**Business Case Template**

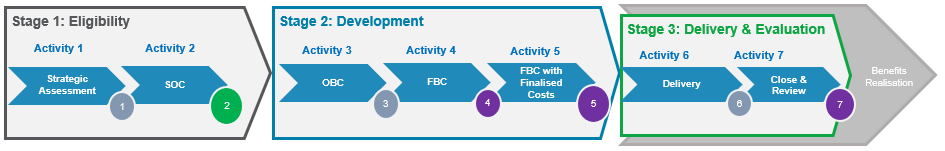
**What is the purpose of the Business Case?**

The Business Case Template is to be used in providing an Outline of Full Business Case to the West Yorkshire Combined Authority in line with the agreed Assurance Pathway for any given scheme. preferred

The Business Case must be completed by the Scheme Promoter (this is the organisation seeking the funding for a scheme they are delivering), and submitted to the Combined Authority along with any supporting documentation in order for any scheme to be appraised by the Combined Authority and approved to continue to the next Activity on the Assurance Process.

All Business Cases must be based on the 5 Case Model and follow [HM Treasury – The Green Book](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685903/The_Green_Book.pdf) guidance, and follow guidance as set out in the Leeds City Region Assurance Framework.

All Business Cases should also be proportional to the scale and complexity of a scheme as defined in the Leeds City Region Assurance Framework. For further advice on this, please contact the Combined Authority’s PMA and/or the Combined Authority Case Officer assigned to your scheme.



The Business Caseforms adetailed ‘five cases’ assessment of a scheme and builds on the evidence presented in the Expression of Interest. Its purpose is to present detailed information about a scheme and evidence that the scheme meets the strategic aims of the Combined Authority offers value for money a good return on investment, is affordable and deliverable. The Business Case will also form the basis on which any appropriate conditions precedent for a funding agreement can be identified.

|  |  |
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| **Case** | **Focus** |
| **Strategic Case:**  To set out the need for the scheme, and to define the outcomes and scope of the scheme.  **Does the scheme have a strong strategic case?** | * Revisit the case for change and update accordingly, summarising any changes * Does the case for change still exists? * Confirm that the preferred way forward still stands * Ensure clear evidence of:   1. Alignment to SEF Priorities   2. Objectives are SMART   3. Evidence of the need for intervention/market failure   4. Clearly identified barrier/opportunities the scheme will unlock   5. Evidence of stakeholder engagement |
| **Commercial Case:**  To set out the market demand for the scheme and the procurement strategy.  **Is there demand for the scheme and is it commercially viable?** | * Revisit the Commercial Case and update accordingly, summarising any changes * Is there still a market demand for the scheme? * To prepare the scheme for procurement with high level summary of procurement option(s)/preferred plan (OBC) * Set out detailed procurement plan (FBC) |
| **Economic Case:**  To include any options analysis and initial value for money assessment.  **Does the preferred project option demonstrate value for money and a good return on investment?** | * Revisit the Economic Case and update accordingly, summarising any changes * Revisit long and short list of options * Set out any options analysis and the initial Value for Money assessment of those short-listed options * To set out the detailed economic appraisal that will be undertaken as part of the FBC (OBC) * To undertake initial benefits appraisal (OBC) * Select and set out the Preferred Option (OBC) * Present an assessment of any of the uncertainties i.e. sensitivity analysis (OBC & FBC) * Present final benefits appraisal (FBC) * Set out the detailed economic appraisal of the Preferred Option and the Final VfM Statement (FBC) * Note for transport schemes this should include an Appraisal Specification Report * Note also that the Final VfM Statement should be updated following any procurement exercise |
| **Financial Case**:  To set out the scheme costs, including the funding and financial profile.  **Is the project financially viable, affordable and sustainable?** | * + Revisit the Financial Case and update accordingly, summarising any changes   + Update the project costs as detailed in the Initial Cost Plan and the funding profile and provide a Detailed Cost Plan   + Set out capital and revenue implications for preferred option   + Set out arrangements for dealing with cost risks and confirm 'match' funding is in place |
| **Management Case:**  To set out the governance and project management arrangements for the project, including how the project will be delivered.  **Is the project deliverable, are the objectives achievable and have all compliance issues been addressed?** | * + Revisit the Management Case and update accordingly, summarising any changes * Set out the necessary management arrangements for the successful delivery of the scheme * Set out the project management strategy, change management strategy, benefits realisation strategy, risk management strategy, communications strategy and post project evaluation strategy * Produce and update any related registers to the named strategies e.g. Risk Register, Benefits Realisation Plan |

**What happens once a Business Case is submitted?**

* On receipt of a completed OBC or FBC, the scheme’s assigned Combined Authority Case Officer will check the document to ensure all necessary information has been provided. Including any supporting documentation.
* The Combined Authority Case Officer will then arrange any necessary appraisal of the Business Case. This may involve internal appraisal by Combined Authority officers, external appraisal by independent third parties and/or a Peer Review.
* Once the Business Case has been appraised, the Combined Authority Case Officer will draft a Business Case Appraisal Report, summarising the results of the appraisal.
* This will be presented to the Portfolio Appraisal Team (PAT) along with the Business Case and or not a scheme will recommend whether should continue to the next activity in the Assurance Process, be rejected, of that further information is required in order for a recommendation to proceed is made.
* Once a scheme has been reviewed by the PAT, the Scheme Promoter and the author of the Business Case will be contacted to confirm the next steps.

**Completing the Business Case Template**

1. All sections **highlighted in yellow** to be completed by the Scheme Promoter. “*Advice for completion*” text within yellow boxes should be overwritten. Please do not write in white boxes.
2. **PLEASE NOTE – If this a Full Business Case, a summary of any key changes and their implications on the business case should be included in each section.**
3. Once completed, the Business Case should be submitted to the Combined Authority, along with any supporting documentation at [pma@westyorks-ca.gov.uk](mailto:pma@westyorks-ca.gov.uk).
4. The Combined Authority will endeavour to respond to applicants within one week to confirm receipt of the Business Case.
5. Guidance and examples for completing the form can be found within the template.
6. For further information or help in completing the template, please contact the Combined Authority via:
   * Email: [pma@westyorks-ca.gov.uk](mailto:pma@westyorks-ca.gov.uk)
   * Tel: 0113 2517421

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**OUTLINE BUSINESS CASE**

**(Activity Point 3)**

**A660 Lawnswood Roundabout Improvement Scheme**

**July 2023**

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| **Applicant Details** |

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| --- | --- |
| **Name of scheme:** | **A660 Lawnswood Roundabout Improvement Scheme** |
| **Scheme PMA Reference Code:** |  |
| **Business Case Stage** | Outline Business Case (Activity 3) |
| **Location of scheme (including postcode):** | The scheme encompasses improvements at the junction of the A660 Otley Road with the A6120 Ring Road, and also includes works along the section of the A660 Otley Road from Weetwood Road to Lawnswood cemetery. LS16 6EZ. |
| **Lead Organisation:** | Leeds City Council |
| **Type of organisation:** | Local Authority (Metropolitan District) |

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| **Lead contact:** | Morgan Tatchell-Evans |
| **Position:** | Graduate Transport Planner |
| **Phone number:** | 0113 37 83655 |
| **Email address:** | [Morgan.tatchellevans@leeds.gov.uk](mailto:Morgan.tatchellevans@leeds.gov.uk) |
| **Postal address:** | Transport Strategy, Leeds City Council, Merrion House, 110 Merrion Centre, LEEDS, LS2 8BB |

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| **Business Case Owner:** | Gary Bartlett |

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| **Combined Authority Lead / Programme Manager** | Caroline Coy |

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| **Is any information in this form is considered exempt from release under Section 41 of the Freedom of Information Act 2000** | **Yes** |  |
| **No** | **x** |

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| **Document Control** |

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| --- | --- | --- | --- |
| **Version** | **Date** | **Author** | **Checked** |
| 0.0 | 30/06/2023 | Morgan Tatchell-Evans | Rebecca Dickson |
| 0.1 | 03/07/2023 | Morgan Tatchell-Evans |  |

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| **Certificate of Approvals** |

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| To be completed by Combined Authority staff:  This business case has been appraised in accordance with the Leeds City Region Assurance Framework and approved by the following:  Note - the required approvals will depend on the agreed approval pathway set out and agreed for the scheme during Stage 1: Pipeline Eligibility, if it does not require a certain approval then mark as N/A | | | |
|  | **Approved (Y/N, n/a)** | **Signed** | **Date** |
| Combined Authority Case Officer: |  |  |  |
| Appraisal Team/Peer Review Team |  |  |  |
| Portfolio Appraisal Team: |  |  |  |
| Combined Authority Managing Director: |  |  |  |
| Investment Committee: |  |  |  |
| Combined Authority: |  |  |  |
| Other (Please State): |  |  |  |

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| **Glossary of Terms** | |
| **Acronym** | **Full Title** |
| **AADT** | **Annual Average Daily Traffic** |
| **AMAT** | **Active Mode Appraisal Toolkit** |
| **AMCB** | **Analysis of Monetised Costs and Benefits** |
| **ASR** | **Appraisal Specification Report** |
| **AST** | **Appraisal Summary Table** |
| **AVL** | **Automatic Vehicle Location** |
| **BCR** | **Benefit to Cost Ration** |
| **CDM** | **Construction Design and Management Regulations 2015** |
| **CERP** | **Carbon Emissions Reduction Pathways** |
| **CIP** | **Corridor Improvement Programme** |
| **CLTS** | **Connecting Leeds Transport Strategy** |
| **COBA-LT** | **Cost and Benefit to Accidents – Light Touch** |
| **CRSTS** | **City Region Sustainable Transport Settlement** |
| **CSF** | **Critical Success Factors** |
| **CWIS** | **Cycling and Walking Investment Strategy** |
| **DfT** | **Department for Transport** |
| **EATF** | **Emergency Active Travel Fund** |
| **EDCI** | **Equality, Diversity, Cohesion and Integration** |
| **EIA** | **Environmental Impact Assessment** |
| **FBC** | **Full Business Case** |
| **GPDO** | **General Permitted Development Order 2015** |
| **IVT** | **In-Vehicle Time** |
| **LCC** | **Leeds City Council** |
| **LMVR** | **Local Model Validation Report** |
| **LPTIP** | **Leeds Public Transport Investment Programme** |
| **LTM2** | **Leeds Transport Model** |
| **LTN** | **Local Transport Note** |
| **MCAT** | **Multi-Criteria Assessment Tool** |
| **MEC** | **Marginal External Cost** |
| **MECC** | **Marginal External Costs of Car** |
| **MOVA** | **Microprocessor Optimised Vehicle Actuation** |
| **NIA** | **Noise Important Areas** |
| **NPPF** | **National Planning Policy Framework** |
| **OBC** | **Outline Business Case** |
| **PA** | **Public Accounts** |
| **PVB** | **Present Value of Benefits** |
| **PVC** | **Present Value of Costs** |
| **QRA** | **Quantified Risk Assessment** |
| **SEF** | **Strategic Economic Framework** |
| **SRO** | **Senior Responsible Owner** |
| **TAG** | **Transport Analysis Guidance** |
| **TEE** | **Transport Economic Efficiency** |
| **TfN** | **Transport for the North** |
| **TOMs** | **Themes, Outcomes and Measures** |
| **TRL** | **Transport Research Laboratory** |
| **TUBA** | **Transport Users Benefits Appraisal** |
| **UTMC** | **Urban Traffic Management and Control** |
| **VA** | **Vehicle Actuation** |
| **VfM** | **Value for Money** |
| **WYCA** | **West Yorkshire Combined Authority** |
| **WYTS** | **West Yorkshire Transport Strategy** |

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| **1. Scheme Summary** |

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| **1.1 Scheme Description:** |
| The scheme seeks to improve road safety, provision for active modes and bus journey times and reliability at the Lawnswood roundabout (junction of A660 Otley Road with A6120 Ring Road). The short list of options developed as part of this business case include the following elements:   * + Introduction of a signalised roundabout at the Lawnswood junction, under Microprocessor Optimised Vehicle Actuation (MOVA) control (all options).   + Introduction of signalised pedestrian and cycle crossing facilities at the Lawnswood junction (all options).   + Introduction of segregated cycle facilities on all approaches to the Lawnswood junction, and connecting the new crossing facilities (all options).   + Reduce speed limit on eastern arm of junction from national speed limit (70 miles per hour) to 40 miles per hour (extents to be determined, all options).   + Introduction of a southbound bus lane on Otley Road, on the approach to the Lawnswood junction (‘Do Something – Preferred’ and ‘Do Something – More Ambitious’ only).   + Introduction of traffic signals at the Otley Road / Otley Old Road junction, under MOVA control (‘Do Something – More Ambitious’ only).   + Introduction of signalised pedestrian crossing facilities at the Otley Road / Otley Old Road junction, under MOVA control (‘Do Something – More Ambitious’ only).   + Introduction of segregated cycle facilities southbound on Otley Road, between Otley Old Road and Lawnswood roundabout (‘Do Something – More Ambitious’ only).   As set out in section 5, the modelling undertaken to support the economic case has predicted that the ‘Do Something – Preferred’ option would cause a significant issue with congestion for southbound traffic on Otley Old Road, which is served by a quarter hourly bus service. The ‘Do Something – Less Ambitious’ and ‘Do Something – More Ambitious’ do not experience this issue, and have therefore emerged as the most preferable options for delivery. Given the extent of funding available at present, the ‘Do Something – More Ambitious’ option is not considered deliverable until additional funding has been secured. The ‘Do Something – Less Ambitious’ option is therefore being treated as the preferred option in the business case, with the outstanding elements of the ‘Do Something – More Ambitious’ option (southbound bus lane on Otley Road and signalisation of Otley Road / Otley Old Road junction) to be subject to further development, and to be delivered at a later stage subject to additional funding being secured.  Figures 1 and 2 show the extents of the short list options. General Arrangement drawings are included in Appendix A.    **Figure 1. Extents of proposed scheme (Do Something – Less Ambitious).**    **Figure 2. Extents of proposed scheme (Do Something – Preferred and More Ambitious).** |

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| **1.2 Scheme Objectives:** |
| Scheme specific objectives have been identified, taking into consideration the objectives of the Corridor Improvement Programme Phase 2 (CIP2) and the City Region Sustainable Transport Settlement (CRSTS) funding packages, alongside the issues with the existing Lawnswood roundabout. The issues identified are as follows:   * **Poor safety record:** The junction has a poor safety record, with cyclists in particular suffering high levels of casualties. * **Poor active mode provision:** There are no signalised crossing facilities at the junction for pedestrians or cyclists, and no segregated cycling facilities for cyclists, meaning that the junction creates severance for active travel journeys. * **Poor provision for buses:** The junction has no capacity to prioritise bus journeys, which leads to buses experiencing significant delays at certain times of day, and substantial variability in journey times.   The proposed scheme seeks to improve safety, make bus services more attractive and provide facilities to encourage a safe increase in walking and cycling. By making public transport and active modes more attractive, the proposals are intended to encourage mode transfer from car, thus helping to reduce congestion, reduce carbon emissions and improve air quality.  The scheme will transform an outdated, car-dominated roundabout which discourages bus use, cycling and pedestrian activity. In its place will be a modern signalised junction which will prioritise activity by those users, and reduce the negative impacts currently caused by motorised modes in this location (severance, road traffic collisions, carbon emissions and poor air quality). It will be a highly visible improvement which will support the aspirations of the Connecting Leeds Transport Strategy (CLTS) and the West Yorkshire Transport Strategy (WYTS), which along with other projects in north Leeds, will lead to a less car dominated transport network where the demand for an increase in bus use, cycling and walking can be encouraged and accommodated.  Figure 3 illustrates how the objectives will be measured, and at what timeframe. The Logic Map provided in Appendix B illustrates how the objectives relate to the inputs, activities, outputs and outcomes which will characterise the proposed scheme.    **Figure 3. Scheme specific SMART objectives.**  Table 1 sets out how the proposed scheme will meet the objectives. The objectives are then listed in Table 2.  **Table 1.** How the scheme-specific objectives will be met.   |  |  | | --- | --- | | **Objective** | **How this will be met by the proposed scheme** | | Improve network safety for all users | The current roundabout has high levels of personal-injury collisions, many of which involve cyclists. By introducing segregated cycle tracks and signalised cycle crossings, all of the short list options reduce the risk of conflict between cycles and motor vehicles. By signalising the roundabout, the scheme also reduces risk of vehicles emerging onto the roundabout into the path of circulating vehicles, including for cyclists choosing to remain within the carriageway. New pedestrian crossing facilities will make the junction safer for pedestrians. | | Facilitate modal shift towards walking/wheeling | The current roundabout has only informal, non-signalised crossing facilities for pedestrians. Observation has found that pedestrians often have to wait for long periods before a suitable opportunity to cross arises, and respondents to consultation have highlighted that crossing here feels unsafe. All of the short list options include new signalised pedestrian crossing facilities on all arms of the roundabout which will make crossing feel safer and more attractive for pedestrians. The target 50% increase has been selected due to a similar increase observed in pedestrian footfall at the nearby A6120 / A61 junction, at which traffic signals and pedestrian crossings were recently introduced.  The ‘Do Something – More Ambitious’ option additionally proposes new signalised pedestrian crossings at the Otley Road / Otley Old Road junction, which would improve the pedestrian facilities in this location, including improving access to/from bus stops. | | Facilitate modal shift towards cycling | The current roundabout has a priority arrangement with 3 and 4 lane approaches and 2 circulatory lanes, with no segregation provided for cyclists. During consultation, many cyclists have identified this roundabout as feeling unsafe. All of the short list options would introduce segregated cycle tracks on the approaches to the roundabout, connecting to signalised crossings for cyclists on each arm of the roundabout, making the roundabout much safer and more attractive to cyclists.  The proposed new shared bus, taxi and pedal cycle lane on the southbound approach to the roundabout on Otley Road (included in the ‘Do Something – Preferred’ and ‘Do Something – More Ambitious’ options) will also provide separation between cyclists and general traffic in this location.  The ‘Do Something – More Ambitious’ option would also include segregated cycle facilities southbound on Otley Road between Otley Old Road and Lawnswood roundabout, and would provide facilities for cyclists at the Otley Road / Otley Old Road junction.  The target 50% increase has been selected due to a similar increase observed in cycle traffic at the nearby A6120 / A61 junction, at which traffic signals and segregated cycle tracks were recently introduced. | | Improve bus journey times | Under the current priority roundabout arrangement, buses experience significant delays at certain times, as well as significant variability in journey times, due to needing to wait for an opportunity to enter the roundabout. The proposed signalised roundabout (included in all short list options) will have the capability to adjust signal timings in real time to reduce the likelihood of approaching buses being delayed at a red light, by using MOVA technology. This will help to protect buses from delays at the roundabout, and will enable the prioritisation of buses ahead of general traffic, hence providing a relative benefit to buses over and above general traffic.  The proposed new bus, taxi and pedal cycle lane on Otley Road (included in the ‘Do Something – Preferred’ and ‘Do something – More Ambitious’ options) will also protect buses from queuing on the southbound approach to the roundabout.  By signalising the Otley Road / Otley Old Road junction, the ‘Do Something – More Ambitious’ option would additionally help to reduce the significant delays and variability currently affecting southbound buses on Otley Old Road, and would enable all buses passing through this junction to be prioritised ahead of general traffic through the use of MOVA technology. | | Improve punctuality of bus services | |

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| **Table 2: Scheme Objectives** | |
| **Objective No.** | **Scheme Objective** |
| 1 | Improve network safety for all users |
| 2 | Facilitate modal shift towards walking/wheeling |
| 3 | Facilitate modal shift towards cycling |
| 4 | Improve bus journey times |
| 5 | Improve punctuality of bus services |

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| **1.3 Key activities to be funded:** |
| The Combined Authority funding is to provide the majority of the funding for this scheme, and will fund the scheme as a whole (construction, design work, stakeholder engagement, monitoring and evaluation etc.). The only other funding source identified for this scheme is Section 106 contributions, which are expected to provide £676,963.96. The Section 106 funding has not been allocated to any specific element of the scheme, rather to the scheme as a whole. |

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| **Scheme Programme:** | **Scheme Start Date** | **Scheme End Date** |
| Forecasted Full Approval Date: April 2024 | Forecasted Completion Date: July 2025 |
| **Total Scheme Cost (£m):** | Do Something – Less ambitious: £13,050,442.02  Do Something – Preferred: £13,067,850.19  Do Something – More ambitious: £17,617,412.35  As detailed in the economic case, the scheme promoter’s preferred approach is to deliver the Do Something – Less Ambitious option as Phase 1 of the scheme, using funding already allocated to this scheme through the Corridor Improvement Programme Phase 2, the City Region Sustainable Transport Settlement, and from section 106 contributions. The intention would then be to deliver the outstanding elements of the Do Something – More Ambitious options as a second phase, subject to sufficient additional funding being secured at a later date. | |
| **Combined Authority funding (£m):** | £12,373,478 (for Do Something – Less Ambitious option)  Note that the funding currently allocated from Combined Authority funding comprises £9,200,000 from CRSTS, and £825,807 from CIP2. This leaves a short fall of £2,347,671 in the current required funding from the Combined Authority (in order to deliver the Do Something – Less Ambitious option).  A review of the CRSTS fund is currently underway, and it has been agreed between officers at Leeds City Council (LCC) and at the Combined Authority that this review will be used as an opportunity to reallocate funding to Lawnswood from other schemes (subject to approval of the current OBC), to the extent required to make up the identified shortfall. The review is set to conclude in August 2023.  Delivery of the remaining elements of the Do Something – More Ambitious option would require an estimated £4,566,970.34 of additional funding to be secured. It is proposed that sources for this additional funding be sought by LCC separately from the current Activity Point 3 approvals process. | |
| **Combined Authority funds as % of total scheme investment:** | 94.8% (for Do Something – Less Ambitious option) | |
| **Total other public sector investment (£m)** | None | |
| **Total other private sector investment (£m):** | It is anticipated that £676,963.96 of section 106 funding will be available for this scheme, subject to legal advice and approval to spend. | |
| **Applicable Funding Stream:** | CIP2 is funding the development of this scheme to OBC stage (£825,807). Funding for continued development and delivery of the scheme has been secured from CRSTS. £9.2 million has been allocated to the Lawnswood scheme within CRSTS, and, as noted earlier in this table, additional funding is anticipated to be allocated to Lawnswood within CRSTS to cover the existing shortfall required to deliver the Do Something – Less Ambitious option (subject to the approval of the current OBC).  Delivery of the remaining elements of the Do Something – More Ambitious option would require additional funding to be secured. | |
| **Strategic Economic Framework Priority Area:** | Which priority of the [Strategic Economic Framework (SEF)](https://www.westyorks-ca.gov.uk/growing-the-economy/strategic-economic-framework/) will the project help deliver:   * Boosting Productivity * Enabling Inclusive Growth * Tackling the Climate Emergency * Delivering 21st Century Transport * Securing Money and Powers  |  |  | | --- | --- | | SEF Priority | How the project will help to deliver | | Boosting Productivity | By making more efficient modes of transport (cycling, walking and bus) more attractive, the scheme is expected to encourage modal shift away from private car, thereby increasing the carrying capacity of the corridor, and boosting productivity.  Under the proposed signalised roundabout arrangement (included in all short list options), increases in traffic would result in smaller increases in delay than the current layout. This improves network resilience, insofar as closures on alternative routes resulting in temporarily increased traffic at Lawnswood would have less impact on journey times. By improving reliability of journey times at the roundabout for all modes, the scheme would help to increase confidence in the highway network and boost productivity. | | Enabling Inclusive Growth | By improving facilities for cheaper modes of transport (cycling, walking and bus), the scheme reduces car dependence and improves access to opportunities for those unable to afford access to a car. | | Tackling the Climate Emergency | By generating modal shift away from private car, the scheme is expected to reduce operational carbon emissions. More broadly, whilst the modal shift generated by this specific scheme may be modest, the scheme plays a part in transforming the transport infrastructure in Leeds so as to facilitate the large increases in active travel (and associated reduction in car use) targeted as part of the Connecting Leeds Transport Strategy. | | Delivering 21st Century Transport | The scheme supports this priority by prioritising buses over general traffic, making bus use more attractive and helping to increase bus patronage. | | Securing Money and Powers | Not directly supported by this scheme. | | |

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| **2. Strategic Case** |

The purpose of the Strategic Case is to set out the strategic drivers for this investment and the associated strategies, programmes and plans both locally and nationally. This should be based upon a robust evidence base which demonstrates a case for change.

