Wichelstowe Southern Access

Outline Business Case

On behalf of **Swindon Borough Council**

Project Ref: 24177/5511 | Rev: AA | Date: January 2018

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1 Introduction

1.1 Overview

1.1.1 Peter Brett Associates (PBA) has been commissioned by Swindon Borough Council (SBC) to produce an Outline Business Case for the Wichelstowe Southern Access (WSA). The scheme has been allocated provisional funding through the Local Growth Fund (LGF) process and is a Department for Transport (DfT) retained scheme, which means that DfT will provide the final approval of the scheme.

1.1.2 Whilst it is a retained scheme, the Swindon and Wiltshire Local Enterprise Partnership (S&WLEP) will still play a prominent role in the approval process, with DfT requiring that this Outline Business Case and the Full Business Case be reviewed and approved by the S&WLEP, prior to DfT signing off the Full Business Case.

1.2 Wichelstowe Southern Access

1.2.1 The scheme is located to the south west of Swindon and straddles the M4 motorway to the east of junction 16. The scheme location is shown in Figure 1.1 in the context of the Wichelstowe development and wider area. Scheme drawings are provided as Appendix A.

1.2.2 The WSA scheme consists of the construction of an additional access to the Wichelstowe site crossing the M4 motorway, together with associated infrastructure to the south and north of the crossing to connect to existing infrastructure (to the south) and the new development (to the north). The southern end of the WSA requires a new junction to be provided on the B4005 Wharf Road, just to the east of the existing junction with Hay Lane. The route then travels in a north-easterly direction, with a new under-bridge provided where it will cross the M4 motorway. It will then travel in an east-north-east direction to tie in with infrastructure provided as part of the Wichelstowe development.

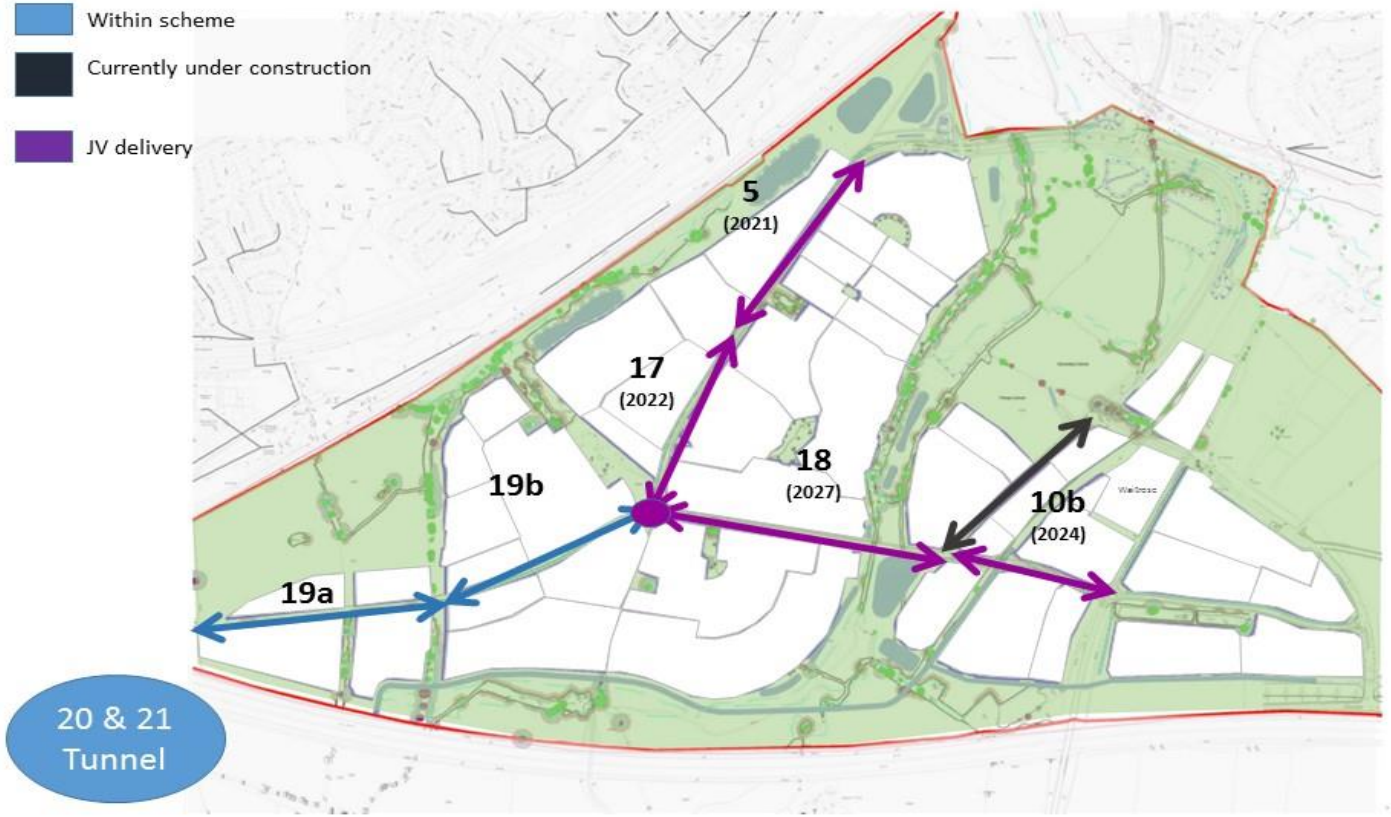
1.2.3 The main function of the WSA is to provide access to Wichelstowe and it is not designed as a relief road or expected to attract large volumes of through traffic. The road will be a standard two-way 30mph link.

1.2.4 The WSA is required as part of Condition 42 of the planning permission for the Wichelstowe development. The condition restricts the number of dwellings to 2,500 until the scheme is complete.

1.2.5 The WSA will unlock the Wichelstowe development above the 2,500 residential units currently permitted without the scheme. The scheme will thus make it possible to support the full 4,500 new dwellings. It will also unlock 12.5 hectares of B1/B2/B8 employment land and will support around 2,000 new jobs. The WSA will result in a positive benefit derived from 'Planning Gain', through delivery of the additional housing and employment.

Figure 1-1: Scheme Location

Figure 1-2: Wichelstowe Indicative Phasing Infrastructure



Note: Roundabout constructed as part of package 17

1.3 Context in Relation to Wichelstowe Development

1.3.1 The WSA forms part of the infrastructure to be provided for the Wichelstowe development. The phasing of the internal infrastructure, which is to be provided as part of the committed Wichelstowe development, has a phased built out as shown in Figure 1-2. This shows that the scheme for which funding is sought and includes developer contributions, includes the new infrastructure to the south of the M4, the tie-in at Wharf Road, the crossing of the M4 and the infrastructure to the north, as far as the major junction with the northern and eastern routes (19a and 19b on the plan). Other key infrastructure will come forward as indicated within the figure.

1.3.2 The WSA scheme will open in 2021, providing direct access to the employment and housing plots to the western side of the development. A through route will be in place by the end of 2022, when the route north is scheduled to be finished.

1.4 Document Purpose

1.4.1 The purpose of this document is to provide evidence-based information to secure support from the Local Growth Fund for £22.9m through the S&WLEP to progress the WSA scheme. Swindon Borough Council (SBC) has successfully secured provisional funding of £22.9m to deliver the WSA earlier than would otherwise be the case, facilitating economic growth and improving the viability of the development. A further £5.29m in total will be provided by SBC through developer contributions, making up the anticipated full scheme cost of £28.19m.

1.4.2 The funding allocation runs through to early 2021, with a phased drawdown of funds from 2018 to 2021. To secure this funding, full scheme details and a Department for Transport (DfT) compliant scheme business case needs to be prepared for approval by the LEP and the DfT.

1.4.3 Guidance for the preparation of Business Cases for Transport Schemes has been published by the Department for Transport (DfT). This is based on H.M. Treasury's advice on evidence-based decision making as set out in the Green Book and uses the best practice five case model approach. It also brings in other strands where relevant, such as summary of predicted scheme outcomes and scheme operational case. The latest guidance for the development of business cases is provided in '*The Transport Business Cases, DfT, January 2013'.*

1.4.4 This approach assesses whether schemes:

- are supported by a robust case for change that fits with wider public policy objectives – the strategic case;
- demonstrate value for money – the economic case;
- are commercially viable – the commercial case;
- are financially affordable – the financial case; and
- are achievable – the management case.

1.4.5 The work undertaken to produce the evidence for this business case has been prepared using guidance provided by DfT and WebTAG (Web-based Transport Appraisal Guidance).

1.5 Document Status

1.5.1 This document forms the Outline Business Case for the WSA scheme. Should the scheme pass the gateway review at the end of the outline business case stage, a Full Business Case will be produced.

1.6 Structure of remainder of this document

1.6.1 Following this introduction, the remainder of the report follows the Transport Business Cases guidance and is structured as follows:

- Section 2 presents the Strategic Case;
- Section 3 details the Economic Case including the Value for Money Statement
- Section 4 outlines the Financial Case;
- Section 5 outlines the Commercial Case; and
- Section 6 outlines the Management Case.

2 Strategic Case

2.1 Overview

2.1.1 This section will set out the 'case for change' which fits to the wider public policy objectives. Below are described each section and its content:

- Context of business case, outlining Swindon Borough Council's strategic aims and responsibilities;
- Nature of transport-related problems that have been identified, using evidence to justify intervention and examining the impact of not making the investment;
- Specific, measurable, achievable, realistic and time-bound objectives that solve the problem, based on Swindon Borough Council's strategic aims and responsibilities;
- Measures for determining successful delivery of the objectives;
- Scheme scope, determining what the project will and will not deliver;
- Analysis of constraints and opportunities for development;
- Breakdown of interdependencies on which the successful delivery of the scheme depends;
- Details of main stakeholders;
- Options considered;

2.2 Business Strategy

2.2.1 Swindon Borough Council as key authority of the scheme has key guide policies for planning and transport. The key guidelines are issued in the Swindon Local Transport Plan 2026. Any scheme must address identified problems and align with its policies.

2.2.2 As the LTP3 states development proposals shall provide access appropriate to the scale, type and location without detriment to highway safety and local amenity, providing the same time measures to offset any adverse impacts on the transport network and sustainable travel choices.

2.2.3 The scheme must support the economic growth aspirations set out in the S&WLEP Strategic Economic Plan and meet key national and local policy objectives.

Strategic Economic Plan (SEP)

2.2.4 The SEP identifies four key opportunities:

- Innovation
- Military
- Town centres
- Unlocking urban expansion

2.2.5 The Growth Deal is about accelerating major urban expansion and ensuring that growth is sustainable. This will be done by:

- Investing in infrastructure to unlock key developments
- Mitigating the impact of new development on the transport network to improve journey time reliability
- Providing alternative travel options for residents in new (and existing) communities, including rail, bus rapid transit, and other sustainable transport, such as safe cycle and walking routes.

2.2.6 The WSA meets the criteria for key opportunity in the fourth bullet point listed in paragraph 2.2.4 above. The WSA will unlock the opportunity for further development at Wichelstowe, which is constrained otherwise.

Swindon Local Plan 2026

2.2.7 The Swindon Local Plan 2026 was adopted in 2015 and sets out the policies and plans for development within the borough up to 2026. Wichelstowe is identified as one of five strategic development sites.

2.2.8 Policy SD2 sets out the Sustainable Development Strategy and states:

a. Recognising its role and function in the wider area development in the Borough will be concentrated at Swindon through a combination of:

- Realising development opportunities within Swindon's urban area; and
- Allocated strategic sites at Wichelstowe, Commonhead, Tadpole Farm, Kingsdown (east of the A419) and the proposed New Eastern Villages, Rowborough and expanded South Marston

2.2.9 The Local Plan identifies the Wichelstowe allocation as providing 4,064 dwellings for the period 2011 to 2026 and 12.5 hectares of employment. Ultimately 4,500 dwellings are proposed by 2036.

2.2.10 The planning permission for Wichelstowe identifies that only 2,500 dwellings can be provided prior to the WSA being delivered. Therefore, the WSA is essential to meet the full Local Plan allocation within the Borough.

Swindon Local Transport Plan

2.2.11 Swindon's third Local Transport Plan identifies that Swindon is a positive and highly ambitious town, which aims to develop its status as an economic, retail and cultural centre. It notes that substantial progress has been achieved in its plans for growth but that there is much more to be done. This includes regenerating central Swindon and economic growth through planned urban extensions and, focussing on rejuvenating deprived areas. The aim is for Swindon to become a successful economic driver for the south-west of England and the entire UK. The transport challenges are to:

- Optimise the operation of key strategic transport corridors and the local road network to allow the efficient and reliable movement of people and goods, vital for the economic prosperity of the area

- Deliver transport measures and interventions that will accommodate housing and employment growth in an environmentally sustainable manner
- Contribute towards carbon reduction targets by achieving a shift to a more sustainable transport network
- Overcome barriers and severance caused by key transport corridors and ensure new development allows for walking and cycling
- Improving accessibility to/from the town centre, and ease of movement within it, to support regeneration
- Delivering transport solutions which are sympathetic to the local environment and do not adversely affect local quality of life
- Reducing the negative health impacts of the transport system (i.e. road safety and health benefits)

2.2.12 The desired transport outcomes are:

- Improved journey time reliability for all forms of transport
- Improved road safety
- Increased overall share of journeys by public transport, walking and cycling
- Reduced need to travel and reduced dependency on the private car
- Improved accessibility
- Improved local environment and quality
- Improved access to the town centre

2.2.13 The policy framework, set out in the Local Transport Plan, was approved with a view to addressing the key transport challenges and delivering the desired transport outcomes.

