stopping)	33	3		31	3		26	5	
		Average Score	31.5	3		29.5	3		23	5	
	Fast service - theoretical non-stop journey time for all options based on a route of Cambourne to Cambridge stopping at a Park and Ride Site and West Cambridge.	Inbound – AM/PM Peak (Express)	22	3		21	4		17	5	
		Outbound – AM/PM Peak (Express)	21			19			17		
Bus Frequency	It is proposed that 9 buses an hour will route between Cambourne and Cambridge. 3 will continue to Cambridge North Station. 6 services will access the City Centre of which 3 would continue to Addenbrookes. Should the Western Orbital Scheme come forward the latter services would operate along the Western Orbital	AM Peak, buses per hour, inbound Note that this does not indicate the capacity of each Option, which will be assessed separately.	9	3	Initial agreed assumption.	9	3	Initial agreed assumption.	9	3	Initial agreed assumption.
Journey time variability (based on current traffic conditions)	A comparison of the potential improvement in journey time variability compared to the current Citi4 service, based on existing traffic conditions during peak hours.	Potential % improvement in journey time variability in the peak hour, compared to Citi4		TBC			TBC			TBC	
				TBC			TBC			TBC	
Capital out-turn costs (not including cost of Park and Ride site)	Surveyor assessment. Not equivalent to Value for Money (see BCR below) These costs include all infrastructure costs between Cambourne and Cambridge and do not include land costs	£(2010 basis)	£11,531,900	5	Score based on linear interpolation.	£18,972,000	4	Score based on linear interpolation.	£77,185,000	1	Score based on linear interpolation.
High Level BCR		To be included following further analysis	TBC	TBC		TBC	TBC		TBC	TBC	

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			Option 1			Option 6			Option 3a		
Criteria	**Notes / Data**	**Details / Metrics**	**Metric**	**Score**	**Rationale**	**Metric**	**Score**	**Rationale**	**Metric**	**Score**	**Rationale**
Landscape and Visual / Heritage	As per assessment in the SOBC – on a 7-point scale (Large Adverse – Large Beneficial) (pre-mitigation)	Relative change from current situation; desk-top assessment	Slight Adverse	3	Some visual intrusion and impacts on vegetation specifically at the Park and Ride site, details below	Moderate Adverse	2	Greater visual intrusion and change of landscape character as a result of the required gantries	Moderate Adverse	1	Impact on public open space and agricultural land on the offline alignment.
Air Pollution	As per assessment in the SOBC – on a 7-point scale– change in CO_2 emissions and total change in air quality over 60-year appraisal period. Assumed Option 6 is Similar to Option 1 with respect to air pollution.	Relative change from current situation; desk-top assessment	Moderate Adverse	3	Potential for an adverse impact in Cambridge city centre as a result of an increase in bus traffic. Potential offset due to mode shift and reduction in veh-km have not been considered at this stage.	Moderate Adverse	3	Potential for an adverse impact in Cambridge city centre as a result of an increase in bus traffic. Potential offset due to mode shift and reduction in veh-km have not been considered at this stage.	Moderate Adverse	3	Potential for an adverse impact in Cambridge city centre as a result of an increase in bus traffic. Potential offset due to mode shift and reduction in veh-km have not been considered at this stage.
Noise Impact	As per assessment in the SOBC – on a 7-point scale - change in noise impacts on receptors, such as households	Relative change from current situation; desk-top assessment	Slight Adverse	3		Slight Adverse	3		Moderate Adverse	2	
Constructability Risk	No full assessment of construction disruption has been undertaken, however the construction impact on Madingley Hill (option 6) is likely to be similar to that caused on the M11 due to the construction of a new bridge.	As per assessment criteria in the SOBC (complexity of delivery)	Medium	2	Significant risk relating to stats diversions and traffic management issues.	High	1	Construction of a mid-carriageway tidal flow lane would be associated with significant disruption, stats issues and traffic management issues. M11 Bridge widening is cheaper than a new bridge, but more complex to deliver (condition of existing structure, hydro demolition etc.).	Lowest	4	New Bridge more straightforward than widening). Fewer stats issues due to greenfield land. Fewer traffic management issues.
Deliverability Risk	Deliverability risk (in terms of planning requirements and permissions) is expected to be lowest where schemes are based on upgrades to existing infrastructure. New infrastructure on greenfield sites is expected to have the highest risk.	As per Oct-2016 Business Case criteria (planning / consents)	Low-Medium	4	CPO required for private land / gardens. Delivered through HA/CPO. Likely to require the least amount of land take.	Medium-High	3	Potential requirement for more land take than Option 1, and related acquisition issues. Delivered through Highways Act / CPO.	Medium-High	2	Potential to negotiate greenfield land without CPO. Delivered through TWA. Requires the most land take.
Time to full implementation	Year of scheme opening	Years	2021	4	c. 18 months for HA / CPO. No Public Enquiry. Established design and planning procedures and experience.	2022	3	c. 18 months for HA / CPO, however the additional land take could increase the time required. No public Enquiry. Design and planning process expected to take longer due to the more complex nature of the scheme, compared to Option 1.	2024	3	TWA slightly quicker than HA/CPO, but objections will lead to public enquiry.
Modal Shift	CSRM2 output	% of commuters from communities along the A428 corridor (Cambourne, Bourn, Caldecote etc.) travelling to Cambridge employment sites using bus services - AM inbound.	27%	3		28%	3		31%	4	

