NEW THAMES CROSSING EAST OF READING

STRATEGIC OUTLINE BUSINESS CASE

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Wokingham Borough Council

Strategic Outline Business Case

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1 EXECUTIVE SUMMARY

1.1.1 This Strategic Outline Business Case (SOBC) presents the evidence base for the New Thames Crossing East of Reading. The document has been prepared in accordance with the Department for Transport guidance on the five business case model. Guidance was published in April 2013, and requires the following five cases to be considered:

- Strategic case
- Economic case
- Financial case
- Commercial case
- Management case

1.1.2 The SOBC focuses on the Strategic Case and the Economic Case. Only an outline of the Financial Case, Commercial Case and Management Case is expected to support the SOBC. Full financial case, commercial case and management case elements are developed during the next phases of the appraisal process.

1.2 STRATEGIC CASE

1.2.1 The Reading Economic Area is the most successful economy in the UK (PwC/Demos 2016) and is projected to have the fastest growth in the UK 2017-19 (EY UK and Regions Economic Forecast 2016), with a Gross Value Added (GVA) growth of 2.5%, growing faster than London and creating potentially 3,000 additional jobs. At a European level it is benchmarked against cities such as Zurich and Antwerp (Centre for Cities 2017) and is among the 25 most successful European economies for attracting inward investment (FDI Cities of the Future 2016/17).

1.2.2 The success of the economy is underpinned by strength in the ICT sector, a growing bio-pharma cluster, professional and business services, finance and energy. Joining the 13 of the world top 30 brands already located in Reading in the last 12 months are multinationals PepsiCo, Bayer and Thales, who have relocated here as a result of the excellent rail connectivity, strong business clusters, highly skilled and educated workforce and an increasingly exciting lifestyle offer. Major players such as SSE and Becton Dickinson are also consolidating their regional and national offices in Reading.

1.2.3 The station and mainline rail investment and the imminent arrival of Crossrail to Reading has driven over two million sq. ft. of office investment in the urban core of Reading itself, as well as substantial residential investment ringing the station, south of the M4 and to the east of Reading. There is also major industrial development to the south and east of central Reading. Reading is growing quickly and needs transport infrastructure to keep pace. The development of the Thames Valley Science Park, plans for an international convention centre, expanding out of town business parks and major housing schemes will only add to this pressure on transport.

1.2.4 The demand for access to and through Reading, to connect with employment centres and strategic transport hubs, puts pressure on the current limited provision of River Thames Crossings. The existing Caversham, Reading and Sonning Bridges experience significant levels of congestion and associated problems related to unreliable and extended journey times, quality of journey, driver stress and negative impacts to local air quality. With only two available crossings of the River Thames within Reading, more capacity is required to spread congestion-

loading and generate local benefits, as well as assist strategic transport movements throughout the wider area.

1.2.5 The projected growth in housing across the Thames Valley requires greater investment in infrastructure in order to limit the increasing pressure on the local road network and to support sustainable economic growth. The headline growth figures for housing are summarised below:

- **Reading** - the Core Strategy states a total of 5,210 dwellings are required in the period 2016-2026
- **Wokingham** - 13,000 new homes are set to be delivered and four communities expanded in the period 2006 – 2026.
- **Oxfordshire** – In the region of 36,000 new homes are planned to be delivered across Oxfordshire in the period 2016-2026 with around 11,487 houses planned to be delivered in South Oxfordshire District.

1.2.6 The high demand for the existing River Thames crossings means that the local transport network currently has low resilience to bridge closures due to incidents such as traffic accidents and flooding. The B478 Playhatch Road on approach to Sonning Bridge is vulnerable to flooding and this crossing becomes impassable when the B478 floods. The A321 Wargrave Road to the east of Sonning is also susceptible to flooding and this further reduces crossing capacity during flood events as Wargrave Road is a diversionary route for vehicles to reach Henley Bridge in the event that Sonning Bridge is closed.

1.2.7 Restricted capacity of current River Thames crossings has been a key challenge for resolution for almost 20 years. Solutions to this have been sought by various stakeholders since as early as 1998. A new river crossing was considered and a substantial amount of development work was undertaken to identify suitable locations for the New Crossing.

1.2.8 The Options Review (2005) established that the preferred location for a crossing was to the east side of Reading town centre, linking A4155 Henley Road/Caversham Park Road junction (via Caversham Lakes access road) north of the river, with Thames Valley Park roundabout south of the river.

1.2.9 The Strategic Outline Business Case (SOBC) has been developed in support of the 'New Thames Crossing East of Reading'. The SOBC builds on the previous studies and has been prepared using the standards and format for business cases, as set out in 'The Transport Business Cases', Department for Transport (DfT), January 2013.

1.2.10 The time and resources invested in the SOBC are proportionate to the current stage of the decision making process. Should it be agreed that the New Crossing will be taken to Outline Business Case, the more detailed assessment will take place with full economic and financial appraisals completed; preparations will be made for the potential delivery contract through the development of the commercial case. The arrangements required to ensure successful delivery will be set out in the management case.

1.2.11 To oversee the development of the New Crossing proposals a Cross-Thames Travel Group (CTTG) comprising officers from the key stakeholder groups (Reading Borough Council, Wokingham Borough Council, Oxfordshire County Council, South Oxfordshire District Council, Thames Valley Berkshire Local Enterprise Partnership, Oxfordshire Local Enterprise Partnership) was called back together, after previously having been established to oversee works related to identifying the need and options assessment. Other key stakeholders include local MP's, local councillors, local businesses and local resident groups. As the plans for the New Crossing emerge and should the decision be taken to proceed to an Outline Business Case, appropriate levels of consultation will be programmed and undertaken with each of the stakeholder groups.

1.2.12 The key supporters of the New Crossing are Reading Borough Council and TVB LEP, given that the existing River Thames crossings fall within their borough boundary and that key immediate issues associated with lack of river crossing capacity, congestion and poor air quality are felt most here. A new river crossing would contribute to a reduction in traffic and an improvement in connectivity and the environment for residents of Caversham, East Reading, Sonning and Henley-on-Thames. Without a new river crossing the traffic effects of the planned housing allocations across the Thames Valley area will be difficult to mitigate. Wokingham Borough Council is in full support of the scheme and the Wokingham Strategic Transport model (WSTM4) has been updated and utilised to model the impact of the New Crossing.

1.2.13 The New Crossing is cited explicitly in the Thames Valley Berkshire Strategic Economic Plan (see p17) and in the SEP Implementation Plan, alongside Great Western electrification, extension of Crossrail to Reading, Western Rail Access to Heathrow, M4 Smart Motorway and, of course, Heathrow expansion. In particular, the SEP states that the "biggest single risk to the future economic contribution of TVB concerns our transport and communications infrastructure" and that "the growth of our economy has been – and continues to be – fundamentally shaped by our connectivity".

1.2.14 It goes on: "…the transport and communications infrastructure on which we rely is simultaneously a local, national and international resource. It is very congested. This in turn is threatening to undermine our intrinsic growth potential. It is therefore essential to invest in it and also to encourage local sustainable transport networks that promote active travel on foot, on bicycle and on public transport."