- Policy A – Optimise the capacity of the highway network and improve journey time reliability for all forms of transport
- Policy B – Improve road safety
- Policy C – Achieve and sustain a high quality, resilient and well maintained highway network for all members of the community
- Policy D – Integrate land use planning and transport to reduce the need to travel and mitigate the impact of new development on the transport network
- Policy E – Deliver a high quality public transport network that is accessible, easy to use and supported by appropriate priority measures
- Policy F – Encourage a change in behaviour in transport by promoting alternatives to driving alone and supporting infrastructure, where appropriate

2.2.14 The proposed WSA scheme aligns well with the Local Transport Plan, Policy A and D. The scheme will help to deliver housing and employment growth and reduce the impact on the wider network through provision of the additional access, therefore optimising the capacity on the existing network.

National Planning Policy Framework

2.2.15 The 'National Planning Policy Framework' (March 2012) sets out the Governments planning policies for England and how these are expected to be applied. This framework provides a foundation for local stakeholders and councils to produce bespoke local plans that reflect the needs of local communities.

2.2.16 The strategy sets out that sustainable development is at the core of drawing up plans and determining applications. There are three mutually dependant dimensions; economic, environmental and societal improvements. These form the foundation of most long-term objectives set out by the Government and major transport infrastructure projects are assessed against these three tenets both for the present and future. To achieve sustainable development, economic, social and environmental gains must be made.

2.2.17 Building a strong, competitive economy and securing economic growth to create jobs and prosperity is a strong commitment from the Government. The framework states that pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life, including:

- Making it easier for jobs to be created in cities, towns and villages;
- Replacing poor design with better design;
- Improving the conditions in which people: live, work, travel and take leisure; and
- Widening the choice of quality homes.

2.3 Problem Identified and Impact of Not Changing

2.3.1 The Wichelstowe site has been identified through the local plan process, as a strategic site for delivery of housing and employment in Swindon, this will form a key site for Swindon to meet its identified housing needs in the future. As part of delivering the housing needs, infrastructure requirements have been identified, including the WSA and junction 16 improvements. The latter is required to assist in the wider delivery of housing and employment in Swindon and Wiltshire.

2.3.2 The WSA scheme is intrinsically linked to the delivery of housing at this site, as identified within the local plan. The planning permission for Wichelstowe allows for 2,500 dwellings to be delivered prior to the WSA being built, but without the scheme the Local Plan targets and objectives cannot be met and the delivery of housing and employment at Wichelstowe will not be possible.

2.3.3 Without the scheme, the growth at Wichelstowe cannot proceed beyond 2,500 houses, resulting in the loss of up to 2,000 new homes and 12.5ha of employment land. This will stifle Swindon's growth and/or put pressure for growth in other less suitable areas.

2.4 Objectives

The major objectives that have been identified are:

- Unlock the Wichelstowe development after the first 2500 units

- Reduce congestion from Wichelstowe development on the wider network – the scheme will offer relief to Wharf Road and the roads to north and east of Wichelstowe, which would otherwise become congested without the scheme. These include Great Western Way, Mill Lane and Croft Road. Without the WSA scheme, these existing roads would have to accommodate Wichelstowe development from the south and west. A review of the future demand on the section of the M4 between junctions 16 and 17 was undertaken by the then Highways Agency (now Highways England -HE) in 2012. The assessment was on the premise that the WSA scheme was to the south and that this provided the "agreed" scheme for Junction 16. If the scheme was altered, then the study's assumptions that the proposed Junction 16 improvements would be sufficient to accommodate future demand could be altered and HE would need to reconsider its policy/strategies for the area. The WSA scheme will maximise use of the capacity provided by the M4 Junction 16.

- Improve accessibility to new jobs at Wichelstowe from the south and west. As noted, access to and from the site is currently via Redposts Drive to the north, via Croft Road/Blackhorse Way to the east and via Mill Lane to the south. The WSA scheme will provide a connection from the proposed Wichelstowe development to M4 Junction 16 located the west thus improving access to the development from the south and west and alleviating pressure that would otherwise have to be borne by the current three accesses. The scheme will facilitate more people moving to the area and spending money in the local economy. The jobs and housing can be accelerated by moving the scheme forward, which will be facilitated by the Local Growth Funding.

2.5 Measures for Success

2.5.1 The measures for success will revolve around the specific objective of the scheme to deliver the additional housing and employment at Wichelstowe. This will need to be monitored following the delivery of the scheme.

2.5.2 It will also be necessary to monitor that the traffic impacts of the scheme on Wharf Road and the roads to the north and east of Wichelstowe are not adverse and the scheme is serving its purpose to reduce congestion and offer relief to these surrounding roads from Wichelstowe development traffic including being the main means of access to the employment zones for traffic from the south and west. The transport outcomes will revolve around preserving journey time reliability for travel to and from Wichelstowe, minimising the impacts of congestion that could potentially arise from growth at the site and high road safety standards with improvements in the accident/incident rate.

2.5.3 Other measures of success will pertain to sustained house building rate, with on-track starts and completions of new residential and employment units, occupation of new units being enabled by the new transport infrastructure, growth in resident population and jobs being accommodated, greater attractiveness of the development leading to high occupancy rates and growth in land values reflecting high demand to live and work in the S&W LEP.

2.6 Scope

2.6.1 The scheme's purpose is to facilitate the link to Wichelstowe, south of the M4 and enable Wichelstowe development reach the 4,500 houses target and the provision of employment opportunities.

2.7 Current Opportunities and Constraints

2.7.1 The significant housing and employment growth planned for Swindon and Wiltshire in the coming years is a great opportunity to deliver transport improvements and maximise economic growth in the area. The development, combined with the DfT investment, will

contribute to a transport network that will assist in the delivery with a resultant economic benefit.

2.7.2 The M4 Junction 16 improvements currently being delivered, were predicated on there being a fourth access for Wichelstowe, and this fourth access being from the south i.e. WSA scheme, otherwise the full impacts of the M4 Junction 16 capacity improvements would not be realised.

2.8 Interdependencies

2.8.1 Swindon Borough Council (SBC) has successfully secured provisional funding of £22.9M, from the Local Growth Fund to deliver the WSA earlier than would otherwise be the case, facilitating economic growth and improving the viability of the development. The Wichelstowe developer will contribute a further £5.29M, making up the anticipated full scheme cost of £28.19M. This funding allocation runs through to early 2021, with a phased drawdown of funds from 2018 to 2021.

2.8.2 The M4 Junction 16 improvements currently being delivered, were predicated on there being a fourth access for Wichelstowe, and this fourth access being from the south i.e. WSA scheme, otherwise the full benefits of the M4 Junction 16 capacity improvements would not be realised. The planning permission for Wichelstowe requires that the M4 Junction 16 scheme is completed as part of the infrastructure to provide adequate access arrangements for the Wichelstowe development. Works for the WSA scheme cannot commence until the set of improvements taking place at M4 Junction 16 have finished. The Junction 16 improvements are expected to be fully operational by the time this report is considered by the S&W LEP Board, and hence in time for them not to impede the progress of the WSA scheme.

2.8.3 The project will require a good working relationship to continue with Highways England, to support the construction of the route under the M4 and to meet the project delivery programme. Highways England will need to programme the works in a timely fashion and discussions around this are in progress. Furthermore, a regular Strategic Board has been established between Swindon Borough Council and Highways England to discuss schemes affecting the Strategic Network, of which the WSA is one.

2.8.4 The project will assist SBC in meeting the requirements for housing and employment growth, as identified within the Local Plan process. Without the scheme SBC will have a shortfall in its housing need target.

2.9 Stakeholders

2.9.1 SBC and Highways England (HE) are the key stakeholders of the scheme. The improvements are part of the Wichelstowe development.

2.9.2 The planning application for the Wichelstowe development, which includes details of the WSA (formerly the Western Access), went through an extensive consultation process with all local stakeholders prior to consideration of the application in 2005.

2.9.3 Furthermore, the scheme formed part of the consultation for the planning application to update the land use masterplan and associated proposals, which was granted in 2014.The consultation ran from Tuesday 27 August 2013 until Friday 13 September 2013.

2.9.4 Engagement with stakeholders has been extensive regarding the recent options analysis, and a full copy of the report is available to the public as noted above.

2.9.5 Some of the key issues that have been raised over the years as part of the extensive consultation process included concerns about highways impacts, provision of cycling/public

transport, housing style as well as expression of support of the plans by some consultees. By far, the majority of responses were received from residents of Wroughton, a village to the south of the Wichelstowe development. Concerns expressed included:

- The rural separation of Wroughton;
- Changes to the layout and timing of the road creating a greater impact on Wroughton;
- Concern that Wharf Road will become urbanised and is unsuitable for increased traffic;
- The age of the transport modelling supporting the application;
- Impact on future Wichelstowe residents of the road being realigned through the development.

2.9.6 These issues have been discussed extensively with residents and concerns where appropriate addressed in the planning application for the Wichelstowe development. Subsequently as part of the evidence base to inform the business case, the transport modelling has been informed by an updated model using data collected in 2014. It is evident that a rigorous and transparent consultation process has informed the Wichelstowe development plans.

2.9.7 The principle of the WSA being to the south has been discussed in detail with HE to the extent that the benefits of the M4 Junction 16 improvements which are designed to complement the WSA, will be maximised on the basis of this common understanding.

2.10 Options

2.10.1 The consented scheme for the Western Access was developed from Options Appraisal work undertaken by PBA and reported in the 'Wichelstowe – Western Access Review', May 2014. As part of this work several options were examined and some discounted. Further work has been undertaken to look at four options as follows:

a. Option 1 – Consented M4 Tunnel

b. Option 1a – Straightened Alignment M4 Tunnel

c. Option 2 – Western M4 Bridge (at location of tunnel)

d. Option 3 – Eastern M4 Bridge

2.10.2 These options are illustrated spatially on Figure 2-1.

Option 1 – Consented M4 Tunnel

2.10.3 This option involves an already consented tunnel beneath the M4 motorway, which links to a proposed roundabout junction to the south of the M4 connecting to the B4005 Wharf Road/ Hay Lane. The tunnel length is 75 metres.

Option 1a – Straightened Alignment M4 Tunnel

2.10.4 This option offers a slightly different approach to option 1. A tunnel is proposed in the same location beneath the M4 motorway, but is aligned so that it crosses the M4 at a near

perpendicular angle. The tunnel would link to a proposed roundabout junction to the south of the M4 connecting to the B4005 Wharf Road/ Hay Lane. The tunnel length would be approximately 55 metres (20 metres shorter than Option 1).

Option 2 – Western M4 Bridge

2.10.5 This option comprises a raised bridge over the M4 in a similar location to the tunnel options 1 and 1a. The bridge would link to a proposed roundabout junction to the south of the M4 connecting to the B4005 Wharf Road/ Hay Lane. The bridge length would be approximately 65 metres.

Option 3 – Eastern M4 Bridge

2.10.6 This option comprises a raised bridge over the M4 approximately 600m east of the railway line. The bridge forms a near-perpendicular angle with the M4, and would link to a proposed roundabout junction to the south of the M4 connecting to the B4005 Wharf Road. The bridge length would be approximately 55 metres.

Preferred Option

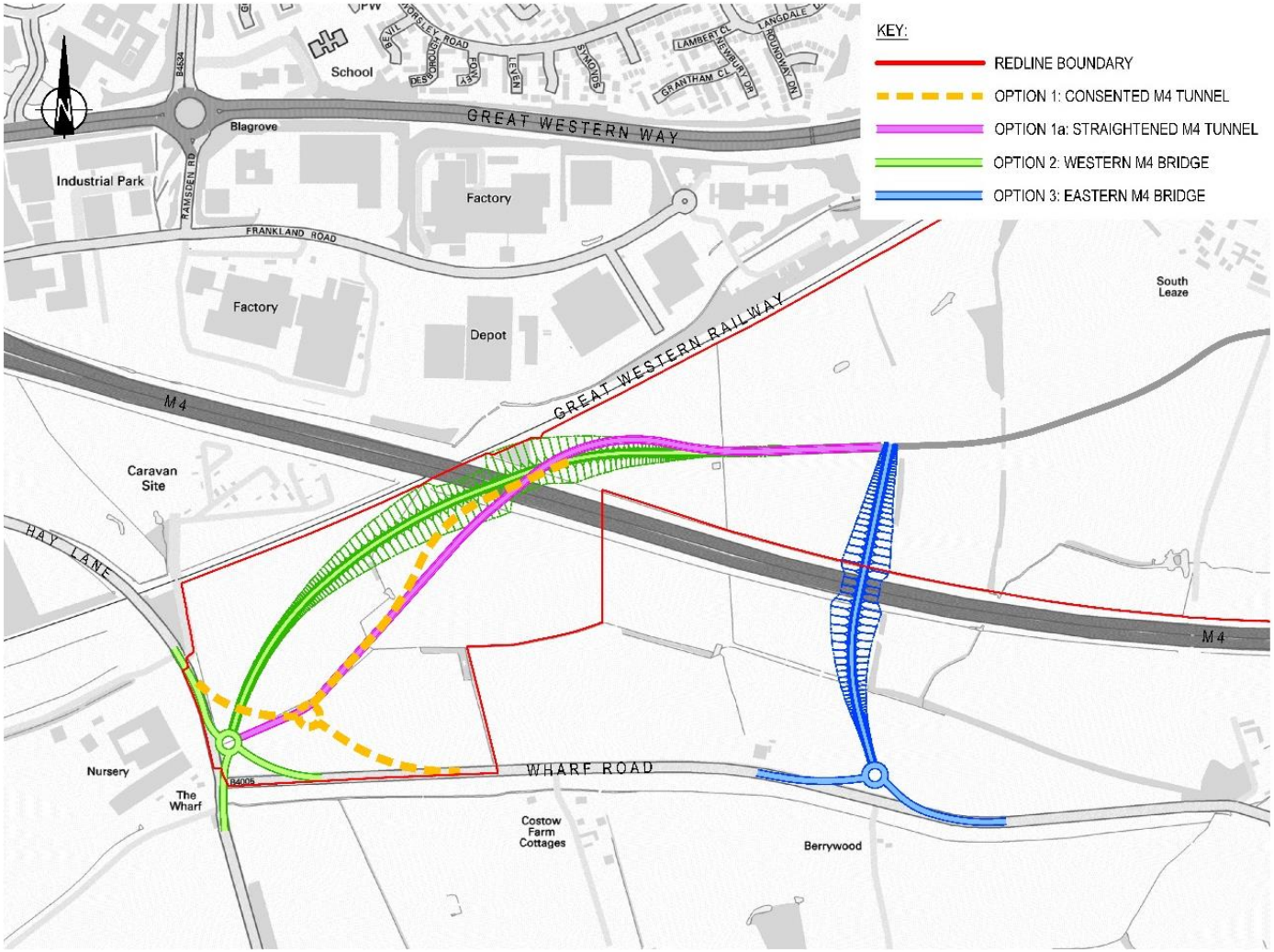
2.10.7 Option 1A has been considered the preferred option, as it is deliverable within the timescale of the available funding, will not require a large amount of planning work (as it is like the consented scheme and a similar alignment) and has lower construction costs than the consented scheme.

