



Greater Cambridge
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ENTERPRISE PARTNERSHIP



UNIVERSITY OF
CAMBRIDGE



South
Cambridgeshire
District Council

Report To: Greater Cambridge City Deal Executive Board

1 October 2015

Lead Officer: Graham Hughes, Executive Director of Economy, Transport and Environment, Cambridgeshire County Council

M11 Bus-only Slip-Roads Feasibility Report

1. Purpose

1.1 On 17th June 2015 the Greater Cambridge City Deal Executive Board instructed officers to bring a report to the September cycle of the Joint Assembly and Executive Board meetings containing a high level appraisal of the technical implications and costs of creating bus-only slip-roads at the following locations:

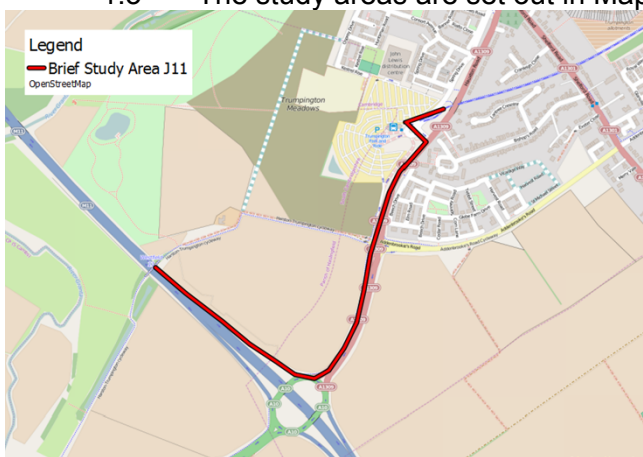
(i) M11 junction 13: when turning off the A1303 (going east) onto the M11 (going south);

(ii) M11 junction 13: creating a bus lane alongside the existing sliproad off the M11, that would get priority treatment at the traffic lights;

(iii) M11 junction 11: turning off the M11 (going south) between the existing farm and footbridge and the existing slip-road, then going round the corner of the farmland at Trumpington Meadows, running parallel to (and west of) Trumpington Road, and entering the Trumpington Road Park and Ride thence joining up to the Guided Busway.

1.2 In relation to J13 it was considered necessary in order to ensure that the appraisal was realistic in an operational context, to assess options for bus priority across the junction. This is because it would not be realistic to only appraise bus slip roads if buses could not access the slip roads with priority.

1.3 The study areas are set out in Map 1 (next page.)





Map 1: Study areas for this report

1.3 The technical report is appended to this paper. A summary of the concepts and a short assessment of their impact on the A42/Western Orbital Study is contained in section 4 below.

1.4 This study has identified that a number of concepts are available to provide bus-only slip roads at Junctions 11 and 13 of the M11. Costings and concept designs have been provided for each concept.

1.5 This study avoids policy based assessment of the appraisal options. Some of the concepts may not be policy compliant to the adopted local transport strategy objectives. No concepts are 'recommended' or 'preferred' but are set out for illustrative purposes only for completeness. Any further assessment of these (or other) concepts should be carried out in the context of the relevant City Deal project development framework.

2. Recommendations

2.1 The Board is asked to:-

- (i) Note the findings from the technical report;
- (ii) Note that the outcome of the A428/ A1303 (Madingley Rise and Madingley Road) corridor and Western Orbital scheme development work will be the key determinant in considering the future recommended bus priority options in the locations set out in this report.

3 Reasons for Recommendations

3.1 The A428/ A1303 corridor scheme is a high priority scheme for the City Deal programme and a key proposal within the Local Transport Plan 2011-2026. The Western Orbital is a scheme undergoing early development as part of the City Deal with the objective of providing for orbital bus movements to the west of Cambridge.

3.2 Both of these schemes will be developed through the Department for Transport major scheme framework approach (WebTag). This will include wide ranging technical work, public consultation and support the recommendation of a preferred option or options for these schemes. In addition, a preferred alignment and level of public transport priority can be determined. Until the relevant stage of this process has been reached it is unknown if/how improvements of junctions 11 and 13

of the M11 will support the preferred options. Continued development of one of the options included within this M11 study outside of the Webtag process could therefore result in abortive work/costs. It may also unduly impact the 'stage by stage' method of assessment which will be a key factor in assessing schemes during the necessary statutory processes.

3.3 The concepts within this paper have been generated primarily on the basis of engineering feasibility. Some of the concepts are likely to have major strategic and policy level impacts both within the City Deal context as well as the adopted local transport strategies. These impacts have not been assessed.