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			Option 1			Option 6			Option 3a		
Criteria	**Notes / Data**	**Details / Metrics**	**Metric**	**Score**	**Rationale**	**Metric**	**Score**	**Rationale**	**Metric**	**Score**	**Rationale**
Connectivity	Desktop appraisal of connectivity of options with the proposed Western Orbital Scheme. Options will consider an online, off-line east and off-line west Western Orbital.	To Western Orbital – assuming on-road and off-road		3	Longer travel distance to get to hub, but possible to get directly onto M11. All score neutral due to level of certainty around the hub.		3	Longer travel distance to get to hub, but possible to get directly onto M11. All score neutral due to level of certainty around the hub.		3	Direct access to 'hub' and then onto M11. All score neutral due to level of certainty around the hub.
Policy Fit	Analysis of key policy documents including: Cambridgeshire LTP3 Highways England RIS Greater Cambridge and Peterborough SEP Greater Cambridge City Deal Local Plans for South Cambridgeshire and Cambridge	With broader City Deal, Combined Authority	Medium	2	Potential to deliver a HQPT service, however buses are not fully segregated from general traffic and are more likely to suffer from reliability issues as a result.	Medium	2	Potential to deliver a HQPT service, however buses are not fully segregated from general traffic and are more likely to suffer from reliability issues as a result. The Option does not consider wider connectivity, especially towards the Centre, following termination of the Tidal lane. There are more limited opportunities to improve cycle connectivity.	Very Good	5	High strategic fit in terms of delivery of HQPT and segregation of buses from general traffic. Future proofing with respect to development sites and adopting alternative transport systems. Supports connectivity throughout the route.
Stakeholder Support	Based on 2015 consultation responses and subsequent stakeholder engagement. For Option 6 this is based on support from LLF.	Based on 2015 consultation responses and LLF support.		4	More popular than offline		2	Not tested in public consultation.		1	Less popular than online.
Simple total - Not weighted according to any specific criteria		**Total (unweighted)**		51	**Total (unweighted)**		45	**Total (unweighted)**		52	

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4. Response from the LLF

The LLF undertook a review of the MCAF analysis and provided comments and new scores based on their views of some of the criteria assessed as follows:

Having worked collaboratively with the appointed consultants to establish the criteria by which Options 1, 3a and 6 would be compared, the LLF (technical subgroup) is disappointed with the final 'scoring' of the options. The figures favour Option 3a, with multiple scores in criteria that benefit it (four individual scores for journey time; whereas just one each for environment/heritage, stakeholder support and cost.) Even scoring rationales provided in the previous MCAF report (September 2016; noise impact, air pollution and constructability risk) are now contradicted. This assessment should be objective; the relative weighting of the various criteria to be decided by the Executive Board. The main areas of contention are as follows:

Journey Times
The LLF strongly disagrees with the inclusion of four separate scores for journey time (inbound, outbound, average of inbound/outbound and express), and so has discounted the latter two. We consider it unreasonable to include 'average' (what does that add?), and since the 'express service' is purely theoretical, it should not be included either. All options should be compared on the basis of the five stops previously agreed. However, the express service that runs along the existing A428 dual carriageway, and is a fundamental part of Option 6, should be included in this analysis as it stops five times and is directly comparable to Option 3a. Without it Option 6 is little different from Option 1.