**Note – All sections should be reviewed and updated if this is the Full Business Case. A summary of any key changes and their implications on the business case should be included.**

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| **2.1 The Strategic Context** |
| 2.1.1 What are the strategic drivers for this investment? |
| Regional economic context  The Leeds City Region is the largest UK economy outside of London, and is critical to the North’s and the UK’s success. With an economy worth over £62 billion, Leeds City Region accounts for 5% of the UK’s economic output and a fifth of the output of the Northern Powerhouse. The West Yorkshire Combined Authority (WYCA), which was formed in April 2014, is the Local Transport Authority and has responsibility for transport, economic development and regeneration in the five West Yorkshire Districts of Bradford, Calderdale, Kirklees, Leeds and Wakefield. LCC is the planning and highways authority for the Leeds district.  Leeds city centre plays a key economic and strategic role at the heart of the Leeds district and Leeds City Region, accounting for 27% of all jobs in Leeds. This concentration of economic activity within the city centre has resulted in Leeds being the second most attractive core city for inward investment, with the fastest rate of private sector jobs growth and largest wage increases of any city in the region. Hence, it is anticipated that there will be an increase in jobs (and the need to access these jobs) in the future.  However, there are existing transport challenges which negatively impact on current businesses in the city centre and on the future growth:   * Commuting into Leeds city centre is currently dominated by car, with levels of car trips into the city centre much higher than in other UK core cities. * There is currently congestion - with extended and highly variable journey times – during the morning and evening peak periods along key radial routes into the City Centre, such as the A660 corridor, and along the strategic orbital A6120 Ring Road around part of the north of the city. * Congestion is constraining the attractiveness of the city centre for both current and prospective employers, employees and investors. This consequently hampers business and economic growth potential due to the difficulties in accessing the city centre and other key employment sites. * Rising congestion levels has contributed to Leeds suffering from poor air quality, particularly in the city centre.   The West Yorkshire Transport Strategy (WYTS) document is set out as a 20-year vision for modern, high quality and integrated transport systems supporting the Leeds City Region Enterprise Partnership’s Strategic Economic Plan (now replaced by the Strategic Economic Framework). The WYTS, underpinned by the Strategic Economic Framework and regional econometric forecasting, sets out an anticipated increase in population from 2015 to 2035 of over 12%. In a similar timeframe, the population of the Leeds City Region will grow from 3 to 3.4 million.  The growth will contribute towards more commuter and business travel, which cannot be accommodated by private motorised transport without worsening congestion, air quality and noise issues, and increasing carbon emissions. Measures to make alternatives to the private car more accessible and more attractive are therefore essential in ensuring that this growth in travel demand can be accommodated in a sustainable manner.  The existing roundabout  Lawnswood roundabout sits at the junction of the A660 Otley Road with the A6120 Ring Road, in northwest Leeds. The roundabout has a priority arrangement with 3 and 4 lane approaches and 2 circulatory lanes, with informal crossings for pedestrians on each arm, and no segregation provided for cyclists.  The A660 is a busy transport corridor in the north-west of Leeds that connects residential areas of northwest Leeds to Leeds city centre via Headingley, and also provides connectivity to three of the city’s universities. The A6120 in this location is a dual carriageway, with 2 lanes of traffic in each direction, and carries a high volume of traffic, often making medium to long distance journeys, since the road provides connectivity to the motorway network. As a result, Lawnswood roundabout serves a number of functions, accommodating local trips to and from Headingley, trips to the city centre and universities and longer distance trips making use of the motorway network.  Speed limits of 40 miles per hour (mph) are in force on the northern (A660) and western (A6120) arms of the roundabout, with a 30 mph speed limit on the southern arm (A660) and the national speed limit (70 mph) in force on the eastern arm (A6120).  The Connecting Leeds Transport Strategy (CLTS) states LCC’s desire to “maintain the Outer Ring Road as the primary route for vehicle trips around the city in order to support the transformation of our local streets”. This highlights the need for the Lawnswood roundabout to continue to be able to accommodate large numbers of vehicle movements, particularly east-west movements, whilst also facilitating a modal shift away from private car for trips crossing the ring road in particular, in line with the broader ambitions within the CLTS (as discussed in more detail in section 2.1.4).  Surveys undertaken in June 2022 found that the roundabout accommodates over 45,000 motor vehicle movements between 7am and 7pm on a typical weekday, with high traffic volumes on all 4 approaches.  In the immediate vicinity of the roundabout, there is a large high school on its southwest corner (Lawnswood School), University of Leeds sports facilities to the northeast, a hotel to the southeast and residential properties to the northwest.  Road traffic collision record  Between 1st October 2017 and 30th September 2022, there were 18 personal-injury collisions at the roundabout, resulting in 24 casualties, of which 5 were seriously injured. Six of the casualties were pedal cyclists. Personal-injury collisions at the roundabout typically include entering versus circulating conflicts, or rear-end shunts. The roundabout was listed 8th on Leeds City Council’s 2022 Sites for Concern report, and has been listed between 2nd and 8th on the list each year from 2016 onwards, demonstrating a long standing road safety issue. All other sites within the top 10 of the 2022 Sites for Concern report have either received a recent intervention, or have an intervention planned. The poor collision record at Lawnswood clearly demonstrates a need for an intervention. Signalising the junction as proposed would help to reduce the likelihood of entering versus circulating conflicts as vehicles would enter the roundabout under signal control. It also reduces the likelihood of rear-end shunts, which are mostly caused by a driver at the head of a queue remaining stationery while the following vehicle wrongly anticipates that the vehicle in front will perceive a particular gap in traffic to be sufficient to allow entry to the roundabout. In terms of collisions involving cyclists, these will be made less likely firstly by the likelihood that most cyclists would use the proposed segregated facilities, and also by the broader safety benefits of signalisation for those cyclists remaining within the carriageway.  Despite the lack of formal pedestrian crossings at the junction, there have thankfully been no recorded pedestrian casualties at the junction in recent years. Nevertheless, observations of pedestrian behaviour at the junction have found that pedestrians often cross during relatively short gaps in oncoming traffic, because of the lack of safer opportunities to cross. There is therefore clearly a risk of pedestrian casualties, and the proposed introduction of signalised pedestrian crossings will reduce this risk by providing frequent opportunities to cross the carriageway under traffic signal control. The existing situation also disproportionately impacts groups with some protected characteristics, including older people and people with mobility impairments, who might find it more difficult to cross during the short gaps in traffic currently available. These groups in particular would benefit from the proposed signalised crossings.  Active travel  Sport England’s most recent Active Lives survey[[1]](#footnote-2) found that around 33% of children in Leeds in school years 1 to 11 undertook less than 30 minutes of physical activity per day, and only around 49% achieved the Chief Medical Officers’ guidelines of taking part in an average of 60 minutes or more of sport and physical activity per day. This is slightly better than the national average of 47%, but remains as an issue representing negative health impacts for children in Leeds. Whilst around 64% of adults in Leeds achieved the Chief Medical Officers’ guidelines of undertaking at least 150 minutes of physical activity per week, around 28% undertook less than 30 minutes exercise per week[[2]](#footnote-3).  Active travel represents an opportunity for increased physical activity, and given the proximity of the proposed scheme to a large high school, as well as the presence of four primary schools within 1km of the roundabout, it is especially important that the transport infrastructure in this area not create a barrier to active travel to school.  There exists potential for a high modal share for active modes for trips over the short distances between shops in Headingley and Weetwood and Lawnswood School, and residential areas to the north of the A6120. However, the unsafe nature of the existing Lawnswood roundabout and its lack of facilities for walking, wheeling and cycling are almost certainly suppressing demand for trips by active modes, and encouraging use of private cars in preference.  Surveys undertaken in June 2022 found between 250 and 435 cyclists traversed the roundabout within the carriageway, daily, between 7am and 7pm (including weekends). A further 37 to 53 cycle movements were recorded on the footways surrounding the junction each day[[3]](#footnote-4). Cyclists represent less than 1% of traffic through the roundabout, whereas surveys undertaken in March 2022 found that bicycles account for around 3.6% of traffic on Otley Road north of St Michael’s Road (2.4km south of Lawnswood roundabout). This contrast lends weight to the above assertion that Lawnswood roundabout represents a barrier to trips using active modes.  The surveys undertaken in June 2022 counted an average of 1,032 instances of pedestrians either using (52) or passing (980) a crossing point at Lawnswood roundabout in an average weekday, between 7am and 7pm[[4]](#footnote-5).  Respondents to a public consultation exercise undertaken between November 2021 and January 2022 reported taking detours to avoid crossing this junction on foot or by bicycle, and a number of respondents identified the roundabout as a barrier to people making trips crossing the A6120 by active modes. A number of respondents to this consultation also highlighted issues at the Otley Road / Otley Old Road junction, specifically (i) concerns that northbound cyclists on Otley Road are at risk of collision with vehicles turning left into Otley Old Road, and (ii) the lack of formal crossing facilities, which impairs access to bus stops for residents of Otley Old Road.  Experience from the recently implemented scheme at the junction of A61 Harrogate Road with A6120 Ring Road (4km east of Lawnswood roundabout), which similarly implemented new signalised crossing facilities and segregated cycle tracks, found 52% and 51% increases in pedestrian and cycle volumes, respectively, at the junction one year post-opening of the scheme.  The above demonstrates that the already significant level of active trips through Lawnswood roundabout would benefit greatly from the introduction of traffic signal control, signalised crossings and segregated cycle tracks, and that trips by active modes would be likely to increase as a result. There is also demand for improvement to active travel facilities at the Otley Road / Otley Old Road junction, and improvements to these facilities would help to make active travel a more attractive and accessible option for journeys passing through this junction, as well as improving access to bus services.  Public transport  The A660 is a high frequency bus route, with 19 services inbound in the peak hour and 17 services outbound. Of these services, 10 traverse the Lawnswood roundabout in each direction during the peak hour whilst in service (services 6, 8 and X84). In addition, the number 1 service runs twice per hour in each direction, terminating immediately to the south of Lawnswood roundabout on outbound journeys, and uses the roundabout to access the first stop of its inbound route (which is south of the roundabout). Leeds City Council’s annual cordon count in June 2022 found that an average of over 2,000 bus users passed the cordon inbound on the A660 Woodhouse Lane, north of Clarendon Road, between 7 and 10 AM. Whilst not all of these bus users will have undertaken bus journeys passing through Lawnswood roundabout, all of the buses in question will have passed through the roundabout and therefore all of these journeys will be impacted by the variability of bus journey times in this location.  The A6120 Ring Road at present accommodates a low frequency bus route (7 eastbound and 8 westbound services passing through Lawnswood roundabout each weekday), operated by Squarepeg. AVL data is not available for these services.  Bus services using the roundabout experience significant delays. Analysis of bus AVL data for services 6, 8 and X84 on Tuesdays, Wednesdays and Thursdays, November 2022 to March 2023 (excluding December), presented in Table 3, found that outbound buses between 8 and 9AM took over 1 minute longer than off peak services, and outbound buses between 5 and 6PM took over 1.5 minutes longer than offpeak services. Inbound services on the Otley Road route experience generally shorter delays, but inbound services on Otley Old Road between 8 and 9AM take over 1 minute longer than offpeak services, due to a combination of delays at the roundabout and at the Otley Road / Otley Old Road junction. Journey time variability is also a significant issue, with 95th percentile journey times being 1.0 to 2.4 minutes longer than mean journey times during the peak periods, depending on the service number and direction.  **Table 3. Bus journey times for services traversing Lawnswood roundabout, based on AVL data for November 2022 and January to March 2023, Tuesday to Thursday only (times presented in decimal minutes).**   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Time period | Otley Road route inbound  (Lawnswood YMCA to Lawnswood School) | | Otley Old Road route inbound  (Spennithorne Drive to Lawnswood School) | | Otley Road route outbound  (Ancaster Road to Weetwood Police Station) | | Otley Old Road route outbound  (Ancaster Road to Weetwood Police Station) | | | Mean | 95th percentile | Mean | 95th percentile | Mean | 95th percentile | Mean | 95th percentile | | 8-9AM | 1.3 | 2.6 | 2.4 | 4.6 | 2.7 | 5.1 | 2.6 | 4.8 | | 10AM-4PM | 1.1 | 1.7 | 1.6 | 2.7 | 2.0 | 2.8 | 1.8 | 2.9 | | 5-6PM | 1.2 | 2.2 | 2.1 | 4.0 | 3.2 | 5.3 | 3.1 | 5.5 | | 7PM-7AM | 0.9 | 1.4 | 1.3 | 1.9 | 1.7 | 2.3 | 1.4 | 2.0 |   By introducing a southbound bus, taxi and cycle lane on Otley Road, on the approach to Lawnswood roundabout, the ‘Do Something – Preferred’ and ‘Do Something – More Ambitious’ options would enable southbound buses on Otley Road to bypass any queuing along this section. The proposed traffic signals at Lawnswood roundabout (included in all options) will also enable prioritisation of bus movements through the junction. The proposed traffic signals at the Otley Road / Otley Old Road junction (included in the ‘Do Something – More Ambitious’ option) would also enable prioritisation of buses ahead of general traffic at this junction, and would help to resolve the existing issue with delays for southbound buses on Otley Old Road. Traffic modelling undertaken as part of the development of these proposals has shown that bus users will experience an overall benefit from the delivery of the ‘Do Something – Less Ambitious’ and ‘Do Something – More Ambitious’ options.  Congestion  The A660 corridor is heavily congested, creating delays for much of the day, as well as creating issues with noise and air quality. On a typical weekday between 7am and 7pm, the A660 corridor through central Headingley accommodates around 12,000-14,000 motor vehicle movements, and around 440 cycle journeys. Analysis of Trafficmaster data from 2019 found average delays for inbound traffic on the corridor in the morning peak of over 2.5 minutes per mile, and almost 4 minutes per mile outbound in the afternoon peak, between the junctions with Portland Way in the city centre, and Holt Lane in Adel. This congestion impacts both private vehicles and buses, but buses are particularly badly affected due to their inability to switch routes to avoid congestion.  For the Lawnswood roundabout specifically, Trafficmaster data from 2021 shows outbound journey times on the northbound approach to the roundabout being almost one minute longer on average between 4 and 5pm than between 10am and 4pm.  Recent upgrades of traffic signals on the A660 corridor delivered as part of the Leeds Public Transport Investment Programme (LPTIP) have optimised the efficiency of traffic movements along the corridor. Further significant increases in the capacity of the corridor for general traffic cannot be delivered without major changes to the landscape of the corridor, which would be unlikely to find political or public support, and which would not be consistent with the ambitions of the CLTS to reduce car use. Efforts to tackle congestion on this corridor must therefore focus on making alternative modes more attractive and thereby generating modal shift away from car. This scheme will contribute to those efforts as described above, and will therefore help to increase the effective carrying capacity of the A660 corridor.  Traffic modelling undertaken as part of the development of these proposals has shown that the proposed signalised roundabout will be able to accommodate traffic volumes at or slightly above the volumes recorded in traffic surveys undertaken in June 2022 without generating large delays. The scheme is therefore expected to deliver improvements for active modes and buses without large journey time increases for general traffic, and without compromising the role of the A6120 Ring Road as the primary orbital route for motorised traffic around the city.  A map of the average number of cars or vans per household, derived from the 2021 Census, for the area around Lawnswood roundabout, is shown in Figure 4[[5]](#footnote-6). The figure shows that the areas immediately adjacent to the scheme predominantly have more cars per household than the Leeds average of 1.10, although some areas served by buses on Otley Old Road (which travel via Lawnswood roundabout) have lower rates of car ownership. It is also important to note that the presence of a high school and University of Leeds sports facilities within the vicinity of the roundabout means that many trips through the roundabout will be undertaken by children and young people, who have lower access to cars.  Access to employment opportunities in the area is affected by the provision of public transport facilities. At the 2021 census, 28.7% of households in Leeds do not have access to a car and it is estimated that 1 in 5 workers have previously been forced to turn down a job due to poor public transport opportunities to travel to work. Without the scheme investment providing improvements to public transport and active travel accessibility, residents will continue to experience challenges in accessing employment opportunities and this in turn will continue to impact on deprivation locally. While 29% of households across Leeds do not have access to a car, car ownership in the area surrounding the scheme is high, with households in several adjacent LSOAs having access to one or more cars on average. Improvements to active travel facilities and prioritisation of bus journeys in this area will provide increased incentive for people to consider more sustainable modes of transport.    **Figure 4. Car ownership levels in the vicinity of Lawnswood roundabout.**  The current Leeds Site Allocations Development Plan[[6]](#footnote-7) includes a number of sites on the A660 corridor approved for development, with approved sites within 2 kilometres of the A660 corridor, between Lawnswood roundabout and the boundary with North Yorkshire, amounting to over 2,700 housing units, in addition to over 5,000 m2 of office space and over 6 hectares of employment area. This highlights the likelihood of increasing demand for travel along the A660 corridor in the coming years, and, as noted in the opening ‘Regional economic context’ sub-section of this answer, it is imperative that this increasing demand is met with improved provision for travel via sustainable modes which make efficient use of existing road space.  Noise  Road transport is a major contributor to noise. There is evidence that noise can cause increased risk of heart attacks and strokes, as well as causing sleep disturbance and annoyance[[7]](#footnote-8).  There are two Noise Important Areas (NIA) within the extent of the Site Boundary, both designated for road sources; these are NIA 2922 which covers residential properties to the west of Lawnswood roundabout along the A6120, and NIA 14828 along Otley Road (A660) to the south of Lawnswood roundabout. A further NIA (NIA 2924), also designated for road sources, is located within 300m of the site to the south on Otley Road (A660). As the scheme is not expected to lead to a significant increase in traffic volumes or speeds within the extents of the scheme, there is not expected to be a perceptible increase in noise levels. Noise modelling work is to be undertaken to investigate this issue further, and the results of this will be included in the Full Business Case. The wider impact is expected to be a reduction in motor vehicle traffic due to modal shift to active modes and buses. This will tend to reduce noise impacts in the wider area.  Air Quality  Vehicular emissions are one of the main contributors to poor air quality, particularly in urban areas[[8]](#footnote-9). Poor air quality has a number of health impacts, such as exacerbating symptoms of lung or heart conditions, and increased susceptibility to respiratory infections and allergens. Air pollution can also have negative impacts on biodiversity.  There are no Air Quality Management areas within 1 mile of the proposed scheme. Diffusion tube monitoring in the immediate vicinity of Lawnswood roundabout in 2018 and 2019 found average concentrations of NO2 ranging from 29 to 42 micrograms per cubic metre (). Of the seven diffusion tubes sited at the roundabout in 2018, only one recorded an average concentration of NO2 exceeding the statutory annual mean limit value of 40 [[9]](#footnote-10). Neither of the two diffusion tubes sited at the roundabout in 2019 record an average concentration in excess of 40 . As the scheme is expected to encourage modal shift away from private car, the scheme is expected to improve air quality overall. The impact on air quality in the immediate vicinity of the roundabout and the Otley Old Road junction is less clear, as vehicle behaviours will change as a result of the introduction of traffic signals. Air quality modelling is to be undertaken to investigate this issue further, and the results of this will be included in the Full Business Case. At this stage, no significant change in air quality in the immediate vicinity of Lawnswood roundabout is anticipated as a result of this scheme, as the scheme is not expected to have a large impact on traffic volumes. |
| 2.1.2 How will the scheme contribute to the achievement of the [Strategic Economic Framework (SEF)](https://www.westyorks-ca.gov.uk/growing-the-economy/strategic-economic-framework/)? |
| |  |  | | --- | --- | | SEF Priority | Scheme Contribution | | **Boosting Productivity**  Helping businesses to grow and invest in the region and their workforce, to drive economic growth, increase innovation and create jobs | The scheme contributes to the SEF priority Boosting Productivity by improving connectivity between northwest Leeds and the city centre. The A660 Otley Road is a key radial route and currently suffers from issues with congestion. The section of the A660 running through Headingley in particular is broadly considered to have no capacity for additional traffic.  Forecast economic growth in the Leeds City Region, and new housing and employment developments on the A660 corridor (as detailed in section 2.1.1) will increase demand for travel on the A660 corridor. This demand cannot be accommodated through additional car trips, and therefore bus and active modes must be made more attractive to enable the additional demand to be met by these modes. If this is not achieved, congestion will continue to constrain travel on the corridor, which in turn will constrain investment and economic growth.  The Lawnswood roundabout currently acts as a barrier to travel via active modes due to its lack of safe crossing facilities and lack of segregation for cyclists.  Its lack of capacity to prioritise bus movements also leads to delays at certain times of day, and considerable variability in bus journey times during the peak periods. All of the short list options represent a step change improvement in provision for active modes at Lawnswood, and will also protect buses from delays at the roundabout. This will ensure that the roundabout does not present a barrier to boosting productivity.  Under the proposed signalised roundabout arrangement, increases in traffic would result in smaller increases in delay than the current layout. This improves network resilience, insofar as closures on alternative routes resulting in temporarily increased traffic at Lawnswood would have less impact on journey times. By improving reliability of journey times at the roundabout for all modes, the scheme would therefore increase confidence in the highway network and boost productivity. | | **Enabling Inclusive Growth**  Enabling as many people as possible to contribute to, and benefit from, economic growth in our communities and towns. | Responses to public consultation suggest that some existing pedestrians and cyclists avoid Lawnswood roundabout because they consider it to be unsafe. These people therefore take significant detours in order to use routes which they view as being safe. By making the roundabout safer and more attractive for cyclists and pedestrians, all of the short list options would enable existing active travellers to use more direct routes, and would also increase the range of people for whom active travel is a viable option.  The scheme will also enable buses to be prioritised ahead of general traffic, which will increase the attractive of public transport.  By making public transport more effective and more attractive, the scheme will improve mobility for people without access to cars, thereby enabling more people to contribute more effectively to, and benefit from, economic growth in Leeds. | | **Tackling the Climate Emergency**  Growing our economy while cutting emissions and caring for our environment. | The existing roundabout acts as a barrier to cycling, walking and wheeling as it feels unsafe. By introducing signalised crossing facilities and segregated cycle tracks at this key location, all of the short list options would help to make a realistic option for a wider range of people and journeys. This will help to generate modal shift from car to active modes, thereby reducing emissions.  The scheme will also enable buses to be prioritised ahead of general traffic.   This will make buses more attractive, thereby generating modal shift from car to bus, with an associated reduction in emissions. | | **Delivering 21st Century Transport**  Creating efficient transport infrastructure to connect our communities, making it easier to get to work, do business and connect with each other. | The scheme will contribute significantly to the Delivering 21st Century Transport Priority by addressing the public health and environmental challenges currently experienced on the A660 as a result of the significant mode share of private motor vehicles. As mentioned earlier in this section, parts of the A660 route are already considered to be at capacity in terms of traffic volumes, and increasing the people carrying capacity of the corridor can only be achieved by encouraging the use of more efficient modes, such as active travel and buses. The proposed scheme will generate improvements for these modes, thereby creating more efficient transport infrastructure. This will improve mobility for those using active modes and buses, and will drive mode shift away from private car. This in turn will reduce congestion, and improve mobility for those who are dependent on private motor transport. | |
| 2.1.3 Does the scheme link to other activity being delivered either within the City Region or nationally? |
| **Site Allocations Plan**  Leeds City Council’s Site Allocations Plan[[10]](#footnote-11) identifies a total of 35 sites for either new housing, mixed use or employment, within 2 kilometres of the A660 corridor, between the A6120 Ring Road and the border with North Yorkshire. These sites total over 2,700 housing units, in addition to over 5,000 m2 of office space and over 6 hectares of employment area. The development of these sites will result in additional demand for travel on the A660 corridor, with any trips to and from these sites with origins or destinations south of the A6120 Ring Road likely to pass through Lawnswood roundabout. Given the existing issues with congestion on the A660 corridor, it is imperative that as many of these new trips as possible are accommodated via the more efficient modes, i.e. active modes and public transport. Delivering improvements at Lawnswood roundabout to address the existing issues for active modes and buses is essential in enabling this to happen, and thereby to enable these developments to be accommodated in a sustainable manner.  **Planned schemes on the A660 corridor**  There are a number of schemes at various stages of development by Leeds City Council on the A660 corridor, besides the Lawnswood Roundabout Improvement Scheme. These may be summarised as follows:   * **Active Travel Fund** - In 2020, active travel improvements were delivered on the A660 corridor, between St Marks Road and Bainbrigge Road, including new wands and orcas to protect cycle lanes, junction improvements and shared bus, taxi and cycle lanes. These improvements were funded by the Active Travel Fund. Additional work on the corridor as part of Active Travel Fund Tranche 2, began in early 2023, delivering further wands and orcas to protect cycle lanes between Weetwood Road and Shaw Lane, as well as junction improvements at Shaw Lane. This will be complemented by segregated cycle tracks, junction improvements and side road treatments between St Marks Road and Shaw Lane, to be delivered as part of Active Travel Fund Tranche 3. This work is expected to be completed in 2025. * **Woodhouse Lane Gateway (CRSTS) -** Funding has been allocated within the CRSTS to develop and deliver a scheme to improve facilities for buses and active modes on Woodhouse Lane and Albion Street between St Marks Road and The Headrow. This scheme is currently at feasibility design stage, with construction expected to begin in late 2024/25. * **Dyneley Arms** – This scheme is being delivered as part of the Corridor Improvement Package Phase 1 and will increase the capacity of the junction of the A660 Otley Road with the A658 Pool Bank New Road, and is expected to reduce journey times for general traffic and buses. The scheme will also introduce new pedestrian crossings and segregated cycle facilities. Construction on this scheme began in August 2022, and is expected to be completed in summer 2023.   The Lawnswood Roundabout Improvement Scheme will complement the improvements to active travel and bus journeys being made elsewhere on the corridor. In terms of active travel facilities in particular, the result of these schemes will be quality active travel infrastructure along the corridor all the way from Lawnswood to the city centre, thus increasing the proportion of journeys which people in this area are able to undertake by active modes. Nevertheless, the benefits of the Lawnswood scheme are not dependent upon the delivery of any other schemes – the proposed scheme will improve safety and improve active travel infrastructure at a junction with a long standing poor road safety record, and which currently represents a point of severance for journeys by active modes, and those improvements will be impactful regardless of interventions delivered elsewhere on the corridor. Similarly, the prioritisation of bus journeys ahead of general traffic at Lawnswood roundabout will benefit bus users along the corridor, regardless of interventions elsewhere.  **Leeds City Bikes**  Leeds City Council is in the process of introducing a docked, e-bike hire scheme, for which capital funding has been secured from the Transforming Cities Fund. The e-bikes will initially cover the city centre and inner Leeds, with a number of hub locations under consideration on the A660 corridor, including one hub within 500 metres of the Lawnswood roundabout. The Leeds City Bikes scheme is expected to increase uptake of cycling by making bicycles available to people who do not own a bicycle, and it is expected to act as a catalyst for an increase in cycling as people trying the service will be encouraged to cycle more regularly. By increasing cycling rates in Leeds, including on the A660 corridor, the Leeds City Bikes scheme will increase the number of people and journeys which benefit from the proposed Lawnswood Roundabout Improvement scheme. The first e-bikes are expected to be in place and available for hire from September 2023.  **Improvements to the Outer Ring Road**  There are a number of improvements proposed to the Ring Road (A6120) to the north of Leeds at various stages of development. This is in addition to recently delivered schemes which have introduced segregated cycle facilities and signalised pedestrian and cycle crossings to the east of Lawnswood, between King Lane and the East Leeds Orbital Route. The developments currently either under development or in construction may be summarised as follows:   * **Fink Hill** – This scheme is being delivered as part of the Corridor Improvement Programme Phase 1, and forms part of the Connecting West Leeds package. The scheme will deliver an increase in capacity, improvements to bus journey times and reliability and improvements to active travel facilities at the junction of the A6120 Ring Road with Fink Hill and Park Side. Construction of this scheme began in January 2023, and is expected to be completed in around 12 months. * **Horsforth Merge** - This scheme is being delivered as part of the Levelling Up Fund, and forms part of the Connecting West Leeds package. The scheme will improve journey time reliability and reduce journey times for buses and general traffic at the Horsforth roundabout (A6120/A65). Construction of this scheme is expected to begin later in 2023. * **Horsforth to Rodley footway and cycle link** - This scheme is being delivered as part of the Levelling Up Fund, and forms part of the Connecting West Leeds package. The scheme will deliver improved active travel facilities on the A6120 Ring Road between the A65 New Road Side and the A657 Rodley Lane. Construction of this scheme is expected to begin later in 2023. * **A6120 Ring Road cycle facilities** - Leeds City Council aspires to deliver segregated cycle tracks on the A6120 Ring Road, proceeding east and west from Lawnswood to connect with existing and proposed facilities. The preferred layout for these facilities is yet to be determined, and a funding route has yet to be secured. The work could also include upgrades to footpaths. This would ultimately lead to the delivery of continuous high quality cycle facilities between Thorpe Park in east Leeds and Dawsons Corner in west Leeds, totalling 25km in length.   The Lawnswood Roundabout Improvement Scheme will complement improvements to active travel and bus journeys being made elsewhere on the Ring Road. In terms of active travel facilities, the combined result of delivery of all of these schemes would be quality active travel facilities throughout the northern section of the Ring Road. This would improve connectivity between residential areas and district centres flanking this part of the Ring Road for people without access to cars, particularly in the context of the low bus frequencies on the Ring Road at present. The combined impact of these schemes will also improve bus journey times and reliability on the Ring Road, making the provision of higher frequency services cheaper and more attractive. Nevertheless, the benefits of the Lawnswood scheme are not dependent upon improvements elsewhere on the Ring Road, as they will tackle the specific issues at this junction in terms of poor road safety, poor active travel infrastructure and delayed and variable bus journey times. |
| 2.1.4 How does the scheme meet other national, sub-regional and local strategies and policies? |