1.2.15 The New Crossing cannot be delivered by the south bank authorities alone. The New Crossing requires the support of the north bank authorities of Oxfordshire CC and South Oxfordshire DC, with the collaboration of Oxfordshire LEP to endorse the scheme. The following quote is from Oxfordshire County Council's LTP Volume 1: Policy & Overall Strategy (Pages 45–46, para 88) - https://www.oxfordshire.gov.uk/cms/content/connecting-oxfordshire-2015-2031-ltp4

1.2.16 "We will continue to work with Berkshire councils on the potential for additional river crossing capacity at Reading, taking into account the potential for impacts on the local road network from the increased traffic flow across the river and how or if that can be mitigated. We also need to understand expectations for population growth in Berkshire and the impact this would have on future demand across any potential bridge." All parties acknowledge that any new crossing should deliver economic benefits for the Thames Valley Berkshire and Oxfordshire LEP areas.

1.2.17 The intended outcomes of the scheme are:

- Congestion relief across and in the locality of the existing crossings, freeing up capacity for other road users
- Greater opportunity for increasing pedestrian, cycle and public transport connections to deliver positive modal shift and to support sustainable economic growth
- Ensuring that the existing public transport network can continue to function efficiently.
- Reduced and more reliable journey times
- Providing greater choice for trips across the River Thames
- Overall improved air quality across the network affected by the New Crossing
- Improved resilience of the road network during flooding due to reduced demand for Sonning Bridge
- To enable delivery of the planned housing allocations across the Thames Valley area as set out in each Authority's Local Plan.

1.3 SCHEME DESCRIPTION

1.3.1 The following three crossing options are considered in the SOBC:

- **Option 1**: a single two-lane carriageway crossing and associated improvements at the A4155 Henley Rd/ Caversham Park Rd signalised junction in the north and the Thames Valley Park Drive roundabout in the South
- **Option 2**: based on Option 1 but it also assumes that an electronic tolling system will be in place with a single journey crossing charge being:
  - Cars - £2
  - LGV - £3
  - HGV - £6
- **Option 3**: a public transport package option, which assumes a dual four-lane carriageway crossing (two lanes each way with one lane dedicated to buses only), conversion of one of the existing southbound lanes to a tidal flow bus lane on Reading Bridge, East Reading Mass Rapid Transit route and P&R to north Reading. It should be noted that the public transport package could be modified in a number of ways if the scheme is to be taken forward.

1.4 ECONOMIC CASE

1.4.1 The economic case sets out the assessment of benefits that the scheme is forecast to deliver to society as a whole. The Value for Money (VfM) statement provides a summary of these benefits, and is presented in Table 1-1.

Table 1-1 Value for Money statement

	OPTION 1	OPTION 2	OPTION 3	DETAIL
BCR	2.72	0.03	1.17	Calculated using TAG guidance
Value for money category	High	Poor	Low	

1.4.2 The economic performance demonstrates that Option 1 (two-lane crossing) is estimated to have a BCR value of 2.72 and thus represents a high value for money when compared against the DfT classification.

1.4.3 Option 2 (two-lane crossing with a single journey crossing charge) is estimated to generate low benefits and a BCR of 0.03 indicating the option may provide a poor value for money. The poor BCR is attributed to the lower use of the New Crossing due to the reluctance of drivers to pay the toll charge, which for cars would be £20 per 5 day week for return trips. It should however be noted that estimating toll road demand is a complex matter. The accuracy of the forecasts can be further improved through further demand segmentation (for example, by income) and inclusion of area specific information about people's willingness to pay (usually collected through stated-preference surveys). The inclusion of operator revenue may also increase the BCR for this option.

1.4.4 Option 3 is predicted to generate a low BCR of 1.17 indicating that the benefits of the public transport package may not be able to outweigh the additional cost required to construct the four-lane crossing and implement other public transport improvements. However there may be additional revenue to public transport operators due to increased public transport use. Promoting the use of public transport would have clear benefits to congestion and the environment, therefore the package of measures can be reviewed to ensure the BCR reflects this in any future business case development work.

1.4.5 The initial assessment of the environmental aspects (noise, air quality, greenhouse gases, landscape, townscape, historical environment, biodiversity and water environment) indicates that the impacts from the New Crossing are likely to range from negligible to moderate adverse. Most impacts will be adequately mitigated through an appropriate detailed design.

1.4.6 The initial assessment has also identified that key environmental constraints include:

- Landfill to the south of the New Crossing
- The crossing's proximity to highly sensitive controlled waters and underlying groundwater in direct continuity with the River Thames.

1.4.7 It is recommended that consideration should to be given to the water environment in the development of a New Crossing in order to include mitigation embedded within the detailed design. However, it has also been concluded that these constraints would not preclude development at the preferred location and that the impacts would be able to be mitigated to either minor adverse or negligible.

1.5 FINANCIAL CASE

1.5.1 The overall scheme costs are approximate at this stage and the estimates for each option are provided in Table 1-2. The cost includes an estimate of risk /contingency and optimism bias uplift of 30.4%. If the scheme is to be progressed to the Outline Business Case stage preliminary design and costing work will be undertaken.

Table 1-2 Scheme Costings (2016 prices), £'000

	OPTION 1	OPTION 2	OPTION 3
Construction Total	£89,936	£93,066	£143,901
Lands Total	£506	£506	£608
Part 1 Claims Total	£1,150	£1,150	£1,150
Preparation & Supervision Total	£18,300	£18,300	£20,130
TOTAL	**£109,892**	**£113,022**	**£165,788**

1.5.2 The present SOBC is funded by members of the Cross-Thames Travel Group.

1.5.3 Further funding required to take the scheme to the next stage of the assessment process was sought through DfT's LLMTS funding bid. Unfortunately the bid was unsuccessful with a priority given to schemes with some local contribution and shorter full business case completion times. DfT has confirmed that the scheme promoter would be eligible to apply for funding during the next round (programme entry stage). This will be for the development of the Full Business Case and capital funding to deliver the scheme and will require a completed Outline Business Case. The deadline for this round of funding is December 2017.

1.5.4 The funding sources will be further explored from both the public and private sector should the decision is made by the CTTG for the scheme to be progressed to the Outline Business Case stage.

1.6 COMMERCIAL CASE

1.6.1 The commercial case sets out the commercial element of the submission and provides details on the justification for funding, opportunities and additional or alternative forms of funding and the scheme procurement process and outcomes. The initial findings have identified a number of factors which will contribute to a successful outcome of delivery within budget. It has also been highlighted that the procurement strategy will need to be managed, developed and recorded in the dynamic context of the development of the scheme itself.

1.7 MANAGEMENT CASE

1.7.1 The management case assesses whether a proposal is deliverable. It tests the project planning, governance structure, risk management, communications and stakeholder management, benefits realisation and assurance. Evidence of schemes of a similar size delivered by Reading Borough Council and Wokingham Borough Council has been demonstrated. The management case has also provided initial views on the programme, which estimated that the New Crossing can be opened in 2026 if the project is initiated in 2018.

2 SETTING THE SCENE

2.1 INTRODUCTION

2.1.1 WSP | Parsons Brinckerhoff has been commissioned by Wokingham Borough Council (WBC) to provide support in the development of the Strategic Outline Business Case (SOBC) and scheme details for the 'New Thames Crossing East of Reading'. This document has been prepared using the standards and format for business cases, as set out in 'The Transport Business Cases', Department for Transport (DfT), January 2013.