Low Cost Option

2.10.8 Given that all the schemes meet the overall objectives and Option 1A is the lowest cost scheme that can be delivered under the current planning consent and within the timescale of funding availability, this is considered the low-cost option. The WSA scheme will maximise use of the capacity that will be provided by the M4 Junction 16 improvements. An option that does not include a fourth access will contravene the conditions of the current planning consent. Furthermore, as has been noted elsewhere, a WSA scheme being to the south of M4 Junction 16, is the basis upon which the HE have assessed the capacity of the M4 Junction 16 improvements required to complement the WSA access and any change to this fundamental assumption implies that HE would need to reconsider its policy/strategies for the area thus jeopardising the delivery of the additional 2,000 dwellings and employment uses of the Wichelstowe development proposals.

2.10.9 The use for the existing Wharf Road/Mill Lane Improvement Option as a potential low cost option was considered as part of the options review. It should be noted that in its current arrangement, this access already provides access to and from the Wichelstowe site both for the existing situation and the future full consented scheme. Therefore, if the junction and approaches were to be upgraded to provide the main Wichelstowe Southern Access, it will not be able to accommodate the same level of capacity as a new separate southern access, as the number of site access points would be reduced from 4 to 3 which would not comply with the planning consent. An improved access while being potentially low cost, would only have a finite level of link capacity without widening and would not completely fulfil the role of the southern access. Therefore, such a low-cost improvement would not provide adequate capacity to accommodate the Wichelstowe development.

Figure 2-1: Options Considered for Southern Access



2.11 Summary of Strategic Case

The Wichelstowe development received outline planning consent in 2005. In 2014, an updated Land Use Master Plan was approved. This process included an analysis of all key infrastructure and confirmed the need for and the timing of the scheme. The promoted scheme therefore is a key component of the housing and employment growth of the site. A review was undertaken in May 2014 to establish whether there were any practical alternatives to the consented skewed M4 tunnel scheme. The review concluded that a series of M4 crossing options could achieve similar outcomes. To secure the funding of the scheme, full scheme details and a Department for Transport (DfT) compliant scheme business case needed to be prepared for approval by the LEP Board and the DfT.

3 Economic Case

PV Benefits (£m)	PV Costs (£m)	BCR	Value for Money Category
43.491	26.118	1.661	High (taking into account 'Planning Gain')

3.1 Overview

3.1.1 This section sets out the economic case for the Wichelstowe Southern Access (WSA) scheme and provides evidence of how the WSA scheme is predicted to perform, in relation to its stated objectives, identified problems and targeted outcomes. The Economic Case determines if the scheme is a viable investment and provides good value for money.

3.1.2 The economic, environmental, social, public accounts and distributional impacts of the scheme have been appraised using qualitative, and quantitative information, following the principles in the DfT's transport appraisal guidance (WebTAG). This has been done in a proportionate manner. This section contains the following elements:

- Options Appraised
- Value for Money Methodology
- Assumptions
- Initial BCR
- Adjusted BCR
- Other Quantified Benefits
- Qualitative Impacts
- Appraisal Summary Table
- Value for money statement, in line with the latest DfT guidance

3.2 Options Appraised

3.2.1 Options Appraisal work undertaken by PBA is reported in the 'Wichelstowe – Western Access Review', May 2014 and discussed within the Strategic Case. The consequence of this work was to produce a preferred option for the WSA, which consists of an under-bridge across the M4, located to the east of M4 junction 16. This was considered the preferred option, as it is deliverable within the timescale of the available funding, will not require a large amount of planning work (as it is like the consented scheme and a similar alignment) and has lower construction costs than the consented scheme.

3.2.2 The preferred option will constitute the 'Do Something' option for appraisal purposes which will be assessed against a 'Do Minimum' option whereby no access scheme to the south is introduced.

3.3 Value for Money Methodology

3.3.1 In line with WebTAG guidance, a proportionate approach to developing the Economic Case of the Wichelstowe Southern Access scheme has been undertaken. This section provides a framework of the proposed methodology and discusses the key processes.

3.3.2 The methodology follows the DfT Value for Money Framework – Moving Britain Ahead, 2015. Section 4 of the DfT framework, sets out the key considerations for determining the value for money for a scheme.

3.3.3 In standard appraisal, where the majority of impacts are measured in monetary values, the value for money category is primarily informed by one of two metrics, the Benefit Cost Ratio (BCR) and the Net Present Value (NPV).

3.3.4 These metrics provide a primary indication of the extent to which a proposal is expected to represent value for money. Other impacts, risks and uncertainties are then considered to arrive at a final value for money category and wider conclusions.

3.3.5 The Economic Case for this scheme is focused on:

- Assessing the monetised direct, localised and economic efficiency benefits of the scheme;
- Qualitatively appraising the wider scheme benefits, in terms of enabling planned developments; and
- Offsetting the scheme benefits against the direct scheme costs (including whole life maintenance and operation costs where applicable).

3.3.6 Box 4.4 of the DfT Framework sets out the typical impact of a transport scheme and splits them into four separate categories for consideration, when determining the Value for Money.

3.3.7 In terms of the WSA scheme the impacts considered under each of the four categories is shown in Table 3-1.

Table 3-1: Typical impacts of a transport proposal

Established Monetised Impacts	Evolving Monetised Impacts	Indicative Monetised Impacts	Non-Monetised Impacts
Included in initial and adjusted metrics	*Included in adjusted metrics*	*Considered after metric using switching values approach*	
Journey Time Savings *Vehicle Operating Costs* *Accidents* *Green House Gases* *Delays During Construction* *Indirect Tax Revenues*	*Reliability Benefits*	*Planning Gain*	*Noise* *Air Quality* *Landscape* *Townscape*

Established Monetised Impacts

3.3.8 Calculation of the main monetised benefits used within the initial metrics has been based on the output from the Swindon SATURN traffic model which has been used to support the

Business Case. Details of the model are provided within the Modelling and Economic Appraisal Report and supporting documentation that have been submitted as part of the business case.

3.3.9 The initial BCR has been assessed within a WebTAG compliant framework drawing on the following:

- An assessment of monetised economic impacts (i.e. business users and providers travel time and vehicle operating cost impacts);
- An assessment of greenhouse gas emissions;
- Assessment of monetised social benefits, including commuting and other users travel time, vehicle operating costs and accidents;
- Impacts during the construction phase of the scheme; and
- An assessment of public accounts impacts – impact on the broad transport budget and changes in indirect taxation.

Evolving Monetised Impacts

3.3.10 The adjusted metrics for the WSA scheme has included reliability benefits, due to reduced congestion on the network.

Indicative Monetised Impacts – Dependent Development

3.3.11 A key aspect of the WSA scheme is the unlocking of development at Wichelstowe and this needs to be considered when determining the Value for Money category of the scheme in the final assessment.

3.3.12 The WSA scheme will unlock a significant portion of the Wichelstowe development, therefore the modelling and appraisal of the scheme has followed DfT guidance contained in TAG Unit A2.3 “Transport Appraisal in the Context of Dependent Development, July 2016”. The Guidance and modelling has predominantly been effected using the Swindon Transport Model (STM).

3.3.13 Development related benefits comprising of Planning Gain benefits net the transport system external costs. The Planning Gain benefits arise due to increases in land values from the current land use e.g. agricultural to residential, whilst the transport external costs are the disbenefits to other traffic caused by the additional dependent development traffic on the wider network.

Non-Monetised Impacts

3.3.14 The following impacts have been assessed qualitatively

(i) Noise

(ii) Air quality

(iii) Landscape

(iv) Town Scape

Value for Money Statement

3.3.15 The Value for Money (VfM) Statement is produced at the end of the process, by drawing together all the evidence presented in the steps above.

3.4 Proportionality

3.4.1 The business case has assessed potential benefits and disbenefits of the scheme, but there are a number of areas that have not been considered. These include:

- Regeneration;
- Wider impacts;
- Physical activity;
- Security;
- Historic Environment;
- Impacts on Biodiversity;
- Impacts on Water Environment;
- Impacts on Severance;
- Option values and non-use values;
- Accessibility; and
- Affordability

3.5 Assumptions

3.5.1 This section sets out the key assumptions supporting the value for money assessment

Traffic Modelling Tool

3.5.2 Traffic inputs to the economic appraisal are taken from the Swindon Strategic Highway Transport Model (STM). Details of the traffic modelling approach are provided within the Modelling and Economic Appraisal Report, along with the *'Swindon Strategic Highway Model Update – Local Model Validation Report'*[1].

3.5.1 The SATURN highway model interacts with the DIADEM model and predicts highway route choice and travel costs considering changes in travel demand. The calculated travel costs in the highway network are fed back to the DIADEM demand model alongside a representation of the costs of public transport alternatives to estimate how travellers will vary their trip making patterns in the light of changes in travel costs. This process iterates between demand calculations and assignments until equilibrium is reached with converged results. The demand and forecast modelling approach are included within the *'New Eastern Villages DfT Retained Schemes Demand Model and Traffic Forecasting Report'*[2] (DMFR, Atkins 2017).

[1] Produced by CH2M for Swindon Borough Council, May 2016

[2] Produced by Atkins on behalf of Swindon Borough Council, 8th November 2017

3.5.2 The highway model represents an average weekday and consists of three time periods as follows:

- AM peak hour representing hourly traffic conditions between 08:00 and 09:00;
- Inter peak average hour, representing average hourly traffic conditions between 10:00 and 16:00;
- PM peak hour representing hourly traffic conditions between 17:00 and 18:00.

3.5.3 The model consists of eleven (11) user classes comprising of car commute, car other, car employer business, LGV and HGV. Each of the car purposes are further split into three user classes as Long Stay, Short Stay and non-parkers.

3.5.4 Reference Case forecast models have been developed by Atkins for 2021 and 2036 and these forecast years are deemed suitable for the appraisal. These reference case forecasts will form the basis for the modelling of the scheme.

3.5.5 The basis for the development of the forecast models has been an uncertainty log which includes all known future developments within the Swindon area. The reference case model will include development categorised as 'near certain' or 'more than likely' as per the categorisations provided in WebTAG Unit M4, Table A2[3].

3.5.6 The forecast model networks have been reviewed and updated in the Wichelstowe area, based on the current Masterplan, on-site work already undertaken through implementation of some highway sections and junctions and design work for other elements with Wichelstowe.

3.5.7 As the main function of the WSA is to serve as an access to the Wichelstowe development, a proportionate approach to the use of the available models has been undertaken. This has utilised the SATURN highway element only and did not involve the use of the demand model. The reference case models have been produced using the demand model, so this will take account of demand effects due to forecast traffic growth in 2021 and 2036. This approach was considered proportionate.

3.5.8 The following models have been created to inform the appraisals:

- ***Do-Minimum*** - Without WSA scheme scenarios for 2021, 2027 and 2036. They include the appropriate development quanta in 2021 (up to 1,160 dwellings) and (up to 2,500 dwellings) in 2027 and 2036, but do not include the dependent development. The build out rate is such that the 2,500 dwellings will have been reached by 2027.
- ***Do-something*** - With WSA scheme scenarios for 2021, 2027 and 2036. They include the same appropriate development quanta in 2021, 2027 and 2036 but do not include the dependent development. They therefore include the WSA scheme under test this being the only difference with the DM models. The phasing of the internal development infrastructure means that although the WSA will be constructed by 2021, it is in 2027 that the scheme will connect through to the wider Wichelstowe development.
- ***Dependent Development Models*** - With WSA scheme scenarios for 2036 and with dependent development. They include the full Wichelstowe development quanta in 2036 including the dependent development (2,000 dwellings and 76,700 sqm of employment).