| **National**  **Local Transport Note 1/20 – Cycle Infrastructure Design**  The design for the ‘Do Something – Less Ambitious’ and ‘Do Something – More Ambitious’ options have been informed by LTN 1/20 and the associated Gear Change guidance. These options would introduce segregated cycle tracks on the approaches to Lawnswood roundabout, and provide signalised crossings allowing all cycle movements through the roundabout to be segregated from general traffic. Compromises have been made on cycle infrastructure in order to reduce impacts on trees and green space, since previous consultation exercises in this area have found that such impacts would be likely to compromise the public acceptability of the scheme. This has led to toucan crossings and some shared area being proposed on the northern arm of the roundabout in the preliminary design. Disability groups have been engaged regarding the design, with no concerns being raised about the proposed toucan crossings and shared areas by these groups. Whilst LTN 1/20 recommends against shared use, it acknowledges that conversion of existing footways to shared use can be considered where options that use existing carriageway or other space are unworkable, as was considered to be the case here at preliminary design stage. The proposed shared areas in the preliminary design generally have widths exceeding 3 metres, which is recommended as the minimum width for shared areas with pedestrian and cycle flows of less than 300 per hour in section 6.5.7 of LTN 1/20 – current pedestrian and cycle flows are both less than 40 per hour at the busiest time of day, hence there is room for almost 10 fold growth before the 300 per hour threshold is met. The preliminary design includes one point of constraint with a shared area with a width less than 3 metres (2.2 metres at its narrowest) – however, further widening of the footway in this location cannot be achieved without impacting on tree roots. A full assessment of the scheme design against LTN 1/20 is to be undertaken at Full Business Case. It should also be noted that work is currently underway to amend the design in this location to avoid shared area and replace the toucan crossings proposed in the preliminary design with separate pedestrian and cycle crossings. An update regarding the outcome of this will be provided in the Full Business Case.  The design for the additional elements of the ‘Do Something – More Ambitious’ option was undertaken prior to the publication of LTN 1/20, and this design would need to be reviewed and updated in light of current guidance before proceeding to detailed design. It is proposed that the preliminary design of this element is undertaken alongside the further development and delivery of the ‘Do Something – Less Ambitious’ option.  **Inclusive Mobility: a guide to best practice on access to pedestrian and transport infrastructure (DfT)**  This document sets out the need to consider the needs of all disabled people from the outset of any transport scheme. The needs of disabled people have been considered throughout the design process for this scheme, and engagement with LCC staff with expertise in inclusive design, and with groups representing disabled people, has been undertaken to inform the design of the ‘Do Something – Less Ambitious’ and ‘Do Something – Preferred’ options (as detailed in section 2.1.6). This approach will continue throughout the design process. The preliminary design of the ‘Do Something – Less Ambitious’ and ‘Do Something – Preferred’ options is consistent with the guidance set out in this document. As highlighted earlier in this section, further design work is required for the ‘Do Something – More Ambitious’ option before this option proceeds to detailed design, and this work will include reviewing the design against the Inclusive Mobility guidance.  **Recent Highway Code Changes**  Changes to the Highway Code introduced in January 2022 have sought to improve safety for cyclists and pedestrians by (i) introducing a hierarchy of road users, with road users most at risk of injury at the top of the hierarchy; (ii) stating that vehicles should give way to people crossing or waiting to cross at junctions; and (iii) stating that turning vehicles should give way to cyclists going straight ahead at junctions. By improving safety for cyclists and pedestrians within the scheme extents, the proposed scheme complements the safety benefits of the changes to the Highway Code.  **Levelling Up**  The UK government’s Levelling Up agenda, as set out in the Levelling Up the United Kingdom white paper in February 2022, includes “missions” to boost productivity, pay, jobs and living standards, and to spread opportunities. The proposed scheme will help to boost productivity, pay, jobs and living standards by making the more efficient modes of transport (public transport and active travel) more accessible and more attractive, thereby improving the efficiency of the transport network and improving mobility. By improving facilities for public transport and active travel, the scheme will also help to spread opportunities by improving access to jobs, training and education for people without access to a car.  **Working Together to Promote Active Travel – Public Health England**  This briefing sets out the physical and mental health benefits of active travel, and highlights that building active travel into daily routines is an effective way to increase physical activity. The briefing further highlights that improving infrastructure for cycling is associated with increased levels of cycling. The briefing calls on local transport authorities to maximise safe, convenient and inclusive access for pedestrians and cyclists. By improving active travel infrastructure at a key point of severance, the proposed scheme will provide such access, and will help to facilitate uptake of active travel.  **Decarbonising Transport – Department for Transport**  This document sets out the Department for Transport’s plan for decarbonising the transport sector. The document highlights the benefits of walking and cycling in terms of improved health and wellbeing, reduced congestion and reduced emissions. The importance of improved walking and cycling infrastructure is highlighted as part of this. By delivering improved cycling and walking infrastructure at a key point of severance, the proposed scheme will help to facilitate greater uptake of active travel. The benefits of the scheme for bus journeys will also help to decarbonise transport, by encourage modal shift from car to bus.  **UK plan for tackling roadside nitrogen dioxide concentrations**  This plan sets out the need to reduce nitrogen dioxide concentrations, particularly at problem locations. As set out in section 2.1.1, air quality monitoring undertaken in the vicinity of Lawnswood roundabout in 2018 found average concentrations of nitrogen dioxide exceeding the statutory annual mean limit value of 40 in one location, although monitoring undertaken in 2019 did not find a repeat of this. The proposed intervention is expected to reduce nitrogen dioxide emissions overall, by encouraging modal shift from private car to public transport and active modes. The precise impact in the immediate vicinity of the roundabout and the Otley Old Road junction is harder to predict, but air quality modelling will be undertaken to better understand this, and the results will be included in the Full Business Case. At this stage, no significant change in air quality within the scheme extents is anticipated as a result of the scheme.  **National Planning Policy Framework, Department for Communities and Local Government (2021)**  The Government’s planning policies for England are detailed in the National Planning Policy Framework (NPPF) and this includes how these policies are expected to be applied. The NPPF describes the purpose of the planning system as contributing to the achievement of sustainable development and identifies three mutually dependent dimensions: economic, social and environmental. Planning can therefore contribute to building ‘a strong, responsive economy’ whilst supporting ‘strong, vibrant and healthy communities’ and ‘protecting and enhancing our natural, built and historic environment’.  The various aspects of sustainable development are detailed within the NPPF; of particular pertinence are the following:   * Building a strong, competitive economy: This details the Government’s commitment to securing economic growth to create jobs and prosperity, whilst meeting the challenges of global competition and a low carbon future. This support includes addressing potential barriers to investment. * Promoting sustainable transport: This section describes the contribution of transportation to wider sustainability and health objectives. This includes encouragement of solutions which support reductions in greenhouse gas emissions and congestion.   The NPPF also highlights the Government’s commitment to boosting the supply of housing and delivering a wide choice of high-quality homes. The local authority is entrusted to identify an annual supply of specific deliverable sites to provide housing over 5 years, 6-10 years and 11-15 years.  The proposed scheme will contribute to achieving the priorities within the NPPF by making active travel and public transport more attractive, thereby promoting sustainable transport, and supporting economic growth by encouraging use of more efficient modes, thereby facilitating an increase in effective capacity of transport infrastructure and in turn helping to support economic growth and job creation through improved mobility and connectivity.  **Transport Investment Strategy (July 2017)**  The Government’s Transport Investment Strategy is “a plan to build a stronger, fairer country, with an economy that works for everyone, in which wealth and opportunity are spread across the country and we are set up to succeed in the long term”.  This scheme will contribute to achieving the Transport Investment Strategy by improving mobility for those without access to private cars, and thereby improve their access to training and job opportunities.    **Cycling and Walking Investment Strategy (CWIS) (2017)**  CWIS sets out how the government seeks to “make cycling and walking the natural choices for shorter journeys, or as part of a longer journey”.  The lack of signalised pedestrian and cycle crossings and segregated cycle tracks at the existing Lawnswood roundabout has been identified as a barrier preventing many people from using active modes for journeys in this area. The proposed scheme will make cycling and walking a more attractive choice for a broader range of people by introducing safe and attractive facilities in this key location.  CWIS also states an intention to reduce the rate of cyclists killed or seriously injured on England’s roads. Noting the history of serious injuries to cyclists at Lawnswood (as detailed in section 2.1.1), the proposed scheme will help to achieve this aim by greatly improving safety for cyclists in this location, through the introduction of signalised crossing facilities and segregated cycle tracks.  **Clean Air Strategy (2019)**  DEFRA’s Clean Air Strategy 2019 highlights the importance of reducing emissions from transport, particularly oxides of nitrogen. This scheme will contribute to achieving the objectives of the Clean Air Strategy through providing the infrastructure to make cycling, walking and public transport more attractive, and thereby generating modal shift away from private car.  **Bus Back Better (2021)**  The DfT’s Bus Back Better strategy highlights the importance of bus provision in providing access to jobs, education and services, particularly for young people, old people and disabled people, and highlights the benefits of bus services in reducing carbon emissions and other pollution, and making more efficient use of road space than private cars. The document also highlights the cycle of decline in terms of worsening congestion negatively impacting bus journeys, making buses less attractive and driving more people towards car use, which compounds the problem. The document goes on to set out the DfT’s ambitions to increase bus patronage and mode share beyond the levels seen prior to the COVID-19 pandemic, by ensuring that buses represent “an attractive alternative to the car for far more people”. Making journeys faster and more reliable are identified as routes to achieving this ambition. By introducing MOVA control at the newly signalised Lawnswood roundabout (in all short list options), and by introducing a new inbound, 24 hour bus, taxi and pedal cycle lane (in the ‘Do Something – Preferred’ and ‘Do something – More Ambitious’ options), the proposed scheme will enable buses to be prioritised ahead of general traffic, thus helping to support this strategy.  **Sub-regional**  **West Yorkshire Investment Strategy**  The West Yorkshire Investment Strategy sets out the Combined Authority’s investment priorities and the criteria against which schemes will be evaluated. This is informed by the SEF. The six Investment Priorities identified in the strategy, and the relevance of the Lawnswood scheme to these Priorities, are set out in Table 4.  **Table 4 – West Yorkshire Investment Strategy Investment Priorities**   |  |  | | --- | --- | | Investment Priority | Fit with Lawnswood Roundabout Improvement Scheme | | 1. Good jobs and resilient businesses | By making active modes and public transport more attractive, the proposed scheme is expected to generate modal shift towards more efficient modes, thereby helping to tackle congestion and improve the efficiency of Leeds’ transport system. The scheme will also improve access to jobs for people without access to a car. This will help residents to access good jobs, and will increase productivity. | | 2. Skills and training for people | By making active modes safer and more accessible, and by enabling the prioritisation of bus journeys ahead of general traffic, the proposed scheme will improve access to training for people without access to a car. | | 3. Creating great places and accelerated infrastructure | By making active modes safer and more accessible, and enabling the prioritisation of buses ahead of general traffic, the Lawnswood scheme will support the delivery of the outcome listed under this priority “To keep communities connected, particularly to work and training opportunities, connect communities digitally, socially and through sustainable modes of transport”. | | 4. Tackling the climate emergency and environmental sustainability | By making active modes and public transport more attractive, the proposed scheme is expected to drive modal shift away from private car, thereby reducing carbon emissions and contributing to environmental sustainability. | | 5. Future transport | This priority includes outcomes to make travel by bus more effective, and to make cycling and walking the obvious choice for accessing town and city centres. The proposed scheme contributes to these outcomes by tackling a key point of severance for active travel and by improving bus journey times. | | 6. Culture and creative industries | This priority includes an outcome of “Cultural activity that promotes clean growth and sustainability is developed and promoted including active travel, walking and cycling”. The proposed scheme contributes to this by improving active travel infrastructure at a key point of severance for journeys by active modes. |   **West Yorkshire Connectivity Infrastructure Plan (draft January 2021)**  The draft Connectivity and Infrastructure Plan sets out the Combined Authority’s long term transport investment programme, as well as the connectivity priorities. The first stated connectivity priority is to make walking and cycling the first choice for short journeys, and to make active travel a safe and convenient way of integrating with public transport. The proposed scheme is in line with this priority as it tackles a key point of severance for active travel in the area, making walking and cycling a more attractive choice for a greater proportion of the population. The second stated priority is that bus is at the heart of WYCA’s plans, and that new infrastructure should give buses a competitive advantage over the car. The bus lane proposed as part of the ‘Do Something – Preferred’ and ‘Do Something – More Ambitious’ options will allow buses to bypass queuing traffic, and the signalisation of the Lawnswood roundabout (included in all short list options) will allow prioritisation of buses at the roundabout via MOVA control.  **West Yorkshire Transport Strategy 2040**  The West Yorkshire Transport Strategy acts as the Local Transport Plan for West Yorkshire. The strategy identifies existing issues with congestion, unreliable bus services, car dominance and concerns about road safety on West Yorkshire’s transport networks. By implementing MOVA bus priority at the Lawnswood roundabout, the proposed scheme is expected to improve reliability of bus services. The scheme will also deliver safer and more attractive facilities for active modes. By improving bus journeys and active travel facilities, the scheme is expected to result in modal shift from car to active modes and public transport – this in turn is expected to reduce congestion and car dominance. The scheme will also improve safety at the roundabout.  **West Yorkshire Bus Strategy 2040**  The West Yorkshire Bus Strategy 2040 sets out its vision “To create a modern, integrated and innovative bus system which puts customer first and contributes to the delivery of the economic, environmental and quality of life ambitions as set out in the Strategic Economic Plan and the West Yorkshire Transport Strategy”. The strategy highlights the importance of delivering schemes which improve the reliability and punctuality of bus services – by facilitating prioritisation of buses at a new signalised roundabout at Lawnswood, and via a new bus lane on Otley Road (in the ‘Do Something – Preferred’ and ‘Do Something – More Ambitious’ options), the proposed scheme will support this strategy.  **West Yorkshire Bus Service Improvement Plan**  The West Yorkshire Bus Service Improvement Plan includes targets to increase bus patronage, improve customer satisfaction, and improve journey times and reliability. By improving bus journeys, the proposed scheme will help to attract more bus users and improve customer satisfaction.  **West Yorkshire Climate and Environment Plan 2021-2024**  The West Yorkshire Climate and Environment Plan sets out the Combined Authority’s target for the region to become a net zero carbon economy by 2038, with significant progress by 2030. By making active modes and bus use more attractive, the Lawnswood scheme is expected to encourage modal shift from private car towards more sustainable modes, thereby helping to reduce carbon emissions. The scheme will therefore contribute to achievement of the targets set out in this plan.  **Leeds City Region HS2 Connectivity Strategy**  This document “sets out the strategy for delivering the step change in connectivity required to enable the transformative impact of HS2 to be realised across the City Region”. The Lawnswood scheme contributes to the third strand of the strategy, “Delivering Inclusive Growth through transforming connectivity on the corridors where the economic need is greatest” – under this strand, the importance of strengthening high value assets in northwest Leeds, including the University of Leeds, is highlighted. By making more efficient modes such as bus and active modes more accessible and more attractive and thereby generating modal shift away from private car, the Lawnswood scheme will increase the effective carrying capacity of the A660 corridor. This will improve connectivity to the University of Leeds, which will strengthen this asset.  **Transport for the North (TfN) – Strategic Transportation Plan**  Whilst TfN’s focus is on pan-northern strategic transport interventions, the Strategic Transportation Plan also highlights the importance of facilitating shorter trips via public transport and active modes, including by providing bus priority and delivering a step change in cycling infrastructure and improved walking infrastructure. By introducing MOVA bus priority at the proposed traffic signals (in all short list options) and allowing buses to bypass queuing traffic via the proposed new bus lane (in the ‘Do Something – Preferred’ and ‘Do Something – More Ambitious’ options), the Lawnswood scheme will contribute to the Strategic Transportation Plan’s identified requirement to provide bus priority. By introducing signalised pedestrian and cycle crossings and segregated cycle tracks, the Lawnswood scheme will similarly contribute to the Strategic Transportation Plan’s identified requirements to deliver a step change in cycling infrastructure and improved walking infrastructure.  **Local**  **Connecting Leeds Transport Strategy**  The proposed scheme supports several objectives within the Connecting Leeds Transport Strategy (CLTS), as set out in **Table 5**.  **Table 5. Lawnswood Roundabout Improvement Scheme fit with Connecting Leeds Transport Strategy.**   |  |  | | --- | --- | | **Objective** | **Fit with Lawnswood Roundabout Improvement Scheme** | | Encouraging people to choose active travel and public transport | By making active travel and public transport more attractive as set out in section 1.2, the scheme will encourage people to choose these modes. | | Improving the efficiency of the transport network and making better use of our road space | By encouraging people to choose active travel and public transport, the scheme will encourage use of modes which make more efficient use of road space, thereby improving the efficiency of the transport network. | | Support individuals to access more employment opportunities through a comprehensive transport network | By making travel by active modes safer and more accessible, and by improving bus journeys, the scheme will improve access to employment opportunities for people without access to a car. | | Lower the cost of mobility, ensuring transport is affordable and accessible for everyone | By improving mobility for those using cheaper modes of transport (bus, cycling and walking), the scheme will lower the cost of mobility. | | Ensure walking and cycling are the first choice for the shortest journeys improving physical and mental health | By making walking and cycling safer, more accessible and more attractive, the scheme will help to ensure that these modes are the first choice for shorter journeys. | | Reduce the negative effects of transport on our local communities, improving air quality and reducing CO2 emissions | By encouraging modal shift from car to bus and active modes, the scheme will improve air quality and reduce CO2 emissions. | | Help make Leeds the best city to grow old in and a child friendly city through making streets accessible to all | By making the Lawnswood roundabout more accessible for a broader range of pedestrians and cyclists, the scheme will contribute to making Leeds the best city to grow old in, and will make the city more child friendly. | | Eliminate road danger by adopting a Vision Zero approach to road accidents | By improving road safety at a junction with a long standing poor safety record, the scheme design is consistent with a Vision Zero approach to road traffic collisions. |   **Leeds Vision Zero 2040 Strategy**  The Leeds Vision Zero strategy sets out LCC’s ambition that by 2040 no one will be killed or seriously injured on roads in Leeds. The strategy sets out a Safe Systems approach, which is split into five ‘pillars’: Safe Behaviours and People, Safe Speeds, Safe Roads, Safe Vehicles and Post-collision Learning and Care. By reducing the risk of collisions at the Lawnswood roundabout through the implementation of a layout which is safer for all modes, the scheme directly supports the Safe Roads pillar. The Safe Roads pillar specifically highlights the need to place the needs of people and communities above those of vehicles and to create streets which are safer for active travel through design. The scheme clearly addresses an issue at a junction which is dominated by motor vehicles, and where walking, wheeling and cycling feel unsafe and are inaccessible for many.  **Leeds City Council Climate Emergency Declaration**  In March 2019, LCC declared a Climate Emergency, committing to work towards carbon emissions reductions consistent with the Paris agreement to limit global temperature increase to no more than 1.5°C, and to work towards making Leeds carbon neutral by 2030. By making active modes and bus use more attractive, the Lawnswood scheme is expected to encourage modal shift from private car towards more sustainable modes, thereby helping to reduce operational carbon emissions. More broadly, whilst the modal shift generated by this specific scheme may be modest, the scheme plays a part in transforming the transport infrastructure in Leeds so as to facilitate the large increases in active travel (and associated reduction in car use) targeted as part of the Connecting Leeds Transport Strategy. The scheme will therefore contribute to achievement of the targets set out as part of this declaration.  **Leeds City Council Best Council Plan 2020-2025**  LCC’s Best Council Plan lists 8 outcomes which LCC wants to deliver for everyone in Leeds. The Lawnswood scheme would contribute directly to the delivery of 4 of these outcomes, as follows:   * **Be safe and feel safe** – The existing Lawnswood roundabout has a long standing poor road safety record, and many respondents to our consultation have highlighted that the roundabout feels unsafe, particularly for pedestrians and cyclists. The proposed scheme will improve the safety of the roundabout for all modes, and will introduce signalised crossing facilities for pedestrians and cyclists, and segregated routes for cyclists, making the roundabout feel safer for these users. * **Enjoy happy, healthy, active lives** – The existing Lawnswood roundabout represents a barrier to active travel due to the lack of signalised crossing facilities, lack of segregation for cyclists, and high traffic volumes and speeds. The proposed scheme will make active travel journeys in this location more accessible and more attractive, and will therefore support people to undertake more journeys via active modes. * **Move easily around a well-planned, sustainable city that’s working towards being carbon neutral** – By making active modes safer and more attractive, and by improving bus journeys, the proposed scheme will improve mobility for those without access to a car. By encouraging modal shift away from private car, the scheme also supports the city’s efforts to become carbon neutral. * **Live with dignity and stay independent for as long as possible** – The poor provision for pedestrians and cyclists at the roundabout in its current format represents a barrier for some older and some disabled people in particular (e.g. people with mobility or vision impairments). The proposed scheme will make the roundabout accessible by walking, wheeling or cycling for a broader range of people, and will make it possible for a broader range of people to navigate this area independently. |
| 2.1.5 Why is Combined Authority funding (Grant or Loan) required in order to carry out this scheme? |
| Section 2.1.1 has highlighted a number of issues with the existing Lawnswood Roundabout, including the persistent poor road safety record, unattractive and unsafe facilities for cyclists and pedestrians, and delays and variable journey times for buses. There is no prospect of the free market delivering an intervention at this roundabout which would help to address these issues, as this requires an extensive remodelling of the roundabout, the benefits of which will accrue to society at large. Without intervention, traffic volumes would be likely to increase as a result of new housing and employment developments, exacerbating the issues with road safety, making travel by active modes even less attractive, and worsening congestion and journey time variability. Thus, the transport modes which make the most efficient use of road space, and which produce fewer negative externalities in terms of road safety issues, noise and pollutants, would continue to be disincentivised. This represents a market failure, which the scheme addresses.  There is no funding available from LCC to deliver the scheme, and the funding available from private sector investment (as detailed in section 5.2.1) is not sufficient to deliver the scheme. Combined Authority funding is therefore required to deliver the scheme, so that the identified market failure can be addressed. An extensive options appraisal process has been undertaken, as set out in section 4, and a justification provided for a proposed phased approach, whereby the ‘Do Something – Less Ambitious’ option is to be delivered through the current round of CRSTS funding, supplemented with funding from CIP2 funding and section 106 contributions, with the additional elements of the ‘Do Something – More Ambitious’ option to be further developed for future delivery subject to additional funding being secured in due course. This approach has been justified on the basis of benefit cost ratio and fit with strategic context. Based on the latest cost estimate, the funding currently requested from the Combined Authority is the minimum required to deliver the ‘Do Something – Less Ambitious’ option. Opportunities to minimise the cost of both phases of the proposed scheme will be sought as the scheme progresses through further stages of development and delivery, and as a result it may be possible to reduce the amount of funding required from the Combined Authority. |
| 2.1.6 What engagement/consultation has taken place with the main stakeholders and beneficiaries affected by the scheme? |
| The scheme currently being developed for Lawnswood was preceded by a different design, developed as part of LPTIP. The design developed through LPTIP proposed replacing the existing roundabout with a signalised crossroads. Extensive consultation was undertaken for this previous design in 2018. The current scheme has been developed with consideration given to feedback received as part of the previous consultation and engagement processes undertaken as part of LPTIP. Consultation exercises undertaken as part of LPTIP included online publication of scheme details including use of social media platforms as well as off-line publicity, stakeholder meetings, local consultation events and a range of additional neighbourhood forum and local community events.  The consultation process for LPTIP as a whole started with the Transport Conversation in Leeds, 2016, which led to the submission of the LPTIP-wide Strategic Outline Case to government in December 2016, with the A660 being one of five corridors highlighted as requiring intervention. A summary of the consultation and engagement process for the Lawnswood LPTIP scheme is set out below.  **The Transport Conversation**  LPTIP proposals for Lawnswood were developed following a comprehensive optioneering and prioritisation exercise involving dialogue between Leeds City Council, WYCA and other stakeholders and relevant authorities (‘the Leeds Transport Conversation’) in relation to the best-use of funding previously allocated to the New Generation Transport scheme. The key findings of the Leeds Transport Conversation were that there was a strong desire to travel more sustainably, specifically in reference to necessary improvements in public transport, walking and cycling routes and provision.  **Public consultation undertaken for the LPTIP A660 corridor proposals, including for Lawnswood**  Two phases of consultation were undertaken in relation to Lawnswood as part of LPTIP. The first round of consultation included proposals across the length of the A660 corridor, between Holt Lane and Clarendon Road. This phase was undertaken in summer 2018. The proposals in the vicinity of the Lawnswood roundabout at this stage included the following elements:   * Implementation of a signalised crossroads at Lawnswood * Signalisation of the Otley Road / Otley Old Road junction * New southbound bus lanes on Otley Road and Otley Old Road * New crossing facilities at both of the above junctions * Improved cycle facilities within the scheme extents   A comprehensive programme of engagement was undertaken between 20th June and 3rd August 2018, including a series of drop in events and use of the online Commonplace platform, with this engagement focussed on gathering feedback on 19 proposals across seven sub sections of the A660 route:   * Otley Road – Holt Lane to Lawnswood Cemetery; * **Lawnswood Signalised Crossroads Scheme;** * Otley Road – Lawnswood School to Glen Road; * Otley Road – Glen Road to St Chads Drive; * Otley Road and Headingley Lane – Shaw Lane to Grosvenor Road; * Headingley Lane – Grosvenor Road to Woodhouse Moor; and * Woodhouse Lane – Hyde Park Corner to Clarendon Road.   Opinion on the proposals was divided, but veered towards the negative for each section of the route, including Lawnswood, as shown in Commonplace responses presented in Figure 5. There were strong feelings and submissions made from those wanting improvements and those against any change.    **Figure 5. Commonplace responses to LPTIP A660 corridor proposals presented at public consultation in summer 2018.**  There were a number of key themes identified in consultation responses across each section of the A660 corridor. These were:   * A feeling that there are significant constraints on this corridor which make implementing improvements for one mode difficult without negative impacts on other modes. * A feeling that without addressing any of the congestion issues in central Headingley, interventions along the rest of the route would not help to tackle congestion. * Opposition to reallocation of road space away from general traffic/private vehicles especially outside central Headingley. * Support from key stakeholders and some individual respondents for improved cycling facilities along the route particularly given high existing cycling levels and the poor safety record for cyclists at key junctions. * Concern for impacts on the local environment including trees, verges and historic buildings. * Concern the proposed interventions were not required or would not result in value for money / significant benefits. * Support for a Park & Ride facility on this corridor.   The feedback received specifically in relation to the Lawnswood Signalised Crossroads Scheme is summarised in the box below.   |  | | --- | | Feedback from respondents on the proposed intervention at Lawnswood was mixed but veered towards the negative: 43% of respondents viewed the intervention in a neutral or positive way, whereas 57% viewed the intervention in a negative way.  Reasons respondents gave for negative feelings (560 negative feelings) towards the proposals included:   * Loss of green space – in particular grass verge and mature trees. * Perceived negative impact on air quality. * Cycle improvements could go further i.e. segregated facilities through the junction. * The loss of a U-turn facility for Otley Road residents. * The perception that there is no real congestion issue at Otley Old Road.   Reasons respondents gave for positive feelings (443 positive/neutral feelings) towards the proposals include:   * Lawnswood roundabout is perceived to be dangerous for pedestrians and cyclists in its current form and therefore something needs to be done to improve it. * Congestion at Lawnswood Roundabout could be eased by the proposals. |   In direct response to the comments received to the consultation exercise in June-August 2018, a number of changes were made to the design at Lawnswood. A second round of consultation was then undertaken, specifically in relation to the proposals for the Lawnswood junction, the Otley Road/Otley Old Road junction, and for Otley Old Road itself. This consultation exercise consisted of a public meeting held in September 2018 at the Weetwood YMCA, use of the Commonplace platform for hosting scheme information and facilitating comments, and targeted engagement with Lawnswood School, University of Leeds, Cycle Forum and local ward Members.  The majority of responses to the proposal during this second round of consultation were negative or slightly negative, as shown in the Figure 6. The most common reasons recorded for negative responses to the proposal were the impact on green space, and a perception that the scheme would worsen congestion, air quality and the local environment.    **Figure 6. Commonplace responses to LPTIP Lawnswood scheme presented at public consultation in Autumn 2018.**  A report was submitted to LCC’s Scrutiny Board in September 2019 regarding the LPTIP proposals for the Lawnswood junction. This report described the strength of objections to the signalised crossroads proposals, and noted that in consultation with the relevant Executive Member, it had been agreed that the scheme concept and principles should be further revisited. The scheme now being developed through CIP2 is the outcome of this work, and seeks to strike a balance between tackling the existing safety issues and lack of provision for active modes and prioritisation of public transport at the Lawnswood junction, whilst minimising impacts on trees and green space. Table 6 summarises the impacts on trees and green space of the current scheme, compared with the anticipated impacts of the LPTIP proposals.  **Table 6.** Impact of current scheme on trees and green space, compared with impact of scheme developed through LPTIP.   |  |  |  | | --- | --- | --- | | Impact | LPTIP | Current design | | Trees | At least 17 trees to be removed, additional trees at risk. | Two trees to be relocated, two or three trees to be removed | | Green space | Impact on grass verges on all approaches to the Lawnswood roundabout.  Loss of green space at centre of existing roundabout.  Impact on grass verges on Otley Old Road. | Impact on grass verges on all approaches to the Lawnswood roundabout (less extensive than for the LPTIP scheme).  Green space at centre of existing roundabout to be reshaped, but retained.  No impact on Otley Old Road. |   Negative comments received during the LPTIP consultation regarding perceived impacts on congestion and air quality have also been considered as part of the development of the current design. Creating a junction which can accommodate anticipated volumes of traffic without creating major issues with queuing traffic and associated air quality issues has been central to the design process. Traffic modelling undertaken as part of this Outline Business Case (OBC) has demonstrated that neither of the two options proposed for further development and delivery will result in large increases in journey times or queue lengths. The scheme is also expected to result in an overall reduction in car traffic due to modal shift towards public transport and active modes. There is therefore expected to be an overall slightly positive impact on air quality. As described in section 2.1.1, air quality modelling is to be undertaken to investigate this issue further, and the results of this will be included in the Full Business Case.  A new consultation exercise was undertaken in November 2021-January 2022, in relation to the scheme being developed through CIP2 (specifically, the design presented was the ‘Do Something – Preferred’ option). A consultation report for this consultation exercise has been included as Appendix C, but the key elements are summarised in the following. The key activities undertaken to promote the consultation exercise and facilitate responses were as follows:   * Hosting of information about the scheme and inviting comments via the Commonplace webpage; * Three public drop in events held in December 2021 and January 2022; * Meetings with key stakeholder groups:   + Cycle Forum Subgroup   + Lawnswood School   + West Park Residents Association   + Weetwood Residents Association   + Northwest Leeds Transport Forum   + Bus Operators and Infrastructure Group   + Becketts Park Residents Association, Drummonds and Churchwoods Residents Association, Ash Road Residents Association, Weetwood Residents Association and Far Headingley Village Society (all one meeting)   + Outer Ring Road residents   + Lawnswood School student council   + Cycle Forum * Press release * Letters to businesses and residents * Distribution of flyers * Ward member briefings * Use of social media channels and Connecting Leeds mailing list   A total of 609 consultation responses were received for the scheme proposals, demonstrating a high level of engagement and an effective consultation process. 532 responses came from the Commonplace portal and 77 surveys were completed at the public drop-in events or returned by post. Overall, 52.8% of respondents reported feeling either happy or very happy about the proposals, with 35% either unhappy or very unhappy and 12.3% not sure. Positive responses typically reported feeling that the proposals would improve cycling and walking provision, whilst negative comments tended to focus on perceived negative impacts on congestion and air quality. A number of respondents also raised two specific safety concerns about the Otley Road / Otley Old Road junction, at which no intervention was proposed as part of the designs presented at consultation. Specifically, respondents highlighted (i) the risk of northbound cyclists on Otley Road coming into conflict with vehicles turning left into Otley Old Road, noting that this turn can be undertaken at high speeds due to the shallow angle of the turn, and (ii) the risk of conflict between northbound traffic on Otley Road and vehicles turning right from Otley Old Road to Otley Road. Some respondents also highlighted the lack of crossing facilities at the Otley Road / Otley Old Road junction, noting that this impairs access to bus stops.  The Executive Member with responsibility for transport is supportive of the scheme. During ward member briefings, local ward members raised some concerns regarding safety and junction capacity, but raised no fundamental objections to the scheme. One local ward member, whose term ended in May 2023, raised objections to the scheme at the meeting of Leeds City Council on 22nd March 2023, questioning the costs and value for money of the scheme.  Following the consultation exercise undertaken between November 2021 and January 2022, some targeted engagement has been undertaken with groups representing disabled people. This was due to no responses having been received from such groups during the consultation exercise. This targeted engagement included presenting the designs for the ‘Do Something – Preferred’ option to Leeds City Council’s Disability and Wellness Network (an LCC staff forum), and circulating materials to the Access and UseAbility Group. No adverse comments were received from these groups.  Further consultation with bus operators has been undertaken during 2023. Bus operators have raised concerns that provisional modelling results presented at the time suggested some bus journeys could be negatively impacted by the scheme (particularly for the ‘Do Something – Preferred’ option), and also highlighted that measures to tackle existing issues with congestion impacting southbound buses on Otley Old Road would be welcomed. The final traffic modelling results produced in support of this business case show that bus journey times would benefit overall in the ‘Do Something – Less Ambitious’ option, and this position is expected to be strengthened by the introduction of MOVA, the impacts of which are not represented in the traffic model at present. Additionally, the Do Something (More Ambitious) option investigated as part of this business case would help to reduce journey times for southbound buses on Otley Old Road, and would also result in an overall improvement in bus journey times and reliability. |