4 Background

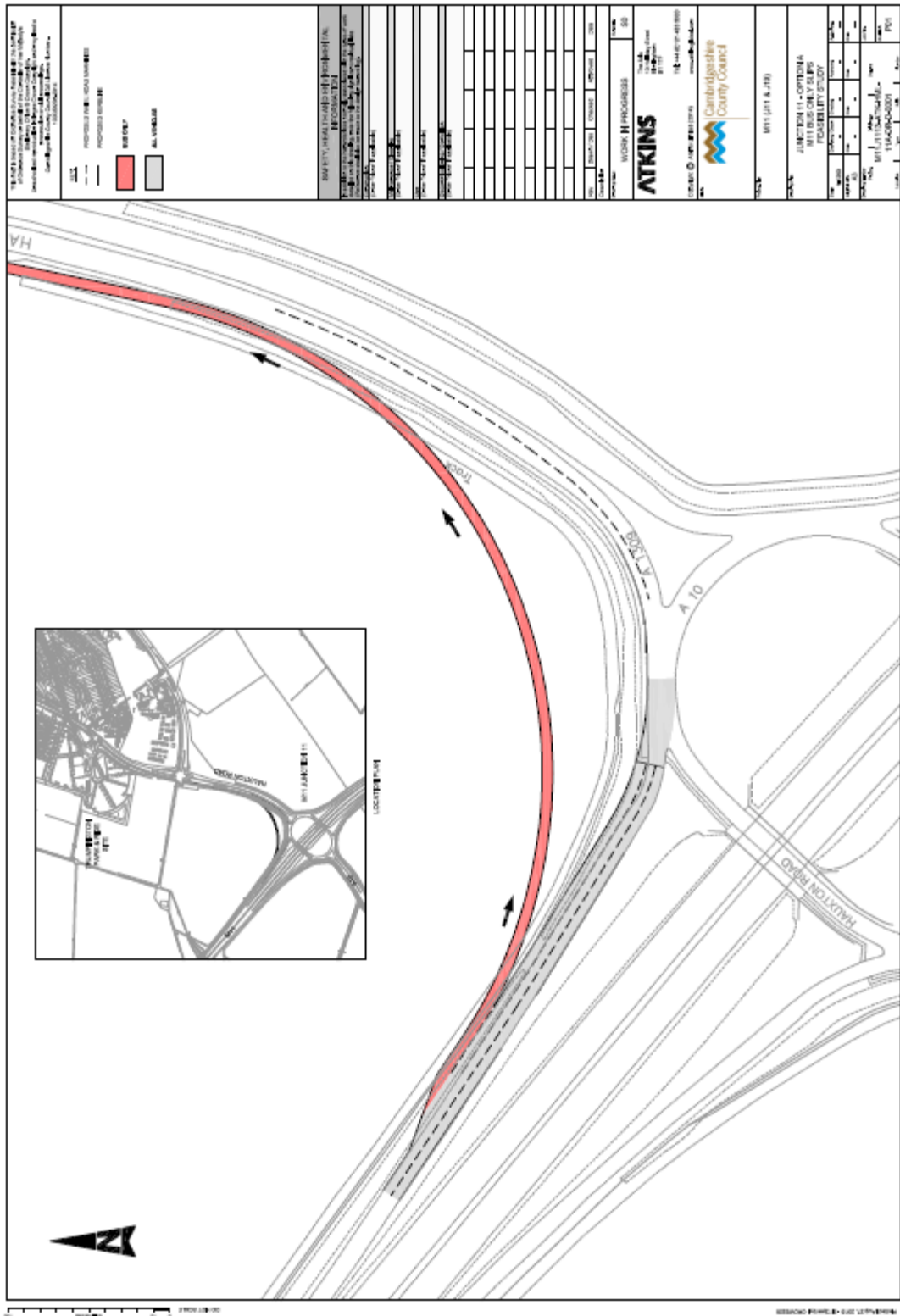
4.1 This study has been approached separately at this time to the City Deal projects and each option considered has been taken as a stand-alone scheme designed to operate independently . .

4.2 As with other City Deal work, the study firstly identified a long list of concepts that were generated and assessed in order to identify a short list for more detailed analysis.

4.3 The following shortlisted concepts are summarised below

Junction 11: Concept A

This option provides a bus-only access road running alongside the existing general traffic slip road from the M11 towards Trumpington Park and Ride. This option also provides a fully segregated bus-only access to the Park and Ride site.