[3] Unit M4 'Forecasting and Uncertainty' DfT, July 2017

Economic Assessment Parameters

Appraisal Period

3.5.9 In line with Government advice, the appraisal considers the economic case over 60 years of operation. The opening year of the scheme is assumed to be 2021 and the horizon year is 2080. It has been assumed that the infrastructure measures of the scheme will continue to be in place over the whole of the 60-year appraisal period.

Present Value Year/Discounting

3.5.10 All costs and benefits for the purposes of economic appraisal are converted to 2010 prices and values to match DfT price base year.

3.5.11 The discount rate brings all future year values to a 'Present Value' (PV) in 2010. This is done by adjusting future year values, discounting them at 3.5% for the first 30 years from the current year in which the appraisal is undertaken (assumed as 2018 in this appraisal), and 3.0% thereafter. This is carried out to reflect the fact that benefits and costs today are valued more highly than those in future. Discount rates and are taken from WebTAG Databook Table 1.1.1 (DfT December 2017 v1.9.1). The discounting process is internally carried out within TUBA.

Annualisation Factors

3.5.1 The appraisal has assumed average weekday benefits and dis-benefits (e.g. Construction delays) assuming 253 days to annualise the benefits. Off – peak and weekends have not been appraised as no transport models were available for these periods.

3.5.2 Table 3-2 summarises the annualisation factors that have been calculated to inform the TUBA appraisal given the SATURN highway model time periods.

Table 3-2: Time Slice and Annualisation Factors assumed in TUBA

Time Slice	Duration (minutes)	Annualisation Factor	Time Period	Description
1	60	253*2.733=691	1	0700-1000 (AM Peak)
2	60	253*2.878=728	2	1600-1900 (PM Peak)
3	60	253*6=1518	3	1000-1600 (IP)
4	Not modelled	Not modelled	4	0700-1900 (Off-Peak)
5	Not modelled	Not modelled	5	Weekend

User Classes and TUBA Matrix Conversion Factors

3.5.3 Thirteen (13) user classes have been defined within the TUBA and is consistent with the vehicle classes and journey purposes used within the modelling process. These are detailed in Table 3-3. The corresponding data template specification entered in TUBA is shown in Table 3-4.

Table 3-3: TUBA User Classes and Trip Matrix Conversion Factors

TUBA User Class	Vehicle Type/Sub-Mode	Journey Purpose	Matrix Conversion Factors
1	Car	Commuting non-parkers	1
2	Car	Employers business non-parkers	1
3	Car	Other non-parkers	1
4	Car	Commuting long stay	1
5	Car	Commuting short stay	1
6	Car	Employers business long stay	1
7	Car	Employers business short stay	1
8	Car	Other long stay	1
9	Car	Other short stay	1
10	LGV (personal)	Commute	0.12
11	LGV (freight)	Business	0.88
12	OGV1	All	(0.62/2.5) = 0.2480
13	OGV2	All	(0.38/2.5) =0.1520

3.5.4 The SATURN model has single stack matrices each for LGV and HGV trips respectively. To convert the LGV and HGV vehicle matrices into the TUBA vehicle types of LGV (personal) and LGV (freight) and OGV1 and OGV2, proportions stated in the COBA manual were used as follows:

- 12 % LGV (personal) and 88% LGV (freight) for the LGV matrix.
- 62% OGV1 and 38% OGV2 for the HGV matrix.

3.5.5 The SATURN model assumes a PCU factor of 2.5 for each HGV. Therefore, the final factors entered in to TUBA for OGV1 and OGV2 were as follows:

- OGV1 - (0.62/2.5) = 0.2480;

- OGV2 - (0.38/2.5) = 0.1520.

3.5.6 No further factoring was required for LGV as the SATURN model assumes that an LGV vehicle is equivalent to 1 PCU.

3.5.7 Time matrices were factored from seconds into hours for the highway model by multiplying each by 0.00028 (1/3600). Distance matrices were factored from metres into kilometres by multiplying each matrix by 0.00100 (1/1000).

Table 3-4: TUBA User Class Specification

TUBA User Class	Vehicle Type/Sub-Mode	Purpose	Person Type
1	1	2	0
2	1	2	0
3	1	2	0
4	1	1	0
5	1	1	0
6	1	1	0
7	1	3	0
8	1	3	0
9	1	3	0
10	2	2	0
11	3	1	0
12	4	0	0
13	5	0	0

3.6 Calculation of Initial BCR and NPV

3.6.1 As previously indicated, the initial BCR consists of the following components

- An assessment of the monetised economic impacts i.e. business users and providers travel time and vehicle operating cost impacts – including impacts during construction;
- Assessment of monetised environmental benefits, in this case greenhouse gas emissions;

- Assessment of monetised social impacts, namely: commuting and other users travel time (including during construction) and vehicle operating cost and accident impacts; and

- Assessment of public accounts impacts, namely: cost to the broad transport budget; and changes in indirect taxes.

3.6.2 For the purposes of the economic appraisal at this stage, the do-minimum and do-something models are used i.e. without the dependent development included.

Assessment of Economic Impacts

Business Users and Providers

3.6.3 Travel time savings are derived through comparing travel times in the DM scenario against those in the DS scenario. Any travel time savings are converted into monetary values.

3.6.4 The TUBA model will determine the travel time savings along with vehicle operating cost (VOC) savings, by taking trip and distance matrices from the SATURN model, which are input into TUBA along with other scheme parameters.

3.6.5 A breakdown of the economic impacts to business users and providers is provided in Table 3-5.

Table 3-5: Business User and Provider Benefits

Benefit	Value (£000's) in 2010 Prices and values
Travel Time	9,246
Vehicle Operating Cost	2,021
Private Sector Provider Impacts	0.000
Other business Impacts – Developer Contributions	-4,895
Net Business Impact	6,121

Assessment of Monetised Environmental Impacts

3.6.6 This section summarises the monetised impacts of the scheme on the environment. The monetised environmental impacts only include greenhouse gases.

Greenhouse Gases

The assessment of greenhouse gases is undertaken within TUBA following the guidance in TAG Unit A3 paragraph 4.3.1. The Greenhouse gas benefit derived from the scheme is £0.578m in 2010 prices and values.

Assessment of Monetised Social Benefits

Consumer Users

3.6.7 TUBA has been used to derive the journey time and vehicle operating cost benefits accrued by consumer users because of the scheme. Consumer user benefits are summarised in Table 3-6.

Table 3-6: Consumer User Benefits

Benefit	Value (£000's) in 2010 Prices and values
Travel Time - Commuters	18,848
Travel Time – Other Users	8,519
Vehicle Operating Cost - Commuters	1,144
Vehicle Operating Cost – Other Users	674
Net Consumer User Impact	29,185

Accident Benefits

3.6.8 Accident appraisal has been undertaken using COBALT and uses a part of the highway network closest to the development, using the same links and junctions as in the SATURN model. This has ensured that full account has been taken of traffic flow changes on all affected routes. All road links in the traffic model have been classified in COBALT, by road type, to enable accident rates to be calculated in accordance with forecast flows. The cordon within which accidents have been appraised is shown in Figure 3-1.

3.6.1 Observed accident records over the 5-year period 01/08/2012 to 31/07/2017 inclusive were input to COBA-LT for links and junctions within the entire study area. A summary of the observed accident numbers by casualty and year within the assessed cordon corresponding to the same links and junctions as in the SATURN model, are summarised in Table 3-7.

Figure 3-1: COBALT accident assessment cordon

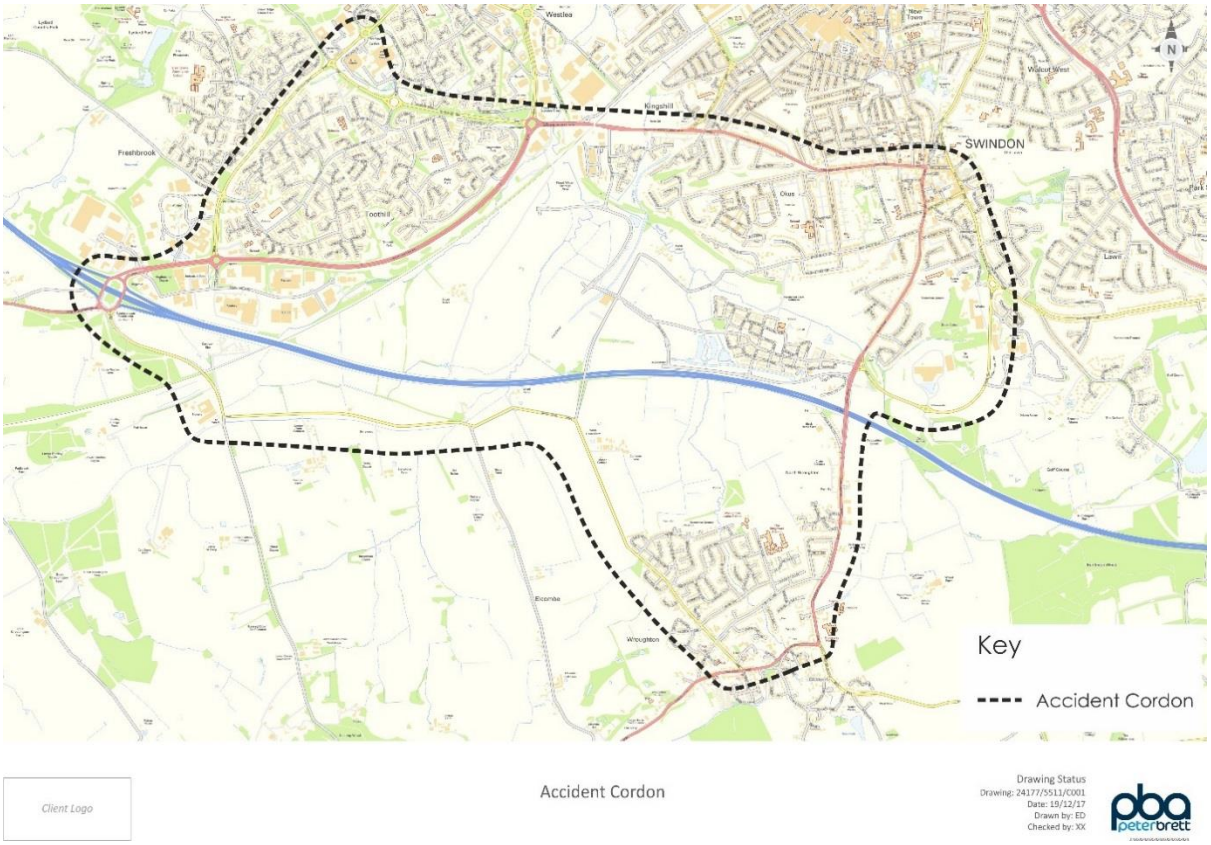


Table 3-7: Observed accidents within assessed cordon

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Slight	32	32	47	52	59	**222**
Serious	5	6	8	6	7	**32**
Fatal	0	0	0	1	2	**3**
Total	**37**	**38**	**55**	**59**	**68**	**257**

3.6.2 The total accidents saved by the scheme is 136.9 accidents which provides an accident benefit of £7.811m over the 60-year appraisal period, in 2010 values and prices. The casualties saved by the scheme include 2.9 fatalities, 25.6 serious and 194.9 slight.

Assessment of Public Accounts

Treatment of Costs

3.6.3 The scheme costs have been subjected to the processes in DfT WebTAG guidance Unit A1-2 Scheme Costs to calculate a Present Value of Costs (PVC). The following steps have been undertaken in line with WebTAG guidance:

(i) Deriving a base cost estimate which converts scheme nominal prices to real prices by accounting for inflation;

(ii) Adjusting for risk and optimism bias (OB)

(iii) Re-basing the price base to the Department's base year

(iv) Discounting to the Department's base year

(v) Converting to the market prices unit of account.

3.6.4 Steps (i) and (ii) were undertaken within a spreadsheet while steps (iii) to (v) where carried out within TUBA once the scheme costs with OB had been entered into the TUBA scheme file.

3.6.5 Preparation and supervision costs were explicitly estimated by the cost consultant as opposed to using default TUBA values. Land required for the scheme is owned by SBC and hence no land costs are assumed to be incurred. Default supervision costs in TUBA, are assumed to be 5% of land and construction costs as informed by the COBA manual above.

3.6.6 The scheme is at Outline Business Case stage, therefore a 15% optimism bias (OB) has been used for the road elements and 23% to the scheme elements pertaining to the under-bridge. This is in line with guidance set out in WebTAG A1-2 Scheme Costs. The level of optimism bias applied is consistent with the knowledge and understanding of quantified risks. The road element costs were estimated to constitute about 74% of the scheme costs while the under-bridge costs constituted about 26%.

3.6.7 A sensitivity test assuming an optimism bias of 44% for road elements under 66% for structures has also been undertaken and is reported as part of the sensitivity testing in Section 3.13.

3.6.8 The scheme costs are estimated at £26.010 million in 2017 prices before accounting for real cost increases and optimism bias. The scheme costs are summarised in Table 3-8. Land required for the scheme is owned by SBC and hence no land costs are assumed to be incurred.

Table 3-8: Base (Nominal) Scheme Costs (£M) (2017 prices)

Description	Costs (£M)
Preparation	0.930
Preliminaries	3.402
Construction	16.205
Site Supervision	2.065
Land	n/a
Quantified Risk Assessment Budget (including utilities)	3.408
Total Cost	26.010

3.6.9 The profile of expenditure is incorporated into the TUBA model. The profile used is shown in Table 3-9. Default TUBA profiles have been assumed for Preparation and Supervision costs as defined in the standard TUBA economics file. The profile adopted is that assuming a Preferred Route (PR) scheme stage.