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| **3. Commercial Case** |

The purpose of the Commercial Case is to demonstrate the demand for the project and that there is a sound procurement strategy for the project that will ensure that the Scheme Objectives are realised over the life span of the project.

**Note – All sections should be reviewed and updated if this is the Full Business Case. A summary of any key changes and their implications on the business case should be included.**

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| **3.1 The Case for Change** |
| 3.1.1What evidence is there to support the market demand justification for this project? |
| Road Safety Record  As outlined in section 2.1.1, the existing roundabout has a poor road safety record, with the majority of collisions associated with entering versus circulating conflicts, and nose-tail impacts on the approaches. A significant proportion of these collisions involve cyclists, and there have been a large number of serious injuries recorded at the roundabout. Without an engineering intervention, there is no obvious prospect of an improvement in road safety in this location. Signalisation of the roundabout as proposed will reduce the potential for human error in entering the roundabout, and will minimise stop-start movements on the approaches associated with nose-tail collisions. The proposed provision of segregated cycle facilities will also enable cyclists to traverse the junction without coming into conflict with other vehicles.  Active Travel  The existing roundabout has no signalised crossing facilities, and no segregated facilities for cyclists. As outlined in section 2.1.1, given the high traffic volumes and speeds, the lack of active travel facilities inhibits uptake of active travel, which is particularly important given the close proximity to a large high school (Lawnswood School) and University of Leeds sports facilities. Further south on the A660 corridor, pedestrian and cycling volumes are high, and it is likely that the severance created by the lack of facilities at Lawnswood suppresses demand for active travel journeys crossing the ring road. Implementing safe, attractive active travel facilities as proposed will help to unlock this demand.  Bus journeys  Given that the existing roundabout is under priority arrangement, there is no way to prioritise bus movements at the roundabout. As highlighted in section 2.1.1, buses currently experience delays and journey time variability in this location. The proposal to introduce a signalised roundabout, under MOVA control, will enable bus movements to be prioritised ahead of general traffic. Coupled with the southbound, 24 hour bus, taxi and pedal cycle lane on Otley Road proposed as part of the ‘Do Something – Preferred’ and ‘Do Something – More ambitious’ options, the proposal will enable an overall improvement in bus journeys in both of the options proposed for further development and delivery, helping to make public transport a more attractive option for a greater proportion of journeys traversing Lawnswood roundabout.  Consultation responses  The current design has been developed with consideration of responses received during consultation undertaken as part of LPTIP (as detailed in section 2.1.6). In particular, this has meant minimising the impact of the scheme on trees and green space, whilst ensuring that the objectives of the scheme can still be met.  The current ‘Do Something – Preferred’ design (as described in section 1.1) was presented at a public consultation exercise undertaken between November 2021 and January 2022. Many respondents to the consultation reported feeling that the existing roundabout was unsafe, particularly for pedestrians and cyclists, with some respondents stating that they chose to use longer routes in order to avoid the roundabout. 52.8% of respondents reported feeling either happy or very happy about the proposals, with positive comments typically highlighting perceived road safety benefits and/or benefits for pedestrians and cyclists. The responses to the consultation indicate that there is a public demand for improvements to be made at Lawnswood roundabout, and also provide evidence that the improvements will empower a wider range of people to travel more freely in this area via active modes. |
| 3.1.2 What evidence is available to support the projected take-up by the market? |
| As described in section 2.1.1, the existing Lawnswood roundabout lacks controlled pedestrian crossing facilities, and has no dedicated cycle infrastructure. Given the proximity of the roundabout to a large high school, University of Leeds sports facilities, residential properties to the north and the district centre of Headingley to the south, it is likely that there is latent demand for trips by active modes, which is currently suppressed because of the lack of facilities for pedestrians and cyclists. Responses to the public consultation exercise undertaken in November 2021-January 2022 highlighted that some people see the roundabout as a barrier to walking and cycling in its current form. Experience from the recent implementation of traffic signal control and pedestrian and cycle crossing facilities at the nearby A61 Harrogate Road / A6120 Ring Road junction found increases in pedestrian and cycle activity exceeding 50% following implementation of these facilities, and a similar increase is anticipated at Lawnswood upon implementation of this scheme. Complementary schemes highlighted in section 2.1.3, notably the Active Travel Fund scheme on the A660 corridor and Leeds City Bikes scheme, are anticipated to generate additional cycling trips in the area, further increasing the likely usage of the proposed facilities at Lawnswood. As detailed in section 2.1.1, traffic surveys undertaken in June 2022 found that between 250 and 435 cyclists traverse the roundabout within the carriageway, daily, between 7am and 7pm (including weekends). The surveys also recorded an average of 471 instances of pedestrians using a crossing point at Lawnswood roundabout in an average weekday, between 7am and 7pm.  As highlighted in section 2.1.1, the A660 corridor is a high frequency bus route, with 10 services traversing Lawnswood roundabout in each direction in the peak hour. A cordon count undertaken in June 2022 found an average of over 2,000 bus users passing the cordon inbound on the A660 Woodhouse Lane, north of Clarendon Road, between 7 and 10 AM. The services traversing Lawnswood roundabout experience significant delays during the peak periods, and also experience significant journey time variability during the peak periods. Traffic modelling undertaken as part of the scheme development has indicated that bus journey times will be improved overall by the implementation of both of the two options proposed for further development and delivery. By introducing signalised crossing facilities, the scheme will also improve access to bus stops, particularly for residents on the north-western corner of the roundabout wishing to access southbound buses on Otley Road. Experience from other schemes in Leeds and elsewhere demonstrates that improving bus journeys helps to increase bus patronage. For example, cordon counts undertaken on the A65 following implementation of the A65 Quality Bus Corridor found an almost 50% increase in patronage, and Farebox data for this scheme found an increase in inbound boardings on this route of 12% on key services within the extent of the scheme. Whilst the existing bus journeys at Lawnswood roundabout do not experience the same level of pre-scheme delays and variability as was the case on the A65 prior to implementation of the A65 Quality Bus Corridor, the evidence nevertheless demonstrates that improvements in bus services typically result in increased patronage. |

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| **3.2 Procurement Strategy** | |
| 3.2.1 What is the procurement strategy/approach? | |
| It should be noted that Leeds City Council have significant experience in the development, design, construction and management of strategic highway and junction improvement schemes in Leeds. LCC have developed very thorough and inclusive engagement campaigns as part of the Connecting Leeds programme. This has been employed in developing projects, but also in refining and designing projects that can maximise local benefits, address necessary mitigation, and maintain and develop local support for projects during the design and construction stages. This expertise provides reassurance that LCC are well placed to deliver the commercial procurement and delivery of this scheme on time and within budget.  Procurement is an integral part of the project management process and critical to the successful delivery of the Lawnswood scheme. The procurement strategy for Lawnswood has therefore been designed to ensure:   * Continuity of the design process. * That the speed of scheme delivery is in line with timescales for funding drawdown. * That LCC retains control of work programmes. * Value for money is achieved. * That the scheme contributes to LCC’s wider decarbonisation and net zero emissions targets. * Compliance with national statutes and regulations. * Control of fraud and corruption, with a transparent and visible approach, including tightly controlled limits to potential fraud and corruption. * Compliance with LCC’s social value policy.   Leeds City Council is in the process of setting up a suite of frameworks in order to deliver its extensive capital programme of infrastructure works over the next four years. LCC currently have a Consultants Framework to assist in the development, design, supervision, and assurance of infrastructure schemes where sufficient resource and/or expertise is unavailable in house. This is complemented by bespoke Contractor Frameworks. The Minor Works Contractor Framework and the Intermediate Contractor Works Framework are already in place for works up to £2m, and £2m to £7m respectively. All the frameworks are based on NEC4 ECC terms and conditions.  The proposed procurement strategy for the construction of Lawnswood Roundabout is via the Intermediate Works Contractor Framework – the current cost estimate for the Civil Engineering works associated with the ‘Do Something – Less Ambitious’ and ‘Do Something – More Ambitious’ options are £4.3m and £6.6m, respectively (excluding fees, landscaping, and all UTMC elements). This framework was procured using an open tender procedure and was carried out in accordance with the Public Contract Regulations 2015 and LCC’s own Contract Procedure Rules. A rigorous evaluation process was carried out which included the evaluation of a Construction Selection Questionnaire which assesses the Contractors’ ability to perform the contract and covers mandatory areas such as finance, health & safety, equality, and the environment. As well as this, 14 method statement responses were scored as part of a 60% quality - 40% price evaluation. The four highest scoring contractors were then duly appointed to the framework, which avoids the need for the Pre-selection phase in turn resulting in a saving of around two months on the procurement of the delivery phase.  For each call-off opportunity under the framework, a mini-tendering exercise will be carried out with the four successful contractors which will again be evaluated on quality and price. At this stage, a social value commitment will also be required which will be based around the LCC TOM’s (themes, outcomes, and measures). All call-offs will generally be issued under option C – target costs where the staff costs will be capped within the framework.  Other procurement options used by previous LCC highways schemes of similar cost and scope have been considered, such as the Development and Delivery Partner Framework. However, following indifferent results and poor-quality submissions using other available frameworks, such as Yorcivils, LCC have looked to undertake a step change in the construction of infrastructure schemes by developing and tendering a bespoke suite of contractor frameworks. If an existing framework is not used during procurement, then the only other alternative is to carry out a full open tender procedure, which would labour intensive to complete. Therefore, the project team has identified that the Intermediate Works Contractor Framework would be the most suitable method by which to procure the construction of the Lawnswood scheme.  The design of this scheme is being undertaken in house, led by the LCC Civil Engineering team, with support from the LCC Urban Traffic Control Management & Control (UTMC) team on signals design. The UTMC team are also undertaking the traffic modelling required to support scheme design and appraisal. Business case development is being led by the LCC Transport Strategy team, although consultant support has been procured via the existing LCC Major Schemes Framework to assist with the economic case element of the existing Outline Business Case, and this approach is expected to continue for the remaining appraisal Activity Points. Consultant support has also been secured to assist with air quality modelling work, and again this has been procured via the LCC Major Schemes Framework. | |
| 3.2.2 Risk Allocation and Transfer | |
| A Risk Register and Risk Management Strategy are appended as **Appendix D.** The approach being taken to risk is an established approach which has been used by LCC in other similar highways projects funded by the Combined Authority.  In order to achieve successful delivery of schemes, management policies, processes and procedures are required to be followed accurately. An important aspect of the management process is identifying risks associated with scheme delivery and funding early in the process to allow mitigation to be identified.  Where appropriate, the aim is to eliminate the risk, or prepare relevant mitigation measures to manage and reduce the impact of the risk. At this stage, the risks for the project sit with the Project Manager and/or Programme Board but an owner has been allocated to each risk during the development of the risk register.  Following approval of the OBC, it is anticipated that a number of final risk reduction, value engineering and detailed design activities will commence to support the delivery of the scheme. These are also likely to reduce the costs of the scheme in the Financial Case.  As part of the Commercial Case, the general principle that will be adopted is that the risks should be managed by the party best able to manage them. As the project moves to delivery, the majority of the delivery and financial risk will be transferred to the contractor as the party best able to manage risks associated with construction.  A strategic aim and objective of LCC’s management of the contract is that risk is appropriately proportioned through the careful management of relationships within, and throughout the project. This is also important from a delivery and resilience point of view.  An initial risk register has been developed by LCC to inform the QRA (in Appendix D) and will be updated during the detailed design phase (with contractor input once appointed) and regularly through to construction. Potential issues having been identified will be allocated a risk owner and appropriate resolutions sought to mitigate or eliminate the risk where possible.  Design risk is intended to be retained by LCC as the designer. The indicative allocation of risks resulting from the contractual and procurement arrangements is summarised in Table 7. At the Outline Business Case stage, ticks have been provided to indicate where each risk type rests with the public sector (the Council / Government Treasury), the private sector (the consultants and contractors), or whether these risks are shared between the two.  **Table 7. Indicative allocation of risk.**   |  |  |  |  | | --- | --- | --- | --- | | Risk Category | Public | Private | Shared | | 1. Design Risk | ✓ |  |  | | 1. Construction Risk |  |  | ✓ | | 1. Transition and Implementation Risk |  |  | ✓ | | 1. Availability and Performance Risk |  |  | ✓ | | 1. Operating Risk |  | ✓ |  | | 1. Variability of Revenue Risk |  |  | ✓ | | 1. Termination Risks |  |  | ✓ | | 1. Financing Risks | ✓ |  |  | | 1. Legislative Risks | ✓ |  |  |   Delivery and programme risk will be shared and incentivised through a pain/gain mechanism provided for as part of the construction contract. The specifics for any incentive arrangements will be specified within the tender documentation and contract documentation for each Call Off Contract under the framework agreement. The below model is applicable only where NEC4 Option C Target Contracts are used.  The ‘share range’ for Pain/Gain detailed in Table 8 will be applied and will be standard across both Professional Service and Engineering Construction Contracts awarded under this framework arrangement. Incentivised performance will be based against this through to final delivery.  **Table 8. Proposed incentivised performance definitions.**   |  |  | | --- | --- | | Share Range | Supplier Share | | Less than 85% (of the agreed total of the Prices) | 0% | | From 85% to 115% (of the agreed total of the Prices) | 50% | | Greater than 115% (of the agreed total of the Prices) | 100% | | |
| 3.2.3 Statutory and Other Regulatory Consents | |
| **Town and Country Planning Act**  It is the view of the Promoter that no planning permission is required for the scheme due to construction taking place within the highway boundary and thus permitted development under Schedule 2, Part 9, Class A (Development by highways authorities) of the General Permitted Development Order 2015 (GPDO).  **Environmental Impact Assessment Regulations (2018)**  Based on the characteristics of the works proposed, it is not considered that the works would constitute Schedule 1 development, as described within the Environmental Impact assessment (EIA) Regulations.  Following an appraisal against Schedule 2 of the EIA Regulations, the works are considered to fall under Schedule 2, Part 10f (construction of roads) and/or 13b (a change to or extension of development classified under Schedule 2, Part 10f).  The footprint of the proposed scheme is anticipated to exceed the 1ha threshold outlined within Schedule 2 of the EIA Regulations. Nevertheless, as outlined within the EIA Regulations and Department for Communities and Local Government Planning Practice Guidance, the exceedance of the thresholds detailed within Schedule 2, Column 2 does not automatically determine that the Proposed Scheme is EIA Development, but rather that “the proposal needs to be screened by the local planning authority to determine whether significant effects on the environment are likely and hence whether an Environmental Impact Assessment is required”.  The project team have submitted an Environmental Impact Assessment screening request to the Local Planning Authority on 01/02/2023. The response from the Authority has not been received prior to the submission of this business case.  The position in regard to Statutory and other Regulatory Consents will be clarified prior to and included within the Full Business Case submission. Nonetheless, a previously proposed scheme at this junction, developed as part of the Leeds Public Transport Investment Programme, was determined by the Local Planning Authority not to require an EIA, which implies that the currently proposed works, which are less extensive in terms of land take and local environmental impact, are unlikely to require an EIA. | |
| 3.2.4 Construction Design and Management Regulations 2015 (CDM) | |
| Do the CDM regulations apply to this scheme? | Yes |
| Is the lead organisation/promoter as identified in this business case the CDM Client as set out in the CDM 2015 regulations? | Yes – Mark Philpott (LCC Transport Strategy) will take the CDM Client role. |
| If the lead organisation is NOT the CDM client:  Provide details of the organisation which has formally accepted the CDM client role  Explain why they have been selected as the most appropriate organisation for this role |  |

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| **4. Economic Case** |

The purpose of the Economic Case is to demonstrate the project offers value for money.

It is expected that any supporting documentation that summaries any work carried out to develop the Economic Case are referenced and attached as appendices.

For the Preferred Option Testing part ofthe Economic Case (Section 4.3), this has been split into two parts:

* Part 1 – **Non-Transport** schemes should complete this section
* Part 2 – **Transport** schemes should complete this section

**Note – All sections should be reviewed and updated if this is the Full Business Case. A summary of any key changes and their implications on the business case should be included**

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| **4.1 Long List Options Testing** |
| 4.1.1 What Long List of Options have been considered? |
| The Long List of Options for the Lawnswood Roundabout Improvement Scheme builds upon optioneering work previously undertaken as part of the development of the Leeds Public Transport Investment Programme (LPTIP).  As part of work under the LPTIP, an option generation and appraisal process were carried out to help identify scheme options that would address transport issues in the vicinity of Lawnswood roundabout. Through an options identification workshop, involving officers from LCC and technical advisors from WSP, undertaken in October 2017, 18 possible interventions were identified.  This ultimately led to the promotion of a signalised crossroads proposal at Lawnswood roundabout through a public consultation exercise undertaken in 2018. There was some opposition to the proposed design, with several adjustments being made to the design in response. However, following a subsequent round of consultation undertaken later in 2018, it was decided to put scheme development on hold, to reappraise the original long list options in light of both responses to the consultation, the developing strategic/policy context and the CIP2 programme objectives (given that it was clear that there was insufficient time remaining within LPTIP funding constraints to deliver the scheme, and CIP was identified as the most likely source of funding for development and delivery at that stage). A number of new options also emerged as part of this process. The resultant updated Long List of Options is set out in Table 9.  For clarity, Table 9 highlights with an asterisk those options which were originally proposed during the LPTIP workshop undertaken in October 2017.  In summary, the process was as follows:   * During LPTIP, long list of options for Lawnswood roundabout generated at an officer workshop held in October 2017. * Initial long list assessed against project’s success criteria. * Following pause of LPTIP Signalised Crossroads scheme, additional options added to Long List after consideration of consultation responses and emerging policy context. |

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| **Table 9. Long List of Options** | | |
| **Option** | **Option Name** | **Option Description** |
| \*1a | Existing Roundabout ('Do Nothing') | Existing priority roundabout, with informal pedestrian crossings, no segregated cycle provision and no facility to prioritise buses. |
| \*1b | Existing Roundabout with Signalised Crossings | Geometry of existing roundabout retained, with signalised crossings provided on each arm. |
| \*1c | Existing Roundabout with Metering | Geometry of existing roundabout retained. Traffic approaching the roundabout to be metered via the introduction of traffic signals on the two ring road arms, a new bus gate on the southbound approach, and by use of the existing toucan crossing on the northbound approach. |
| \*2a | Modified Roundabout with Signalling | Signals added to existing roundabout, with minimal change to geometry of roundabout. Pedestrian crossings added, and cycle lanes on all arms. |
| \*2b | Cycle track through Signalised roundabout (Using crossings) | As 2a, but with controlled cycle movements through the junction for the main north-south movements. |
| \*2c | Modified Signalised Roundabout with Internal Storage | Signalised roundabout with internal storage, elongating the central island to maximise storage. Pedestrian crossings on each arm, and cycle lanes and advanced stop lines on each approach. |
| \*2d | Modified Signalised Roundabout with Cycle lanes Through Roundabout | As 2c, but with cycle lanes through the centre of the roundabout for the main north-south movements. |
| \*2e | Modified Signalised Roundabout with Cycle Track Through Junction (Using NGT Bus Lane Layout) | As 2c, but with cycle track provided through the centre of the roundabout for the main north-south movements. |
| \*2f | Modified Roundabout with Internal Storage and Left-Turn Slip Lanes | As 2d but utilising with-flow cycle lanes on the approaches to and through the junction, on the main north-south movements, rather than a cycle track through the centre of the roundabout. |
| 2g | Modified Signalised Roundabout with Internal Storage, with new southbound bus lane | As Option 2c and also including a southbound bus lane between Lawnswood Cemetery and Weetwood Police Station site |
| 2h | Modified Signalised Roundabout with Internal Storage, with new southbound bus lane and segregated cycle tracks on Otley Road | As Option 2g but also include segregated cycle tracks between roundabout and Otley Old Road |
| 2i | Modified Signalised Roundabout with Internal Storage, with new southbound bus lane and segregated cycle tracks on Otley Road, and signalisation of Otley Old Road | As Option 2h but with signalisation of Otley Road / Otley Old Road junction, with toucan crossings provided at this junction. |
| 2j | Modified Signalised Roundabout with Internal Storage, with new southbound bus lane (extended) | As option 2g but with bus lane extended closer to roundabout. |
| 2k | Modified Signalised Roundabout with Internal Storage, 2 lane approaches | As Option 2c, but with 2 lane approaches to the roundabout instead of 3 lane |
| \*3 | Hamburger roundabout | Signalised roundabout with controlled pedestrian crossings, with a route directly through the centre of the roundabout for vehicles on the north-south route. |
| \*4a | Signalised crossroads | Replace the existing roundabout with a signalised crossroads, with pedestrian crossings provided. |
| \*4b | Signalised Crossroads with Left-Turn Slip Lanes | As Option 4a, but with left-turn slip lanes included for increased capacity. |
| \*4c | Signalised Crossroads with Left-Turn Slip Lanes and cycle facilities | As Option 4b, but with segregated cycle tracks provided for the north-south movements. |
| \*5a | Grade Separation for Motor Vehicles (East-West Along Ring Road) | Existing roundabout broadly retained (potentially with addition of improved pedestrian/cycle facilities), with grade separation required for motor vehicles on the east-west movements. |
| \*5b | Grade Separation for Motor Vehicles (North-South Along Otley Road) | As Option 5a, but with grade separation provided for motor vehicles on the north-south movements, rather than east-west. |
| \*5c | Grade Separation for Cyclists (North-South Along Otley Road) | As Option 5a, but with grade separation provided for cyclists rather than general traffic. |
| \*6 | Bi-Directional Cycle Track | Existing roundabout retained, but with bi-directional cycle tracks provided on all approaches. |
| \*7 | Underpass | Underpass provided at the roundabout for pedestrians and cyclists. Roundabout may either remain as a priority arrangement, or could be signalised. |
| 8 | Dutch-style roundabout | Priority arrangement at roundabout, with circulatory routes provided for pedestrians and cyclists, each of which have priority over general traffic. |
| 9 | CYCLOPS junction | Signalised junction provided at the roundabout, with pedestrian crossings on an ‘inner loop’, and cycle crossings on an ‘outer loop’, with general footway on the outside of the cycle crossings. |
| 10 | Standalone southbound bus lane between Lawnswood Cemetery and Weetwood Police Station site | No intervention at Lawnswood roundabout. Southbound bus lane provided on Otley Road, between Lawnswood Cemetery and Weetwood Police Station site. |
| 11 | Existing Roundabout with Signalised Crossings, positioned at a distance from the roundabout | As Option 1b, but with toucans positioned at a greater distance from the roundabout |

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| 4.1.2 What Critical Success Factors (CSF)s have been used to evaluate the Long List of options? |

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| **Table 10: Critical Success Factors** | | |
| **CSF** | **CSF Name** | **CSF Description** |
| 1 | Value for Money | Optimises value for money. |
| 2 | Strategic fit | Meets business needs and wider government policies / strategies / objectives.  Enables sustainable development. |
| 3 | Achievability | Public and political acceptability.  Deliverable utilising current engineering solutions.  Sufficient capability and capacity of the client, contractors and others to deliver. |
| 4 | Affordability | Can be delivered within capital funding available. |
| 5 | Timescale | Can be delivered within timeframe of available funding |

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| 4.1.3 How has the Long List of Options been appraised? |
| The process used to sift the long list options is described fully in Appendix E. The process involved the use of a Multi-Criteria Assessment Tool (MCAT) to score options against the CIP2 and CRSTS objectives, and against the scheme-specific Critical Success Factors (CSFs). The CIP2 and CRSTS objectives are listed in Table 11, and the scheme-specific CSFs are listed in Table 10. Each option was given a score ranging from -3 to +3 for each objective/CSF, based on the anticipated benefits/impacts of that option and that stage of project development. The highest scoring option was selected as the ‘Do Something – Preferred’ option. The highest scoring option which was smaller in scope than the ‘Do Something – Preferred’ was then selected as the ‘Do Something - Less Ambitious’ option, and the highest scoring option which was greater in scope than the ‘Do Something – Preferred’ option was selected as the ‘Do Something - More Ambitious’ option.  **Table 11. Objectives of CIP2 and CRSTS.**   |  |  | | --- | --- | | **Programme** | **Objective** | | CIP2 | Deliver Clean Growth, enhanced environmental resilience & reduced carbon emissions. | | To support a more sustainable transport network and modal shift from private cars. | | To improve journey time reliability and reduce journey times along the CIP corridors. | | Indirectly support the delivery of housing & employment opportunities, particularly in Spatial Priority Areas | | Deliver inclusive growth by connecting disadvantaged communities to jobs and other economic opportunities, while also adding value to the environment, health and wellbeing of local communities. | | To improve road safety along the corridors for all users with a focus on reducing the level of KSIs | | CRSTS | Driving growth and productivity through infrastructure investment | | Levelling up services towards the standards of the best | | Decarbonising transport, especially promoting modal shift from cars to public transport, walking and cycling | |

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| **4.2 Short List Options Testing** |
| 4.2.1 What is the Short List of Options? |
| The Short List of options identified at the conclusion of the Long List sifting exercise is presented in Table 12. These options form the focus of this OBC and Scheme appraisal in order to arrive at a preferred option. The scheme drawings for the options can be found in Appendix A. All of the short listed ‘Do Something’ options were identified through the MCAT long list options appraisal process as being expected to provide significant benefits in terms of safety, improved facilities for active travel and journey time benefits for buses. |