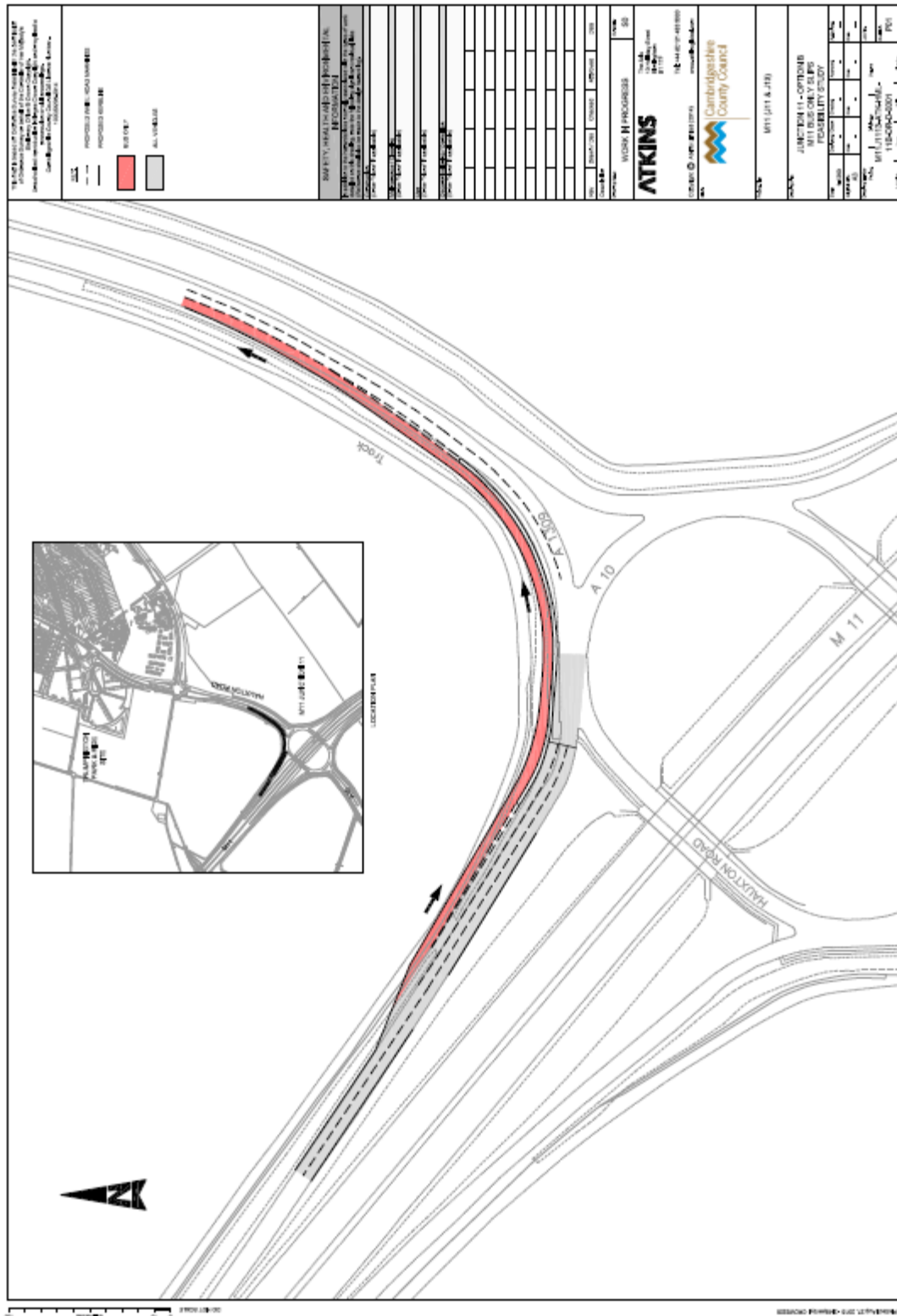


Map 2: J11 Concept A

Junction 11: Concept B

This option provides a bus-only access route parallel to the existing off slip and bypasses the existing traffic signals at the end of the slip road. The bus only access

route then continues onto the dedicated Park and Ride traffic lane beyond the junction.