2.1.2 The development of the New Crossing requires the joint working of the following key stakeholders, which have been engaged in the production of this study:

- Reading Borough Council
- Wokingham Borough Council
- Oxfordshire County Council
- South Oxfordshire District Council
- Thames Valley Berkshire Local Enterprise Partnership (TVB LEP)
- Oxfordshire Local Enterprise Partnership (OxLEP).

2.1.3 In 2015 a Cross-Thames Travel Group (CTTG) comprising officers from the key stakeholder groups was called back together to oversee the development of the New Crossing proposals, after previously having been established to oversee works related to identifying the need and options assessment. As well as the Officer Group, the CTTG comprises a Member Group made up of Executives (Councillors and MPs) from the stakeholder groups. This is the decision making body for the proposed New Crossing.

2.2 SCHEME DESCRIPTION

2.2.1 The New Crossing is proposed on the east side of Reading town centre, linking A4155 Henley Road/Caversham Park Road junction (via Caversham Lakes access road) north of the river, with Thames Valley Park roundabout south of the river. The proposed location is shown on Figure 2-1, together with the location of Caversham, Reading and Sonning Bridges.

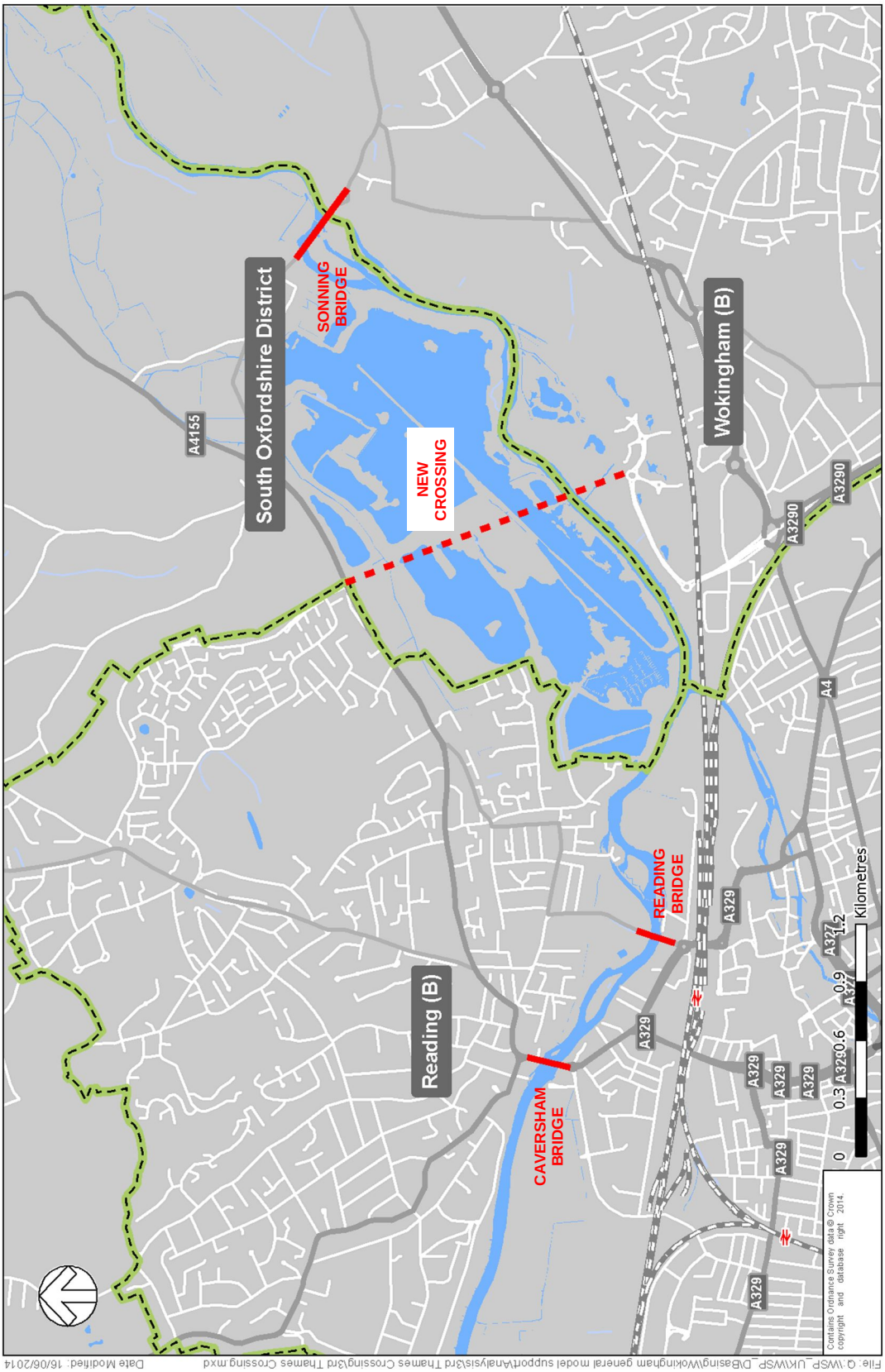


Figure 2-1 Location of the New Thames Crossing East of Reading

2.3 AREA DESCRIPTION

EMPLOYMENT ACTIVITY

2.3.1 Reading is a major conurbation and prime employment centre within the South East of England, benefiting from close proximity to London and Heathrow Airport, and with excellent links to national road and rail networks. The town has an established reputation as a business hub with particular strengths in information technology and business services.

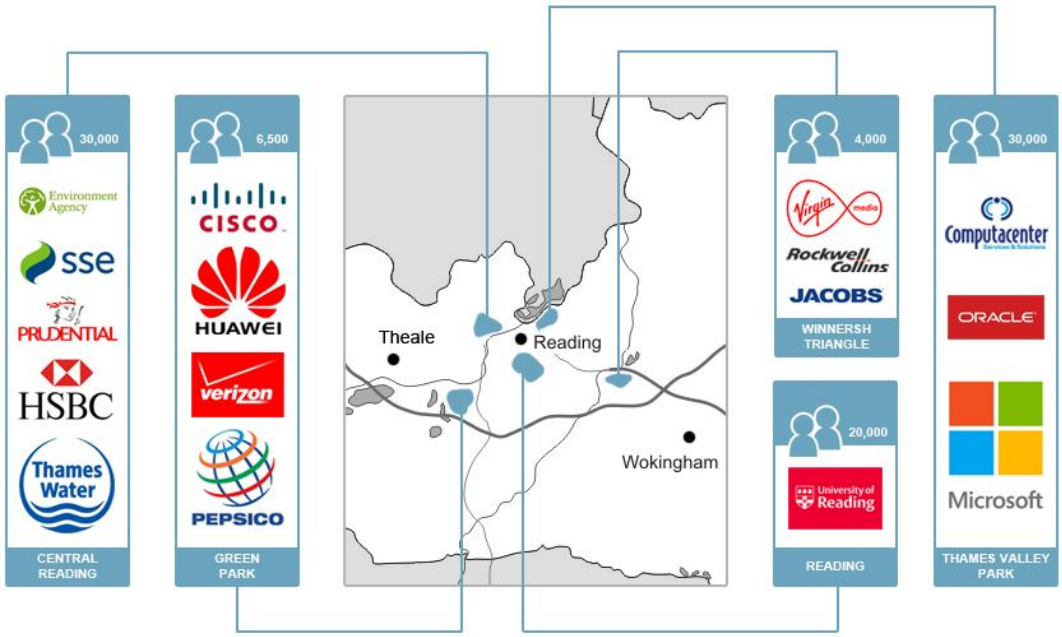


Figure 2-2 Employment Locations

2.3.1 East Reading contains the Thames Valley Park (TVP), which is a premier business park and employment focus for residents in the Reading and Wokingham areas, and across the Thames Valley. TVP contains a range of large employers including Microsoft, Fujitsu, Vail Williams, Barclays Direct and Oracle IT Services amongst others. The TVP is a home to around 30,000 employees.