Table 3-9: Cost Profile for TUBA

Cost	2018	2019	2020	2021	Total
Construction	2%	9%	44%	45%	100%
Preparation	default	default	default	default	default
Supervision	default	default	default	default	default

Whole life Costs

3.6.10 Table 3-10 summarises the whole life costs that have been assumed in the appraisal. Whole life costs of highway maintenance links for the scheme have been estimated at £2.578M for the period 2022 to 2080 covering the appraisal period. The whole life costs associated with the under-bridge over the appraisal period 2022 to 2080 has been estimated at £1.477M thus giving the total whole life costs at £4.055M in 2017 prices. The under-bridge costs include costs associated with pumping or de-watering.

Table 3-10: Maintenance (Whole life Costs) (2022 – 2080) (£M) (Nominal 2017 prices)

Description	Costs (£M)
Highway Maintenance (Whole life costs (2022 to 2080)	2.578
Under-bridge and associated structures Maintenance Costs (2022 to 2080)	1.477
Total Maintenance (Whole life Costs)	4.055

3.6.11 Prior to entering in TUBA, the maintenance costs have been adjusted for real cost increases and optimism bias (15% for highways and 23% for the under-bridge elements) as per the assumptions used in the scheme costs. The scheme costs entered into TUBA inclusive of real cost increases and OB amounted to £34.698M in 2017 prices, of which about 20% of £6.940M was assumed to be developer contribution. After accounting for real cost increases and OB, the whole life costs for entry into TUBA were estimated at £13M in 2017 prices.

3.6.12 The resultant discounted PVC of the scheme after running through TUBA has been estimated at £27.394M at 2010 prices. These comprise of Investment Costs of £29.655M of which Developer Contributions amount to £5.146M, about 20% of scheme costs; and £2.885M as operating or whole life costs. The developer contributions are subtracted from the investment costs since they are borne by the private sector and not the public sector.

Indirect Taxation

3.6.13 The indirect taxation impacts of the scheme are produced within TUBA. Changes in speed and distance travelled as a result of the scheme will have an impact on the amount of taxation Central Government will receive from fuel. The indirect taxation impact is included in the calculation of the PVB.

Summary of Initial BCR

The benefits and costs that make up the initial BCR and NPV are shown in Table 3-11.

Table 3-11: Initial Scheme Summary

Benefit	Value (£m) in 2010 Prices and Values
Business Users	6.158
Consumer Users - Commuting	20.124
Consumer Users - Other	9.225
Greenhouse Gases	0.578
Accidents	7.811
Delays During Construction	-0.483
Indirect Taxation	-1.274
Present Value of Benefits (PVB)	**42.672**
Broad Transport Budget	26.188
Present Value of Costs (PVC)	**26.188**
Net Present Value (NPV)	**16.484**
Initial BCR	**1.629**

3.6.14 The costs and benefits outlined above show that the Initial BCR of the scheme, based on standard monetised values, is 1.629. This is considered medium value for money according to DfT guidance.

3.7 Adjusted BCR and NPV

Reliability Benefits

3.7.1 The reliability analysis has applied guidance on urban road reliability as set out in WebTAG A1.3. This uses a forecast of the improvement in standard deviations of journey time based upon journey distance and time in the do-minimum and do-something scenarios. Reliability benefits have been assessed across the modelled area for all origin-destination pairs, and monetised using a process equivalent to the TUBA calculation of user time benefits.

3.7.2 Total reliability benefits accrued as a result of the scheme are £0.818m in 2010 prices and values and over the 60-year appraisal period.

Summary of Adjusted Metrics

3.7.3 A summary of the result adjusted metrics is shown in Table 3-12.

Table 3-12: Adjusted Scheme Summary

Benefit	Value (£m) in 2010 Prices and Values
Initial PVB	42.672
Reliability Benefit	0.818
Adjusted Present Value of Benefits (PVB)	**43.491**
Broad Transport Budget	26.188
Present Value of Costs (PVC)	**26.188**
Adjusted Net Present Value (NPV)	**17.303**
Adjusted BCR	**1.661**

3.7.4 The costs and benefits outlined above show that the Initial BCR of the scheme, based on standard monetised values, is 1.629. The adjusted BCR considering evolving monetised values is 1.661. This is considered medium value for money according to DfT guidance.

3.8 Consideration of Other Monetised Benefits

Dependent Development Benefits

3.8.1 The calculation of the dependent development benefits has been developed using the guidance in WebTAG Unit A2-3 and this is two-fold.

i. Firstly, there is the calculation of land value uplift as a result of land previously used for agricultural purposes, coming into residential and employment use, known as planning gain; and

ii. Secondly there is the marginal external impact that additional traffic generated by the dependent development on the wider transport network and other users. These costs termed Transport External Costs (TEC) refer to the change in costs caused to all other transport users on the network by the traffic generated by the new housing or dependent development.

3.8.2 The TAG Workbook *'Valuing Housing Impacts'* has been used to calculate the planning gain element and is shown to constitute £92.082m of benefits. As stated above, the planning gain consists of the uplift in land values arising in this case from the Wichelstowe dependent development. This has been calculated using the DfT spreadsheet 'tag-workbook-valuing-housing-impacts.xlsx. The land values have been taken from those provided in the spreadsheet sourced from the 'VOA Property Market Report 2011' using the South West Region Values for Bristol as the most suitable for the Wichelstowe location in Swindon. The

spreadsheet estimates the planning gain based on the approach in Appendix A of TAG Unit A2.3. The approach requires the following inputs:

- Value of land in residential use assumed as stated above based on Bristol values being representative of Swindon in £'000/ha) = 2100
- Value of land in industrial use in £'000/ha also assuming Bristol in the South West region as representative = 800
- Value of land in existing use (agricultural or industrial) in £'0000/ha - the Wiltshire value was assumed = 19
- Externality value (perpetuity value) of land in £'000/ha - this was assumed on Wichelstowe being land on 'Urban Fringe (greenbelt)' = 236.62
- The hectarage of dependent housing was estimated at 46.2 ha assuming a housing density of 43.27 dwellings/ha for the 2000 dwellings of dependent development
- The hectarage of dependent employment was estimated at 12.5 ha
- The above inputs were entered into the DfT Tag-workbook mentioned above which then automatically calculates the planning gain or Net Social Value of housing and of employment in £'000. This has then been reported in £m to give the £92.082m of planning gain reported above. This comprises £85.271m attributed to residential and £6.811m attributed to employment.

Transport External Costs (TEC)

3.8.3 Following the estimation of the planning gain, the TEC have been estimated using a bespoke spreadsheet/VBA macro tool using the formulation defined in Appendix C of WebTAG Unit A2-3. and was undertaken using the Do-something and dependent development models as inputs. The disbenefit associated with the dependent development as a result is £49.606m.

3.8.4 The overall benefit accrued is the net planning gain value, once the TEC value is taken off. This equates to a benefit of £42.476m.

3.8.5 It is recognised that the dependent development will adversely impact journey time reliability of other road users. This disbenefit in reliability has been estimated using a bespoke spreadsheet following the reliability methodology set out in WebTAG Unit A1.3. This disbenefit or reliability externality has been estimated to be £3.14m leading to a net planning gain value of £39.332m.

3.8.6 Table 1 of WebTAG Unit A2-3 provides the suggested qualitative assessment score based on the benefits accrued. The benefits in this instance fall within the £25m to £100m band, indicating a **Moderate Beneficial** Score.

3.9 Consideration of other non-monetised Benefits and Dis-benefits

Regeneration and wider impacts

3.9.1 The scheme will support the Wichelstowe development (4500 dwellings and 12.5 ha of B1/B2/B8 employment land). It will enable the dependent development of 2,000 dwellings to come forward. It will unlock 12.5 ha of employment with the creation of 2000 new jobs (based on B1=264 jobs per ha, B2=94 jobs per ha; and B8=58 jobs per ha) at Wichelstowe. This is **Large Beneficial**.

Environment

Noise

3.9.2 Noise assessment has been undertaken in-line with WebTAG Unit A3. An initial scoping exercise has been undertaken. The initial scoping indicates that the scheme is unlikely to have a noise impact on households as where the largest reductions in traffic occur there are no identified receptors. There will potentially be a slight increase in noise during construction. These impacts will need to be managed by the contractor during construction. Overall assessment is ***slight adverse.*** Flow analysis has scoped out the need for detailed noise assessment. A simple assessment as per the DMRB has been undertaken and the results indicated that the threshold criteria relating to potential impacts are not likely to be exceeded. Therefore, a detailed assessment is not required and further noise and vibration should be scoped out of the wider WebTAG assessment.

Air Quality

3.9.3 Air Quality assessment has been undertaken in-line with WebTAG Unit A3. Flow analysis at opening year has scoped out the need for detailed air quality assessment.

3.9.4 Air quality is likely to be improved along Wharf Road, where the scheme will result in less traffic, therefore air quality score is ***slight beneficial***.

Landscape

3.9.5 The landscape and visual impact of the consented M4 under-bridge Option 1 have already been assessed in the 2003 ES and retain the status quo accepted by the existing planning consent. The immediate landscape setting of the under-bridge is of low quality and strongly influenced by the surrounding strategic infrastructure. The mitigation proposed as part of the Wichelstowe development and under-bridge construction would help to locally improve the landscape quality. With mitigation in place, it is anticipated that this under-bridge would have a **neutral** impact on the local landscape, wider landscape character and views from the south-east.

3.10 Appraisal Summary Table

3.10.1 The appraisal summary table (AST) provides a brief and consistent and consistent summary of the qualitative, quantitative and monetised impacts of the scheme. The scheme AST is shown in Appendix B.

3.11 Economic Outputs

3.11.1 The TEE, Public Accounts and Analysis of Monetised Costs and Benefits (AMCB) tables are attached in Appendix C.

3.12 Value for Money Statement

3.12.1 This section has outlined the source of scheme benefits derived using TUBA, COBALT, and spreadsheet tools to inform reliability benefits, Planning Gain benefits and TEC due to dependent development.

3.12.2 The scheme is seen to generate considerable user benefits and is therefore beneficial and viable. The scheme benefits and Value for Money metrics are summarised in Table 3-11. The table shows that the Initial BCR is 1.629 and is derived from established benefits only in line with DfT's Value for Money (VfM) Framework.

3.12.3 The adjusted BCR includes evolving benefits in addition to the established benefits. In the case of the WSA scheme the adjusted BCR of 1.661 includes journey time reliability benefits, which places the scheme in the **Medium VfM category**.

3.12.4 As has been previously noted, the WSA is an access scheme and the benefits derived from the dependent development are an important part of the scheme. Without the scheme progressing, the housing needs identified through the Local Plan System will not be met.

3.12.5 The planning gain benefits are shown to be in the order of £39.332m. Taking on board DfT guidance on switching value, to go from a Medium VfM score to High VfM, a switching value of £8.885M would be required.

3.12.6 Therefore, considering the planning gain benefit it is concluded that the WSA scheme would provide **High VfM.**

3.13 Value for Money Sensitivity

Overview

3.13.1 There will always be uncertainty about future consumer behaviour and circumstances when predicting so far into the future. It is therefore good practice for economic and transport assessments to include a set of sensitivity tests to explore the relationship between the assumptions and the robustness of the value for money of the scheme, in this case the BCR.

3.13.2 The tests that were undertaken for the WSA scheme are described below. The economic case considers the following tests:

- Scenario 1 – Core scenario which is the main subject of this report. An optimism bias of 15% for road elements and 23% for structures was assumed for this run.
- Scenario 2 – This is a TUBA run which assumes the higher OB values associated with Stage 1 i.e. 44% for road elements and 66% for structures. This checks the robustness of the VfM category of the scheme at higher OB assumptions.
- Scenario 3 – As in Scenario 1 above, but the scenario assumes a pessimistic developer contribution of 50%. Therefore, in this scenario, the costs to the public sector are higher than in Scenario 1.

3.13.3 The results of the tests are reported in Table 3-13. As noted above, Scenario 1 refers to the main Core Scenario test in which the dependent development is excluded from the TUBA run for the purposes of estimating scheme benefits. An optimism bias of 15% for road elements and 23% for structures is assumed in the test.

Table 3-13: Sensitivity Test Results – Monetary Values in £M

Initial or Adjusted Metrics	Benefit Type	Scenario 1 (Main)	Scenario 2 (High OB)	Scenario 3 (50% Dev Contribution)
Based on Initial VFM metrics	PVB	42.672	41.334	45.147
	PVC	26.188	32.688	28.635
	BCR	1.629	1.265	1.577
	NPV	16.484	8.646	16.512
Based on Adjusted VfM Metrics	PVB	43.491	42.152	45.965
	PVC	26.188	32.688	28.635
	BCR	1.661	1.29	1.605
	NPV	17.303	9.464	17.33
	Switching Value	8.885	23.224	11.305

3.13.4 The results show that in all three scenarios, the scheme benefits exceed the scheme costs giving a positive Net Present Values (NPV). The Benefit to Cost Ratio (BCR) is in the Medium Value for Money (VfM) range of 1.6 for the Core Scenario. The above results do not include consideration of Planning Gain benefits which will be common to all the scenarios above.

3.13.5 The initial BCR in which only established benefits are considered, ranges from 1.265, through to 1.629 which are in the Low and Medium VfM categories respectively. When evolving benefits are considered, the adjusted BCR is 1.661 for the main scenario, which is in the Medium VfM. Scenarios 2 and 3 are in the Low and Medium VfM category with BCR values of 1.129 and 1.605 respectively.