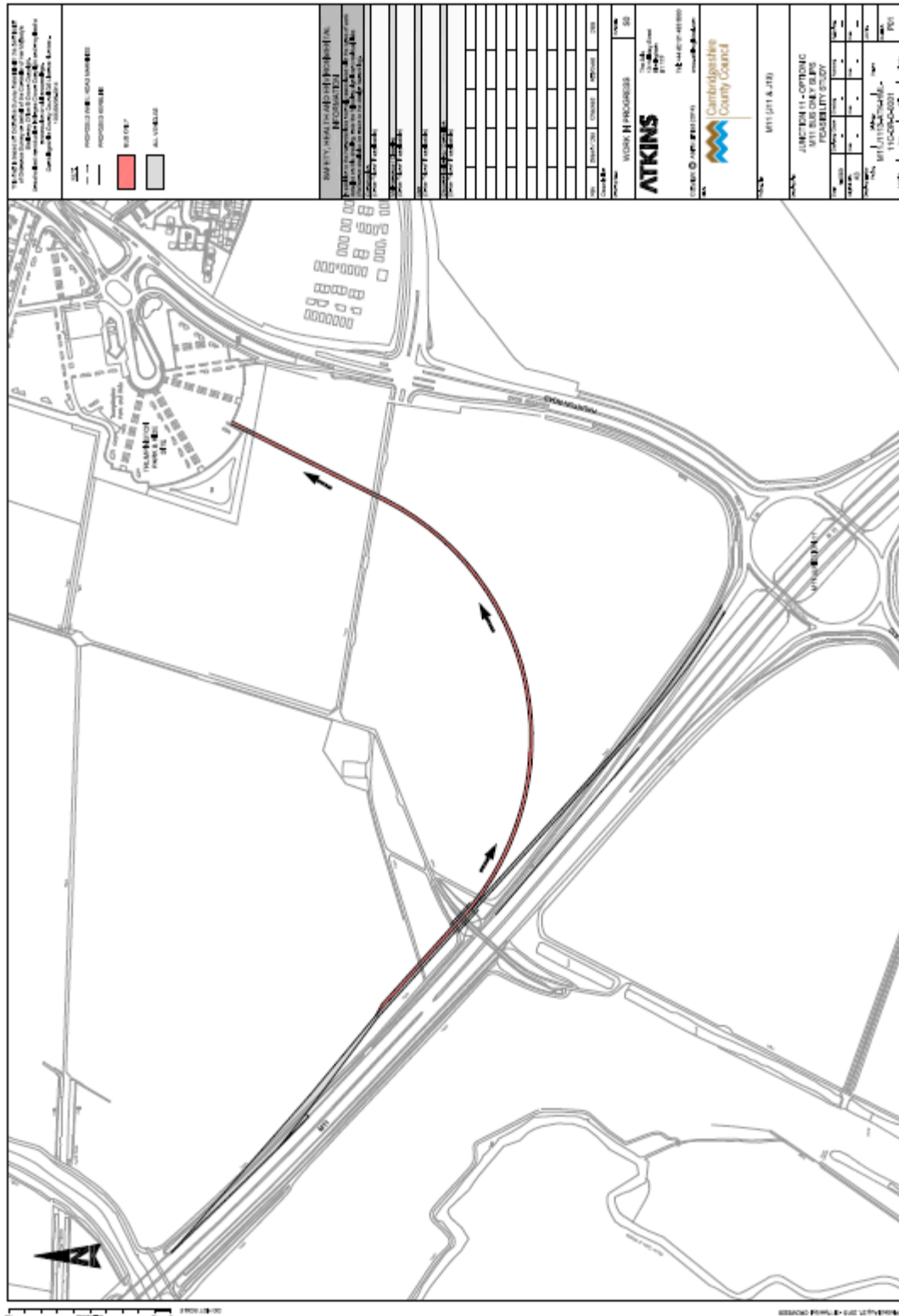


Map 3: J11 Concept B

Junction 11: Concept C

This option provides a bus-only slip road leaving the M11 prior to the existing agricultural bridge (for buses travelling southbound on the M11). It is likely that this

option could require widening of the existing agricultural bridge. The segregated bus-only lane could continue to the Park & Ride site.