2.3.2 Just one kilometre south from TVP is the Suttons Business Park which includes large employers such as HP, Brakes Food Wholesalers, Royal Mail, SAS International, Rockwell Collins and FPS. In addition, Winnersh Triangle Business Park is currently undergoing significant redevelopment and is home to a wide range of employers including Jacobs, Virgin Media and Daewoo. The state-of-the-art Thames Valley Science Park will also open its doors in summer 2017 in Shinfield, eventually providing up to 5,000 jobs.

2.3.3 Central Reading is a key commercial and business destination for around 30,000 employees. There are a wide range of large employers in the area, such as HSBC, Barclays, the Oracle Shopping Centre and Thames Water. To the south of central Reading, is Green Park business park, which is home to a number of multi-national companies including Pepsico and Huawei, and the University of Reading's campus on Whiteknights Road, a key employer and trip attractor in the town. The University of Reading is also constructing a new Science Research Park to the south of Reading in Shinfield which will be create employment and generate vehicle trips.

2.3.4 To the east of Reading there are two main areas of employment in Bracknell; the Western Business Park to the south of Wokingham Road, and the Southern Industrial Area south of Berkshire Way. The Western Business Park is home to a number of large technology firms including Hewlett Packard, Dell, 3M and Honda. The Southern Industrial Area houses the headquarters of Waitrose, and technology firms including Panasonic and Fujitsu.

2.3.5 Reading also has the highest business start-up rate (per capita), 2nd highest business stock (per 10,000 population) and 2nd highest GVA per worker of all cities across the UK[1]; and is forecast to outperform London to record the highest GVA growth of any UK city (3.1%) between 2016 and 2018[2].

SOCIO-ECONOMIC CHARACTERISTICS OF THE AREA

2.3.6 A census review and analysis has been undertaken to understand the characteristics of the population living in close proximity to both the existing crossings and proposed New Crossing. This is an important assessment, since these are the people that may be most immediately affected by the implementation of the New Crossing. Furthermore, this is the population that is most likely to be influenced to switch from private car usage to alternative active modes of travel such as cycling and walking as a consequence of reduced journey distances provided by the New Crossing.

2.3.7 Table 2-1 summarises the key characteristics of the area. The data has been derived by analysing 2011 Census population[3] and journey to work data[4] within 1km of each of the crossings listed. In particular, the assessment aimed to identify those living within 1km of each crossing that is in employment, works within a distance of 5km or less and currently drives to work.

Table 2-1 Census 2011 Population Characteristics within 1km of Caversham, Reading and the New Crossing

Census 2011 DATA	Caversham & Reading Bridges	Sonning Bridge	New Crossing	All Crossings
Total Population within 1km	19,883	3,391	6,644	29,918
Total population in employment within 1km	12,517	2,357	3,609	18,483
Total population in employment travelling <2km to work	3,735	163	646	4,544
Total population in employment travelling between 2km and 5km to work	1,860	417	945	3,222
Car mode share	46.5%	77.1%	70.6%	56.0%
Bike, foot & bus combined mode share	36.7%	13.1%	20.4%	29.9%
Total population in employment travelling <5km to work by car	2,604	447	1,123	4,350
Bike, foot & bus combined mode share	2,054	76	325	2,319

Source: 2011 Census, NOMIS

2.3.8 Table 2-1 shows that there are 4,350 people living within 1km of the Caversham, Reading, Sonning and the location of the New Crossing who travel less than 5km to work by car. These

[1] Cities Outlook 2016, Centre for Cities, January 2016
[2] Rebalancing: UK Region and City Economic Forecast, EY, December 2015
[3] Available for the Lower Super Output areas (LSOAs)
[4] Publicly available for the Middle Super Output areas (MSOAs)

people may directly benefit from the construction of the New Crossing due to the expected reduction in congestion in Central Reading. The construction of the New Crossing is expected to provide an alternative route for commuters who use the existing bridges in Central Reading. This may allow a proportion of the 2,602 residents living in close proximity to the bridges who travel to work by car to benefit from a less congested road network in Central Reading and a reduced journey time to their workplace.

2.3.9 Table 2-1 shows that there are a total of 19,883 people living within 1km of the existing Caversham and Reading bridges, as well as 3,391 people living within 1kn of Sonning bridge. These people may directly benefit from improved air quality, journey choice (mode choice) and journey times.

2.3.10 The New Crossing is also expected to bring improvements to public transport provision in addition to for walking and cycling. For the latter modes there will be improved journey quality resulting from improvements to localised air quality. Table 2-1 shows that at most 2,319 people in employment may benefit from the proposed scheme in this respect.

2.4 NEED TO CHANGE

2.4.1 The demand for access to and through Reading, to connect with employment centres and strategic transport hubs, puts enormous pressure on the current limited provision of River Thames crossings. The existing Caversham, Reading and Sonning Bridges experience significant levels of congestion and associated problems related to unreliable and extended journey times, quality of journey, driver stress and negative impacts to local air quality. With only two available crossings of the River Thames within Reading town, more capacity is required to spread congestion-loading and generate local benefits, as well as assist longer-distance transport movements throughout the wider area.

2.4.2 The New Crossing will unlock the potential within Reading to provide better, higher quality environments for alternative travel modes including walking, cycling and public transport. Associated benefits of the New Crossing include an overall improvement in air quality, particularly surrounding the existing river crossings, more reliable journey times across all river crossings, more road space for sustainable travel modes and the ability to support sustainable economic growth.

2.4.3 The projected growth in housing across the Thames Valley requires greater investment in infrastructure in order to limit the increasing pressure on the local road network and to support sustainable economic growth. The headline growth figures for housing within each of the stakeholder's authority boundary are summarised below:

- **Reading** - the Core Strategy states a total of 5,210 dwellings are required in the period 2016-2026
- **Wokingham** - 13,000 new homes are set to be delivered and four communities expanded in the period 2006 – 2026.
- **South Oxfordshire** – the Core Strategy identifies 11,487 dwellings are required to be delivered in the period 2016-2026.
- **Oxfordshire** – In the region of 36,000 new homes are planned to be delivered across Oxfordshire in the period 2016-2026 with around 11,487 houses planned to be delivered in South Oxfordshire District.

2.4.4 The existing river crossings do not have sufficient capacity to cope with this level of development, if it results in a significant increase in the number of north-south journeys.