	Option 1	Option 6	Option 3a
Atkins scoring	12	13	20
LLF scoring	4	8	10

Landscape and Visual Heritage
The LLF considers the environmental and heritage impacts of on-road options 1 and 6 are considerably lower than for Option 3a:

	Option 1	Option 6	Option 3a
Atkins scoring	3	2	1
LLF scoring	4.5	4	1

Air Pollution and Noise Impact
The LLF has not changed the Atkins scoring (all options almost identical), but is sceptical. Why has the scoring has changed so markedly from the previous MCAF report (Option 3a = 2 points; Option 1 = 5 points). Is this because the buses are to be electric?

Constructability Risk
The SOBC-S (Strategic Business Outline Case) states that 'delivery will be most complex where the route options include a new bridge over the M11' (Table 10-2, page 78). In the original MCAF of September 2016, Option 3 scored 1 (highest risk) versus 2 (Medium-high) for option 1. How can Option 3a now score 4 (low risk)? The LLF agrees with the original MCAF assessment.

	Option 1	Option 6	Option 3a
Atkins scoring	2	1	4
LLF scoring	2	2	1

Deliverability Risk
The LLF has lowered the score for Option 3a due to high risk of legal challenge that will cause delays.

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	Option 1	Option 6	Option 3a
Atkins scoring	4	3	2
LLF scoring	4	3	1

Time to Full Implementation

The score for Option 3a must be lower than Option 6 as it will take two years longer to complete.

	Option 1	*Option 6*	*Option 3a*
Atkins scoring	*4*	*3*	*3*
LLF scoring	*4*	*3*	*2*

Policy Fit

The LLF considers Option 6 at least as good a policy fit as Option 3a because, although it is slightly slower and slightly less reliable, it is far cheaper and frees up funds which can be used on other GCP schemes. It can also be argued that Option 6 marries far better than Option 3a with the Mayor's thinking because it offers flexibility whilst longer-term, more strategic, transport solutions are developed.

	Option 1	*Option 6*	*Option 3a*
Atkins scoring	*2*	*2*	*5*
LLF scoring	*2*	*3*	*3*

Stakeholder Support

Given Option 6 has almost unanimous support within the LLF (the elected representatives of 35,000 residents on route.), and provides a better service than Option 1 (the most popular in public consultation). It must therefore score at least the same as Option 1.

	Option 1	*Option 6*	*Option 3a*
Atkins scoring	*4*	*2*	*1*
LLF scoring	*4*	*4*	*1*

TOTAL SCORE

The LLF believes the following scores are now objective, but accepts they will change when criteria weighting is added by the Executive Board.

	Option 1	*Option 6*	*Option 3a*
Atkins scoring	*51*	*45*	*52*
LLF scoring	*44.5*	*46*	*35*

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5. Scoring Comparison, Further Clarifications and Recommendations

5.1. Journey Times

The journey time assessment considers inbound and outbound flows, an average of these, and express flows, with an overall score that aggregates the individual scores and which favours Option 3a. However, this scoring reflects double counting. **It is recommended that the options be compared on the basis of identical services and stopping patterns with an overall score out of 5 that reflects all movements. Option 1 and Option 6 should score 3 out of 5 and Option 3a should score 5 out of 5.** This removes the weighting towards journey times, given that there should be no weighting of criteria at this stage.

5.2. Landscape and Visual/Heritage

There is consistency between Atkins and the LLF in terms of ranking options based on Landscape and Visual/Heritage impact but Option 1 and Option 6 are scored more generously by the LLF. The Atkins view is that these scores should still be relatively low given the adverse impact from the Park & Ride site (Option 1) and gantries (Option 6). Scores above 4 out of 5 suggest minimal impact without mitigation, which would not be the case.