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| **Table 12: Short List of Options** | | |
| **Option** | **Option Name** | **Option Description** |
| 1 | Do Something - Preferred | * + As shown in ‘Appendix A – General Arrangement Drawing, Do Something – Preferred’.   + Introduction of a signalised roundabout at the Lawnswood junction, under MOVA control.   + Introduction of signalised pedestrian and cycle crossing facilities at the Lawnswood junction.   + Introduction of segregated cycle facilities on all approaches to the Lawnswood junction, and connecting the new crossing facilities.   + Introduction of a southbound bus lane on Otley Road, on the approach to the Lawnswood junction.   + Reduce speed limit on eastern arm of junction from national speed limit (70 miles per hour) to 40 miles per hour (extents to be determined). |
| 2 | Do Something - Less Ambitious | As ‘Do Something – Preferred’, but without the proposed southbound bus lane on Otley Road. |
| 3 | Do Something - More Ambitious | As ‘Do Something – Preferred’, but with the following additional elements:   * + Signalisation of the Otley Road / Otley Old Road junction, under MOVA control.   + Introduction of signalised pedestrian crossing facilities at the Otley Road / Otley Old Road junction.   + Introduction of segregated cycle facilities southbound on Otley Road, between Otley Old Road and Lawnswood roundabout.   + As shown in ‘Appendix A – General Arrangement Drawing, Do Something – More Ambitious’. |
| 4 | Do Nothing | No intervention |

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| 4.2.2 How has the Short List of Options been appraised? |
| The Short Listed options have been appraised in line with the methodology agreed with WYCA as set out in the Appraisal Specification Report (ASR) (Appendix F). The ASR sets out the appraisal approach for the economic, social and environmental assessments. The ASR was developed in consultation with WYCA’s appraisal team and signed off in December 2022.  In summary, the following approaches have been applied to appraise the Scheme Short Listed options:   * **Bus User Impacts** – An elasticity model has been used to estimate the levels of generated demand and associated benefits for bus users based on the relative generalised journey costs between the Do Nothing and Do Something options. The bus journey time improvements have been derived from the Lawnswood Aimsun microsimulation model (the development of this model is set out in Section 4.3.2). The appraisal has been undertaken in accordance with the DfT’s TAG Unit A1.3. * **Bus Reliability Impacts** – Bus journey time reliability benefits for bus users have been calculated by comparing the standard deviation of lateness for buses in the Aimsun model for each Do Something option against the same measure in the Aimsun model for the Do Nothing option. The appraisal of the active travel impacts was undertaken in accordance with TAG Unit A1.3. * **Active Travel Impacts** - The DfT’s Active Mode Appraisal Toolkit (AMAT) has been used to estimate the infrastructure benefits of the options. The appraisal of the active travel impacts was undertaken in accordance with the DfT’s TAG Unit 5.1 guidance.   The signalisation of the Lawnswood Roundabout as proposed in each Do Something option, and also the Otley Road/Otley Old Road junction in the Do Something – More Ambitious option, is also likely to have safety benefits for pedestrians and cyclists. Therefore, to monetise these benefits, historic collision data involving pedestrians and cyclists at the junctions have been analysed to calculate an annual average number of collisions and casualties. TAG Databook values (Table 4.1.2) for casualty prevention savings have then been used to calculate an annual casualty prevention saving which has been applied across the appraisal period.   * **Highway User Impacts** – Input trip and cost matrices/skims have been taken from the forecast Aimsun models for the Do Nothing and each Do Something scheme option and used in the Transport Users Benefits Appraisal (TUBA) software to appraise the highway transport user benefits associated with each Do Something option. This appraisal has been undertaken in accordance with TAG Unit A1.3. * **Accident Impacts** – Traffic flows from the Aimsun model have been used to undertake a Cost and Benefit to Accidents – Light Touch (COBA-LT) assessment based on the changes in junction types in the Do Something options. This appraisal has been undertaken in accordance with TAG Unit A4.1. * **Environmental Impacts** - The appraisal of the options’ environmental impacts was undertaken in accordance with TAG Unit A3, and includes a qualitative assessment of impacts on noise, air quality, greenhouse gases, landscape, townscape, historic environment, biodiversity and water environment.   For the noise, air quality and greenhouse gas impacts, a quantitative assessment has also been undertaken using outputs from the highway appraisal (greenhouse gases) and Marginal External Cost values from the bus and active travel appraisal. A Stage 2 High-level Assessment Carbon Impact Assessment has been undertaken to review and account for the embedded and operational carbon impact of the Scheme.   * **Social and Distributional Impacts** – The appraisal of the options’ Social and Distributional impacts was undertaken in accordance with the DfT’s TAG Unit A4.1 and 4.2. Whilst the eight social impacts that are considered part of the Social Impact appraisal have been completed, only a screening of the Distributional Impacts has been completed at this stage, with a full Distributional Impacts appraisal subject of the preferred option at the Full Business Case (FBC) stage of work. |
| 4.2.3 How does the Scheme contribute to the SEF Headline Indicators ([access the Plan here](https://www.lepnetwork.net/media/1119/leeds-city-region-sep.pdf))? |
| Section 2.1.2 has highlighted how the proposed scheme will contribute to the SEF priorities. This is summarised in Table 13. Table 14 then indicates where contributions to each of the SEF priorities are direct or indirect, for each ‘Do Something’ option.  **Table 13. Contributions of proposed scheme to SEF priorities.**   |  |  | | --- | --- | | SEF Priority | Scheme Contribution | | **Boosting Productivity**  Helping businesses to grow and invest in the region and their workforce, to drive economic growth, increase innovation and create jobs | By making active travel and buses more attractive, the scheme will help to ensure that anticipated increases in demand for travel on the A660 corridor can be accommodated sustainably and efficiently. This will help to ensure that investment and economic growth are not constrained by the limited capacity of the A660 corridor. This will help to boost productivity. | | **Enabling Inclusive Growth**  Enabling as many people as possible to contribute to, and benefit from, economic growth in our communities and towns. | By improving facilities for buses and active travel, the scheme will improve mobility for people without access to cars, thereby enabling more people to contribute more effectively to, and benefit from, economic growth in Leeds. | | **Tackling the Climate Emergency**  Growing our economy while cutting emissions and caring for our environment. | By introducing signalised crossing facilities and segregated cycle tracks at this key location, all of the short list options would help to make active travel a realistic option for a wider range of people and journeys. This will help to generate modal shift from car to active modes, thereby reducing emissions.  The scheme will also enable buses to be prioritised ahead of general traffic.   This will make buses more attractive, thereby generating modal shift from car to bus, with an associated reduction in emissions. | | **Delivering 21st Century Transport**  Creating efficient transport infrastructure to connect our communities, making it easier to get to work, do business and connect with each other. | By making bus and active modes more accessible and more attractive, the scheme is expected to generate modal shift towards these more efficient modes. This will increase the people carrying capacity of the corridor, making it easier for people to get to work, do business and connect with each other. | |

| **Table 14: Summary of Scheme Short List Options’ Contributions to SEF Priorities** | | | | | | |
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| **Priority** | **Option 1:**  **Preferred** | | **Option 2:**  **Less Ambitious** | | **Option 3:**  **More Ambitious** | |
| **Direct** | **Indirect** | **Direct** | **Indirect** | **Direct** | **Indirect** |
| Boosting Productivity |  | ✓ |  | ✓ |  | ✓ |
| Enabling Inclusive Growth |  | ✓ |  | ✓ |  | ✓ |
| Tackling the Climate Emergency | ✓ |  | ✓ |  | ✓ |  |
| Delivering 21st Century Transport | ✓ |  | ✓ |  | ✓ |  |

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| **4.3 Preferred Option Testing** |

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| **Part 2: Appraisal of Transport Schemes** |
| 4.3.1 What methodologies have been used for modelling and appraisal of the scheme? |
| The Short Listed options have been appraised in line with the agreed methodology set out in the Appraisal Specification Report (ASR) (Appendix F). The ASR sets out the appraisal approach for the economic, social, and environmental assessments for this Scheme. A summary of the approaches is set out in Section 4.2.2. |
| 4.3.2 What transport model(s) have been used for the scheme appraisal? |
| The ASR (Appendix F) provides detail on the modelling approach used for the Scheme.  To inform the appraisal of the options, an Aimsun microsimulation model of the Scheme area representing weekday conditions has been developed (the Lawnswood Aimsun microsimulation model). Figure 7 shows the extents of the Aimsun model. Traffic flows in the model are based on traffic surveys undertaken in June 2022. Key characteristics of the model are outlined in the Local Model Validation Report (LMVR) (Appendix F). As explained in the LMVR, Aimsun models representing the weekday AM peak hour, a typical weekday interpeak hour and the weekday PM peak hour have been developed.    Spen Lane  Otley Road  Weetwood Lane  A6120  Lawnswood Roundabout  Spen Lane  A6120  Long Causeway  Otley Road  Otley Old Road  Figure 7. Lawnswood Aimsun Model Extent  Whilst a SATURN model for Leeds does exists, called the Leeds Transport Model (LTM2), there were concerns regarding local validation in the model, which has been shown to overstate delays on the eastbound approach to the A660 Lawnswood roundabout. Initial modelling using the LTM2 highway assignment model was shown to provide unrealistic results due to delays on the eastbound approach to the roundabout significantly exceeding observed delays in the Base scenario, which led to a prediction of unrealistically high growth on this arm in the ‘Do Something’ options. These findings indicated that the existing LTM2 was unsuitable for the purpose of appraising a Scheme at this location and, following liaison with WYCA (August 2022), it was agreed to not use LTM2 and use Aimsun instead for the OBC appraisal and modelling as it is proportionate to the scale of the scheme. The ASR was updated based on this agreement and signed off by WYCA in December 2022. |