3.13.6 The Switching Value required to switch each Scenario to a BCR of 2 and hence High VfM category has been calculated at £8.885M for Scenario 1, £23.224M for Scenario 2 and £11.305 for Scenario 3.

3.13.7 The benefit associated with the dependent development has been calculated and shown to constitute £39.332M of Planning Gain benefits in the Core scenario. This far exceeds the Switching Values required to take the WSA scheme into the high VfM category for each of the three scenarios modelled.

3.13.8 Overall the value for money appraisal shows that the scheme provides good value for money even in Scenarios 2 and 3 where pessimistic assumptions have been made. Given this, it is therefore concluded that the proposal should be assigned to the **High VfM category**.

Occupancy Sensitivity

3.13.9 Two pessimistic sensitivity tests have been run to test the robustness of the planning gain to less favourable occupancy values. The first sensitivity assumes 90% dwellings being occupied or 1,800 dwellings instead of the planned 2,000. The second considers 1,500 dwellings or 75% occupancy. Table 3-14 summarises the results compared against the full 2000 dwellings (Scenario 1). The sensitivity tests are termed Scenario 4 and Scenario 5 following on from Table 3-13. For a robust assessment, the worst TEC values based on the full 2,000

dependent dwellings have been assumed. In reality, reduced occupancies will result in lower transport externalities. The results indicate robust net planning gain. Table 1 of WebTAG Unit A2-3 provides the suggested qualitative assessment score based on the benefits accrued. The benefits in this instance fall within the £25m to £100m band, indicating a **Moderate Beneficial** Score for Scenario 4 and **Slight beneficial** for Scenario 5 which falls at the upper levels of the range between £25m and zero.

Table 3-14: Planning Gain Sensitivity Results – Monetary Values in £M

Benefit Type	Scenario 1 (Main) 2000 dwellings	Scenario 4 1800 dwellings	Scenario 5 1500 dwellings
Planning Gain	92.08	83.555	70.765
TEC	52.75	52.75	52.75
Net Planning Gain	39.332	30.805	18.015

4 Financial Case

Overall Cost of Scheme (£m) (Outturn Prices)	LTB Contribution	Local Contribution
28.19	22.89	5.29

4.1 Introduction

4.1.1 The financial case provides evidence on the affordability of the scheme, its funding arrangements and technical accounting issues. It presents the financial profile of the scheme and the impact of the proposed investment on budgets and costs. This chapter therefore presents evidence of the scheme's financial affordability. The costs presented in this section provide the evidence of the scheme's affordability, consider inflation and are to be used for funding totals.

4.2 Costs

4.2.1 The base scheme costs have been estimated at £26.010 million in 2017 prices. Blue Reach Services Ltd, an experienced cost consultant has provided input to the scheme cost estimates, so that the costs are robust given current understanding. The scheme is bounded by land owned by SBC, therefore land acquisition is not a risk or cost factor in the overall scheme costs. Table 4-1 shows a summary of the scheme costs. Detailed breakdown of costs is provided in Appendix D. These costs include quantified risk and real cost increases to account for inflation from year of estimate to year of expenditure and are therefore in outturn prices. Compound inflation was applied to the 2017 scheme costs to give outturn prices. General inflation of 2.5% per annum was assumed, while construction price inflation of 5% per annum was assumed. No optimism bias (OB) is included in the outturn costs, although OB was accounted for as part of the scheme costs used in TUBA, in line with WebTAG guidance.

Table 4-1 Scheme Construction Costs (Outturn Cost)

Item	Cost (£m)
Preparation (design and survey work)	0.930
Preliminaries	3.402
Construction	16.205
Site supervision	2.065
Land	n/a
Quantified risk assessment budget	3.408
Inflation from year of estimate to Expenditure Year	2.181
Total	**28.190**

4.3 Budget and funding cover

4.3.1 The scheme will be funded through the S&WLEP, local and developer contributions. SBC has successfully secured provisional funding of £22.9m through the S&WLEP to deliver the WSA

earlier than would otherwise be the case, facilitating economic growth and improving viability of the development. SBC as landowner and developer will contribute £5.29m, making up the anticipated full scheme cost of £28.19m. Furthermore, SBC as landowner and developer will be responsible for any additional costs if they exceed the anticipated total. This funding allocation runs through to early 2021, with a phased drawdown of funds from 2018 to 2021. To secure this funding, full scheme details and a Department for Transport (DfT) compliant scheme business case needs to be prepared for approval by the S&WLEP Board and the DfT.

4.3.2 Table 4-2 sets out the funding for the scheme based on the current indicative funding profile.

Table 4-2: Scheme Funding and Profile (Outturn Cost)

Source of funding	2018	2019	2020	2021	Total
Amount from LEP/Local Growth Fund	200,000	2,480,000	10,000,000	10,220,000	22,900,000
-					
Local Authority/ private sector	280,000	0	2,640,000	2,370,000	5,290,000
-					
-					
-					
Total Scheme Cost	**480,000**	**2,480,000**	**12,640,000**	**12,590,000**	**28,190,000**

4.4 Whole-life costs

4.4.1 The whole life costs were discussed in paragraphs 3.6.10 to 3.6.12 and summarised in Table 3-10. Whole life costs of highway maintenance links for the scheme have been estimated at £2.578M for the period 2022 to 2080 covering the appraisal period. The whole life costs associated with the under-bridge over the appraisal period 2022 to 2080 has been estimated at £1.477M thus giving the total whole life costs at £4.055M in 2017 prices. The under-bridge costs include costs associated with pumping or de-watering.

4.4.2 Prior to entering in TUBA, the maintenance costs have been adjusted for real cost increases and optimism bias (15% for highways and 23% for the under-bridge elements) as per the assumptions used in the scheme costs. After accounting for real cost increases and OB, the whole life costs for entry into TUBA were estimated at £13M in 2017 prices.

4.4.3 The resultant discounted PVC of the scheme after running through TUBA has been estimated at £27.394M at 2010 prices. These comprise of Investment Costs of £29.655M of which Developer Contributions amount to £5.146M, about 20% of scheme costs; and £2.885M as operating or whole life costs. The developer contributions are subtracted from the investment costs since they are borne by the private sector and not the public sector.

4.4.4 The costs considered with the infrastructure over the 60-year appraisal period include an allowance for the annual maintenance of mechanical equipment to deal with pumping of surface water drainage.

4.4.5 Table 4-3 summarises the key items assumed in the derivation of the whole life costs including the maintenance interval as appropriate.

Table 4-3: Maintenance (Whole life Costs) – Key assumptions

Type	Maintenance Component		Interval (years)	Wholelife Costs (£)
Highways	Pavement	Surface Course (inc. footway)	25	1100000
		Binder Course	40	280000
	Street Lighting	Columns, Ducts & Cables	40	495000
		Luminaires and Photocells	20	90000
	Ancillaries	Road Markings	7	96000
		Traffic Signs and Posts	20	220000
	Annual Maintenance	Gully Cleansing	1	135000
		Grass Cutting	1	162000
	Highways Total			2578000
Under-bridge	Finishes to Concrete: Repairs		30	227370
	Waterproofing: Replacement		37	387000
	Expansion Joint Replacement: 15 to 40m span		20	155200
	Safety Fence: Maintenance		47	107660
	Drainage: Maintenance (Routine Clearance and Occasional Component Replacement)		35	30000
	Mechanical / Electrical Element: Annual Maintenance		2	145000
	Mechanical / Electrical Element: Renewal of Component		20	200000
Under-bridge	Principal Inspection: Specific to Structure		5	110000
	Routine Inspections		2	69600
	Traffic Management Costs Associated with Maintenance Operations: Traffic mgt. Activity 1		2	17400
	Traffic Management Costs Associated with Maintenance Operations: Traffic mgt. Activity 1		5	27500
	Under-bridge Total			1476730

4.5 Funding Assumptions

4.5.1 SBC is to fund the balance, including scheme design and business case development. The Council will cover all risk budgets for the scheme with LGF funding secured and capped at £22.9m.

4.6 Financial Risks

4.7 A Quantified Risk Assessment has been developed to identify the range of cost risks that could impact on the project and suitable mitigation measures to measure them. This is attached as Appendix E.

4.8 Accounting Implications

4.8.1 Accounting and budgeting will be in accordance with SBC's financial regulations and standing orders. Commuted sums to a value of £300,000 have been allowed for to cover future ongoing maintenance costs.

4.9 Budget statement

4.9.1 The budget was confirmed as part of the capital budget setting, done annually through SBC's Cabinet. £22.9M has been confirmed by Full Council as part of the February 2017 capital budget. The remainder of the budget will be confirmed in subsequent years, when the spend becomes necessary.

5 Commercial Case

5.1 Overview

5.1.1 The commercial case provides evidence on the commercial viability of the scheme and the procurement strategy that will be used to engage the market. There are several procurement methods for the works. Different solutions may suit the scheme and the associated highway works.

5.1.2 This section therefore sets out relevant information for a robust contracting and procurement strategy. It considers:

- Where risks lie and who is responsible.
- How the procurement strategy was agreed and whether there is market appetite.
- Is the proposed risk allocation consistent with cost estimate and does this incentivise performance, efficiency and innovation?

5.1.3 The assumed risk associated with the commercial case is low. The scheme is a requirement of the original outline planning permission for Wichelstowe (Condition 42). This means that the Wichelstowe development cannot proceed beyond 2,500 residential units without the Southern Access.

5.1.4 This section sets out the key requirements and assumptions for procurement. Consideration is given to each of the available procurement options and the preferred procurement strategy is described.

5.1.5 The preferred procurement options, identified in this section, are based on an initial assessment only and may be subject to change as the scheme is developed.

5.2 Output Based Specification

5.2.1 The commercial case is based on strategic outcomes and outputs, against which alternative procurement options are assessed. The outcomes which the procurement strategy must deliver are to:

i. Achieve reasonable surety that the scheme can be delivered within the any funding constraints;

ii. Minimising preparation costs through ensuring best value, and appropriate quality in relation to scheme design elements;

iii. Utilise contractor experience and input to the construction programme to enable the preparation of a robust and achievable implementation programme; and

iv. Obtain contractor input to risk management, including mitigation measures, to capitalise at an early stage on opportunities to reduce construction risk.

5.3 Required Outputs

5.3.1 The scheme is defined as an access road to provide access to the Wichelstowe development from the south.

5.3.2 The scheme involves:

- Provision of a new junction on B4005 Wharf Road, to the east of Hay Lane;
- A new under-bridge under the M4 motorway to the east of junction 16;
- Additional road infrastructure to the north and south of the new under-bridge – in the form of a single carriageway link with 30mph speed limit.

5.3.3 The land required for the scheme is wholly within the highway boundary or council land.

5.3.4 The estimated construction value of the scheme is £28.19 million. Scheme drawings are included in Appendix A.

5.4 Issues and Risks

5.4.1 Apart from the usual risks associated with construction projects, there are specific construction risks for the WSA scheme associated with:

- Utilities buried near the site
- Ground conditions
- Weather conditions during onsite works
- Existing structural faults and maintenance required prior to scheme delivery
- Provision of sufficient drainage
- Presence of protected species

5.4.2 The following issues are relevant to procurement:

- The scheme estimate is higher than the OJEU limit and, therefore, needs to be procured in accordance with the relevant EU rules.
- The most important criterion is to obtain the most economically advantageous tender.
- Funding will be fixed so price certainty is important.
- Due to the requirements of the development, the scheme must be delivered before the additional 2000 dwellings and employment uses dependent on the scheme are built. Furthermore, the terms of the funding require the scheme to be delivered by early 2021. The funding allocation runs through to early 2021, with a phased drawdown of funds from 2018 to 2021. To secure this funding, full scheme details and a DfT compliant business case needs to be prepared for approval by the S&WLEP Board and the DfT.
- Provision needs to be made for season/weather/night time working and significant levels of traffic management.
- Minimising the impact on the travelling public during construction is a priority.

5.5 Procurement Strategy

5.5.1 The project governance, discussed in Section 7, will ultimately determine the preferred procurement strategy. The key risks identified and managed through any procurement process are:

- Time (speed or certainty of completion date)
- Cost (price level or cost certainty)
- Quality (functionality and performance)

5.5.2 Quality can be managed through the procurement process, whether traditional or design and build. The following options have a variety of advantages and disadvantages:

Option 1 – Traditional Contract

5.5.3 The traditional approach with any project, particularly in the construction industry, is to have design as a separate function from construction. This option provides the client with a high level of control, particularly in relation to quality issues.

Option 2 – Design and Build

5.5.4 There are several variants of design and build contracting, including just design and build (D&B), design, build and operate (DBO) and design, build, operate and maintain (DBOM). A greater or lesser proportion of the design work can be included in the design and build contract.

Option 3 – Prime Contracting

5.5.5 This is conceptually very similar to D&B. A single contractor again acts as the sole point of responsibility to a client for the management and delivery of a construction project, on time, within budget (this time defined over the lifetime of a project) and in accordance with a performance specification.

Option 4 – Management Contracting

5.5.6 This option involves the Management Contractor assisting the Client in putting together the scope of the work and procuring the works. This form of contract is suitable for fast tracking projects, rather than achieving cost certainty and the transfer of risk. It is likely to provide benefit only if instigated right at the start of project development.

5.6 Procurement Option Assessment

5.6.1 A simple analysis has been carried out to evaluate the benefits of the four delivery options, consisting of rating the cost, time and quality of each option from 1 (good) to 4 (poor). This has been multiplied by a risk factor (also 1 to 4) to assess the relative risks associated with each option. The analysis is summarised in Table 5-1.