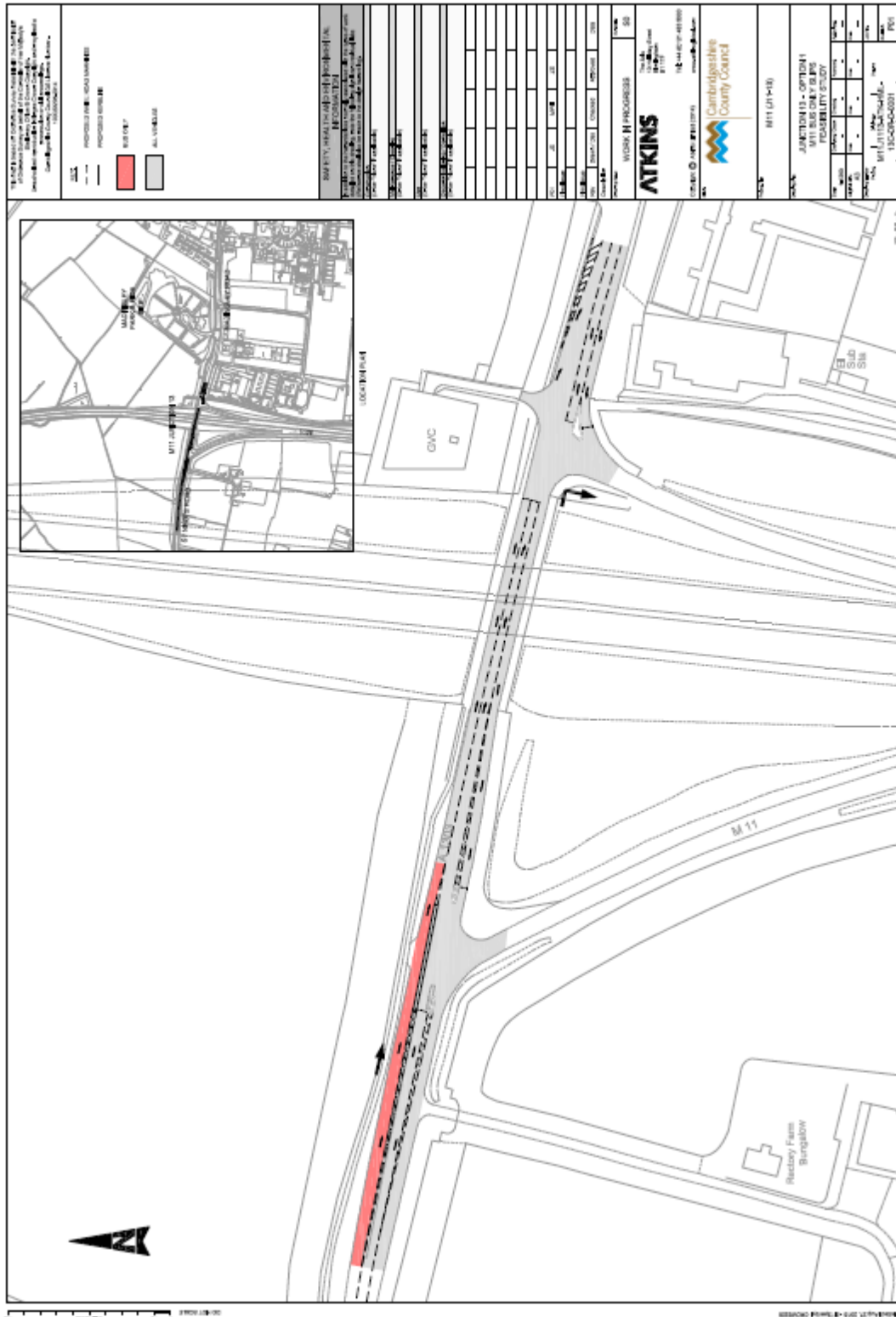


Map 4: J11 Concept C

Junction 13: Concept 1

This concept provides a bus-only lane eastbound over the M11 on Madingley Road towards Cambridge. No signals are present in this option, allowing the bus to continue forward

unobstructed. An introduction of bus detector loops would enable a 'green wave' across the bridge towards Cambridge and the M11 southbound. A new signal controlled junction would be required to the east of the bridge for the M11 southbound on-slip.

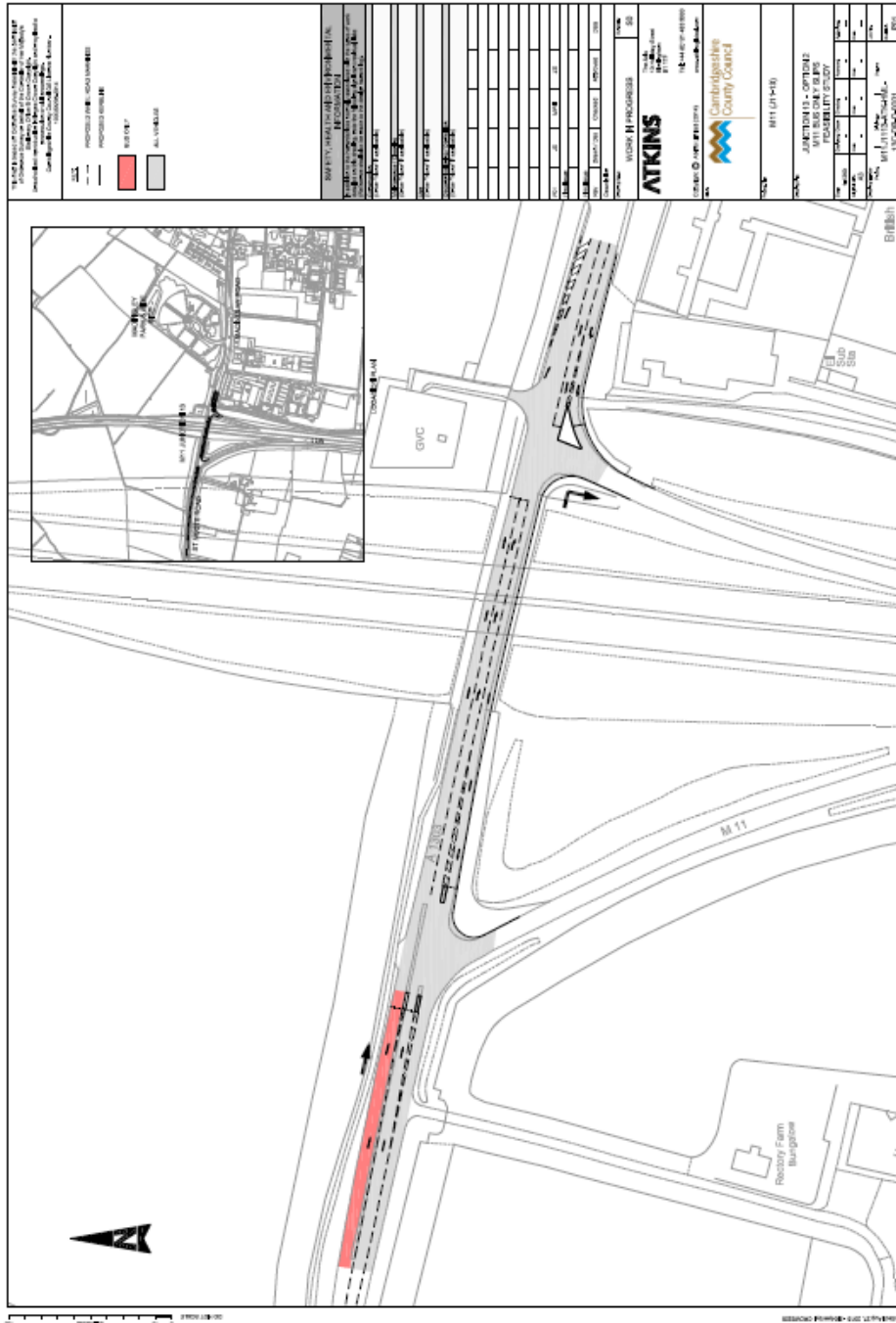


Map 5: J13 Concept 1

Junction 13: Concept 2

Concept 2 provides a bus priority measure based on vehicle detection on the eastbound approach to Madingley Road Bridge for buses turning right onto the M11. Buses can be held