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| 4.3.3 What forecasting methodologies have been used for the scheme appraisal? |
| Aimsun model scenarios have been prepared to cover the assessment years of 2023 (assumed Scheme opening year) and 2038 (15-year horizon year) for three time periods (AM peak, Inter-peak and PM peak).  Traffic flows in the Aimsun model are based on traffic surveys undertaken between Tuesday 7th and Thursday 9th June 2022, at the Lawnswood roundabout and A660 Otley Road / Otley Old Road junction. For the 2023 opening year, it has been assumed that traffic volumes are the same as those observed in 2022. For 2038, growth factors have been applied to the traffic volumes from the traffic surveys data. These growth factors were based on a comparison of traffic flows in 2038 and 2023 LTM2 model runs, with individual growth factors calculated for each arm of the roundabout. These growth factors have been directly applied to the June 2022 survey data for the 2038 forecast Aimsun models on the northbound, southbound, and westbound approaches to the roundabout. Given the unrealistic growth constraints on the eastbound approach to the roundabout in the LTM2, as described in Section 4.3.2 and the ASR (Appendix F), forecasts for the eastbound approach are calculated using the average of the growth factors from the other three arms, and applied to uplift the June 2022 count data.  The use of LTM2 to inform forecast growth means that specific developments and proposed infrastructure improvements are accounted for in the forecasts – Appendix H provides full details on these in the Uncertainty Log.  Traffic demand in the forecast Aimsun models is fixed and consistent across the Do Nothing and each Do Something scenario. This approach was agreed through the ASR process, on the basis that interim Aimsun modelling results show little change in journey times as a result of implementation of the scheme, and therefore large changes in traffic flows were not expected. |
| 4.3.4 How has the impact of the scheme on travel demand and behaviour been incorporated? |
| Prior to the agreement on the use of the Lawnswood Aimsun microsimulation model with WYCA to appraise the Scheme, discussions were held about whether there was the need to use LTM2 to undertake a variable demand modelling run. As mentioned in Section 4.3.2, there were known issues with the LTM2 in terms of how it reflects the eastbound approach to the Lawnswood roundabout. A 2038 LTM2 SATURN run including the Scheme was undertaken which showed unrealistic levels of reassignment as a result of this issue within the model. After discussing these results with WYCA, it was agreed that as the focus of the Scheme is on providing active travel improvements and bus priority rather than increasing capacity, the level of reassignment being shown in the LTM2 model was not a true reflection of the expected impact of the Scheme and further justified the use of the Lawnswood Aimsun microsimulation model.  In terms of modal shift to bus from improved bus journey times, this has been estimated using an elasticity-based spreadsheet model. The spreadsheet model is based on the relative In-Vehicle Time (IVT) between the Do Nothing and Do Something options to calculate a % uplift in users. Evidence on the elasticities of demand and diversion factors are derived from the ‘Bus fare and journey time elasticities and diversion factors for all modes’ report[[11]](#footnote-12).  In terms of the increase in active travel as a result of the improved infrastructure for walking, wheeling and cycling and the modal shift from car, this has been calculated using the DfT’s Active Mode Appraisal Toolkit (AMAT). The increase in active travel has been estimated using evidence from comparator schemes recently delivered elsewhere in Leeds where pre- and post-scheme usage data has been collected to understand how travel demand and behaviour has changed (see section 4.3.5 for more detail). The increase in journeys is likely a result of modal shift with the monetised benefit of a reduction in vehicle kms resulting from modal shift calculated in AMAT. |
| 4.3.5 What methodologies have been used to calculate the **Monetised Benefits**? |
| The approach to determining the monetised benefits of the scheme was developed in line with TAG guidance, principles, and values. The key appraisal methodologies are described in the ASR (Appendix F) and are summarised above in Section 4.2.2.  This section describes the key assumptions, caveats and reports on the monetised benefits for each benefits stream. All benefits in this section are reported in 2010 values and prices in accordance with TAG. The Transport Economic Efficiency (TEE), Public Accounts (PA) and Analysis of Monetised Costs and Benefits (AMCB) tables are presented in Appendix I with an Appraisal Summary Table (AST) for each option in Appendix J[[12]](#footnote-13). The appraisal spreadsheets for the active mode impacts can be found in Appendix K and for the bus user/reliability impacts in Appendices L to O.  Monetised benefits of the Scheme have been calculated as described in the remainder of this section.  **Bus User Impacts**  Bus journey time benefits are derived by comparing the outputs of the Aimsun model for the short list options with the model for the Do Nothing scenario.  Appendix L shows the full journey time savings for each section/movement against each option for the three modelled time periods. Table 15 shows a summary of the impact on an average user for a return journey once time period and journey purpose have been accounted for. It should be noted that the routes showing journey time disbenefits in the Do Something – Preferred and Do Something – Less Ambitious options are for the less frequent service on Otley Old Road, with services on Otley Road experiencing an overall improvement for return journeys in all options, in both modelled years.  **Table 15: Average daily return journey time across scheme extents (seconds)\***   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Origin** | **Destination** | **Model Year** | **Model results\*2** | | | | **Difference from DN** | | | | **DN** | **Pref.** | **MA** | **LA** | **Pref.** | **MA** | **LA** | | Otley Old Rd | Otley Rd south | 2023 | 185 | 313 | 164 | 199 | 127 | -21 | 13 | | Otley Rd north | Otley Rd south | 2023 | 159 | 155 | 154 | 156 | -4 | -5 | -2 | | Otley Rd south | Otley Old Rd | 2023 | 180 | 277 | 164 | 171 | 97 | -16 | -9 | | Otley Rd south | Otley Rd north | 2023 | 156 | 149 | 150 | 150 | -8 | -7 | -7 | | Otley Old Rd | Otley Rd south | 2038 | 253 | 399 | 157 | 270 | 147 | -95 | 18 | | Otley Rd north | Otley Rd south | 2038 | 188 | 160 | 147 | 160 | -28 | -41 | -27 | | Otley Rd south | Otley Old Rd | 2038 | 203 | 316 | 167 | 183 | 113 | -37 | -20 | | Otley Rd south | Otley Rd north | 2038 | 172 | 152 | 151 | 134 | -20 | -21 | -38 |   \* Green colouring denotes journey time savings, red colouring denotes journey time increase. A darker shade has been used to denote larger values.  \*2 DN = Do Nothing, Pref. = Do Something – Preferred, MA = Do Something – More Ambitious, LA = Do Something – Less Ambitious  The underlying assumptions and sources are presented in Appendices M and N. Additionally, a flow chart of the inputs is shown in Appendix O as a mapping of the appraisal process.  A summary of the transport user benefits as a result of improvements for existing bus users is presented by journey purpose in Table 16. This shows that the Do Something – Less Ambitious and Do Something – More Ambitious options deliver bus journey time benefits, whereas the Do Something – Preferred option is shown to deliver disbenefit to bus journey times. The results in Table 15 suggest this disbenefit is primarily due to the significant increase in bus journey times southbound on Otley Old Road where bus journey time increases of around 90 – 150 seconds (depending on production/attraction and model year) are forecast compared to the Do Nothing. Whilst the Do Something – Preferred introduces a southbound bus lane on the approach to Lawnswood roundabout, the Aimsun model suggests that buses (bus service 6) will be delayed in accessing the bus lane when completing a right turn from Otley Old Road to Otley Road. This results in increases in journey times for buses and general traffic southbound on Otley Old Road (see Highway User Impacts for more detail).  **Table 16: Bus User Journey Time Benefits (60-year appraisal period) in £’000s**   |  |  |  |  | | --- | --- | --- | --- | |  | **Less Ambitious** | **Preferred** | **More Ambitious** | | Commuting | £340 | -£653 | £1,245 | | Other | £146 | -£420 | £634 | | Business | £4 | -£13 | £21 | | **TOTAL PVB** | **£489** | **-£1,085** | **£1,899** |   Note: Sum of values may not equal total due to rounding  Due to the decrease in bus journey times for the Do Something – Less Ambitious and Do Something – More Ambitious options compared to the Do Nothing, it has been assumed that this will result in modal shift to bus from car. This has been calculated in the form of an elasticity demand forecast model approach based on IVT elasticity. The elasticity factors have been applied by purpose-based factors from the ‘Bus fare and journey time elasticities and diversion factors for all modes’ report[[13]](#footnote-14). The benefit of this has been monetised using the DfT marginal external cost (MEC) approach, based on diversion factors due to existing bus services improving. These results are shown in Table 17. As journey time increases are forecast for the Do Something – Preferred option compared to the Do Nothing, modal shift from bus to car is assumed, resulting in a MEC disbenefit.  **Table 17: Bus User Marginal External Cost Benefits (60-year appraisal period) in £’000s**   |  |  |  |  | | --- | --- | --- | --- | |  | **Less Ambitious** | **Preferred** | **More Ambitious** | | Congestion benefit | £126 | -£144 | £385 | | Infrastructure maintenance | £0 | £0 | £1 | | Accidents | £13 | -£15 | £40 | | Local Air Quality | £1 | -£1 | £2 | | Noise | £1 | -£1 | £3 | | Greenhouse Gases | £4 | -£6 | £12 | | Indirect Taxation | £1 | £1 | £3 | | **TOTAL PVB** | **£146** | **-£166** | **£446** |   Note: Sum of values may not equal total due to rounding  The attraction of new users to bus will also have a revenue benefit. An elasticity demand model approach, similar to the MEC benefit calculation, has been used to calculate this benefit. A nominal revenue value of £2.00 per standard user journey has been applied, which is based on the West Yorkshire Combined Authority’s ‘Mayors Fares’ campaign where single journeys are capped at £2.00[[14]](#footnote-15). The private sector (bus operator) revenue benefits are presented by journey purpose in Table 18.  **Table 18. Revenue from Bus User Journey Time Benefits (60-year appraisal period) in £’000s**   |  |  |  |  | | --- | --- | --- | --- | |  | **Less Ambitious** | **Preferred** | **More Ambitious** | | **TOTAL PVB** | £115 | -£144 | £346 |   Note: Market Prices, excluding loss of Indirect Tax  **Bus Reliability Impacts**  For bus, the value of reliability is based on the standard deviation of lateness. To estimate the value of reliability, values of time from the TAG Databook have been used with a reliability ratio value of 1.4 used in line with TAG Unit A1.3.  An improvement in reliability is represented by a decrease in the standard deviation of lateness. The reliability impact has been calculated by comparing outputs from the Aimsun model for the Do Nothing model with outputs for each Do Something option. The impact of each option on reliability for return journeys using each bus route, for each modelled year, are summarised in Table 19. The table shows improved reliability in all options for the higher frequency services on Otley Road, whereas there is a disbenefit for services using Otley Old Road in the Do Something – Preferred option, as well as for trips originating from Otley Old Road in the Do Something – Less Ambitious option in future years.  **Table 19. Average return journey standard deviation of lateness across scheme extents (seconds) \***   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Origin** | **Destination** | **Model Year** | **Model results\*2** | | | | **Difference from DN** | | | | **DN** | **Pref.** | **MA** | **LA** | **Pref.** | **MA** | **LA** | | Otley Old Rd | Otley Rd south | 2023 | 29 | 42 | 11 | 25 | 13 | -18 | -4 | | Otley Rd north | Otley Rd south | 2023 | 17 | 11 | 12 | 5 | -6 | -5 | -12 | | Otley Rd south | Otley Old Rd | 2023 | 19 | 42 | 8 | 11 | 24 | -11 | -7 | | Otley Rd south | Otley Rd north | 2023 | 10 | 8 | 8 | 5 | -3 | -2 | -6 | | Otley Old Rd | Otley Rd south | 2038 | 54 | 73 | 9 | 76 | 19 | -45 | 22 | | Otley Rd north | Otley Rd south | 2038 | 20 | 9 | 13 | 13 | -10 | -7 | -7 | | Otley Rd south | Otley Old Rd | 2038 | 36 | 52 | 8 | 24 | 16 | -28 | -12 | | Otley Rd south | Otley Rd north | 2038 | 21 | 8 | 7 | 6 | -13 | -14 | -15 |   \* Green colouring denotes journey time savings, red colouring denotes journey time increase. A darker shade has been used to denote larger values.  \*2 DN = Do Nothing, Pref. = Do Something – Preferred, MA = Do Something – More Ambitious, LA = Do Something – Less Ambitious  The transport user benefits of improvements to the reliability of existing bus services are valued as shown in Table 20 with these benefits informing the adjusted BCR. This shows that the Do Something – More Ambitious option is the only Do Something option which is forecast to generate a bus reliability benefit compared to the Do Nothing. The Do Something – Less Ambitious option is shown to provide a bus reliability benefit in 2023, but this gradually reduces overtime and results in a bus reliability disbenefit in 2038 which continues until the end of the 60 year appraisal (the reliability benefit/disbenefit value is capped from year 30 of the appraisal). The Do Something – Preferred option is shown to have a reliability disbenefit in 2023 which reduces in 2038 and gradually results in a reliability benefit in year 30 of the appraisal which continues until the end of the 60 year appraisal. This is the reason for the overall reliability disbenefit being lower for this option than the Do Something – Less Ambitious option.  It should be noted that the modelling used to inform the bus reliability appraisal does not include Microprocessor Optimised Vehicle Actuation (MOVA) at the traffic signals, which is proposed to be delivered as part of each Scheme, and which is more responsive to traffic conditions compared to traditional Vehicle Actuation (VA) control. Research by the Transport Research Laboratory (TRL) showed that at isolated junctions, MOVA provided an average 13% delay reduction compared to up-to-date VA operation. Further work is therefore required at the FBC stage to incorporate MOVA into the traffic modelling, which would be expected to improve the reliability forecast for the Do Something options.  **Table 20: Bus User Reliability Benefits (60-year appraisal period) in £’000s**   |  |  |  |  | | --- | --- | --- | --- | | Journey Purpose | **Less Ambitious** | **Preferred** | **More Ambitious** | | Commuting | -£79 | -£45 | £613 | | Other | -£41 | £2 | £358 | | Business | -£2 | £1 | £12 | | **TOTAL PVB** | **-£122** | **-£42** | **£983** |   **Active Travel Impacts**  Monetised benefits have been calculated using the DfT’s Active Mode Assessment Toolkit (AMAT). AMAT quantifies the uplift in demand for walking and cycling, with standard diversion factors applied to estimate diversion and mode shift from other modes such as cars. These come from standard TAG Databook diversion factors, and the concurrent Marginal External Costs of Car (MECC) values. AMAT provides the monetised benefits in relation to:   * Decongestion * Journey ambience * Reduced rates of absenteeism * Health * Environment – including air quality, greenhouse gases and noise * Reduced collisions   To calculate the existing number of cyclists and pedestrians, cycle and pedestrian counts were undertaken in June 2022 at Lawnswood roundabout. Weekday and weekend data was collected allowing benefits to active mode users of the options to be calculated for 357 days of a year (number of days in a year minus bank holidays). The average weekday and weekend count values for each location are shown in the Table 21.  **Table 21: Average weekday and weekend cycle and pedestrian counts (June 2022)**   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **Cyclists - weekday** | **Cyclists - weekend** | **Pedestrians - weekday** | **Pedestrians - weekend** | | Otley Road (north of Lawnswood) | 151 | 136 | 265 | 219 | | Otley Road (south of Lawnswood) | 140 | 107 | 349 | 272 | | A6120 (east of Lawnswood) | 7 | 28 | 139 | 134 | | A6120 (west of Lawnswood) | 31 | 2 | 369 | 244 |   To forecast the cycling and pedestrian demand increase resulting from the Scheme, data from comparative schemes delivered elsewhere in Leeds (Horsforth Roundabout, A61/A6120 roundabout and the A61/B6157 roundabout) were analysed. Data collected pre- and post-scheme implementation for each scheme showed:   * Horsforth roundabout: 24.3% increase in cyclists * A61/A6120 roundabout: 50.8% increase in cyclists and 52% increase in pedestrians * A61/B6157 roundabout: 123.7% increase in cyclists and 23.3% decrease in pedestrians   The demand uplifts seen at the A61/A6120 roundabout have been used in the appraisal as it is the most directly comparable scheme to the Lawnswood Scheme. These percentage increases have been applied to the baseline cycle and pedestrians counts at Lawnswood roundabout to calculate future growth as a result of the Scheme options.  The forecast pedestrian and cycle demands are shown in Table 22.  **Table 22. Forecast weekday and weekend cycle and pedestrian values as a result of the Scheme.**   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **Cyclists - weekday** | **Cyclists - weekend** | **Pedestrians - weekday** | **Pedestrians - weekend** | | Otley Road (north of Lawnswood) | 228 | 205 | 403 | 333 | | Otley Road (south of Lawnswood) | 211 | 161 | 530 | 413 | | A6120 (east of Lawnswood) | 11 | 42 | 211 | 204 | | A6120 (west of Lawnswood) | 47 | 3 | 561 | 371 |   Table 23 sets out the benefits calculated in AMAT for each option.  **Table 23: Active Travel Benefits (40-year appraisal period[[15]](#footnote-16)) in £‘000s**   |  |  |  |  | | --- | --- | --- | --- | |  | **Less Ambitious** | **Preferred** | **More Ambitious** | | Congestion benefit | £387 | £490 | £516 | | Infrastructure maintenance | £1 | £1 | £1 | | Accident | £33 | £42 | £44 | | Local air quality | £6 | £7 | £8 | | Noise | £2 | £3 | £3 | | Greenhouse gases | £16 | £20 | £21 | | Reduced risk of premature death | £6,142 | £7,373 | £7,918 | | Absenteeism | £937 | £1,069 | £1,171 | | Journey ambience | £158 | £195 | £295 | | Indirect taxation | -£16 | -£21 | -£22 | | **TOTAL PVB** | **£7,667** | **£9,180** | **£9,955** |   **Active Travel Safety Impacts**  To assess the safety benefits of the Scheme to pedestrians and cyclists as a result of the improved crossing facilities, a casualty prevention calculation has been undertaken. Collision data for 2015-2019 (to omit the impact of Covid-19 as the Scheme is aiming to address issues identified with the junction pre-Covid) has been analysed to calculate the annual average number of collisions involving pedestrians and cyclists in the vicinity of Lawnswood roundabout (for all Do Something options) and the Otley Road/Otley Old Road junction (for the Do Something – More Ambitious option). The number of collisions involving pedestrians and cyclists at the roundabout and Otley Old Road is shown in Table 24. It should be noted that the analysis showed no collisions involving pedestrians occurred at either the roundabout or Otley Old Road/Otley Road junction.  **Table 24. Total and annual average number of collisions involving pedestrians and cyclists (2015-2019)**   |  |  |  | | --- | --- | --- | | **Junction** | **Total collisions (2015-2019)** | **Annual average** | | Lawnswood Roundabout | 18 | 3.6 | | Otley Old Road/Otley Road junction | 1 | 0.2 |   Source: Crashmap  It is unlikely that the Scheme will result in a complete eradication of collisions involving pedestrians and cyclists, especially if more cyclists and pedestrians are crossing the junctions as a result of the Scheme. To understand an appropriate assumption for the reduction in collisions, a study undertaken by Transport for London (2005)[[16]](#footnote-17) on the effectiveness of traffic signals at roundabout in relation to safety benefits for pedestrians and cyclists has been used. The study found that across 10 roundabouts, there was an average 80% reduction in collisions involving a pedal cycle once the roundabouts had been signalised. This percentage reduction has been applied to the annual average collision saving and monetised using TAG Databook casualty prevention values from Table A4.1.2. This annual monetised benefit has then been applied across the full appraisal period.  Table 25 shows the casualty prevention benefit for each option.  **Table 25. Active Travel Safety Benefit (40-year appraisal period) in £‘000s**   |  |  |  |  | | --- | --- | --- | --- | |  | **Less Ambitious** | **Preferred** | **More Ambitious** | | Casualty prevention benefit | £2,155 | £2,155 | £2,275 |   **Highway User Impacts**  To assess travel time and vehicle operating cost impacts the latest versions of TUBA (v1.9.17) and the TAG Data Book (v1.20.2) available at the time have been used. The following provides an overview of the approach undertaken and results from the TUBA assessments, with further detail provided in Appendix P.  Trip matrices and cost (distance and time) skims have been taken from the Do Nothing and Do Something Aimsun models for each modelled time period and used in TUBA to appraise the highway transport user impacts over a 60-year appraisal period. As noted above in Section 4.3.3, trip matrices are fixed and consistent between the Do Nothing and Do Something scenarios.  As the Aimsun models represent a single hour in each of the AM peak, inter peak and PM peak periods, annualisation factors have been used to uplift the results for the modelled periods to represent as many hours during the year as possible. This includes allowance for the weekday off-peak period, making use of the modelled inter peak as a proxy. The annualisation factors have been derived using long term local traffic count data and account for the factoring of modelled hours to longer periods and from June conditions to annual average conditions. Further detail on their derivation is provided in Appendix P. The resulting factors are as follows:   * AM peak = 620 hours * Inter peak = 1624 hours * PM peak = 672 hours * Off-peak (using inter peak model as proxy) = 783 hours   An overview of the highway user impacts associated with each scheme option is provided in Table 26.  **Table 26. Highway User Benefits (60-year appraisal period) in £’000s**   |  |  |  |  | | --- | --- | --- | --- | | **Measure** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Travel time | -£9,094 | -£20,912 | -£13,466 | | Vehicle operating costs (fuel) | -£483 | -£815 | -£737 | | Vehicle operating costs (non-fuel) | -£239 | -£434 | -£351 | | Indirect Taxation | £221 | £363 | £329 | | **TOTAL PVB** | **-£9,595** | **-£21,798** | **-£14,225** |   A more detailed consideration of the TUBA results is provided in Appendix P, which includes a presentation of impacts by time period, modelled year, benefit type, time change band and sector. An overview of the results is provided below.  Each option under consideration is shown to lead to an overall disbenefit to highway users (general traffic). The majority of disbenefits are associated with forecast increases in travel time for general traffic arising from the addition of traffic signal control at Lawnswood roundabout (all options) and the Otley Road / Otley Old Road junction (Do Something – More Ambitious option only).  The majority of disbenefits to highway users are associated with relatively minor increases in travel times – for example, in both the Less Ambitious and More Ambitious options approximately 85-90% of disbenefits are associated with trips that experience increases in travel times of less than 60 seconds.  The Do Something - Preferred option does see a higher level of disbenefit for trips experiencing larger increases in travel times (more than one minute slower), which is largely due to longer delays on the Otley Old Road approach to its junction with Otley Road (see Figure 8 which shows snapshots of queuing vehicles from the 2023 Aimsun models in the AM peak for the Do Nothing and Do Something options). These larger delay increases are caused by the introduction of the southbound bus lane on Otley Road in this option, which the Aimsun model suggests would make it more difficult to complete a right turn from Otley Old Road to Otley Road. It is noted that signalising this junction in the More Ambitious option is forecast to reduce delays for Otley Old Road traffic but does add some new delay to traffic travelling on Otley Road in both directions.    **Figure 8: Lawnswood Aimsun Model (2023 AM Peak) – Otley Road / Otley Old Road junction**  Highway user disbenefits associated with the scheme options generally decline in the later forecast years and are also lower in the peak periods. Indeed, by 2038, the Less Ambitious and More Ambitious options are shown to provide a net benefit in the peak periods. This demonstrates that the signalised Lawnswood roundabout is forecast to operate more efficiently than the existing layout as traffic volumes increase and in the busier periods of the day.  **Highway User Accident Impacts**  COBA-LT software (v2.5) has been used to assess the safety impacts of the Scheme options for highway users over a 60-year appraisal period. The software estimates the impact of each scheme on the number of collisions and casualties, and their associated economic impact.  The COBA-LT assessment has been undertaken for the Lawnswood roundabout and Otley Road / Otley Old Road junctions, for which personal injury collision data has been obtained for the full five-year period from 2015 to 2019 from the DfT’s Road Safety Data website. A full five-year period’s worth of data is required for the appraisal and it was necessary to use data unaffected by the Covid-19 pandemic. The observed collision data, in combination with Annual Average Daily Traffic (AADT) flows, is used by COBA-LT software to derive observed collision rates at the two existing junctions. As observed collision data can only be applied to existing junctions, and in accordance with COBA-LT guidance, default collision rates based on junction type (i.e. signalised roundabout and signalised junction) are applied to the proposed revised junction layouts in the relevant Do Something scenarios.  Table 27 shows the road safety impacts for each option. As COBA-LT does not differentiate between highway links with or without bus lanes, and because the appraisal assumes the same levels of traffic demand in each scenario, the results for the Do Something – Less Ambitious and Do Something - Preferred options are identical.  More detailed results and associated commentary are provided in Appendix P.  **Table 27. Highway Accident Impacts (60-year appraisal period)**   |  |  |  |  | | --- | --- | --- | --- | | **Measure** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Fatal Casualties Saved | 0.0 | 0.0 | -0.4 | | Serious Casualties Saved | 4.6 | 4.6 | -2.6 | | Slight Casualties Saved | 32.1 | 32.1 | -109.3 | | Total Casualties Saved | 36.7 | 36.7 | -112.2 | | Total Collisions Saved | **41.8** | **41.8** | **-60.1** | | **TOTAL PVB (£’000s)** | **£1,241** | **£1,241** | **-£2,161** |   The addition of traffic signal control at Lawnswood roundabout is forecast to reduce the number of highway collisions and casualties, and lead to economic benefits of approximately £1.2m. This is driven by default collision rates for signalised roundabouts being lower than the observed rates at the existing roundabout, where a total of 30 personal injury collisions occurred between 2015-2019.  The conversion of the Otley Road / Otley Old Road junction to signal-control in the ‘Do Something – More Ambitious’ option is forecast in the COBA-LT appraisal to lead to additional collisions and associated economic disbenefits, which are seen to outweigh the collision reductions forecast at Lawnswood roundabout. This is due to the existing junction, at which five personal injury collisions occurred between 2015‑2019, having an observed collision rate lower than default rates calculated within the COBA-LT software for a signal-controlled junction with similar traffic volumes. It is the project team’s view that, contrary to the outcome of the COBA-LT assessment, signalising the Otley Old Road junction would in fact reduce the risk of personal-injury collisions here. Whilst there were only five personal-injury collisions at this junction between 2015 and 2019, there have been five further personal-injury collisions here since 1st January 2020, resulting in one serious and six slight injuries. The collision record for this junction between 2017 and 2021 was worse than for any signalised 3-armed junction in Leeds, which tends to suggest that signalising the junction would improve the collision record. It should also be highlighted that the COBA-LT assessment calculated a much higher rate of collisions at this junction in the Do Something – More Ambitious option, with a total of 163 collisions over the 60 year appraisal period, which corresponds to an average of 13.6 collisions every five years, and which is more than double the number of collisions occurring at any signalised 3-armed junction in Leeds between 2017 and 2021. This clearly lends support to the view that the true rate of collisions if the Do Something – More Ambitious option were delivered would be less than predicted in the COBA-LT assessment. Four of the five collisions occurring at this junction since 1st January 2020 were between a vehicle turning right into Otley Road and a northbound vehicle on Otley Road (including the one collision resulting in serious injury). The project team believes that signalising the junction would make this type of collision less likely, as the right turn would be undertaken under signal control. Signalising the junction would also enable safe provision to be introduced for northbound cyclists, helping to reduce the actual and perceived risk of collisions between northbound cyclists on Otley Road and vehicles turning left into Otley Old Road (as reported in section 2.1.6, this was raised as a concern during the public consultation). If this option were to progress to delivery, the design would need to pass through the standard Road Safety Audit process, which would provide an opportunity for the safety of the proposed design to be reviewed and optimised. It is also notable that the COBA-LT assessment has a broad classification for ‘signalised junctions’ which does not differentiate between junctions of different complexities, i.e. the likelihood of a 3-armed signalised junction having a better safety record than a signalised junction with 4 or more arms is not accounted for.  **Summary of Monetised Benefits**  Each of the monetised benefits for each option has been drawn together and summarised in Table 28. These are used to inform the Value for Money calculations presented in Section 4.3.12. It should be noted that the summary values reported below do not necessarily match those reported above for the individual appraisal impacts. This is due to the values reported below accounting for the potential double counting of benefits. For example, it is likely that some prospective active travel users will switch from using the bus to walking/cycling which is not accounted for when considering the individual bus user impact and active travel impact benefits.  **Table 28. Summary of Monetised Benefits (in £’000s)**   |  |  |  |  | | --- | --- | --- | --- | | **Benefit** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Bus User Impacts | £489 | -£1,085 | £1,899 | | Active Travel Impacts | £7,238 | £8,637 | £9,384 | | Mode Shift Impacts | £574 | £376 | £1,015 | | Highway User Impacts | -£9,811 | -£22,172 | -£14,561 | | Highway User Accident Impacts | £1,241 | £1,241 | -£2,161 | | Bus Operator Revenue | £93 | -£177 | £280 | | Active Travel Safety Impacts | £2,155 | £2,155 | £2,275 | | **SUB TOTAL PVB**  **Core Benefits** | **£1,979** | **-£10,965** | **-£1,870** | |  |  |  |  | | Bus Reliability Impacts | -£122 | -£42 | £983 | | **SUB TOTAL PVB**  **Adjusted benefits** | **-£122** | **-£42** | **£983** | |  |  | **£** |  | | **TOTAL PVB** | **£1,857** | **-£11,007** | **-£888** |   \* Value includes CO2 impacts and therefore does not match the Highway User Impacts noted previously |
| 4.3.6 What methodologies has been used to calculate **Monetised Costs**? |
| The monetised costs have been taken from the Scheme baseline cost estimates for each option and have been processed following TAG Unit A1.2, and using TUBA software, to provide the Present Values of Costs (PVC) for each option. Table 29 presents the baseline capital cost for each option.  **Baseline Capital Costs**  The baseline capital costs cover construction costs and consist of:   * **Main works contract**: This includes preliminaries, structures, road works, general works, and earthworks * **Ancillary work contracts**: This includes maintenance compounds, lighting, communications, landscaping, and noise insulation * **Testing and commissioning**: This accounts for on-site supervision and testing of scheme elements prior to scheme opening * **Preparation costs**: This consists of all project management, consulting engineers and agent authority fees to cover the elements of survey requirements, preliminary design, public consultation, and the costs of obtaining statutory orders * **Statutory undertakings**: Costs to divert or protect existing Statutory Undertakers’ equipment affected by the works   Note – there is no land acquisition required for the Scheme, so no associated land costs.  Further detail on how the costs have been developed is set out in the Financial Case, with Appendices V, W and X showing the detailed cost breakdown, spend profile and cost summary.  **Table 29. Option Baseline Costs (£’000s) (excluding risk)**   |  |  | | --- | --- | | **Option** | **Baseline Cost (Q1 2023)** | | Less Ambitious | £10,975 | | Preferred | £10,993 | | More Ambitious | £14,313 |     **Assumptions and adjustments**  The Present Value Costs (PVC) for each option are presented in Table 30. The following assumptions and adjustments have been applied to the scheme costs in order to arrive at a PVC.   * Costs discounted to 2010 prices using Green Book Discount Factors * GDP deflator adjustment applied, taken from the most recent TAG data book (May 2023) * Market price adjustment factor applied at 19% * Opening year is 2023 * Optimism bias has been applied to reflect the current level of design detail for the Scheme options. In line with TAG, optimism bias has been applied at 23% (TAG Unit A1.2 Table 8) for the Do Something – Less Ambitious and Do Something - Preferred options. As the development of the Do Something Max option is not as progressed as the other two Do Something options, it has been decided to include an optimism bias of 46% for this option to account for the higher level of uncertainty * Spend profile applied based on delivery programme and profiled out over the years spend has either been incurred to date or forecast to be spent. * Impact of mode shift on on-going infrastructure costs is included in the PVC calculation.   **Table 30. Option PVC (2010 prices) (£’000s)**   |  |  | | --- | --- | | **Option** | **PVC** | | Do Something Less | £6,740 | | Preferred Way Forward | £6,752 | | Do Something Max | £10,259 | |
| 4.3.7 How is uncertainty in the appraisal dealt with? |
| To enhance the robustness of the appraisal, a series of sensitivity tests have been undertaken around some of the key uncertainties. These were agreed with WYCA through the development of the ASR, and are summarised in Table 31.  **Table 31. Sensitivity Tests**   |  |  | | --- | --- | | **Name** | **Detail** | | Core Growth | As reported in previous sections of the Economic Case | | High Growth | Focussed on background demand growth for bus usage and additional growth in number of cyclists compared to the Core Growth scenario  For bus usage, the demand growth has been undertaken based on TAG Unit M4 Section 4.2 which recommends a growth value of 3% multiplied by the square root of the future year for high growth (2038) minus the base year (2023). This equates to a patronage growth of 11.6%  For cycling demand, in line with Connecting Leeds Transport Strategy target, a 400% increase in cyclists from the baseline level has been assumed | | Low Growth | Focussed on a background demand decline for bus usage and reduced growth in number of cyclists compared to the Core Growth scenario  For bus usage, the same value as calculated for the High Growth scenario, but below the Core Growth scenario has been used (patronage decline of -11.6%)  For cycling demand, the demand uplift observed at Horsforth Roundabout (24.3%) is assumed | | Climate Emissions Reduction Pathway alternative future fleet mix | Based on WYCA’s Carbon Emissions Reduction Pathways (CERP) and Low Carbon scenario which is based on the ‘Balanced’ pathway from CERP. This assumes from 2020 to 2038 a:   * 38% reduction in private car use * 70% increase in walking * 2000% increase in cycling   To account for the changes in walking and cycling, changes have been made in AMAT to the background growth rate of demand increases. Rather than the 0.75% growth per annum in the standard AMAT, a background growth value of 3.68% for walking and a 105.26% per annum for cycling has been used with this growth factor applied from 2023 to 2038 (inclusive). | | COVID Behavioural Changes[[17]](#footnote-18) | * At the outset of the OBC, discussions were held with the Combined Authority about undertaking a COVID Behavioural Changes test using information from The University of Leeds Institute of Transport Studies paper Less is More which makes reference to a 16% reduction in trips being undertaken as a result of COVID. * The count data used to inform the highway user impact appraisal is from June 2022 with the counts shown to be comparable to pre-COVID traffic conditions within the Scheme extent. The count data used to inform the bus user impact appraisal is also from 2022. At present, there is no evidence to show that bus usage will return to pre-COVID levels. * Therefore, at the time of undertaking the OBC appraisal, it was decided to not undertake this sensitivity test. The TAG Uncertainty Toolkit (May 2023[[18]](#footnote-19)) provides further justification for not undertaking this test, stating that for low value schemes, of less than £50m, the Common Analytical Scenario is not required. | | No highway disbenefit | As agreed with WYCA, a sensitivity test removing any highway disbenefit from the PVB calculation has been undertaken, given the focus of the Scheme is on improving public transport and active travel rather than improving capacity at Lawnswood roundabout | | 30 year appraisal period | A shorter appraisal period has been used to understand the impact on the PVB by reducing the number of years over which the highway disbenefit of the options is accounted for |   The outcome of each of these sensitivity tests is discussed below. All results are shown in 2010 values and have been discounted to 2010.  **High and Low Growth**  The results of the High and Low Growth sensitivity tests on the Present Value of Benefits (PVB) are shown in Table 32. This shows that for the High Growth sensitivity test, the Do Something - More Ambitious option has the highest PVB value and all three options have a positive PVB with growth in the bus and active travel benefits outweighing the highway disbenefit. For the Low Growth sensitivity test, the Do Something – Less Ambitious option is shown to be the only option that has a positive PVB value.  **Table 32. Results of High and Low Growth Sensitivity Tests (£’000s)**   |  |  |  |  | | --- | --- | --- | --- | | **Scenario** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Core Scenario PVB | £1,979 | -£10,965 | -£1,870 | | High Growth PVB | £21,804 | £13,953 | £27,494 | | Low Growth PVB | £248 | -£12,863 | -£4,694 |   **Climate Emissions Reduction Pathway alternative future fleet mix**  The results of the CERP sensitivity test on the PVB is shown in Table 33. Due to the availability of outputs from the Aimsun model for the CERP sensitivity test, it has only been possible to account for highway benefit/disbenefit for the Do Something – Less Ambitious option. The PVB values reported for the other two Do Something options therefore exclude this benefit/disbenefit. The PVB improves significantly for all scenarios in this sensitivity test, due to the forecast increase in active travel and subsequent active travel benefits. For the Do Something – Less Ambitious option the increase in PVB is smaller due to the inclusion of the highway impact, which is negative. It is worth noting that one outcome of the large increase in cyclists is that this results in longer journey times (in the Aimsun model) on the southbound approach to the roundabout in the AM peak and northbound approach in the PM peak, even though the number of motor vehicle trips has been reduced. This appears to be a result of the increase in cycle volumes which actually means there are more vehicles overall on these approaches in the identified time periods in the CERP sensitivity test than the Core scenario (i.e. the increase in cycles outweighs the reduction in motor vehicles)[[19]](#footnote-20). The outcome of this is that the highway disbenefit value is greater for the CERP sensitivity test than the Core scenario.  **Table 33. Results of CERP Sensitivity Test (£’000s)**   |  |  |  |  | | --- | --- | --- | --- | | **Scenario** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Core Scenario PVB | £1,979 | -£10,965 | -£1,870 | | CERP PVB | £34,566 | £66,020 | £69,093 |   **No Highway Disbenefit**  The results of the removal of highway disbenefits sensitivity test on the PVB is shown in Table 34. This shows that all options have a positive PVB when the highway disbenefit is removed with the total monetised benefits above £10m for all of the options.  **Table 34. Results of No Highway Disbenefit Sensitivity Test (£’000s)**   |  |  |  |  | | --- | --- | --- | --- | | **Scenario** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Core Scenario PVB | £1,979 | -£10,965 | -£1,870 | | No Highway Disbenefit PVB | £11,574 | £10,833 | £12,355 |   **30 Year Appraisal Period**  The results of the 30-year appraisal sensitivity test on the PVB is shown in Table 35. The impact of reducing the number of years over which the highway user disbenefit and bus user and reliability disbenefit (if applicable) are calculated is shown to significantly improve the PVB value for the Do Something – Preferred option, though the PVB remains negative. Whilst the change in PVB for the Do Something – More Ambitious option is not as significant, the PVB in this sensitivity test does change from being negative to positive compared to the core scenario.  **Table 35. Results of 30 Year Appraisal Period Sensitivity Test (£’000s)**   |  |  |  |  | | --- | --- | --- | --- | | **Scenario** | **Less Ambitious** | **Preferred** | **More Ambitious** | | Core Scenario PVB | £2,230 | -£10,601 | -£470 | | 30 Year Appraisal Period PVB | £2,104 | -£5,723 | £383 | |
| 4.3.8 Are there any Wider Scheme Benefits? |
| **Accommodating Future Development**  The current Leeds Site Allocations Development Plan includes a number of sites on the A660 corridor approved for development. On the A660 corridor between Lawnswood roundabout and the Leeds/North Yorkshire boundary, there are approved sites amounting to over 2,700 housing units, in addition to over 5,000m2 of office space and over 6 hectares of employment area. The Scheme seeks to encourage sustainable travel choices to and from this development by improving bus journeys and making active travel safer and more attractive.  **Equality, Diversity, Cohesion and Integration (EDCI)**  LCC, as a public authority, need to ensure that all strategies, policies, service and functions, both current and proposed, have given proper consideration to equality, diversity, cohesion and integration. Therefore an EDCI screening process has been undertaken for the Scheme to determine:   * The relevance of the proposals to equality, diversity, cohesion and integration * Whether or not equality, diversity, cohesion and integration is being or has already been considered * Whether or not it is necessary to carry out an impact assessment   The full EDCI screening is included as Appendix Q to the OBC. Key findings of the EDCI screening on different equality characteristics for the Scheme are shown in Table 36.  **Table 36. EDCI Screening Findings**   |  |  | | --- | --- | | **Equality Characteristic** | **EDCI screening finding** | | Age | Signalised crossings at the roundabout will make it easier and safer to cross the road for all ages and will make active modes a realistic and attractive option for a greater number of people. The improved pedestrian facilities will be likely to particularly benefit older people. Younger people also tend to walk, wheel and cycle at higher rates than other age groups, and may therefore be likely to particularly benefit from the proposed active travel facilities. | | Carers | Signalised crossings and segregated cycle provision are both important to parents of young children, and the scheme will therefore particularly benefit carers of young children by providing safe, signalised crossings and segregated cycle facilities. | | Disability | Signalised crossing facilities can be particularly important for some disabled people, and the proposed facilities will therefore be likely to particularly benefit some disabled people. The Scheme is being designed to ensure the cycle tracks accommodate adapted cycles, ensuring the infrastructure is accessible to all cycles. | | Gender | Women are less likely than men to have access to a car as a main driver, demonstrating that women tend to be more reliant on other modes of transport. The benefits of the proposed scheme for buses and active modes will therefore particularly benefit women.  Women are also more likely than men to perceive cycling as being unsafe. By providing safe and attractive cycle facilities, the scheme will make cycling a more attractive and accessible option for a greater number of women, enabling a greater number of women to experience the mobility and health benefits of cycling. | | Race | Analysis of the 2021 National Travel Survey suggests that people from ethnic minorities may be more reliant on other modes of transport than car, and may therefore be more likely to benefit from the active travel and bus improvements delivered by the Scheme. | | Gender reassignment | The project team has not been able to identify any reason why the proposed Scheme should have a differential impact on transgender people. | | Religion or belief | The project team has not been able to identify any reason why the proposed Scheme should have a differential impact on people of any particular religion or belief. | | Tackling poverty | The proposed Scheme will make active modes safer and more attractive, meaning that these modes of transport will be more accessible, allowing people to avoid the expense of car ownership. The Scheme also enables buses to be prioritised ahead of general traffic, thereby enabling costs of car ownership and car use to be avoided. | | Improving health and wellbeing | By making active travel safer and more attractive, the Scheme will enable a greater number of people to enjoy the physical and mental health benefits of physical activity. | |
| 4.3.9 Are there any Low Carbon and Environmental Scheme Benefits? |
| **Environmental Impact Appraisal**  An Environmental Impact Appraisal has been undertaken as part of the transport appraisal process for the three options to inform the OBC, with the results being summarised in Table 37. The appraisal of options was undertaken in accordance with the DfT’s TAG Unit A3 guidance by the qualified environmental specialists in the following topics (i.e. TAG sub-objectives):   * Air Quality – monetary value informed by active travel and bus user impact appraisals * Biodiversity * Greenhouse Gases – monetary value informed by active travel, bus user and highway user impact appraisals * Historic Environment * Noise– monetary value informed by active travel and bus user impact appraisals * Landscape – the area within and surrounding the Scheme is predominantly urban with minimal landscaping therefore landscape impacts have been scoped out * Townscape * Water   **Table 37. Environmental Appraisal Summary**   | **Impact Area** | **Option** | **Potential Impact** | | **Monetary Assessment** | | --- | --- | --- | --- | --- | | Noise | Less Ambitious | | Neutral | £3 | | Preferred | | Neutral | £2 | | More Ambitious | | Neutral | £6 | | Air quality | DS Less | | Neutral | £7 | | Preferred Way Forward | | Neutral | £6 | | DS Max | | Neutral | £11 | | Greenhouse gases | Less Ambitious | | Adverse | -£196 | | Preferred | | Adverse | -£360 | | More Ambitious | | Adverse | -£300 | | Landscape | Less Ambitious | | N/A | N/A | | Preferred | | N/A | N/A | | More Ambitious | | N/A | N/A | | Townscape | Less Ambitious | | Slight Beneficial | N/A | | Preferred | | Slight Beneficial | N/A | | More Ambitious | | Slight Beneficial | N/A | | Historic Environment | Less Ambitious | | Neutral | N/A | | Preferred | | Neutral | N/A | | More Ambitious | | Neutral | N/A | | Biodiversity | Less Ambitious | | Moderate Adverse | N/A | | Preferred | | Moderate Adverse | N/A | | More Ambitious | | Moderate Adverse | N/A | | Water Environment | Less Ambitious | | Neutral | N/A | | Preferred | | Neutral | N/A | | More Ambitious | | Neutral | N/A |   The TAG worksheets for each of the environmental impacts can be found in Appendix R.  The results suggest that all options would have an adverse impact on biodiversity with the expected removal of three trees and relocation of two others for all of the Do Something options. It is noted though that LCC will be planting at least three new trees for every tree removed as part of the Scheme, with these trees planted as close to the original locations as is reasonably practicable. This, along with the Scheme providing benefits to human interaction in the townscape as a result of the provision of improved active travel infrastructure and crossings, is why the townscape impact is found to be beneficial.  Based on the stage of Scheme development, the monetised values presented for the noise, air quality and greenhouse gases topics are informed by outputs from the highway user impact (greenhouses gases only), bus user impact and active travel impact appraisals. The focus of the assessment has therefore been qualitative at this stage for these topics with the quantification and monetary valuation of these topics, in line with TAG Unit A3, to be undertaken for the Preferred Option at FBC stage.  **Carbon Impact Assessment**  A Stage 2 Carbon Impact Assessment has been carried out in accordance with WYCA Assurance Framework guidance (January 2022) on the Scheme. This has focused on the Do Something - Preferred.  The operational carbon impacts have been taken from MEC calculations from AMAT (active travel impacts) and the bus appraisal. The capital carbon is based on a Method 2 (High-level estimation) as detailed in WYCA’s Carbon Impact Assessment Stage 2 Guidance, with the following capital carbon assumptions used for the infrastructure type proposed as part of the Scheme:   * 0.3tCO2e per m2 of cycleway constructed. * 0.5tCO2e per m2 of footway constructed.   Key assumptions which have been made include:   * This appraisal incorporates carbon from petrol, diesel, and taxi emissions but does not include any untraded carbon from electric vehicles. * No capital carbon has been assumed for the bus lane as this is primarily the result of road space reallocation as opposed to the construction of a new lane. * Although the scheme involves elements that affect the highway, the scheme is not designed to primarily benefit motor vehicles and therefore a highways component has not been included within this CIA, in line with WYCA guidance. * The appraisal period for the cycling and walking interventions is 40 years whilst the appraisal period for the bus interventions is 60 years.   The results can be found in full in Appendices S and T. A summary of the capital, operational and overall carbon impacts of the Scheme is presented in Tables 38 to 40.  **Table 38. Capital carbon emissions – Do Something - Preferred.**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Scope/Source** | **Carbon calculation methodology** | **Total carbon emissions (tCO2e)** | | | | | **Up to end 2030** | **Up to end 2038** | **Up to end 2050** | **Over Whole Appraisal Period** | | Cycleway construction (Benchmark - Little Black Book 2010) | Capital carbon Method 2 Benchmarks for cycleways. Assumes 0.3tCO2e per m2 constructed. | 941 | 941 | 941 | 941 | | Footway construction (Benchmark - Little Black Book 2010) | Capital carbon Method 2 Benchmarks for footways. Assumes 0.5tCO2e per m2 constructed. | 416 | 416 | 416 | 416 |   Source: Carbon Impact Assessment Proforma, September 2022 (Appendix S)  **Table 39. Operational carbon emissions – Do Something – Preferred.**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Scope/Source** | **Carbon calculation methodology** | **Total carbon emissions (tCO2e)** | | | | | **Up to end 2030** | **Up to end 2038** | **Up to end 2050** | **Over Whole Appraisal Period** | | Reduction in carbon emissions from mode shift to cycling and walking from car use | The impact of the intervention in terms of changes in car kilometres from a mode shift to cycling and walking, extracted from the AMAT. Used to calculate the carbon impact of the intervention by using the information in the TAG Databook. | -73.14 | -133.94 | -215.28 | -294.12 | | Reduction in carbon emissions from mode shift to bus from car use | The impact of the intervention in terms of changes in car kilometres from a mode shift to bus. Used to calculate the carbon impact of the intervention by using the information in the TAG Databook. | 14.95 | 25.71 | 37.39 | 62.90 |   Source: Carbon Impact Assessment Proforma, September 2022 (Appendix S)  **Table 40. Total carbon impact of the Scheme – Do Something - Preferred.**   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **Total carbon emissions (tCO2e)** | | | | | **Up to end 2030** | **Up to end 2038** | **Up to end 2050** | **Over Whole Appraisal Period** | | **Total carbon emissions** | 1295.51 | 1246.23 | 1177.39 | 1124.08 | | **Carbon intensity (tCO2e per £m)** | 99.14 | 95.37 | 90.10 | 86.02 |   Source: Carbon Impact Assessment Proforma, September 2022 (Appendix S)  The results show an overall reduction in operational carbon as a result of the Scheme, but this does not offset the capital carbon input from constructing the Scheme. It is also important to note that this Carbon Impact Assessment has considered the Do Something – Preferred option. As set out in section 4.3.5, the Do Something – Less Ambitious and Do Something – More Ambitious options would both be expected to result in greater modal shift to bus from car, and the Do Something – More Ambitious option would also be expected to result in greater shift to active modes from car, and would therefore have a greater operational carbon benefit. Whilst on the basis of this appraisal the carbon benefits associated with the modal shift generated by this scheme may fail to compensate for the capital carbon emissions associated with construction, the scheme plays an important part in transforming the transport infrastructure in Leeds so as to facilitate the large increases in active travel (and associated reduction in car use) targeted as part of the Connecting Leeds Transport Strategy. |