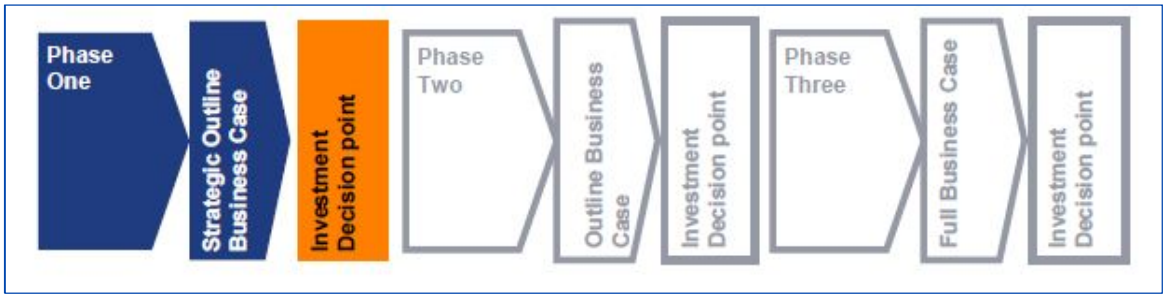
2.4.5 The high demand for the existing River Thames crossings means that the local transport network currently has low resilience to bridge closures due to incidents such as traffic accidents and flooding. The B478 Playhatch Road on approach to Sonning Bridge is vulnerable to flooding and this crossing becomes impassable when the B478 floods. The A321 Wargrave Road to the east of Sonning is also susceptible to flooding and this further reduces crossing capacity during flood events as Wargrave Road is a diversionary route for vehicles to reach Henley Bridge in the event that Sonning Bridge is closed.

2.4.6 Oxfordshire County Council (OCC) have recently applied for funding in order to provide a higher resilience to flooding. The improvement scheme consists of strengthening and raising the Playhatch Road and the stabilisation of embankments. The scheme will also consist of constructing culverts under the carriageway in order to prevent floodwaters from inundating the road. Although the completion of this scheme would further enhance the resilience of local crossings to flood events, it will not eliminate flooding completely and therefore a more robust solution may be required to ensure a resilient network during extreme weather events.

2.5 BACKGROUND TO BUSINESS CASE

2.5.1 This Strategic Outline Business Case (SOBC) is the first step of three phases required to inform the decision making process for major investment, as shown in Diagram 2-1.

Diagram 2-1 Three Phases of the Decision Making Process



Source: DfT, The Transport Business Cases, 2013.

2.5.2 This SOBC sets out the need for intervention (the case for change) and how this will further local and national objectives (the strategic fit). The purpose of the SOBC is to:

- define the scope of the project/programme and its outputs and benefits
- make the case for change
- confirm the strategic fit with the Departmental business plan and wider Government objectives
- state the assumptions made
- set out how achievements will be measured
- outline options, including innovative options, to tackle the problem and carry out initial sift of options
- consider and confirm that a robust project governance structure is in place and that the project is affordable
- outline the sequence in which the scheme and benefits will be delivered
- identify and analyse its stakeholders
- confirm the assurance arrangements.

2.5.3 Restricted capacity of the existing River Thames crossings within Reading, along with the associated issues of congestion and air quality, has been a key issue for resolution for nearly 20 years. The previous studies into the restricted capacity of the existing River Thames crossings and the options assessed for a New Thames Crossing are summarised in section 3.13 'Options Appraisal – Initial Findings'.

2.6 STRUCTURE OF DOCUMENT

2.6.1 The chapters of this report are set out as follows:

- Chapter 3: **Strategic Case** – sets out the strategic and policy context, the case for change and the supporting investment objectives of the New Crossing
- Chapter 4: **Economic Case** – demonstrates that the New Crossing delivers optimal value for money as well as being the most economically advantageous investment option for achieving the supporting objectives
- Chapter 5: **Financial Case** – outlines the New Crossing's affordability and funding arrangements over the lifespan of the project
- Chapter 6: **Commercial Case** – confirms that the New Crossing is commercially viable, in terms of structure, content and nature of the proposed investment deal
- Chapter 7: **Management Case** – confirms that the New Crossing is deliverable and can be achieved within the bounds of cost, time and quality constraints, and

2.6.2 Other documents which are integrally linked to this SOBC are provided within Appendix I, which includes the Appraisal Summary Table (AST) and supporting worksheets.

3 STRATEGIC CASE

3.1 BUSINESS STRATEGY: NATIONAL TRANSPORT PRIORITIES

3.1.1 The Government's 2014 National Infrastructure Plan outlines the Government's approach to identifying and delivering infrastructure. The plan states that there is a strong economic case for infrastructure investment as it is shown to have a significant positive effect on output, productivity and growth rates.

3.1.2 The DFT priorities which relate to road investment projects are set out below:

- Tackling congestion
- Continuing to improve road safety
- Encouraging sustainable local travel
- Promoting lower carbon transport, such as walking and cycling as well as introducing more environmentally-friendly buses and trains.

3.2 SUMMARY OF KEY REGIONAL AND LOCAL TRANSPORT PRIORITIES

3.2.1 A summary of the key regional and local transport priorities and key policy aspirations which refer to the New Crossing is provided in Table 3-1. The regional transport priorities are further detailed in section 3.3 'Business strategy: Regional transport priorities' and section 3.4 'Business strategy: Local transport priorities'.

Table 3-1 Summary of Regional and Local Transport Policy Aspirations and the New Thames Crossing's Contribution

REGIONAL AND LOCAL TRANSPORT POLICY ASPIRATION	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
TVB Strategic Economic Plan (SEP) (2015-2021) -Enhancing urban connectivity	The New Thames Crossing will enhance connectivity between central Reading and other urban centres in the Thames Valley including Caversham, east Reading, Winnersh Triangle, Wokingham and Bracknell.
Reading LDF Core Strategy (2008) - Ensure new development is accessible and sustainable	The New Thames Crossing will support trips by sustainable transport modes and will be designed to accommodate pedestrians, cyclists and buses.
Reading LTP3 (2011) - A transport system that enables people to move around easily, safely, sustainably and in comfort	The New Thames Crossing would facilitate a more freely moving transport network by relieving pressure on other parts of the Reading road network including the A4074, B3345, A4155 andA329/A329M.
OCC LTP4 (2015) - To support jobs and housing growth and economic viability	The New Thames Crossing will reduce journey times to and from employment centres and development areas.
SODC Core Strategy (2012) - Alternative river crossings need to be explored and SODC will continue to work with the local	The New Thames Crossing will bring benefits in relation to journey time improvements that would be experienced by commuters currently using the existing crossings with origins in Reading, South Oxfordshire and Wokingham. Therefore it will be in the interests of each of the Plan for

REGIONAL AND LOCAL TRANSPORT POLICY ASPIRATION	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
South Oxfordshire emerging Local Plan development options report TRANS1	improvements in the Reading area, including a proposal for a new River Thames crossing which provides demonstrable benefits for South Oxfordshire and which ensures that any traffic and environmental impacts of those measures do not result in an adverse impact' Please can this be referenced. Full document can be found at the following link: http://www.southoxon.gov.uk/services-and-advice/planning-and-building/planning-policy/local-plan-second-preferred-options-consul
WBC Core Strategy (2010) - To improve road infrastructure, maintenance and targeted improvements to the road network to improve traffic flow.	The New Thames Crossing will greatly reduce journey times on strategic routes of the Reading road network including the A4074, B3345, A4155, A4 and A329M. The reduction in congestion will also improve journey times for buses.

3.3 BUSINESS STRATEGY: REGIONAL TRANSPORT PRIORITIES

3.3.1 The TVB LEP submitted their Strategic Economic Plan (SEP) in March 2014, which outlines the case for necessary investment to infrastructure, enterprise and employment that is required for the Thames Valley regions economic growth. The plan states that the Thames Valley Berkshire (TVB) area is ranked second behind London for Business birth rate (12.4%) and in economic output per head which is valued at £32.8k. To maintain these standards continued investment in infrastructure is required.