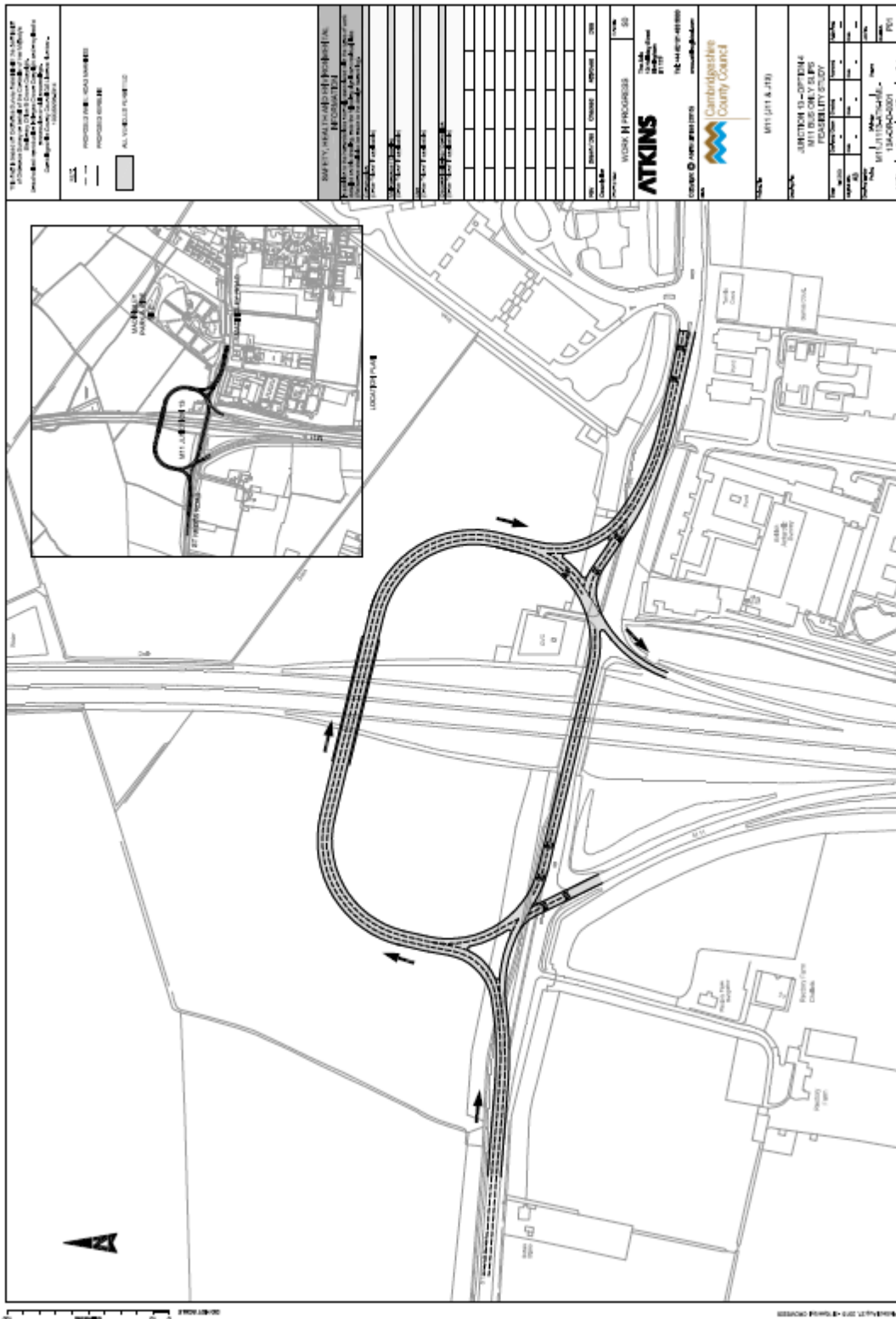
at the signals to allow traffic coming off the M11 to turn onto Madingley Road and merge into the straight-ahead lane unobstructed. Buses heading eastbound would have priority at the signals over other vehicles. The introduction of bus detector loops to enable a 'green wave' across the bridge towards Cambridge and the M11 southbound. A new signal controlled junction would be installed to the east of the bridge for the M11 southbound on-slip to ensure that traffic does not block back across the bridge preventing the bus gate from operating effectively.