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| 4.3.10 How the scheme impacts across different social groups? |
| **Social Impacts Appraisal**  A Social Impacts appraisal considers the human experience of a transport system and its impact on social factors that have not been considered elsewhere in economic or environmental appraisal. The methods prescribed in TAG Unit A4.1 have been used as guidance to assess any beneficial or adverse impacts of the Scheme.  A number of the impacts in this Social Impacts appraisal are examined further as part of the Distributional Impacts screening process (summarised below), in accordance with TAG Unit A4.2. The Social Impacts appraisal looks at impacts on the whole population while the Distributional Impacts appraisal looks at impacts on vulnerable population groups.  This appraisal is based on the most up to date information about the Scheme as presented in this OBC. Table 41 summarises the Social Impact appraisal. More detail on the assessment can been found in the Social Impacts appraisal report appended to the OBC (Appendix U).  **Table 41. Summary of Social Impacts.**   | **Impact Area** | **Option** | **Potential Impact** | | | --- | --- | --- | --- | | Accidents | Less Ambitious | | Slight beneficial | | Preferred | | Moderate beneficial | | More Ambitious | | Moderate beneficial | | Physical Activity | Less Ambitious | | Slight beneficial | | Preferred | | Moderate beneficial | | More Ambitious | | Moderate beneficial | | Security | Less Ambitious | | Moderate beneficial | | Preferred | | Moderate beneficial | | More Ambitious | | Moderate beneficial | | Severance | Less Ambitious | | Moderate beneficial | | Preferred | | Moderate beneficial | | More Ambitious | | Moderate beneficial | | Journey Quality | Less Ambitious | | Slight beneficial | | Preferred | | Moderate beneficial | | More Ambitious | | Moderate beneficial | | Option and non-use values | Less Ambitious | | Not assessed | | Preferred | | Not assessed | | More Ambitious | | Not assessed | | Accessibility | Less Ambitious | | Slight beneficial | | Preferred | | Moderate beneficial | | More Ambitious | | Moderate beneficial | | Personal affordability | Less Ambitious | | Neutral | | Preferred | | Neutral | | More Ambitious | | Neutral |   **Distributional Impact Appraisal**  The Distributional Impact appraisal has been carried out in line with WebTAG Unit A4.2, which is proportionate to the size of the scheme and the level of quantitative data available at the OBC stage. A Distributional Impact appraisal considers the variance of transport intervention impacts across different social groups, seeking to identify those social groups that would be adversely or beneficially disproportionately impacted by the intervention(s).  A Distributional Impact appraisal is comprised of three stages: an initial screening stage; assessment of impacts, should screening require it; and appraisal of the impacts. For this OBC, a Step 1 screening process for the Scheme has been undertaken. Step 2 and Step 3 will be undertaken at FBC stage, dependent on the results of the Step 1 assessment, which are presented in Table 42. With regards to noise and air quality impacts, as reported in section 2.1.1, noise and air quality modelling is already planned to be undertaken to better understand these impacts, and the results of this modelling will be reported at FBC stage.  **Table 42. Summary of Distributional Impact Screening and scoping recommendations.**   | **Impact Area** | **Potential Impact** | **Screening Results – Proceed to Step 2?** | | --- | --- | --- | | User benefits | Neutral | Yes | | Noise | Neutral | No | | Air quality | Neutral | No | | Accidents | Positive | Yes | | Security | Neutral | Yes | | Severance | Positive | Yes | | Accessibility | Positive | Yes | | Personal affordability | Neutral | No | |

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| 4.3.11 What are the summary results from the appraisal of the scheme? |
| Appraisal Summary Table |
| The AST for this appraisal is presented in Appendix J. |
| Transport Economic Efficiency Table |
| The TEE table for this appraisal is presented in Appendix I. |
| Analysis of Monetised Costs and Benefits Table |
| The AMCB table for this appraisal is presented in Appendix I. |
| Public Accounts Table |
| The PA table for this appraisal is presented in Appendix I. |

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| 4.3.12 What is the Value for Money position? |
| The Value for Money (VfM) position for the Scheme takes into consideration all appraisal and assessment work undertaken to date. This takes into account the monetised impacts and the project costs presented as a Benefit to Cost Ratio (BCR), as well as the findings from any qualitative and non-monetised assessments.  Table 43 provides an overview of the VfM assessment for each of the Short Listed options, with the results of the sensitivity tests on the BCR presented in Table 44. Note that for the ‘Do Something - Preferred’ and ‘Do Something – More Ambitious’ options, due to the sum of present value of benefits and present value of other monetised impacts being less than the present value of costs, the standard BCR calculation results in a negative value. The BCR is not considered a useful measure in this context, and therefore has been reported as “N/A” in these cases.  The initial BCR would suggest that the options are in the following VfM category:   * Do Something - Preferred: Very Poor * Do Something – Less Ambitious: Very Poor * Do Something – More Ambitious: Very Poor   Considering the additional benefits considered as part of the Adjusted BCR, the VfM category for each option is:   * Do Something - Preferred: Very Poor * Do Something – Less Ambitious: Poor * Do Something – More Ambitious: Very Poor   The VfM categories are heavily driven by the large highway disbenefit values of each option. However, as outlined in Section 4.3.5 and Appendix P, the majority of disbenefits to highway users are associated with relatively minor increases in travel times with approximately 85-90% of disbenefits for the Do Something – Less Ambitious and Do Something – More Ambitious options associated with trips that experience increases in travel times of less than 60 seconds. The largest disbenefits are also shown to be in the inter-peak and off-peak time periods which is to be expected due to the lower level of congestion in these time periods with the Do Something – Less Ambitious and Do Something – More Ambitious options showing either minimum disbenefit or benefit overall in the AM and PM peak with the introduction of traffic signals at Lawnswood roundabout.  It should also be noted that it is felt the Initial and Adjusted BCRs reported are a ‘worst case scenario’ for several reasons:   * The Scheme will involve the implementation of MOVA at the traffic signals, which is more responsive to traffic conditions compared to traditional Vehicle Actuation (VA) control. This is not represented in the current Aimsun model, which uses fixed traffic signal timings, and the benefits of this are therefore not included in the highway user or bus user impact benefits. Research by the Transport Research Laboratory (TRL) showed that at isolated junctions, MOVA provided an average 13% delay reduction compared to up-to-date D-system VA operation. Options for incorporating the benefits of MOVA into the appraisal at FBC stage will be considered during FBC development. * The mode shift resulting from the Scheme (from car to bus and active travel) is not captured in the modelling and therefore the highway user or bus user impact benefits. * The traffic volumes used in the Aimsun model are based on survey data from June 2022. Based on site observations and analysis of bus AVL data between June 2022 and March 2023, it appears that congestion at Lawnswood roundabout and the Otley Old Road junction has increased significantly since June 2022. New traffic surveys are to be undertaken in June/July 2023, which are expected to show higher traffic volumes and longer journey times. The results of these surveys will be used to inform the Aimsun modelling undertaken at FBC stage, and this is expected to improve the relative performance of the ‘Do Something’ options in terms of impacts on buses and general traffic.   When considering the Scheme objectives, and removing highway disbenefit, the options fall into the following VfM categories (see Table 44 for calculation):   * Do Something – Preferred: Medium * Do Something – Less Ambitious: Medium * Do Something – More Ambitious: Low   These results are important to consider in the context that the scheme is not aimed at providing a benefit for general traffic journey times, and because the highway disbenefit, which has a significant negative impact on the VfM position for all options, is dominated by small increases in journey times being experienced by many trips (for the Do Something – Less Ambitious and Do Something – More Ambitious options). Table 44 summarises the results of the Value for Money assessment with Highway Disbenefits discounted. |

| **Table 43. Value for Money Assessment.** | | | | |
| --- | --- | --- | --- | --- |
| **Measure** |  | **Option 1:**  **Preferred** | **Option 2:**  **Less Ambitious** | **Option 3:**  **More Ambitious** |
| Present Value of Benefits (£k) | A | -£10,965 | £1,979 | -£1,870 |
| Present Value of Costs (£k) | B | £6,752 | £6,740 | £10,259 |
| Present Value of Other Monetised Impacts (£k) | C | -£42 | -£122 | £983 |
| ‘Initial’ Net Present Value (£k) | A-B | -£17,717 | -£4,760 | -£12,130 |
| Initial Benefit to Cost Ratio | A/B | -1.62 | 0.29 | -0.18 |
| **‘Adjusted’ Net Present Value (£k)** | **(A+C)-B** | **-£17,759** | **-£4,883** | **-£11,147** |
| **‘Adjusted’ Benefit to Cost Ratio** | **(A+C)/B** | **N/A** | **0.28** | **N/A** |
|  | | | | |
| **Table 44. Value for Money Assessment – No Highway Disbenefit.** | | | | |
| **Measure** |  | **Option 1:**  **Preferred** | **Option 2:**  **Less Ambitious** | **Option 3:**  **More Ambitious** |
| Present Value of Benefits (£k) | A | £10,833 | £11,574 | £12,355 |
| Present Value of Costs (£k) | B | £6,752 | £6,740 | £10,259 |
| Present Value of Other Monetised Impacts (£k) | C | -£42 | -£122 | £983 |
| ‘Initial’ Net Present Value (£k) | A-B | £4,081 | £4,835 | £2,095 |
| Initial Benefit to Cost Ratio | A/B | 1.60 | 1.72 | 1.20 |
| **‘Adjusted’ Net Present Value (£k)** | **(A+C)-B** | **£4,039** | **£4,712** | **£3,078** |
| **‘Adjusted’ Benefit to Cost Ratio** | **(A+C)/B** | **1.60** | **1.70** | **1.30** |
| **VfM Sensitivity Tests**  As discussed in Section 4.3.7, a series of sensitivity tests, agreed through the development of the ASR with WYCA have been undertaken to understand how the Scheme may perform under different scenarios. The impact of each of these sensitivity tests on the BCR is presented in Table 45. Note that where BCR has been calculated to be negative, this has been replaced with “N/A”, for the same reasons as set out in relation to Table 43.  **Table 45. Sensitivity Test BCRs.**   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  | **Core Growth** | **High Growth** | **Low Growth** | **CERP** | **No Highway Disbenefit** | **30 Year Appraisal** | | Less Ambitious – Initial BCR | 0.29 | 3.24 | 0.04 | 5.13 | 1.72 | 0.31 | | Less Ambitious – Adjusted BCR | 0.28 | 3.22 | 0.02 | 5.11 | 1.70 | 0.29 | | Preferred – Initial BCR | N/A | 2.07 | N/A | 9.78 | 1.60 | N/A | | Preferred – Adjusted BCR | N/A | 2.06 | N/A | 9.77 | 1.60 | N/A | | More Ambitious – Initial BCR | N/A | 2.68 | N/A | 6.73 | 1.20 | N/A | | More Ambitious – Adjusted BCR | N/A | 2.78 | N/A | 6.83 | 1.30 | 0.08 |   \* The BCR values for the CERP sensitivity test for the Do Something – Preferred and Do Something – More Ambitious exclude any highway benefit/disbenefit  The sensitivity tests show significant variability in the VfM categories of the options, ranging from Very Poor/Poor to Very High. It should be noted that the options are only shown to represent a Very High VfM in the CERP sensitivity test for which highway benefits/disbenefits are missing from the Do Something – Preferred and Do Something – More Ambitious options and it could be argued the growth in walking and cycling between 2020 and 2038 (70% for walking and 2000% for cycling) are overly optimistic. For the high growth scenario, where increases in bus use (11.8%) and cycling (400%) are forecast and highway disbenefit is included, all three options are shown to have a High VfM with the Do Something – Low Growth option having the highest BCR, the same for all the sensitivity tests, except the CERP (where highway disbenefit has been calculated for the Do Something – Less Ambitious option). | | | | |

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| 4.3.13 Preferred Option Selection and Justification |
| The work undertaken to develop the Economic Case for the Scheme has shown that the ‘Do Something – Preferred’ option should not be taken forward as the Preferred Option. The impact of converting one of the existing southbound general traffic lanes on Otley Road between Lawnswood Cemetery and Lawnswood roundabout is shown to not only cause disbenefit for general traffic, but also causes disbenefit for buses in terms of both journey times and reliability. This is contrary to the Scheme Specific objectives 4 and 5 as set out in Table 2, and this option should therefore not be considered as the Preferred Option.  The ’Do Something – Less Ambitious’ option has been shown to have significant benefits for road safety, buses and active modes, with the ‘Do Something – More Ambitious’ option having significant bus and active modes benefits over and above the ‘Less Ambitious’ option. However, at this stage it is expected that sufficient funding to deliver the ‘More Ambitious’ option cannot be secured through the current round of CRSTS funding, and that additional funding sources would therefore need to be identified before this option could be delivered. Further design and consultation will also need to be undertaken before the ‘More Ambitious’ option could be delivered. It is therefore proposed to adopt a phased approach, whereby the ‘Do Something – Less Ambitious’ option would be delivered as Phase 1, using the current round of CRSTS funding (in addition to the CIP2 and section 106 funding described in section 1.3). Alongside the continued development of Phase 1, an updated preliminary design would be developed for the additional elements of the ’Do Something – More Ambitious’ option, which LCC would seek to deliver as Phase 2.  Whilst the appraisal undertaken to date has suggested that the ‘Do Something – Less Ambitious’ and ‘Do Something – More Ambitious’ options proposed to be undertaken as Phases 1 and 2 would both cause significant highway disbenefits, this should be considered in light of the narrative presented in section 4.3.12, particularly noting that (i) the majority of the highway disbenefit is associated with relatively small increases in journey times, and (ii) journey time impacts in the current appraisal are considered to be a worst case due to MOVA not being included in the modelling, no representation of mode shift in the modelling and traffic volumes in the model being based on surveys undertaken in June 2022. It is also important to note that improving journey times for general traffic is not one of the objectives of the scheme.  Whilst it is acknowledged that the COBA-LT appraisal presented in section 4.3.5 has suggested that the ‘Do Something – More Ambitious’ option would have a negative impact in terms of road traffic collisions, the project team believe that this scheme would in fact improve safety at the Otley Old Road junction, for the reasons set out in section 4.3.5. However, it is clear that this issue will require further investigation if this option is to progress to delivery. If an improvement in road safety can be demonstrated, it will then become clear that the proposed Phase 2 would deliver on the objectives of the scheme.  It is therefore proposed that the ‘Do Something – Less Ambitious’ option is taken forward as the Preferred Option. This would deliver all the same elements as the ‘Do Something – Preferred’ except the southbound bus lane on Otley Road. This option is shown to deliver improvements for bus users whilst having the least disbenefit for general traffic. This option also still delivers the step change in active travel infrastructure on the approaches to and at Lawnswood roundabout, helping make active travel more attractive and safer modes of travel. This option would deliver on objectives 1 to 4 as set out in Table 2. Whilst the modelling undertaken at this stage suggests that this option would result in an overall slight worsening in bus journey time reliability (and would therefore not meet objective 5), it is important to note that this relates to a worsening of reliability for southbound buses on Otley Old Road only, whereas other routes would experience improved reliability. The reliability disbenefit should also be considered in the light of the overall benefit for bus users, as highlighted in section 4.3.5. It should also be noted that MOVA technology is not represented in the Aimsun model at present. This technology allows buses to be prioritised ahead of general traffic at traffic signals, reducing the likelihood of buses being held at a red light. It is likely that MOVA will therefore enable an improvement in bus reliability over and above what is currently shown in the modelling results, and thus enable an overall improvement in bus reliability through delivery of Phase 1 (‘Do Something – Less Ambitious’). Future delivery of Phase 2 of the proposed scheme would provide an improvement in reliability, meaning that all objectives listed in Table 2 would be met upon delivery of Phase 2. |

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| **5. Financial Case** |

The purpose of the Financial Case is to demonstrate that the preferred option is affordable and has the necessary funding. This should include the capital and on-going revenue costs and impacts.

**Note – All sections should be reviewed and updated if this is the Full Business Case. A summary of any key changes and their implications on the business case should be included.**

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| **5.1 Capital Costs** | | | |
| 5.1.1 What is the total project outturn capital cost? | | | |
| The information set out in the Financial Case is based on delivery of the ‘Do Something – Less Ambitious’ option, as identified as the preferred option for phase 1 of the delivery of this scheme within the Economic Case. The costings provided also include fees associated with reviewing and updating the preliminary design for the additional elements of the ‘Do Something – More Ambitious’ option, in order to bring them into line with the latest guidance (particularly LTN 1/20). The costing provided does not include funding required to deliver or undertake further consultation on the additional elements of the ‘Do Something – More Ambitious’ option. Delivery of the ‘Do Something – More Ambitious’ option would require additional funding to be secured, and LCC will investigate options for securing this additional funding once a preliminary design and associated revised costing has been completed.  The total project outturn capital costs are set out in Table 46. A Detailed Cost Plan is also provided, in Appendix V. The cost of civils works and traffic signals have been estimated by feeding the specifications of the preliminary design through the contractor frameworks currently in use by Leeds City Council. 20% contingencies have been applied to the cost of civils works. Costs for traffic management, drainage attenuation, street lighting, tree works, landscaping, statutory undertakers, Traffic Regulation Orders, project management and stakeholder engagement are based on experience from similar schemes recently undertaken by Leeds City Council. Costs for Monitoring and Evaluation have been assumed to be around 1% of the total scheme costs. An estimate for Part 1 claims has been included, and this is based on an estimate from the Valuation Office Agency. For detailed design fees, site supervision, CDM and statutory undertakers supervision, uplifts of 10%, 8.5%, 1% and 3% have been applied, respectively, which is consistent with recent experience from similar schemes.  Inflation has been calculated on the basis of Consumer Price Index inflation forecasts published by HM Treasury in May 2023, which suggest 3.9% interest for 2023, and 2.5% for 2024 (2.5% has been assumed as the figure for ongoing inflation for costs expected to be incurred beyond 2024). An allowance has also been made within the Quantified Risk Allowance for the possibility of inflation exceeding these rates, in light of high levels of inflation experienced during 2022. | | | |
| **Table 46. Breakdown of Project Outturn Costs.** | | | |
|  | **Total Project Outturn Costs (£m)** | **Brief Description** | **% of total costs** |
| Project Development | 1.739 | Design, project management, stakeholder engagement, business case development, legal fees. | 13 |
| Land Assembly | 0 | No land assembly required. | 0 |
| Enabling works | 0 | No enabling works required. | 0 |
| Delivery | 8.351 | Construction costs, including civils works, traffic management, drainage, utilities, street lighting, landscaping and traffic signals. | 64 |
| Benefits Realisation Reporting | 0.130 | Delivering the Benefits Realisation Plan | 1 |
| Other (Please Specify) | 0 |  | 0 |
| Risk | 2.075 | As per Quantitative Risk Assessment provided in Appendix D | 16 |
| Contingency | 0 | No contingencies included in cost, except for as described in section 5.1.1. | 0 |
| Inflation | 0.756 | As described in section 5.1.1. | 6 |
| **Total (£m)** | 13.050 |  | 100 |

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| **Item** | **Definition** |
| Project Development | This may cover legal fees, consultant fees, design fees, project/programme management costs etc. |
| Land Assembly | This is in relation to infrastructure schemes |
| Enabling Works | This is the costs of any works required prior to Delivery, generally as a separate contract, e.g. removing contamination |
| Delivery | This is the costs of implementing the scheme e.g. road construction costs, building costs, new equipment costs etc. |
| Benefits Realisation Reporting | These are costs required for monitoring and evaluation of benefits. For any scheme over £5m a cost for this must be included. |
| Other | Please specify, for example Combined Authority overhead costs |
| Risk | All projects must include a quantified risk allowance (QRA) at Decision Points 3, 4 and 5 of the Assurance Framework.  The QRA amount and contingency will not be held by the Combined Authority and therefore will be included in the funding agreed and detailed in the funding agreement between the Combined Authority and the Promoter. It will be the responsibility of the Promoter to manage the QRA. It is also the responsibility of the Promoter to advise the Combined Authority through their quarterly claims on the status of the QRA amount. |
| Contingency | The contingency set should be dependent on the scheme, i.e. what stage is it at, how far have the risks been assessed etc. Contingency should reduce as the scheme progresses and design is finalised, so it may be 10% at EOI but 3% at FBC+. This should be no more than 10% of total scheme outturn costs and must be agreed with the Combined Authority.  Optimism Bias is not part of the methodology for calculating project costs and therefore should not be included in any cost estimates provided to the Combined Authority. |
| Inflation | Where a scheme is being developed and implemented over more than 1 year, inflation should be included. |

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| **5.2 Funding Profile** |
| 5.2.1 What is the cash flow and funding profile for the project? |
| A Spend Profile is included in Appendix W, a Cost Summary is included in Appendix X, and a Detailed Cost Plan is included in Appendix V.  The Cash flow and funding profile is described in Table 47. The scheme has been drawing down on CIP Phase 2 funds via WYCA since 2020/21, and draw down of CIP Phase 2 funding will continue until completion of the OBC process, which is expected to be in 2023/24. The total CIP funding available for this scheme is £826k. For further development and delivery, the scheme will draw down on CRSTS funding via WYCA, of which £9.2m is currently allocated to Lawnswood. A further £677k is expected to be contributed by section 106 contributions, subject to final legal approval. The section 106 contribution is expected to be spent early in the construction process, i.e. in the 2023/24 financial year. These funding sources currently sum to £10,702,771, meaning that there is a shortfall of £2,347,671 in the funding required to deliver the ‘Do Something – Less Ambitious’ option. A review of the CRSTS fund is currently underway, and it has been agreed between officers at Leeds City Council and at the Combined Authority that this review will be used as an opportunity to reallocate funding to Lawnswood from other schemes, to the extent required to make up the identified shortfall. The review is set to conclude in August 2023. In parallel with this funding review, opportunities are being sought by the project team to value engineer the scheme. |

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| **Table 47. Cash flow and funding profile.** | | | | | | | | |
| Please set out the anticipated scheme funding profile (£m to 3 decimal places). | | | | | | | | |
| Source | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6+ | Total | Current status |
|  | 2020/ 2021 | 2021/ 2022 | 2022/ 2023 | 2023/ 2024 | 2024/ 2025 | 2025/ 2026 |  |  |
| Combined Authority funds (CIP and CRSTS, plus additional WYCA funding to cover current funding gap) | 0.295 | 0.106 | 0.162 | 1.197 | 8.950 | 1.663 | 12.373 | £0.826m secured from CIP Phase 2. £9.2m allocated through CRSTS. Remaining £2.35m expected to be secured as part of programme-wide review of CRSTS funding. |
| Applicants’ funds |  |  |  |  |  |  |  |  |
| Other public sector |  |  |  |  |  |  |  |  |
| Other private sector (section 106 contributions) |  |  |  | 0.677 |  |  | 0.677 | Subject to legal advice and approval to spend |
| **Total Cost** | 0.295 | 0.106 | 0.162 | 1.874 | 8.950 | 1.663 | 13.050 |  |
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| **5.3 Revenue Costs** |
| 5.3.1 Are there any revenue, on-going/operational costs associated with the project? |
| The most significant revenue cost will be the maintenance and periodic refurbishment of the proposed new traffic signals. Routine maintenance for the ‘Do Something – Less Ambitious’ option has been estimated to cost £3517 per annum (2022/23 prices). In addition, refurbishment of the junction would be expected to be required every 15 years, and to cost £200,000 on each occasion (2022/23 prices). These costs would be borne by LCC’s highways maintenance budget.  Other identified potential impacts on revenue costs include carriageway and footway resurfacing costs, maintenance of new landscaping, and street cleaning (including of the proposed new cycle tracks). At this stage, the balance of these costs is expected to be much smaller than the revenue costs identified in relation to traffic signals maintenance and refurbishment, and has not been fully costed at this stage. More detail regarding these costs will be provided at Full Business Case. Again, these costs would be borne by the LCC highways maintenance budget. |

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| **5.4 Funding Source** |
| 5.4.1 What other funding sources are there within the project? |
| The A660 was one of the 5 corridors included in LPTIP. Two schemes were ultimately delivered on the A660 through LPTIP: the Holt Lane Signalisation scheme and the Headingley to Weetwood Signals Upgrade scheme.  Besides these two schemes, a number of other schemes were developed to various stages using LPTIP funds, including schemes at Lawnswood roundabout, Headingley Hill and Hyde Park Corner. These schemes were not delivered through LPTIP due to funding and programme constraints.  In early 2020 it was agreed with the Combined Authority that the A660 corridor would be considered for inclusion in the Corridor Improvement Programme (CIP) Phase 2, thus providing an opportunity to continue development of one or more legacy LPTIP schemes on this corridor. Subsequently, plans were developed by LCC for the following three A660 schemes:   * Lawnswood Roundabout Improvement scheme * Hyde Park Corner scheme * Headingley Hill bus lane   These three schemes were then considered as part of the Combined Authority’s prioritisation process for CIP Phase 2, sifting schemes brought forward by the five West Yorkshire local authorities. The outcome of this prioritisation process was that the Combined Authority proposed to fund one LCC scheme to delivery (A58 Roundhay Road), and two LCC schemes to Full Business Case (A660 Headingley Hill and A61N Scott Hall Road). No funding was secured for the Lawnswood Roundabout Improvement scheme, or the Hyde Park Corner scheme, on the basis that other schemes performed better against the Combined Authority’s prioritisation assessment.  Following receipt of the indication that, of the 3 proposed A660 schemes, only Headingley Hill would receive development funding through CIP Phase 2, discussions took place between LCC Highways & Transportation officers and the LCC Executive Member with responsibility for transport, regarding LCC’s priorities for the A660 corridor, in the light of the roll out of improved cycling infrastructure on the A660 corridor as part of the Emergency Active Travel Fund (EATF), which was then under way. The latest position on delivery risks for Headingley Hill was also considered, given the need for third party land acquisition and impacts on trees and green space.  The outcome of these discussions was that LCC’s preference was to use CIP Phase 2 funding to develop the Lawnswood Roundabout Improvement scheme, in preference to the Headingley Hill scheme. LCC officers therefore recommended to CIP board in December 2020 that CIP Phase 2 funding be used to develop the Lawnswood Roundabout Improvement scheme, in preference to the Headingley Hill scheme. This was due to the Lawnswood scheme’s better alignment with the overall approach to the management of the corridor through the EATF, in addition to the reduced delivery risk in comparison with the Headingley Hill scheme, due to the latter scheme’s more significant impacts on trees and green space, which were anticipated to endanger public acceptability. Through subsequent discussions with the Combined Authority, it also became clear that the initial decision by the Combined Authority to prioritise Headingley Hill ahead of the Lawnswood Roundabout Improvement scheme was largely due to a misunderstanding regarding the scope of the latter scheme, with the proposed cycling infrastructure not being accounted for. The subsequent emergence of the Active Travel Fund Tranche 2 and Tranche 3 proposals for the A660, which will deliver improved cycling infrastructure on the corridor, has also strengthened the case for the Lawnswood Roundabout Improvement scheme.  Following these discussions, Combined Authority officers confirmed that CIP2 funds could be used to develop and submit an OBC for Lawnswood Roundabout Improvement scheme, instead of developing and submitting an FBC for the Headingley Hill scheme.  The CIP funding secured to develop the scheme up to OBC stage amounts to £825,807. A further £9.2 million is allocated to this scheme via the City Region Sustainable Transport Settlement, which will cover the majority of further development and delivery costs. In addition to this, £676,963.96 of section 106 contributions have been allocated to this scheme, subject to final legal approval.  As set out in Section 5.2, the currently secured funds are insufficient to deliver the ‘Do Something – Less Ambitious’ option which has been selected through this OBC process as the preferred option for delivery as Phase 1 of the Lawnswood Roundabout Improvement scheme. There are no less costly options on the short list of options, and none of the less expensive options present in the long list discussed in section 4.1 would deliver on the objectives of the scheme. As highlighted in section 1.3, a review of the CRSTS fund is currently underway, and it has been agreed between officers at Leeds City Council and at the Combined Authority that this review will be used as an opportunity to reallocate funding to Lawnswood from other schemes, to the extent required to make up the identified shortfall. The review is set to conclude in August 2023. It should also be noted, as highlighted in section 5.1.1, that delivery of the proposed Phase 2 of this scheme, i.e. the additional elements of the ‘Do Something – More Ambitious’ option, would require additional funding to be secured, and LCC proposes to investigate options for securing this additional funding once a preliminary design and associated costing has been completed for this Phase.  The funding sources for the proposed scheme are summarised in Table 48. |