Table 5-1: Comparison of delivery options

Delivery Option	Cost			Time			Quality			Grand Total
	Level	Risk	Total	Level	Risk	Total	Level	Risk	Total	
Traditional form of contract	3	2	**6**	2	1	**2**	3	2	**6**	**14**
Design & build / Prime contracting	2	2	**4**	1	2	**2**	2	3	**6**	**12**
Management contracting	2	3	**6**	3	3	**9**	2	2	**4**	**19**

5.6.2 Given the type of scheme under consideration, establishing a contractor early in the process is considered important to influence the scheme design and construction methodology, reducing the potential level of impact associated with cost and time in comparison with the traditional form of contract.

5.6.3 At this stage, entering in to a management contracting form of contract would be very likely to delay the scheme and add a layer of complexity that is not required.

5.6.4 Therefore, the design and build form of contract is proposed as the appropriate approach in this instance. It will allow a satisfactory level of control while ensuring the contractor is involved at an early enough stage to influence the design of a specialised scheme. Furthermore, it will allow the contractor to take full advantage of the available timescales to ensure the scheme is delivered in time.

5.7 Sourcing Options

5.7.1 The potential options for sourcing the provision of the services include partnerships, frameworks, existing supplier arrangements and one-off procurement. In this instance a one-off procurement process is proposed.

5.7.2 The Council does not have any established partnerships or existing supplier arrangements in place with contractors that it would be able to make use of within the confines of public procurement regulations, and neither has it set up any frameworks that would cover this type of major construction scheme.

5.7.3 Even if it had arrangements in place that could be used, which it does not, the Council would wish to ensure best value for a scheme of this size.

5.7.4 The Council did explore the opportunity to make use of other established frameworks in the public sector, but was not convinced of the benefits they would provide, including their appropriateness for this scheme, any time savings they could achieve, and their ability to demonstrate best value.

5.8 Payment Mechanisms

5.8.1 The funding will form part of the allocation provided to the Local Enterprise Partnership as part of the Strategic Economic Plan budget. The process currently in place for providing this funding is set out in the Assurance Framework. The funding allocations will be made available to the Local Enterprise Partnership quarterly in advance.

5.8.2 Regarding the payment mechanism between Swindon Borough Council and its contractor, the scheme is likely to be based on an NEC3 Option A contract as noted below. This contract links payment to the completion of deliverables. A set of activities will be identified and included in the tender, and the contractor can add to these if desirable to create the 'Activity Schedule'. Payments to the contractor will be made monthly, and the contractor will only be due payment for the activities that have been completed in full during that month. The NEC3 Project Manager, with the help of the Supervisor, will define the appropriate payment each month, taking into consideration any payment applications submitted by the contractor.

5.9 Pricing Framework and Charging Mechanisms

5.9.1 Within the civil engineering industry in the UK there are two widely used forms of contract – the ICE Conditions of Contract, and the New Engineering Contract (NEC3). Both are suitable, although the NEC3 is a more modern, partnership oriented form. The Council's preference is the NEC3 contract, and its staff have training and experience in its use.

5.9.2 The Council will shortly by undertaking an exercise to determine which option within the NEC3 suite of contracts it will use.

5.9.3 Delay damages are likely to be included within the terms and conditions of the contract to ensure the contractor has sufficient incentivisation to deliver the scheme within the defined programme.

5.10 Risk Allocation and Transfer

5.10.1 The NEC3 contract sets out a list of risks that remain with the employer (in Clause 80.1). If any of these risks arise the contractor will be able to make a claim via the compensation event process. All other risks are managed through the contract process and allocated accordingly.

5.10.2 As with all other employers, Swindon Borough Council has added and amended clauses as appropriate to ensure it deals with risks in a manner it considers most appropriate making use of its experience and expertise.

5.11 Contract Length

5.11.1 The contract length will be approximately 40 months to account for a 10-month design period, an 18-month construction period including mobilisation, and a 12-month maintenance period.

5.12 Contract Management

5.12.1 Contract management is likely to be undertaken by Peter Brett Associates (PBA), who would take on the role of Project Manager under NEC3 contract. PBA has extensive contract management experience, most recently on the nearby M4 Junction 16 scheme on behalf of SBC.

5.12.2 The Supervisor role is likely to also be undertaken by PBA, making use of staff already involved in leading the design process, in conjunction with SBC and Highways England inspectors.

5.12.3 Swindon Borough Council's client team will continue to be led by the same staff members involved in the design, planning and procurement, ensuring continuity throughout the delivery process. A Project Board is in place and meets monthly, and reporting lines through the Council's Strategic Highways Programme Board, the Wichelstowe Joint Venture and the Swindon and Wiltshire LEP are all well established.

6 Management Case

6.1 Introduction

6.1.1 The management case sets out how the project will be delivered. It provides evidence from similar projects and programmes to show that the governance, organisational structure and roles are appropriate. The programme assurance and approval processes oversee delivery to ensure risks are identified and mitigated. The management case is ultimately about delivering the scheme's objectives with the benefits being realised, assessed and monitored.

6.1.2 This section contains:

- Programme and project dependencies
- Governance, organisational structure and proposed roles
- A project plan for scheme development and implementation
- Information on proposed communication and stakeholder management
- Risk identification and a risk management
- A benefits' realisation, monitoring and evaluation plan.

6.2 Overall assessment of scheme deliverability

6.2.1 The scheme has been programmed to meet the rate of housing completions and the requirements of the planning permission conditions. It is important to note that the design has planning permission as a skewed tunnel. Furthermore, the straightened under-bridge being taken forward as this scheme has approval via a non-material amendment (NMA) to the planning permission. Approval by all relevant authorities is subject to technical approval of the detailed design.

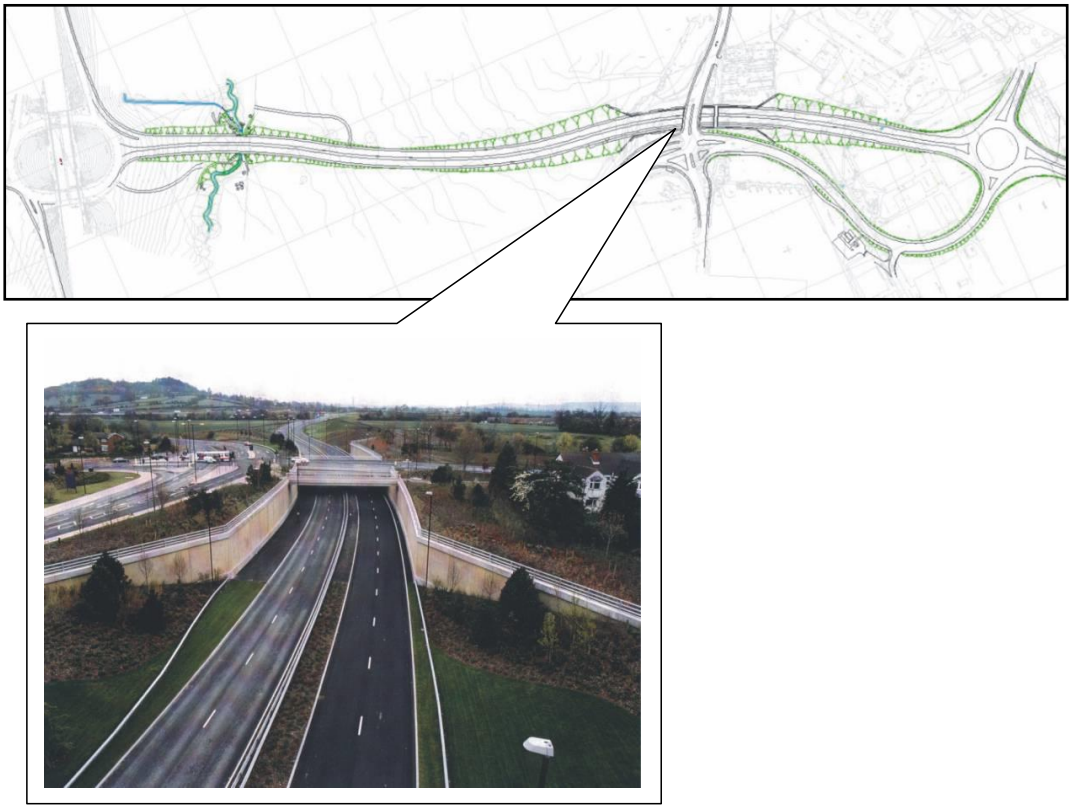
6.3 Evidence of Similar Projects

6.3.1 Swindon Borough Council has experience of large scale infrastructure delivery, having delivered several multi-million-pound highway and infrastructure schemes, including Wichelstowe on-site infrastructure and the Croft Road access scheme, Bruce Street Bridges and the M4 Junction 16 scheme currently being implemented.

6.3.2 Peter Brett Associates (PBA) has been appointed as designer and Principal Designer, and is likely to be appointed as NEC3 Project Manager and NEC3 Supervisor. PBA is a multidisciplinary civil engineering consultancy with a broad range of experience on similar schemes, including relevant experience designing and supervising major junction improvements schemes at Junctions 11 and 16 of the M4 and a longstanding involvement in the Wichelstowe development. PBA was named New Civil Engineer's 'Consultants of the Year' for both 2014 and 2015.

6.3.3 PBA's experience also includes responsibility for the Gloucester Business Park Link Road. The scheme consisted of a 1.1km long dual carriageway link road and a 400m single carriageway road with a signalised junction and connecting roundabout. Structures include a 200m long piled wall underpass – similar to that proposed at the Southern Access but shorter – two overbridges and an underbridge. The contract included the traffic management of an existing road, which crosses the new road at the location of the underpass and a bridge carrying the new road over the stream on some 6m of embankment.

6.3.4 This was a developer-funded highway linking Gloucester Business Park to the trunk road network. This design and build contract, with a value of circa £10m, was completed early in 2000.



6.4 Programme/Project Dependencies

6.4.1 Ultimately, the full benefits of the scheme - to provide access to the Wichelstowe development - will be achieved on completion of the WSA.

6.4.2 Now that funding has been provisionally allocated to the WSA, the risks of delivering the ultimate development access to Wichelstowe are significantly reduced.

6.4.3 The Wichelstowe Scheme is an historical consent from 2005, however since Swindon Borough Council took ownership of the site, a significant level of updating and ongoing assessments have been carried out to amend the Land Use Master Plan (LUMP), which simultaneously reviewed the wider access strategy and committed off site highway improvements. Swindon Borough Council, acting as developers of the site, have engaged with Highways England, Swindon Borough Council and Wiltshire Council on updated reviews and studies of the masterplan and off site works.

6.4.4 These reviews and studies have supported the Section 73 alterations to phasing of the Wichelstowe scheme and the major off site works. In addition, they have reinforced the historical strategy in terms of how the site is accessed and the required off site highway works. In summary, the studies have concluded that the 4-access strategy for the site is retained. As such, Croft Road, Redposts Drive, Mill Lane and the new M4 link to Wharf Road are all required to support the development build out for up to 4,500 dwellings and the associated employment, retail, leisure, education etc. as per the revised LUMP 2.

6.4.5 The offsite infrastructure provision associated with Junction 16, was the subject of an updated assessment carried out with the joint sign-off from Swindon Borough Council, Wiltshire Council and Highways England. The study concluded that the principle of the consented scheme with minor radii and lane changes was agreed by all parties and therefore was fit for purpose and would still seek to mitigate the revised LUMP 2 proposals. The key improvement was the provision of a new right turn lane arrangement linking Swindon Road (A3102) and Hay Lane (B4005) which removed those movements from the main circulatory carriageway of the junction thus releasing capacity to support the Wichelstowe and other developments granted consent on the premise of those consented improvements being implemented.