Map 6: J13 Concept 2

Junction 13: Concept 4

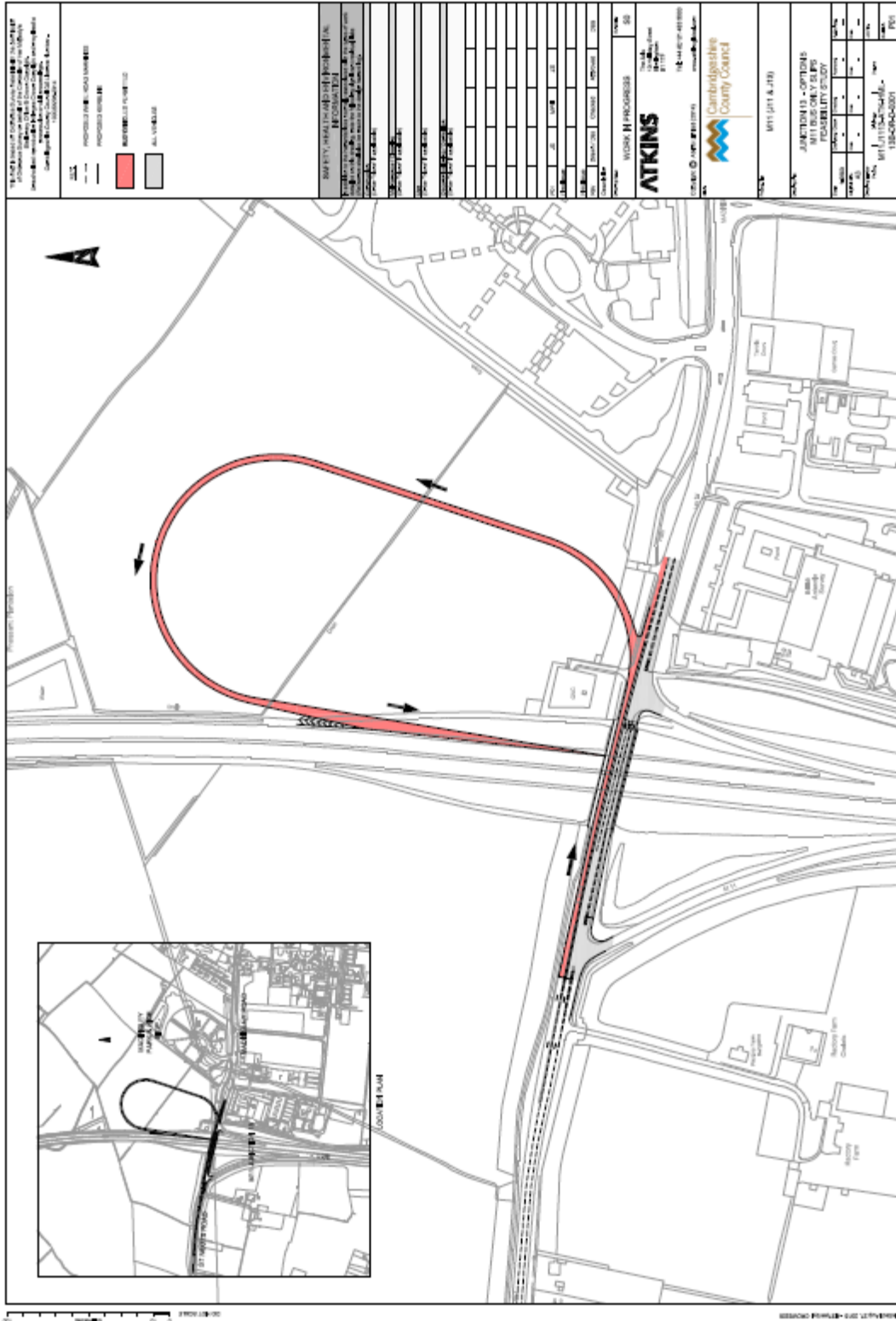
Concept 4 requires the construction of a new gyratory at the junction with all-traffic capacity. This would involve a new structure over the M11 to the north of the current bridge. The gyratory would accommodate 3 traffic lanes.



Map 7: J13 Concept 4

Junction 13: Concept 5

This concept provides of a bus-only loop to the north of Junction 13 to bring buses from the Madingley Road Bridge south onto the M11 prior to general traffic joining. In order to prevent buses turning right onto the slip road a bus lane is proposed to run across the bridge and down the loop, unopposed. A total of four lanes would run across the bridge (3 eastbound and 1 westbound). The potential for a bus stop to serve Madingley Park & Ride and the Cambridge North-west development was also discussed.



Map 8: J13 Concept 5

4.54 The shortlisted concepts for junctions 11 and 13 was sent to Highways England for comment. Highways England do not have any policy objections to the principle of bus priority measures at motorway junctions. Any objections are likely to relate to design issues such as adherence to standards or operation matters such as congestion or safety. In addition to this, while in policy terms new junctions on motorways can be supported for public transport interchanges there would nevertheless need to be a strong case, in particular justifying why access cannot reasonably be achieved via an existing junction.

4.5 Highways England also provided a number of technical comments for each of the concepts that would need to be reviewed should any of the concepts be progressed further, along with continued engagement.

4.6 As has been discussed any more detailed work on the concepts would be within the context of the A428/Western Orbital work. However it is recognised that it may be of interest to briefly summarise any known implications of each concept on these option development work for these projects and these are offered in Table 1.