Both Options 1 and 6 will require online signage for the bus lanes, and both will require additional hardstanding to accommodate the new lanes. Options 1 and 6 will generate a significant loss of screening on both sides of the carriageway for the addition of the bus lanes, which will encroach onto the existing agricultural landscape. This encroachment includes potential losses to ancient woodland within Madingley Wood SSSI, with the potential loss of trees which currently provide screening for residents from the transportation corridor.

Options 1 and 6 are also likely to affect mature treelines and hedgerow boundaries. Loss of agricultural land will be significant for both Options 1 and 6, because new carriageways will be required for each option. Option 1 will have a more significant effect on the landscape due to its extension into Cambridge in addition to Option 6.

In both options, removal of vegetation and the additional bus lane could affect the settings of listed buildings. Mitigation planting will assist with reducing the landscape and visual impact in the next 10-15 years; however short term impacts will be of higher significance due to the increased visibility of the carriageway to the residents and businesses surrounding the A428. There are fourteen listed buildings along the route corridor for Option 1. There are only three listed buildings along the route corridor for Option 6.

It is recommended that the Atkins scores be retained.

5.3. Air Pollution and Noise

The scoring has changed from the previous MCAF report due to a more holistic view being taken in the environmental assessment of options.

For all options, there is the potential for an adverse impact in Cambridge city centre as a result of an increase in bus traffic, which would potentially be offset by mode shift and a reduction in vehicle kilometres. A reduction in the number of vehicles on the A428, which is the primary transportation route between Cambourne and Cambridge, is likely to result in a beneficial impact on the noise environment and air quality along the route corridor.

Air quality impacts are not anticipated to significantly differ between Option 1 (adjacent to the existing carriageway) and Option 6 (within the existing carriageway lanes), as no additional vehicles are being proposed from one option over the other. Therefore, Option 1 will have a longer permanent beneficial effect, further into Cambridge by reducing the number of cars present going into the city, however it is likely to have a more significant short term impact during construction due to the proximity of additional receptors along the route length into Cambridge and the presence of close running lanes for regular traffic.

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Noise impacts on sensitive receptors including users of schools, hospitals and residential property are likely to be the same for both schemes for most the route, due to the additional land take required and the distance between the receptors and the noise source. The extension of Option 1 means that the overall noise impact upon West Cambridge will be more significant during operation than for Option 6 due to the longer route length, however, it is likely to generate a slight reduction in overall traffic noise during operation, due to the addition of the nine buses per day for all Options and reduction in associated vehicle numbers. Option 6 is likely to generate a slight reduction in overall traffic noise during operation, due to the addition of the nine buses per day and reduction in associated vehicle numbers however disruption during construction is still anticipated to result to the local residents along the route length.

It is recommended that the Atkins scores be retained.

5.4. Constructability Risk

Since the SOBC and original MCAF, where Option 3 scored 1 (highest risk), Option 3a has been better defined. The score for Option 3 in the SOBC and original MCAF also included elements of deliverability risk, which have now been captured elsewhere.

Option 3a is anticipated to be the least complex to deliver as the construction of a new bridge is expected to be more straightforward than widening. There would be fewer stats issues due to greenfield land and fewer traffic management issues.

Option 1 is anticipated to be more complex to deliver as there would be significant risk relating to stats diversions and traffic management issues.

Option 6 is anticipated to be the most complex to deliver as the construction of a mid-carriageway tidal flow lane would be associated with significant disruption, stats issues and traffic management issues. Although M11 bridge widening would be cheaper than a new bridge, it would be more complex to deliver.

It is recommended that the Atkins scores be retained.

5.5. Deliverability Risk

Deliverability risk should reflect planning requirements and permissions and is expected to be lowest where schemes are based on upgrades to existing infrastructure. New infrastructure on greenfield sites is expected to have the highest risk.

Option 1 has the lowest deliverability risk as it is likely to require the least amount of land take. It would be delivered through the Highways Act/CPO, with CPO required for private land/gardens.

Option 6 has more deliverability risk as there is the potential requirement for more land take than Option 1 and related acquisition issues. It would also be delivered through the Highways Act/CPO.

Option 3a has the most deliverability risk as it would require the most land take. It would be delivered through the Transport and Works Act with potential to negotiate greenfield land without CPO.