3.3.2 The New Crossing is cited explicitly in the Thames Valley Berkshire Strategic Economic Plan (see p17) and in the SEP Implementation Plan, alongside Great Western electrification, extension of Crossrail to Reading, Western Rail Access to Heathrow, M4 Smart Motorway and, Heathrow Airport expansion.

3.3.3 In particular SEP states that the "biggest single risk to the future economic contribution of TVB Area concerns our transport and communications infrastructure" and that "the growth of our economy has been – and continues to be – fundamentally shaped by our connectivity".

3.3.4 The SEP goes on: "…the transport and communications infrastructure on which we rely is simultaneously a local, national and international resource. It is very congested. This in turn is threatening to undermine our intrinsic growth potential. It is therefore essential to invest in it and also to encourage local sustainable transport networks that promote active travel on foot, on bicycle and on public transport."

3.3.5 The Oxfordshire LEP Strategic Economic Plan (SEP) has recently been revised following public consultation in advance of Oxfordshire LEP finalising their new SEP. Oxfordshire's SEP is intended to be a widely-owned "economic route map" focused on supporting the economic performance, potential and prospects of Oxfordshire. Oxfordshire LEP recognises the economic importance of transport links within the Reading area and it states that the Oxfordshire LEP "recognises the extension of Crossrail to Reading, and Reading's role as an interchange hub for the Thames Valley". Therefore, the New Crossing east of Reading would be of economic value to the Oxfordshire LEP as it would improve access to Reading Station and Crossrail following the redistribution of private transport users and provision of a more free-flowing transport network, for people living in Oxfordshire.

3.3.1 An objective of the New Crossing is to reduce congestion associated with the existing Caversham and Reading bridges in central Reading, as well as Sonning bridge in Wokingham, and reduce

the journey times of thousands of commuters in the Reading urban area, Wokingham and South Oxfordshire. This will have economic benefits for the Thames Valley in terms of reduced congestion, improved employee productivity and a reduction in pollution associated with emissions. The New Thames Crossing will also provide improved access to key employment areas in east Reading such as the Thames Valley Business Park and Suttons Business Park.

3.3.2 The following identifies the key transport priorities for each of the stakeholders and shows how the New Crossing will contribute towards their success.

THAMES VALLEY STRATEGIC ECONOMIC PLAN (2015/16 – 2021)

3.3.3 Table 3-2 shows how the New Crossing will contribute to achieving TVB LEP's policies as set within the Thames Valley Berkshire Strategic Economic Plan (2015/16-2021).

Table 3-2 Summary of TVB LEP's Policies and the New Thames Crossing Contribution

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
Enhancing urban connectivity	The New Crossing will connect existing sections of the road network such as Thames Valley Park Drive, the A4 and the A3290 with the A4074 and Henley Road. This will enhance urban connectivity and relieve pressure on other sections of the road network such as the Reading and Caversham Bridges in central Reading and the Sonning Bridge East of Reading. This will enhance urban connectivity by improving journey times from South Oxfordshire and Caversham to Reading Railway station, improving access to rail journeys via Reading station.
Unlock housing development	The New Crossing will provide a direct and coherent route across the Thames Valley, linking Caversham and South Oxfordshire with the employment and residential areas in East Reading and Wokingham. This will reduce the daily commuting time for residents travelling in this area. More road space will be given to sustainable modes for walking, cycling and public transport which will encourage greater trips by these modes between proposed housing and employment locations, thus reducing the impact of new developments on the local highway network.
Encouraging vibrant town centres	The New Crossing is expected to reduce congestion in central Reading and on routes into Reading, enabling improved journey times to Reading town centre, and significant improvements to the reliability and effectiveness of public transport services to Central Reading from north of the River.' Improving access to town centres by bicycle will also have economic benefits, since it has been quantified that cycle users provide as much, if not more, spending power than car users in town centres[5]
Positioning TVB for a digital future	A reduction in congestion on the A4074, B3345, A4155 and A329/A329M will improve journey times between residential areas and employment sites, making the area more attractive for investment by new businesses in the high technology sector.
Foundations for future growth – housing, transport, utilities	The New Crossing will help to unlock future housing growth and provide an alternative, more sustainable route for new and existing residents to reach key destinations. The reduction in congestion on strategic routes into Reading and central Reading, will result in an economic benefit to the area due to commuters spending less time in traffic.

[5] Essential Evidence on a page: No 68 'Spend on high streets according to travel mode', Bristol City Council (Feb 2011) http://www.cycling-embassy.org.uk/sites/cycling-embassy.org.uk/files/documents/eev68.pdf

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
	The continued economic growth of Reading will also benefit from the continued development of an effective public transport system which needs to be freed from the current and growing levels of congestion caused by commuter traffic across the existing inadequate bridges and supporting road network.
Enhancing the strategic transport network	The provision of an alternative route into south Oxfordshire, Caversham and East Reading will result in a reduction in congestion on strategic routes into Reading and central Reading and a reduction in journey times on a variety of routes. The existing and developing strategic Thames Valley rail network is centred on Reading as its hub and access to this hub will be enhanced by the provision of effective park and ride and other improved public transport access via the New Crossing.

3.3.4 In addition to contributing towards meeting the policies set out in Table 3-2, the New Crossing will contribute to addressing the key issue identified by the Thames Valley SEP; that **Businesses need more road space**.

3.4 BUSINESS STRATEGY: LOCAL TRANSPORT PRIORITIES

3.4.1 The New Crossing is key to achieving the participating stakeholder authorities' local transport policy aspirations for: supporting jobs and housing growth and economic viability; enhancing urban connectivity; ensuring new development is accessible and sustainable; and providing a transport system that enables people to move around easily, safely, sustainably and in comfort.

READING LOCAL DEVELOPMENT FRAMEWORK CORE STRATEGY (2008)

3.4.2 The Reading Local Development Framework (LDF) Core Strategy sets out Reading Borough Council's adopted planning strategy for the Borough. It sets out how planning and development will achieve the Reading 2020 vision for the town and provides a framework for how Reading can grow in a sustainable way. The LDF Core Strategy was adopted in January 2008 and revised in January 2015.

3.4.3 Table 3-3 shows how the New Thames Crossing will contribute to achieving the Reading LDF Core Strategy's policies.

Table 3-3 Summary of Reading LDF Core Strategy and the New Thames Crossing Contribution

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
Ensure new development is accessible and sustainable	The New Crossing will ensure that the road network has sufficient additional capacity to reduce congestion and accommodate new developments. Therefore the New Crossing will improve the viability of new developments in Reading, as it will facilitate the need of future residents to reach employment centres. The New Crossing will allow space for reliable public transport on the new and existing bridges providing improved access to new developments in a sustainable way.
To provide an integrated planning and transport framework that will focus future development on the most sustainable locations, in line	Without a New Crossing the existing public transport network is constrained by the inadequate bridge and road network and severely affected by congestion peak times. The New Crossing will allow a

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
with the key principles.	sustainable network to be developed.
Development must have excellent access to effective and efficient public transport	The New Crossing allows the opportunity for through traffic to avoid the existing congested bridges and central Caversham and Reading, allowing the provision of efficient and effective bus services in these areas.
Improve and develop excellent transport systems to improve accessibility within Reading and for the wider area by sustainable modes of transport	Reading will experience improved access by sustainable travel modes - by reducing congestion, reducing pollution and as a result creating a more attractive road environment for cyclists. This is in addition to the benefits of reduced bus journey times and reduced journey times to Reading Rail station. Furthermore, bus service provision across the river will be enhanced and the New Crossing will connect with a new park and ride at TVP and connect directly to a new mass rapid transit scheme providing direct access into Reading town centre.
Measures to improve cross Thames Travel, which may include a bridge, which will be developed with adjoining authorities to provide alternatives for north-south movement across the river.	Reading and the surrounding areas will experience improved north-south movement across the River Thames and the congestion experienced on the Reading and Caversham bridges in central Reading and Sonning bridge will be relieved.