Table 1: Concepts in the context of developing City Deal Schemes		
	A428	Western Orbital
J11 Concept A (bus only access road alongside existing slip)	No direct impact on options	<p>Only limited bus priority would be available approaching J11 as bus lane length would be limited by agricultural bridge - could affect business case</p> <p>Low penetration to Trumpington Meadows development – could affect business case</p> <p>If new P&R is created on west of motorway it would need to be joined via new bus link across motorway</p> <p>Does not fit well with a new busway next to M11 as no reason to take bus as far as J11.</p>
J11 Concept B (bus lane on existing slip)	No direct impact on options	As Concept A

Table 1: Concepts in the context of developing City Deal Schemes		
	A428	Western Orbital
J11 Concept C (new bus only route coming off before existing J11)	No direct impact on options	<p>Offers more 'bus priority' benefits because could avoid constraint of agricultural bridge.</p> <p>High level of penetration in Trumpington Meadow which could support business case</p> <p>Fits best with busway alongside M11 as otherwise it would create new interface with M11 itself which may not win support from HE – due to enforcement and safety issues.</p> <p>If new P&R is created on west of motorway it would need to be joined via new bus link across motorway</p>
J13 Concept 1 (bus lane across existing bridge)	<p>This option works against M11 running for buses because it does not address congestion at J13 from M11 so buses would be caught in general traffic queue unless Highways England (HE) agreed to hard shoulder running</p> <p>As such this option would tend to support a busway along side the M11 to avoid J13 altogether</p>	<p>This concept shows that it is possible to put a bus lane across the bridge which would support A428 options 1A and 1B however the key issue would be the cost to general traffic delay.</p> <p>It should be noted that Option 1C avoids the M11 bridge altogether.</p>
J13 Concept 2 (bus gate across existing bridge)	As concept 1	<p>This option involves a long phases of stationary traffic to allow buses to 'clear' the bridge. This could promote priority in line with A428 Options 1A and 1B but again at potential high cost to general traffic.</p>

	A428	Western Orbital
<u>J13 Concept 4</u> (new gyratory adding to existing junction)	<p>This concept could potentially support M11 running for buses if it reduced congestion at J13. In that case buses could receive a new bus lane on the junction approach close enough to make a difference.</p> <p>This concept could result in more traffic on local routes which may create congestion problems in other parts of the network that could negatively impact bus priority schemes on existing highway.</p>	<p>This option could support option 1A and 1B if it improved traffic flow across the M11 bridge and perhaps provided a direct arm to the Madingley Road P&R site (much of the delay on Madingley Road is currently due to the P&R junction) It could also provide an arm to the northern loop of option 1B.</p> <p>If capacity of junction 13 were increased for general traffic this may impact the business case for P&R at J11. If car journeys were made more attractive from J13 to J11 then this could impact business case for Western Orbital.</p>

Table 1: Concepts in the context of developing City Deal Schemes		
	A428	Western Orbital
J13 Concept 5 (new bus only slip road southbound)	<p>This option does not address the congestion issues at J13 for general traffic and so would not support M11 running north bound because buses would continue to be caught in existing queues.</p> <p>On the south bound it would provide priority access but in reality there is no need for this because the existing J13 southbound is only backed up if there is congestion on the motorway itself so this option would only work with hard shoulder running in that instance which is unlikely to be agreeable to HE.</p> <p>As such it does not seem possible to combine this option with a busway directly – buses would have to emerge onto the M11 and then re-join a busway at a later point – but again this may not be acceptable to HE</p>	<p>This concept has less direct impact on options 1A and 1B in itself however in practice it would likely need to be combined with concepts 1 or 2 above in order to allow for ‘Western Orbital’ buses to get to the new loop in a prioritised way. In this case the comments on concepts 1 and 2 above would also apply.</p>

Table 1: Brief review of concepts on A428/Western Orbital

4.7; The summary of Table 1 is that in each of the shortlisted concepts would have impacts on the preferred option development in one or the other or both of the linked projects. This further supports the recommendation that the key next steps are to establish preferred options for the linked projects to ensure congruence with consideration of the junctions.

4.8 Impacts on the local road network and the consistency with other City Deal scheme proposals (for example those that could be adopted in the city centre) would need to be fully understood before any assessment on impacts could be made. As such these designs are presented only as ‘concepts’ with no recommendation as to which would be preferred.

5 Next Steps

5.1 The pre-existing development work for both the A428/A1303 and Western Orbital schemes will continue including public consultation to be carried out with the aim of identifying a preferred option.

5.2 The bus priority concepts contained in this report may be considered further at a later date should they tie in with the preferred options identified in the A428/A1303 and/or Western Orbital study. At that stage other concepts may be generated. Any concepts developed as part of these other projects would be fully assessed for engineering, environmental and policy impacts.

6 Implications

6.1 In the writing of this report, taking into account financial, legal, staffing, risk management, equality and diversity, climate change, community safety and any other key issues, the following implications have been considered: -

Financial:	None
Legal:	There are no legal implications in this report.
Staffing:	Project management is undertaken by the Cambridgeshire County Council Major Infrastructure Delivery team.
Risk;	A full project risk register has been developed.
Equality & Diversity	There are no equality or diversity implications in this report.
Climate Change:	There are no climate change implications in this report.
Community Safety:	There are no community safety implications in this report.

Appendices

M11 BUS-ONLY SLIP-ROADS FEASIBILITY REPORT

Appendices to this document can be viewed via the following link:
<http://www.gccitydeal.co.uk/citydeal/info/2/transport/1/transport/3>

Background Papers

No other background papers were relied upon in the writing of this report.

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