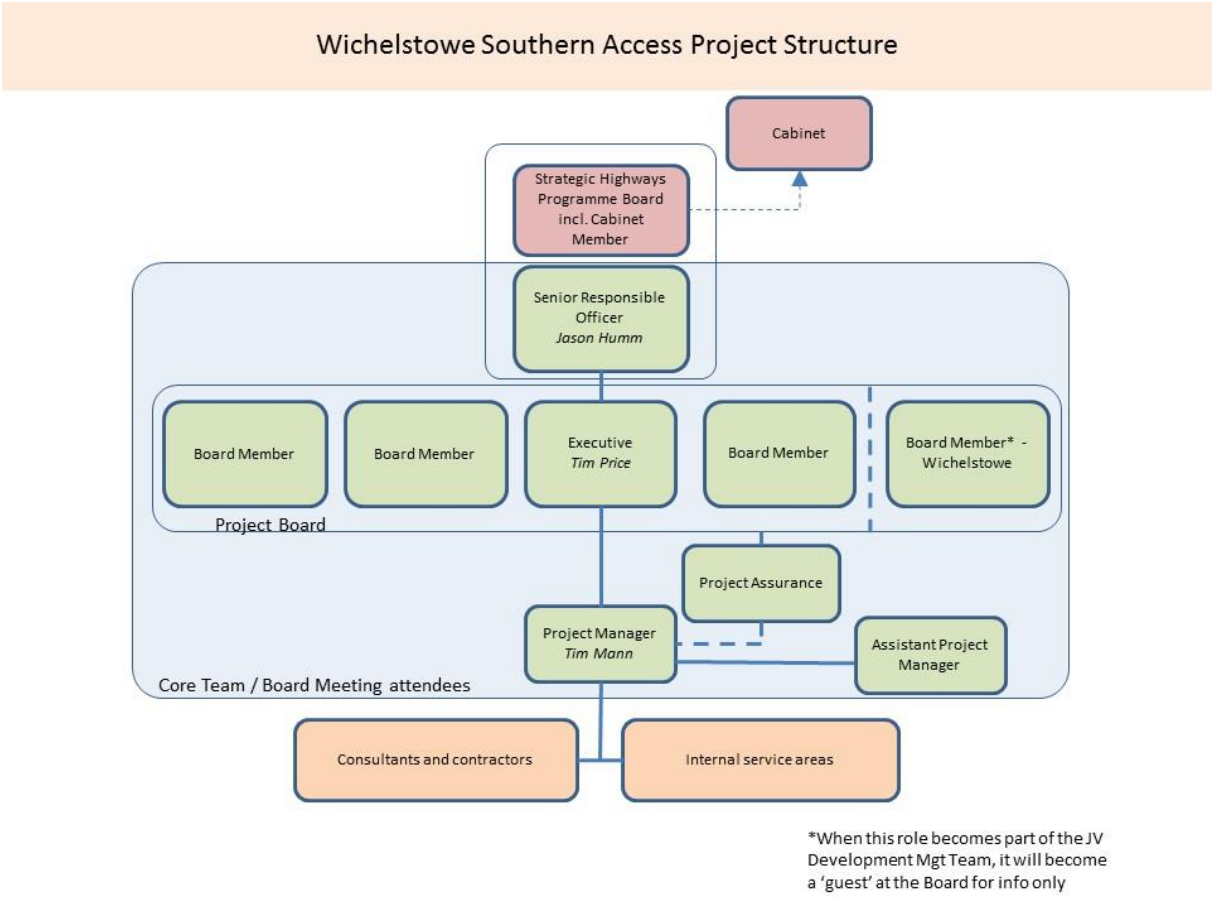
6.4.6 The study also looked at other high level studies for M4 Junction 15 and M4 Junction 16/17 corridor. The outcome of these was that both M4 Junction 15 and M4 Junction 17 would need future mitigation works, due to a result of other developments and historical growth, but that the Wichelstowe development did not have a material impact on these junctions and thus any mitigation works are not a result of the Wichelstowe development. This outcome matches the original assessment at the time of the original consent which showed that the focus for mitigation would be M4 Junction 16 only.

6.5 Governance, Organisational Structure and Roles

6.5.1 Swindon Borough Council is the delivery agent. The programme and governance is already in place to allow full delivery of the scheme. The structure is shown in Figure 6-1.

Upon establishment of the Wichelstowe Joint Venture, the Council's Highway Project and Programme Delivery team has taken over delivery of the scheme, as it did previously for the M4 Junction 16 Improvements scheme. The key staff have remained in place, including the Project Manager.

Figure 6-1 Project Organogram



6.5.2 The 'Consultants and Contractors' set out in in the organogram above consists of several organisations, including the following:

- Peter Brett Associates (design, contract management and supervision)
- Keystone (ecological advisors)
- A range of contractors for various survey and site investigation works
- The main construction contractor (not yet appointed)

6.5.3 The 'Internal Service Areas' set out in organogram above include the following:

- Highways Transport Development Management (approvals including technical approval, with Atkins as their partner)
- A range of advisors from the legal team
- Property, procurement and finance teams
- Additional project support from the Highways Project and Programme Delivery team.

6.6 Programme/Project Plan

6.6.1 The key milestones are set out in Table 6-1. This will be updated throughout the project. A full programme is set out in Appendix F. A full construction delivery programme will be in place once the selected contractor is appointed.

Table 6-1 Programme - Key Milestones

Milestone	Estimated Date
Full Business Case (FBC) submission	June 2019
Full Business Case (FBC) approval	September 2019
Issue Design and Build (D&B) tender	June 2018
Award Contract	December 2018
Finalise scheme design	January 2019 – August 2019
Technical Approval	September 2019
Start construction	October 2019
Complete construction	March 2021

6.7 Assurance and Approval Plan

6.7.1 The WSA is being progressed in line with the S&WLEP Assurance Framework.

6.7.2 This OBC represents Stage 2 of the S&WLEP process. The S&WLEP will use the contents of this OBC to decide whether the scheme should proceed to Full Business Case stage.

6.7.3 Outline Business Case approval is programmed for May 2018. Full Business Case approval is currently programmed for September 2019.

6.7.4 A formal agreement will be made between the owner of the devolved funding and Swindon Borough Council. The agreement will set out the terms and conditions for the devolved funding. Funding will then be released to Swindon Borough Council in line with those terms and conditions.

6.8 Communications and Stakeholder Management

6.8.1 The scheme has been in the public domain for several years. It is therefore proposed that communications will be directly linked to statutory requirements and for information for residential or commercial properties likely to be affected during construction. Wider publicity will be through press releases in the local media, the Council's Highways News e-newsletter and drop-in information sessions prior to commencement on site. A communication strategy can be seen in Appendix G.

6.9 Risk Management Strategy

6.9.1 The risk management strategy is a process for identifying adequate assessment and response to risk. The process in place should allow early decision making to mitigate these. Appendix E contains the risk register. This is managed and reviewed through the project management process.

6.9.2 Where appropriate, risk will be transferred to the contractor by the contract thus giving an acceptable level of financial predictability and stability. A risk register has been prepared for this project with example risk including:

- Utilities

- Geotechnical
- Drainage

6.9.3 The register in Appendix E is the live document currently being utilised by the detailed design team; it is subject to ongoing updates, but it offers a rounded consideration of the multiple risk categories which are being considered.

6.10 Benefits' realisation plan

6.10.1 The objectives and indicators to success are set out in the strategic case. The major objectives that have been identified are:

- Unlock the Wichelstowe development after the first 2500 units;
- Reduce congestion from Wichelstowe development on the wider network;
- Improve accessibility to new jobs at Wichelstowe from the south and west.

6.11 Monitoring and evaluation

6.11.1 The Monitoring and Evaluation Plan identifies how scheme delivery, including wider scheme impacts, construction and budget management, are to be evaluated. The plan will lead to the production of Post-Implementation Reports; it is proposed that reports be produced as follows:

- One Year After Report - using data collected at least one year after scheme opening. This will focus on the construction elements of the scheme and immediate impacts;
- Final Report - based on one year after data and further data collected 5 years after the scheme opening. This will focus on the wider impacts of the scheme.

6.11.2 The plan identifies monitor the following measures:

- Scheme build
- Scheme costs
- Travel demand
- Travel times and reliability of travel times
- Impacts on the economy
- Carbon impacts

Data Requirements

6.11.3 Data requirements are set out in Table 6-2.

Responsibilities and Resources

6.11.4 Data collection and preparation of the report will be managed in-house by Swindon Borough Council Transport Planning officers. The existing most recent modelling assessment and associated surveys will form the basis of the baseline against which outcomes will be assessed.

Table 6-2 Monitoring and Evaluation Data Requirements

Item	Measure	Data Required	Report	Output/Outcome
Scheme Build	Delivery Programme	Performance against key milestones	1 year	Scheme delivered to programme
	Stakeholder Management	Lessons Learnt	1 year	
Scheme Costs	Scheme cost	Out-turn cost	1 year	
Travel Demand	Traffic Flows	Traffic flow on approaches	1 and 5 year	Increase in flow throughput
Travel Times and journey time reliability	Journey Times	Journey times through junction	1 and 5 year	Reduction in journey times
Impacts on the economy	Journey times to businesses	Journey times to key businesses	1 and 5 year	Reduction in journey times
Carbon	Traffic flows and speeds	Traffic flows and speeds	1 and 5 year	Reduction in Carbon emissions

6.12 Project Management Summary

6.12.1 The scheme will be delivered by Swindon Borough Council's Highways Project and Programme Delivery team, following handover from the Wichelstowe team.

6.12.2 The risk register and contingency reporting will continue to be updated through the project management process.

6.12.3 The external communication will be followed through the statutory processes identified.

6.12.4 The benefits' realisation will be monitored by Swindon Borough Council, as part of its existing Transport Planning function.

Appendix A Scheme Drawings

Appendix B Appraisal Summary Table

Appendix C Economics Tables

Economic Efficiency of the Transport System (TEE) Initial — **Core Scenario (15%OB_Roads_23%OB_Structures)**

Non-business: Commuting	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
User benefits	TOTAL		Private Cars and LGVs	Passengers	Passengers	
Travel time	19080		19080			
Vehicle operating costs	1044		1044			
User charges	0		0			
During Construction & Maintenance	-132		-132			
NET NON-BUSINESS BENEFITS: COMMUTING	19992	*(1a)*	19992			

Non-business: Other	ALL MODES			BUS and COACH	RAIL	OTHER
User benefits	TOTAL			Passengers	Passengers	
Travel time	8583		8583			
Vehicle operating costs	642		642			
User charges	0		0			
During Construction & Maintenance	-32		-32			
NET NON-BUSINESS BENEFITS: OTHER	9193	*(1b)*	9193			

Business							
User benefits			Goods Vehicles	Business Cars & LGVs	Passengers	Freight	Passengers
Travel time	9541		6312	3229			
Vehicle operating costs	1940		1604	336			
User charges	0		0	0			
During Construction & Maintenance	-214		-23	-191			
Subtotal	11267	*(2)*	7893	3374			
Private sector provider impacts						Freight	Passengers
Revenue	0						
Operating costs	0						
Investment costs	0						
Grant/subsidy	0						
Subtotal	0	*(3)*			0	0	0
Other business impacts							
Developer contributions	-4895	*(4)*	-4895				
NET BUSINESS IMPACT	6372	*(5) = (2) + (3) + (4)*					

TOTAL		
Present Value of Transport Economic Efficiency Benefits (TEE)	35557	*(6) = (1a) + (1b) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers.
All entries are discounted present values, in 2010 prices and values

Public Accounts (PA) Table Initial

Core Scenario (15%OB_Roads_23%OB_Structures)

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	TOTAL		INFRASTRUCTURE			
Revenue	0		0			
Operating Costs	2876		2876			
Investment Costs	28207		28207			
Developer and Other Contributions	-4895		-4895			
Grant/Subsidy Payments	0		0			
NET IMPACT	26188	*(7)*	26188			
Central Government Funding: Transport						
Revenue	0		0			
Operating costs	0		0			
Investment Costs	0		0			
Developer and Other Contributions	0		0			
Grant/Subsidy Payments	0		0			
NET IMPACT	0	*(8)*	0			
Central Government Funding: Non-Transport						
Indirect Tax Revenues	1274	*(9)*	1274			
TOTALS						
Broad Transport Budget	26188	*(10) = (7) + (8)*				
Wider Public Finances	1274	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values.

Analysis of Monetised Costs and Benefits Initial

Core Scenario (15%OB_Roads_23%OB_Structures)

Noise	0	*(12)*
Local Air Quality	0	*(13)*
Greenhouse Gases	578	*(14)*
Journey Quality	0	*(15)*
Physical Activity	0	*(16)*
Accidents	7811.1	*(17)*
Economic Efficiency: Consumer Users (Commuting)	19992	*(1a)*
Economic Efficiency: Consumer Users (Other)	9193	*(1b)*
Economic Efficiency: Business Users and Providers	6372	*(5)*
Wider Public Finances (Indirect Taxation Revenues)	-1274	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	42672	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	26188	*(10)*
Present Value of Costs (see notes) (PVC)	26188	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	16484	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	1.629	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Appendix D Detailed Scheme Costs

Appendix E Risk Register

Appendix F Delivery Programme

Appendix G Communication Strategy

	Who is the stakeholder?	When will they be contacted?	Who will be responsible for making sure it happens?
Ref	**Stakeholder**	**Frequency**	**Owner**
1	Wiltshire Council	Ad hoc	SBC Project Manager
2	Highways England	Bi -monthly pre-construction Monthly during construction	SBC Project Manager
3	SBC LHA	Bi -monthly pre-construction Monthly during construction	SBC Project Manager
4	Senior SBC Officers - Core Team	Monthly	SBC Project Manager
5	Wichelstowe Joint Venture	Monthly	SBC Project Manager
6	Department for Transport	Ad hoc	SBC Project Manager
7	SWLEP	Monthly	SBC Project Manager
8	Lead Member	Bi-monthly	SBC Project Manager / Executive
9	SBC and HE Streetworks Coordination	Ad hoc	SBC Project Manager / PBA pre-construction. Contractor during construction.
10	Senior SBC Officers - Highways and Wichelstowe teams	Various Board Meetings	SBC Project Manager / Executive
11	Local Ward Members	Ad hoc	SBC Project Manager / Executive
12	Parish and Town Councils	When scheduled. Likely to be 2-3 in total	SBC Project Manager
13	CPRE	As and when required	SBC Project Manager
14	General Public - daily users of junction	Various, but ensure that the communication, particularly during construction, is regular and clear	SBC Project Manager pre-construction. SBC Project Manager and Contractor during construction.
15	Local press - Swindon Adver and BBC Wiltshire	Ad hoc. Aim for press release circa 3 months pre-construction	SBC Project Manager
16	General Pubic - occasional users of junction	As required	SBC Project Manager pre-construction. SBC Project Manager and Contractor during construction.
17	Local residents including those at the Hay Lane Travellers site	Various, but ensure that the communication, particularly during construction, is regular and clear	SBC Project Manager pre-construction. SBC Project Manager and Contractor during construction.
18	Local businesses	As required	SBC Project Manager pre-construction. SBC Project Manager and Contractor during construction.

Please note, a range of of communications methods will be used to communicate with each of the stakeholders set out in this list. This will include all of the usual methods, and we will also make use of the Council's bi-weekly Highways News e-newsletter to communicate regular project progress during construction and at key moments pre-construction.