THE THIRD READING LOCAL TRANSPORT PLAN (2011)

3.4.4 The Reading Local Transport Plan 3 (LTP3) was adopted in April 2011 for the programme dating from 2011 until 2026. The Reading LTP3 details the transport objectives which support Reading Borough Council's vision and also recognise the wider issues signified by Reading's geographic position as a transport hub.

3.4.5 Table 3-4 shows how the New Crossing will contribute to achieving the policies of the Reading Local Transport Plan (2011 – 2026).

Table 3-4 Summary of the Reading LTP3 2011 - 2026 Policies and the New Thames Crossing Contribution

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
A transport system that enables people to move around easily, safely, sustainably and in comfort	The New Thames Crossing would facilitate a more freely moving transport network by relieving pressure on other parts of the Reading highway network including the A4074, B3345, A4155 and A329/A329M. The New Crossing would provide opportunities to develop an improved and more efficient public transport network using dedicated lanes on the New Crossing and the existing bridges.
To ensure that the transport network operates safely and efficiently to meet the needs of all users	Reading will benefit from a road network more resilient to incidents and closures. The improvement to north – south connections across the River Thames would ensure that the road network has more capacity to accommodate closures of Reading and Caversham bridges for maintenance, with less impact on the surrounding road network. The reduction in congestion levels could also reduce pollution levels in central Reading. The provision of new capacity for public transport will encourage greater use of the bus network to and from areas north of the river. This will

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
	reduce pollution and improve road safety for bus and other road users.
To improve journey times and journey time reliability	The New Crossing will reduce journey times on strategic routes of the Reading road network including the A4074, B3345, A4155 and A329M. The reduction in congestion would also improve journey times on buses. Improving journey times and the reliability of buses are critical to the provision of an effective and efficient public transport network which in itself is vital to the continued economic success of the town.
To identify and pursue opportunities to upgrade radial, orbital, regional and national connections that will secure local benefits	The New Crossing will improve connections to a variety of roads of regional importance including the A329/A329M,e M4 motorway, A4074 and A4155 and therefore the New Crossing will have regional and local economic benefits, providing people living in South Oxfordshire and east Reading with better connections to the wider region. The connectivity of the wider commuter area of South Oxfordshire to the rail hub at Reading Station will be improved as a result of the New Crossing freeing up capacity on the accesses to Reading Station.
To work with Wokingham Borough Council, South Oxfordshire District Council and Oxfordshire County Council to progress a third crossing of the River Thames	The New Crossing will result in social, economic and environmental benefits in various areas of Oxfordshire, Reading, Wokingham and Berkshire Councils, therefore it will be in the interests of all the appropriate local authorities to work together to develop the New Crossing.
High volumes of traffic dominate the environment, making these routes less attractive for pedestrians and cyclists, particularly in the peak periods.	The diversion of through car commuters to a more suitable purpose built crossing will allow existing bridges to have improved facilities for public transport, pedestrians and cyclists, and a reduction in the peak traffic levels across these bridges. The provision of dedicated space for cyclists across the New Crossing will encourage more sustainable travel choices across the river to the east of Reading such as commuting to TVP.

3.4.6 The New Crossing will also contribute towards solving a number of issues identified in the Reading LTP3 2011 – 2026:

- → Lack of Bridge Capacity or River Taxi service across the River Thames causes severance and connectivity issues for those wishing to travel between the north and central area
- → High volumes of traffic dominate the environment, making these routes less attractive for pedestrians and cyclists, particularly in the peak periods.

THE OXFORDSHIRE COUNTY COUNCIL LOCAL TRANSPORT PLAN (2015)

3.4.7 The Oxfordshire County Council Local Transport Plan 4 (LTP4) was adopted in 2015 for the programme period 2015 – 2031. It sets out the County Council's policy and strategy for developing the transport system in Oxfordshire to 2031.

3.4.8 Table 3-5 shows how the New Crossing will contribute to achieving the policies of the Oxfordshire County Council LTP4.

Table 3-5 Summary of Oxfordshire County Council "Connecting Oxfordshire" LTP4 Policies and the New Thames Crossing Contribution

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
To support jobs and housing growth and economic viability	The New Crossing will provide people living in Oxfordshire with improved access to jobs in Reading, Bracknell and the wider Thames Valley area. This would improve the viability of housing developments in south Oxfordshire as future residents would have improved access to employment.
Oxfordshire CC will continue to work with Berkshire Councils on the potential for additional river crossing capacity at Reading, taking into account the potential for impacts on the local road network from the increased traffic flow across the river.	The diversion of traffic between south Oxfordshire and the A329 M/ M4 to the New Crossing will provide relief from congestion on Sonning, Reading and Caversham bridges. The effects of this reduction of traffic on these parts of the local road network will be a significant benefit to congestion, the safety of pedestrians and cyclists and air quality.
Understand expected population growth in Berkshire and the impact that this would have on future demand across any potential bridge.	The New Crossing will relieve any additional strain on the Oxfordshire road network which is likely to occur from further population growth in Reading, as a result of Reading's continued economic growth.

THE SOUTH OXFORDSHIRE CORE STRATEGY (2012)

3.4.9 The South Oxfordshire Core Strategy was adopted in 2012 and sets out South Oxfordshire District Council's vision and policies for development in South Oxfordshire until 2027.

3.4.10 Table 3-6 provides a summary of the 2012 adopted Local Plan for South Oxfordshire District Council containing policies for development and how the New Thames Crossing will contribute to meeting these policies. These polices are going through the process of being updated as South Oxfordshire District Council are consulting on the options in the emerging local plan, new draft polices are available on the website at the following location http://www.southoxon.gov.uk/services-and-advice/planning-and-building/planning-policy/local-plan-second-preferred-options-consul

Table 3-6 Summary of South Oxfordshire Core Strategy Policies and the New Thames Crossing Contribution

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
Alternative river crossings need to be explored and SODC will continue to work with the local authorities on both sides of the river.	The New Crossing will result in social, economic and environmental benefits in various local authorities of Oxfordshire, Reading, Wokingham and Berkshire Councils, therefore it will be in the interests of all the appropriate local authorities to work together to develop the New Crossing.
Make sure that new development is accompanied by the necessary infrastructure for efficient and effective transport systems	The New Crossing will reduce journey times between residential centres in Oxfordshire and employment centres in Reading. Though the impact of the New Crossing on traffic flows in South Oxfordshire is forecast to be mixed, providing some relief in Henley but increasing traffic levels in Sonning Common, the New Crossing will improve the efficiency of the transport system in South Oxfordshire generally by reducing congestion on south-Oxfordshire links to Reading. This will make employment in Reading more accessible for people living at new developments in South Oxfordshire, should they choose to work