There is consistency between Atkins and the LLF in terms of ranking options based on Deliverability Risk but the LLF has lowered the score for Option 3a due to the high risk of legal challenge that will cause delays. However, this had already been factored in the Atkins score.

It is recommended that the Atkins scores be retained.

5.6. Time to Full Implementation

Option 1 would have an opening year of 2021, allowing 18 months for HA/CPO with no Public Enquiry and following established design and planning procedures and experience.

Option 6 would have an opening year of 2022, given the additional land take requirements and more complex design and planning process.

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Option 3a would have an opening year of 2024, given that objections would lead to a Public Enquiry (although TWA is slightly quicker than HA/CPO).

The LLF have recommended that the score for Option 3a be lowered to reflect a later opening year than Option 6 and this is a rational amendment.

5.7. Policy Fit

Option 1 gives potential to deliver a HQPT service, however buses are not fully segregated from general traffic and are more likely to suffer from reliability issues as a result.

Option 6 also gives potential to deliver a HQPT service but as with Option 1, buses are not fully segregated from general traffic and are more likely to suffer from reliability issues as a result. There are also issues with wider connectivity, especially towards the city centre, given the termination of the tidal lane and limited opportunities to improve cycle connectivity.

Option 3a has a high strategic fit in terms of delivery of HQPT, segregation of buses from general traffic, future proofing with respect to development sites and adopting alternative transport systems. Connectivity is supported throughout the route.

The LLF argue that the scores for Option 6 and Option 3a should be the same given that Option 6, whilst being slower and less reliable, would be cheaper. However, options are scored on cost separately so that should not be considered here. This scoring of options here should only consider the potential for the option to meet strategic objectives. Future demand can only be fully catered for and future transport interventions made possible through Option 3a.

It is recommended that the Atkins scores be retained.

5.8. Stakeholder Support

Stakeholder support is based on 2015 consultation responses and subsequent stakeholder engagement. For Option 6 it is based on support from the LLF.

Option 1 was more popular than Option 3a in the 2015 consultation responses and stakeholder engagement. Given that Option 6 does not have full support from the LLF but has not been tested in public consultation, it is scored between the other options.

It is recommended that the Atkins scores be retained.

6. Revised Scoring

The table below summarises the scoring of the options against agreed criteria – including the original Atkins scores, LLF suggested scores and revised Atkins scores.

The total unweighted scores are now as follows:

- Option 1: 42
- Option 6: 35
- Option 3a: 36

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	Option 1			Option 6			Option 3a		
	Atkins	LLF	Revised	Atkins	LLF	Revised	Atkins	LLF	Revised
Journey Times	12	4	3	13	8	3	20	10	5
Bus Frequency	3	3	3	3	3	3	3	3	3
Journey Time Variability	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Capital Out-Turn Costs	5	5	5	4	4	4	1	1	1
High Level BCR	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC	TBC
Landscape and Visual/Heritage	3	4.5	3	2	4	2	1	1	1
Air Pollution	3	3	3	3	3	3	3	3	3
Noise Impact	3	3	3	3	3	3	2	2	2
Constructability Risk	2	2	2	1	2	1	4	1	4
Deliverability Risk	4	4	4	3	3	3	2	1	2
Time to Full Implementation	4	4	4	3	3	3	3	2	2
Modal Shift	3	3	3	3	3	3	4	4	4
Connectivity	3	3	3	3	3	3	3	3	3
Policy Fit	2	2	2	2	3	2	5	3	5
Stakeholder Support	4	4	4	2	4	2	1	1	1
TOTAL SCORE	51	44.5	42	45	46	35	52	35	36

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7. Next steps

It is proposed as part of the MCAF assessment to undertake an enhanced MCAF assessment which uses a broader spectrum of criteria. The criteria are listed below:

Enhanced MCAF Attributes	Definition
Public Transport Section	
High Quality Public Transport Attributes	High Quality Public Transport Attributes include: -Infrastructure: integration with other transport modes; bus priority, "tram-like" features, efficiently operated system, strongly branded, public support -Bus Fleet: high quality buses, frequency of buses -Bus Stops: frequent stops, information at bus stops, easy to understand information, fast ticketing
Journey Ambience	Journey Ambience Attributes include: -traveller care: enhanced transit mode, access and egress, easy to understand excellent information, good value, convenient, passenger/customer service -traveller views: exposure to maintenance and construction work, exposure to polution and nosie -traveller stress factors: exposure to accidents, presence of other vehicles, high speed of bus services
Punctuality	Punctuality is the relationship between the bus arriving in real life compared to the timetable – a punctual service should leave the stop between one minute early and 5 minutes late. The phrase Peak: 76% - 94% means the service would arrive between a minute early and 5 minutes late 76-94% of the time during the Peak period.
Reliability	The effect on buses from highway design, dwell times, signalling, driver's operationality. Expected that offline options will offer a more reliable service than those that run online.
Bus Journey time savings	Bus journey time savings achieved due to the delivery of the option
Level of mode shift to PT	The percentages are the differences between mode share of the option and the Do Minimum case.
Resilience / Versatility	Resilience measures how fast the services can return to full functionality following an unplanned change in traffic, such as an accident. Versatility measures the opportunities of the services negating or avoiding the effects of an unplanned change in traffic.
Future proofing against new PT mode	This attribute measure how well the options would address future needs of a new public transport mode along the Cambourne - Cambridge route and the overall.
Road network / Private vehicles	
Vehicle-Km Reduction	This attribute compares the reduction in kilometrage travelled by private car units as a result of option implementation. The effect of the option is derived by comparing the option to the Do Minimum case.
Volume over capacity	Volume/capacity ratio examines congestion along sections of the route between Cambourne and Cambridge. Volume/capacity is a ratio, comparing the number of vehicles in the section to the maximum number of vehicles that section can hold.

Enhanced MCAF Attributes	Definition
Overall Network	
Improvements in active mode infrastructure	This attributes examines the effect of the option on the improvements to active mode infrastructure.
Average Network Journey Time	This attribute examines the effect of the options on the average network journey time.
Accident impact	This attribute examines the effect of the options on the accidents in the network.
Impact on performance of road network	This attribute examines the interface of the options with general traffic.
Deliverability	
Deliverability risk (planning/consents/permissions incl. utilities)	Deliverability risk (in terms of planning requirements and permissions) is expected to be lowest where schemes are based on upgrades to existing infrastructure. New infrastructure on greenfield sites is expected to have the highest risk. Any relevant environmental / statutory consents would be required.
Land acquisition risks	This attribute examines the effect of the options on land acquisition (whether CPO or negotiations) and the number of properties will be affected.
Constructability risk (complexity of delivery)	This attribute examines the complexity of delivering the options
Disruption during construction and maintenance	This attributes examines the level of disruption to general traffic and public during construction and maintenance of the options.
Development	
Future proofing for likely required housing growth	This attribute measure how well the options would address future needs of housing growth along the corridor and the overall.
Accessibility	This attributes examines the level of PT accessibility to development sites allocated in the Local Plan.
Future proofing for likely employment growth	This attribute measure how well the options would address future needs of employment growth along the corridor and the overall.
Environmental Impacts	
Air quality	This attribute examines the effect of the options on air quality.
C02 emissions	This attribute examines the effect of the options on CO2.
Noise impacts on households	This attribute examines the effect of the options on noise impacts on households.
Impact on the water environment	This attribute examines the effect of the options on the water environment.
Landscape and visual impact	This attribute examines the effect of the options on landscape and visual.
Heritage impact	This attribute examines the effect of the options on heritage.
Biodiversity impact	This attribute examines the effect of the options on biodiversity.
Stakeholder support	
Statutory Stakeholders	This attribute reflects the views presented by statutory stakeholders.
Non-Statutory stakeholders	This attribute reflects the views presented by non-statutory stakeholders
public consultation	This attribute reflects the views presented by public.

Enhanced MCAF Attributes	Definition
Costs	
Scheme capital costs	This attribute is based on scheme's capital costs.
Maintenance and Renewal costs	This attribute is based on scheme's maintenance and renewal costs.
Summary	
Total benefits summary	This attribute summaries the scheme's overall benefits, linked with the associated uncertainty.
Total impacts summary	This attribute summaries the scheme's overall impacts, linked with the associated uncertainty.
Indicative Value for Money Range	This attribute shows the option's VfM category.

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