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| **Table 48. Funding Source.** | | |
| **Funding Source** | **(£xm)** | **Current status (secured, pending, applied for)** |
| Corridor Improvement Programme Phase 2 | 0.826 | Secured |
| City Region Sustainable Transport Settlement | 9.200 | Secured |
| Section 106 contributions | 0.677 | Secured, subject to final confirmation from LCC legal team |
| Additional external funding, source to be confirmed | 2.348 | Expected to be allocated from the CRSTS programme, as part of the review of this fund which is expected to conclude in August 2023. |
| **Total (£m)** | **13.050** |  |

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| 5.4.2 What are the main financial risks and how will they be managed? |
| A Quantitative Risk Assessment has been included in Appendix D. The main financial risks identified are as described in Table 49.  **Table 49. Main financial risks.**   |  |  |  | | --- | --- | --- | | Risk | Expected value (£m) | How will this be managed? | | Scope may need to be increased in response to comments from LCC officers - construction | 0.345 | The project team are in regular contact with key LCC officers to ensure that the scheme design has internal buy in. This will continue through the development of the scheme. | | Costs increase due to inflation (more than anticipated in initial cost estimate) | 0.296 | Inflation cannot be influenced by the project team. Latest inflation forecasts will be monitored as the project progresses so that the impact on the scheme can be regularly reassessed. The inclusion of this risk in the risk register provides protection against increases in inflation.  Every effort will also be made to seek the earliest practicable start on site, in order to minimise impact of inflation on cost. | | Cost estimates for statutory undertaking equipment diversions may be insufficient | 0.246 | Initial estimates for utilities works are considered conservative.  C3 estimates have been requested, and most have been received. Trial holes are scheduled for July 2023.  Design team to work closely with utilities companies, and look for opportunities to minimise costs where possible. | | Potential noise level compensation claims from residents may exceed the allowance made in the cost estimates. | 0.197 | An allowance has been included in the cost estimates for Part 1 claims, which is based on an estimate from the Valuation Office Agency – this risk allows for Part 1 claims exceeding this allocation, as well as covering any potential Part 2 claims.  Noise modelling to be undertaken in summer 2023, which will further inform the likelihood of these claims. | | Extreme weather delays construction activities (Significant, 1 in 10-year event) | 0.138 | Time risk allowance to be built into programme for winter working activities. Records to be taken by site supervision team. | | Funding identified for delivery is reallocated, or identified funding is insufficient | 0.138 | Work closely with CA to ensure that proposed design fits with objectives of programmes from which funding is derived.  Investigate alternative funding sources. | |

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| 5.4.3 How will cost overruns be dealt with? |
| A Programme Board has been established at LCC to oversee the management of the LCC CIP schemes, including Lawnswood. This board is expected to be repurposed in the near future to incorporate schemes funded by CRSTS, and therefore would continue to include the Lawnswood scheme post-OBC. This Programme Board will set cost tolerances for the Project Manager. The Project Manager will escalate to the Programme Board if those tolerances are going to be exceeded. Should the costs exceed those approved for the scheme then the Programme Board will escalate the matter to the WYCA Programme Board. Where any change to the scheme programme is identified, a change request and change control will be carried out and early warnings will be issued to the delivery team. To control the project costs the project team will actively manage the QRA and seek to promote value engineering through the NEC3 contract. |

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| 5.4.3 Does the project offer any potential to generate a commercial return to pay back the Combined Authority funding? |
| There would be no commercial return from this scheme to pay back WYCA. |

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| 5.4.4 Has the project considered any State Aid implications? |
| The project team have taken advice from the LCC Legal Services team regarding State Aid/Subsidy Control. Since the funding for the scheme will be used entirely to deliver new public highway infrastructure, the Legal Services team have advised that the scheme does not conflict with the Subsidy Control Act 2022. |

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| 5.4.5Is the Combined Authority funding a loan? **Only complete this section if applying for a loan from the Combined Authority.** | |
| Advice for completion:   * Is the Combined Authority funding a loan?If so, what arrangements/conditions have bene investigated/put in place for the loan? * Provide a summary of key points with regards to the Loan and any conditions surrounding it at this point in time. | |
| When will the loan repayments start? | (month / year) |
| When will the final loan payment be made? | (month / year) |

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| **6. Management Case** |

The purpose of the Management Case is to demonstrate that the preferred option is capable of being delivered successfully, in accordance with recognised best practice.

**Note – All sections should be reviewed and updated if this is the Full Business Case. A summary of any key changes and their implications on the business case should be included.**

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| **6.1 Deliverability** |
| 6.1.1 How will the delivery of the project will be managed? |
| Leeds City Council have a successful track record of delivering major transport schemes across the city, including junction remodelling. Recent examples include the Armley Gyratory scheme, which is currently under construction, and recently delivered schemes at the A61 Harrogate Road / A6120 Ring Road junction, and at the Armley Road / Ledgard Way junction (delivered as part of the LPTIP A647 Bus Priority Corridor scheme). Leeds City Council thus has a wealth of experience managing and delivering effective stakeholder engagement, design and construction activities in relation to these kinds of schemes.  This section describes the arrangements in place to manage the delivery of the ‘Do Something – Less Ambitious’ option, which, as described in section 4, has been selected as the preferred option for delivery through the current round of CRSTS funding. Arrangements for the potential future delivery of the proposed Phase 2 of the Lawnswood Roundabout Improvement scheme (consisting of the additional elements of the ‘Do Something – More Ambitious’ option) will need to be identified as this second phase progresses through the development stages.  **Project Governance, Roles, and Responsibilities**  Previously, the project has been managed as part of an overarching programme of work known as the Corridor Improvement Programme Phase 2 (CIP2). The programme follows CIP Phase 1, which had £65m of funding allocated, with CIP2 consisting of £47m allocated from the Department for Communities and Local Government-funded West Yorkshire Transport Fund to deliver significant investment into the improvement of sustainable transport, inclusive and clean growth, and benefits to the environment. CIP is managed by the West Yorkshire Combined Authority. There is an established programme management board chaired by the Senior Responsible Owner (SRO) and supported within LCC by a Programme Manager; both of these roles along with programme support are jointly fulfilled by the Combined Authority and Leeds City Council. Development of the Lawnswood scheme up to completion of Activity 3 will be managed under this programme.  Once the scheme progresses to Activity 4, it is anticipated that the scheme will be managed as part of the City Region Sustainable Transport Settlement (CRSTS) programme. This programme consists of £830m allocated to WYCA to be spent over five years, of which £61m has been allocated to LCC, as of February 2023. As the delivery of the works has been agreed to be funded from CRSTS funds, it is anticipated that the project and programme management of this scheme will be fulfilled by the existing CIP board, which is proposed to be expanded to incorporate CRSTS schemes.  The Lawnswood roundabout improvement scheme sits within the management and governance structures established to support the delivery of the CIP programme and each individual scheme within the programme. This therefore comprises both programme and scheme management procedures and processes to ensure effective, on-time, and on-budget scheme delivery.  This is structured as follows:  **CIP Programme Board**  The purpose of the CIP Board is to ensure that the programme is delivered in partnership, completed to programme, and delivers the objectives of the programme. The role of the CIP Board is to provide leadership, accountability, decision-making, ownership, and direction to all aspects of the planning, programming, funding, procurement, implementation, and monitoring of the schemes within the wider CIP programme. The board will direct the programme in accordance with PRINCE2 project management principles.  Figure 9 outlines the overall governance structure implemented to manage the delivery of the CIP programme and the associated Lawnswood Roundabout Improvement scheme. It summarises all key roles on the project and their responsibilities, detailing technical managers, project support staff, executive roles and external support/advisors. The CIP Programme Board typically meets every 6 weeks. The structure of the CIP boards is shown in Figure 9. The project team anticipates that a similar structure will be retained as the project progresses into CRSTS as the existing boards expand to include CRSTS schemes.    **Figure 9.** CIP boards overview  The LCC Programme Board informs and supervises the project team. The Project team has delegated powers to deliver within agreed budgets and programme milestones, including the power to approve the appointment of consultants, contractors and advisors as required for delivery within the budgets approved. The Project team will then only need to notify LCC Programme Board if any agreed tolerances are exceeded. Tolerances are to be agreed, and an overview of these will be produced explaining the permissible circumstances if and when the tolerances change, and the implications with regards to costs and programme of changes which are being put forward from project leads.  Lawnswood CIP Project Governance  The contract management team in Leeds City Council will all be existing staff, and predominantly be drawn from teams in Highways & Transportation. It includes:   * Gary Bartlett, Senior Responsible Officer * Kate Morris, Project Executive * Ian Moore, Project Executive * Mark Philpott, Project Assurance * Stephen J Boyle, Financial Manager * Rebecca Dickson, Senior Project Manager and Project Assurance (Programme) * Morgan Tatchell-Evans, Project Manager for Lawnswood Roundabout scheme * Caroline Coy, WYCA Funder, Programme Manager * James Bennett, WYCA Funder, Programme Interface * Members of Highways Board.   This team was selected from an experienced and effective pool of existing staff from across Leeds City Council and Combined Authority, so no new staff had to be recruited. The team above will work on the project throughout all project phases. A number of members of the team were also involved in the signalised crossroads scheme developed for Lawnswood as part of LPTIP, and are therefore fully aware of the background to the current scheme.  The project team meets regularly to review key issues and risks for the project. Any very high risks or issues are then escalated to the Programme Board. The project manager also regularly briefs the Executive Member regarding the scheme.  The Financial Manager (Stephen J Boyle) will be responsible for:   * Acting as Finance Manager, organising day to day financial management activities * Creating systems to maintain all financial records for the project and ensure that these are up to date * Checking all invoices, challenge where appropriate and pay correctly invoiced sums in a timely manner * Providing the Contract Manager with quarterly summaries of invoices and income * Maintaining a clear financial audit trail and providing all financial information at project close * Ensuring that the project complies with financial regulations.   The Lawnswood Project Manager (Morgan Tatchell-Evans) will be responsible for:   * Acting as lead officer for all aspects of the project * Finalising contractual documents * Organising project meetings and noting actions and decisions * Requesting and chasing project claims and outputs from sub-contractors and making an initial check * Managing project documents and ensuring that they are filed and archived appropriately.   The Highways & Transportation team, consisting of Senior Project Manager and Project Assurance (Rebecca Dickson) and Project Manager (Morgan Tatchell-Evans) will, with the support of Leeds City Council’s Target Cost Contract Manager (to be confirmed during detailed design), be responsible for:   * Organising day to day activities to ensure that construction is delivered on time, to budget and to good quality * Managing the sub-contractor undertaking the construction works * Liaising with the sub-contracted technical advisor to ensure works are progressing to required quality standards * Raising major risks and issues with the LCC CIP/CRSTS Programme Board as they arise and working jointly to mitigate risks and resolve issues * Acting as Contract Manager, organising day to day project management activities * Create systems to receive invoices and outputs from contractors * Create systems to maintain documentary records for the project and ensure that these documents are up to date * Ensuring that the project complies with the regulations * Ensuring documentary records are maintained * Resolving any escalated compliance issues * Creating the systems required to record the data and outputs associated with this project * Working with the sub-contractors to ensure that they understand the data and output requirements and supporting them initially to provide information in appropriate forms * Receiving output data from sub-contractors and checking and challenging these * Collating output data and producing output data * Undertaking the final project evaluation by analysing project data to identify trends and draw conclusions. |
| 6.1.2 Which organisations are involved in the delivery and management of this project? |
| LCC is the scheme promoter who will manage delivery, budgets and outcomes at an individual project level. LCC will also manage the delivery of detailed scheme design.  WYCA is the lead partner who will manage delivery, budgets and outcomes at a programme wide level.  Framework Partners will be appointed to assist with development of the FBC and scheme construction.  Table 50 summarises the project delivery partners. |

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| **Table 50. Project Delivery Partners.** | |
| **Organisation** | **Role in project delivery** |
| **Leeds City Council** | Scheme Promoter (Transport Strategy team)  Scheme design (Civil Engineering Team) |
| **West Yorkshire Combined Authority** | Lead partner |
| **Framework partners** | Supporting Consultant for business case development  Construction contractor for delivery |

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| **6.2 Scheme Programme** |
| 6.2.1 What is the anticipated scheme delivery timeframe? |
| A scheme programme is included in Appendix Y, and is based on the ‘Do Something – Less Ambitious’ option, which as described in section 4, has been selected as the preferred option for delivery through the current round of CRSTS funding. Construction is expected to begin in June/July 2024, subject to timely progression through the assurance process, and to be completed in June 2025. Some Statutory Undertakers diversions would be expected to be completed prior to June 2024. The key milestones are set out in Table 51. The proposed programme will require some work at risk, i.e. development of the detailed design in advance of receiving approval of the Outline Business Case, and awarding the construction contract prior to submission of Approval to Proceed document. This approach has been approved by the Senior Responsible Owner and Financial Manager at LCC.  A detailed construction programme will be developed by the contractor following contract award. This will set out the critical path of construction works, and will identify dependencies with work undertaken by other organisations, e.g. utilities works, streetlights and traffic signals. |

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| **Table 51. Scheme Programme** | |
| **Milestone** | **Date** |
| FBC submission | 1st November 2023 |
| Tender package issued to framework contractors | February 2024 |
| FBC approval | February 2024 (pending confirmation of relevant committee dates) |
| Tender award | March/April 2024 |
| Start on site | June/July 2024 |
| Approval to proceed submission | April 2024 |
| (Add additional lines for further options as necessary) |  |

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| **6.3 Delivery Constraints & Risk Management** |
| 6.3.1 What Delivery Constraints exist? |
| Table 52 summarises the key delivery constraints. No land acquisition is required to deliver any of the proposed short list options, since all fall entirely within the highway boundary. |

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| **Table 52. Key Delivery Constraints** | |
| **Delivery Constraint** | **Scheme Position** |
| Planning consents | N/A |
| Compulsory Purchase Orders | N/A |
| Public consultation | Public consultation was undertaken in November 2021-January 2022 with respect to the ‘Do Something – Preferred’ option. Further targeted engagement to be undertaken in relation to the further development and delivery of the ‘Do Something – Less Ambitious’ option following detailed design phase. Future delivery of the proposed Phase 2 ‘Do Something – More Ambitious’ option would be likely to require further public consultation. |
| Public Inquiry | N/A |
| Traffic Regulation Orders | TROs will be advertised following completion of detailed design. |
| Transport and Works Act | N/A |
| Public sector match funding | N/A |
| Private sector match funding | £676,963.96 of section 106 monies are expected to be allocated to the scheme, subject to final legal approval. |
| Procurement contracts | Procurement of contractor to be undertaken via LCC’s Intermediate Works Contractor Framework, which is subject to NEC4 ECC Terms and Conditions.  Procurement of consultant support to be undertaken via LCC’s existing Major Schemes Framework. |

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| 6.3.2 What approach is being adopted towards risk management? |
| The Risk Register for the project is attached as Appendix D with key risks set out in Section 6.3.3 below. The Risk Register is based on the ‘Do Something – Less Ambitious’ option. The approach adopted to risk has been used successfully by LCC on previous projects. An additional Risk Register will need to be developed for the ‘Do Something – More Ambitious’ option should this option be progressed through the relevant developmental stages.  LCC has developed a six-step risk management process from first identifying risks through to mitigating them. This process is intended to ensure that staff / delivery partners:   * Understand the nature of the risks faced; * Are aware of the extent of these risks; * Identify the level of risk that is acceptable; * Recognise ability to control and reduce risk; * Recognise where risk cannot be controlled; and * Take action where possible and when it would be the best use of resources.   The six steps are:   * Step 1: The risks originate from the Best Council Plan. * Step 2: Identify risks using a defined Risk Types and Categories document which provides details of the areas where risks can arise. * Step 3: Risks are evaluated using Risk Evaluation Matrices, based on a probability and severity approach and red / amber / green grading. * Step 4: Risks are managed by existing controls and action plans. * Step 5: Risks are recorded and reported using methods including risk registers. * Step 6: Risks are monitored and updated at an appropriate level.   For this project, as set out in Section 6.1.1, the Corridor Improvement Programme (CIP) and City Region Sustainable Transport Settlement are programmes managed by WYCA. There is an established CIP programme board chaired by the Senior Responsible Officer (SRO) and supported by a Programme Manager. Both of these roles along with programme support are fulfilled by the Combined Authority. The board meets monthly and is attended by Project Managers from the Partner Districts who provide highlight reports outlining progress, key risks/issues and financial forecasting on the individual projects. This board is expected to be reconfigured to encompass CRSTS schemes in the near future  At a project level, risks will be managed by the Project Manager. However, section 3.2.2 describes how LCC’s procurement strategy will seek to place risk with the party best placed to manage or mitigate that risk or manage the consequences should they transpire. |
| 6.3.3 What are the Scheme Headline Risks |
| The risk register for the project is attached as Appendix D. Risks have been scored according to likelihood, cost impact, schedule impact and reputational impact. The highest scoring risks (post-mitigation) are set out in Table 53.   |  |  |  |  | | --- | --- | --- | --- | | **Table 53. Headline Risks** | | | | | **Risk** | **Premit Score** | **Mitigation** | **Postmit Score** | | Cost estimates for statutory undertaking equipment diversions may be insufficient | 16 | Initial estimates for utilities works are considered conservative.  C3 estimates have been requested, and most have been received. Trial holes are scheduled for July 2023.  Design team to work closely with utilities companies, and look for opportunities to minimise costs where possible. | 16 | | Scope may need to be changed in response to comments from LCC officers - construction | 15 | The project team are in regular contact with key LCC officers to ensure that the scheme design has internal buy in. This will continue through the development of the scheme.  Design freeze to be agreed ahead of tender process. | 15 | | Scope may need to be changed in response to comments from LCC officers - design | 15 | The project team are in regular contact with key LCC officers to ensure that the scheme design has internal buy in. This will continue through the development of the scheme. | 15 | | Costs increase due to inflation (more than anticipated in initial cost estimate) | 15 | Inflation cannot be influenced by the project team. Latest inflation forecasts will be monitored as the project progresses so that the impact on the scheme can be regularly reassessed. The inclusion of this risk in the risk register provides protection against increases in inflation.  Every effort will also be made to seek the earliest practicable start on site, in order to minimise impact of inflation on cost. | 12 | | Funding identified for delivery is reallocated, or identified funding is insufficient | 25 | Work closely with CA to ensure that proposed design fits with objectives of programmes from which funding is derived.  Investigate alternative funding sources. | 12 | | General inclement weather delays construction activities (excludes extreme, 1 in 10-year events) | 12 | Build time risk allowance into programme for winter working activities. Records to be taken by site supervision team | 12 | | Additional modelling required in response to comments from Combined Authority | 12 | Engage with CA to understand modelling requirements prior to modelling being undertaken. | 12 | |

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| 6.3.4 Has a Quantified Risk Assessment been carried out? |
| A Quantified Risk Assessment has been completed by the project team and is attached as Appendix D. The Risk Register is currently valued at £2.075m, representing 16% of the overall scheme cost. |

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| **6.4 Communications and Stakeholder Management** |
| 6.4.1 Does the Project have a Communications Strategy? |
| A Stakeholder Management Plan is included in Appendix Z. An extensive public consultation exercise was undertaken between November 2021 and January 2022, and this was followed up with targeted engagement with key stakeholders, as described in section 2.1.6. Through this process, the key stakeholders have been engaged with the project, and further engagement with selected stakeholders will be undertaken as the project progresses.  An Equality, Diversity, Cohesion and Integration Screening assessment has been undertaken in support of this OBC submission, and is attached as Appendix Q. This assessment is based on the ‘Do Something – Less Ambitious’ option. The assessment has highlighted the scheme’s benefits in terms of road safety, improved active travel infrastructure and improved bus journeys will particularly benefit a number of groups, including older people, young people, carers, disabled people, women and economically deprived people. The assessment has also highlighted that the disbenefits for some general traffic movements and bus journeys could have negative impacts for those people who are particularly dependent on those modes, which includes some older people, some disabled people, some ethnic minorities, economically deprived people and women. The screening also highlights that the most significant journey time disbenefits for buses and general traffic in the ‘Do Something – Less Ambitious’ option would be for southbound vehicles and Otley Old Road, and that this issue would be resolved by the future delivery of the proposed ‘Phase 2’, i.e. the additional elements of the ‘Do Something – More Ambitious’ option. |

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| **6.5 Benefits Realisation** |
| 6.5.1 Benefits Realisation Plan |
| A Benefits Realisation Plan has been included as Appendix AA. |
| 6.5.2 Is there a Monitoring and Evaluation Plan? |
| A draft Monitoring & Evaluation Plan has been shared with the Combined Authority in May 2023, and is included as Appendix AB. The plan is based on the delivery of the ‘Do Something – Less Ambitious’ option. £130,000 has been allocated to the delivery of this plan. The Project Manager (Morgan Tatchell-Evans, LCC) will be responsible for the delivery of the plan.  An additional Monitoring and Evaluation Plan will need to be developed for the ‘Do Something – More Ambitious’ option should this option be progressed through the relevant developmental stages |

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| **6.6 Change Management** |
| 6.6.1 How will changes be managed |
| Change can be raised by any stakeholder of the project and assessed by the project manager before referral to the LCC Programme board where required. LCC have a standard change request template. If the change falls within the project team delegations and tolerances, then the change will be dealt at that level. If the change exceeds delegations and tolerances of the LCC Programme Board, then it will be referred to the Combined Authority CIP Programme Board with a recommendation. If the Combined Authority CIP Programme Board delegations or tolerances are exceeded, then a change request will be submitted through the PMO process.  Change will be actively managed so that any escalation required is undertaken in a timely manner and to limit impact on delivery timescales. |

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| **7. Appendices Supporting Technical Studies** |

Please outline any supporting technical studies that have been or will be commissioned as part of project development / evidence to support the project’s Business Case.

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| **A** | **General Arrangement Drawings** |
| **B** | **Logic Model** |
| **C** | **Consultation Report** |
| **D** | **Risk Register** |
| **E** | **Options Appraisal Report** |
| **F** | **Appraisal Specification Report** |
| **G** | **Local Model Validation Report** |
| **H** | **Uncertainty Log** |
| **I** | **TEE, PA and AMCB tables** |
| **J** | **Appraisal Summary Tables** |
| **K** | **Active Mode Assessment Tool Outputs** |
| **L** | **Bus Journey Time Impacts** |
| **M** | **Bus User Impacts - Model Assumptions** |
| **N** | **Bus User Impacts - Sources** |
| **O** | **Bus User Impacts - Flow Chart** |
| **P** | **Highway Impact Appraisal Technical Note** |
| **Q** | **Equality, Diversity, Cohesion and Integration screening** |
| **R** | **TAG Environmental Worksheets** |
| **S** | **Carbon Impact Assessment Stage 2 Report** |
| **T** | **Carbon Impact Assessment Stage 2 Worksheet** |
| **U** | **Social Impacts Appraisal** |
| **V** | **Detailed Cost Plan** |
| **W** | **Spend Profile** |
| **X** | **Cost Summary** |
| **Y** | **Lawnswood Detailed Design and Construction Programme** |
| **Z** | **Lawnswood Communications Strategy** |
| **AA** | **Benefits Realisation Plan** |
| **AB** | **Monitoring and Evaluation Plan** |

1. Tables 1-4 Levels of Activity, Sport England, 2022. Available [here](https://www.sportengland.org/research-and-data/data/active-lives/active-lives-data-tables?section=children_and_young_people_surveys#academicyear202122-19387) [↑](#footnote-ref-2)
2. Tables 1-4 Levels of Activity, Sport England, 2022. Available [here](https://www.sportengland.org/research-and-data/data/active-lives/active-lives-data-tables?section=adult_surveys#november202021-19520) [↑](#footnote-ref-3)
3. Due to the nature of the survey undertaken, cyclists passing or using more than one crossing will have been recorded more than once. [↑](#footnote-ref-4)
4. Due to the nature of the survey undertaken, pedestrians passing or using more than one crossing will have been recorded more than once [↑](#footnote-ref-5)
5. The figure assumes that households listed in the Census as having 3 or more cars have an average of 3.5 cars [↑](#footnote-ref-6)
6. *Site Allocations Plan*, Leeds City Council, 2019. Available [here](https://www.leeds.gov.uk/planning/planning-policy/adopted-local-plan/site-allocations-plan) [↑](#footnote-ref-7)
7. *Draft Noise Action Plan: Roads*, DEFRA, 2018. Available [here](https://consult.defra.gov.uk/environmental-quality/noise/supporting_documents/noiseactionplanroads.pdf) [↑](#footnote-ref-8)
8. *Clean Air Strategy*, DEFRA, 2019. Available [here](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf) [↑](#footnote-ref-9)
9. As set out in The Air Quality Standards Regulations 2010. Available [here](https://www.legislation.gov.uk/uksi/2010/1001/contents/made) [↑](#footnote-ref-10)
10. *Site Allocations Plan*, Leeds City Council, 2019. Available [here](https://www.leeds.gov.uk/planning/planning-policy/adopted-local-plan/site-allocations-plan) [↑](#footnote-ref-11)
11. Bus fare and journey time elasticities and diversion factors for all modes, DfT, 2018 [↑](#footnote-ref-12)
12. TEE, PA and AMCB tables have been produced for each of the Do Something options, both for the core scenario and for the sensitivity test where highway disbenefit has been removed. [↑](#footnote-ref-13)
13. Bus fare and journey time elasticities and diversion factors for all modes, DfT, 2018 [↑](#footnote-ref-14)
14. WYCA Bus Service Improvement Plan Version 2.0, October 2022 [↑](#footnote-ref-15)
15. A 40-year appraisal period has been used in line with guidance released as part of Active Travel Fund 4 for the asset life of high-quality active travel infrastructure. Note, this is different to the standard 60-year appraisal period used for highway and public transport scheme appraisal. [↑](#footnote-ref-16)
16. Transport for London (2005). *Do traffic signals at roundabouts save lives?* Accessed here: <https://content.tfl.gov.uk/signalsatroundabouts-transportationprofessional-article.pdf> [↑](#footnote-ref-17)
17. The TAG Uncertainty Toolkit (July 2022) states that for low value schemes, of less than £50m, the Common Analytical Scenario is not required. However, it is felt that in the current post COVID climate, it is beneficial to undertake a behavioural change sensitivity test, in line with approach outlined. [↑](#footnote-ref-18)
18. Department for Transport (2023). *TAG Uncertainty Toolkit*. Accessed here: <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1164846/tag-uncertainty-toolkit.pdf> [↑](#footnote-ref-19)
19. Cycles are assumed to remain within the carriageway in all modelled options, ensuring that the model represents a ‘worst case’ in terms of the highway user impacts of the proposed scheme. [↑](#footnote-ref-20)