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
	in Reading.
Work with the authorities affected by cross Thames travel in the Reading area to ensure that traffic and environmental conditions in South Oxfordshire are improved by the implementation of measures which also improve access to Reading.	The reductions in traffic congestion on the existing bridges provided by the New Crossing gives the opportunity for improved public transport links from South Oxfordshire to Caversham and Reading helping to reduce the dominance of car commuting as the travel mode of choice from South Oxfordshire. This will improve the traffic and environmental conditions in the area.
Promote and support traffic management measures and environmental improvements which increase safety, improve air quality, encourage the use of sustainable modes of transport.	The diversion of traffic between south Oxfordshire and the A329m/M4 to the New Crossing will provide relief from congestion on Sonning, Reading and Caversham bridges. The effects of this reduction of traffic on these parts of the local road network will be a significant benefit to congestion, the safety of pedestrians and cyclists and air quality.
The council will work with Oxfordshire County Council and others to cater for the needs of all users.	The New Crossing will both improve connections for Oxfordshire and South Oxfordshire residents and improve the traffic and environmental conditions in surrounding areas such as Caversham, Reading and Sonning which will be freed from excessive and increasing car commuter congestion.
Major changes to the local network are focussed around south central Oxfordshire, Oxford and cross Thames issues in the Reading area. These are consistent with the overall strategy that focuses growth at Didcot and growth of the high tech economy.	The provision of the New Crossing has a potential to reduce journey times on the transport network between Didcot employment sites and the major residential area of Reading. The New Crossing may reduce journey times on the A4074 in particular, as a result of reduced congestion on the Reading and Caversham Bridges at the southern terminus of the A4074, which routes between Didcot and Reading.

3.4.11 Oxfordshire District Council Core Strategy also identifies that the capacity of river crossings form a barrier to movement, which the New Crossing would improve.

WOKINGHAM BOROUGH COUNCIL LOCAL DEVELOPMENT FRAMEWORK (LDF) CORE STRATEGY (2010)

3.4.12 The Wokingham Borough Council LDF Core Strategy sets out how the Borough will develop during the period to 2026 and how the council means to address deficiencies in vital infrastructure such as roads, schools, parks and community facilities.

3.4.13 Table 3-7 shows how the New Crossing will contribute towards achieving the policies of the Wokingham Borough Council LDF Core Strategy.

Table 3-7 Summary of Wokingham Borough Council's Policies and the New Thames Crossing Contribution

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
To improve the road infrastructure, maintenance and targeted improvements to the road network to improve traffic flow.	Wokingham Borough will experience an improvement in road capacity as a result of the construction of the New Crossing. The New Crossing would relieve pressure on roads of strategic importance between Reading and Wokingham Borough. The existing unsuitable road and bridge at Sonning would see particular relief from traffic congestion and improved air quality.

POLICY	HOW WILL THE NEW THAMES CROSSING CONTRIBUTE?
To encourage the provision of appropriate infrastructure, services and facilities that enable the borough's residents to achieve their potential.	Provision of dedicated cycling facilities across the New Crossing as well as reductions in congestion over Sonning bridge would encourage greater cycling and other forms of outdoor exercise improving wellbeing and health.
It is important that the council works with South Oxfordshire District, Oxfordshire County and Reading Borough to resolve issues associated with the capacities of the bridges across the River Thames.	The New Crossing will result in social, economic and environmental benefits in various areas of Oxfordshire, Reading, Wokingham and Berkshire Councils, therefore it would be in the interests of all the appropriate local authorities to work together to develop the New Crossing.
Measures to improve cross Thames travel which may include a bridge	Current travel options for cross Thames travel are severely restricted and heavily congested. The New Crossing frees up space on existing bridges for improved public transport access between Wokingham Borough and north of the river. The New Crossing provides direct car access avoiding the unsuitable Sonning bridge route.

3.5 PROBLEM IDENTIFIED

3.5.1 Based on surveys conducted in September-October 2015 the existing bridges within Reading carry high volumes of vehicular traffic, with Caversham Bridge accommodating four lanes of traffic and Reading Bridge three lanes. Caversham Bridge carries approximately 32,350 vehicles on an average weekday and approximately 28,550 vehicles on an average weekend day. Reading Bridge carries less flow with approximately 19,750 and 17,550 vehicles per average weekday and weekend respectively. Between Monday and Friday Sonning Bridge carries around a quarter of Reading and Caversham Bridge flow combined (approximately 13,000 vehicles per day and approximately 10,150 vehicles on an average Saturday or Sunday). The traffic flows are summarised in Table 3-8 and are further detailed in Appendix A.

Table 3-8 Average Traffic Flow on Thames River Crossings (October 2015), vehicles

LOCATION	AVERAGE WEEKDAY FLOW*	AVERAGE WEEKEND FLOW*
Caversham Bridge	32,350	28,550
Reading Bridge	19,750	17,550
Caversham and Reading Bridges combined	**52,100**	**46,100**
Sonning Bridge	13,000	10,150
All Bridges combined	**65,100**	**56,250**

** Flows are rounded to the nearest 50*

3.5.2 The analysis of mobile phone signals of people travelling across the Caversham and Reading Bridges shows that the two crossings predominantly carry local traffic. Sectors 25, 26, 27 and 28, which are graphically shown in Figure 3-1, mainly cover the urban area of Reading and combined account for approximately 60% of all the trips on the two bridges as detailed in Table 3-9.

3.5.3 This is followed by 8.6% of trips to and 9.5% of trips from sector 8, which covers a large area of South Oxfordshire. This equates to approximately 5,650-6,200 vehicles on an average weekday. The rest of the trips represent a mixture of long distance movements (from/to London, Oxfordshire, West Berkshire, etc.) and trips from different areas of Wokingham (Sonning, Twyford, Wargrave, Earley, Lower Earley and Winnersh).

Table 3-9 Average Traffic Flows on the Caversham and Reading Bridges (October 2015)

Sector Number	Distribution**		Estimated Average Weekday Flow*		Estimated Average Weekend Flow*	
	Trips From Sector	Trips To Sector	Trips From Sector	Trips To Sector	Trips From Sector	Trips To Sector
26	29.5%	26.5%	19,200	17,250	16,600	14,900
28	12.1%	13.6%	7,900	8,850	6,850	7,650
25	11.5%	11.5%	7,500	7,500	6,450	6,500
8	8.6%	9.5%	5,650	6,200	4,850	5,350
27	8.2%	7.8%	5,350	5,050	4,600	4,350
1	3.9%	5.1%	2,550	3,350	2,200	2,900
11	3.0%	2.4%	1,950	1,600	1,700	1,350
7	3.0%	2.7%	1,950	1,750	1,650	1,500
12	2.5%	3.6%	1,600	2,350	1,400	2,000
10	2.1%	2.1%	1,400	1,350	1,200	1,200
9	2.1%	2.5%	1,350	1,650	1,150	1,450
3	1.7%	1.2%	1,100	800	950	700
6	1.7%	1.6%	1,100	1,050	950	900
32	1.4%	1.6%	900	1,050	800	900
21	1.3%	1.1%	850	750	750	650
20	1.1%	1.1%	700	700	600	600
5	1.0%	0.9%	650	600	550	550

** Flows are rounded to the nearest 50 vehicles*

*** Areas generating less than 1% of trips have been excluded*

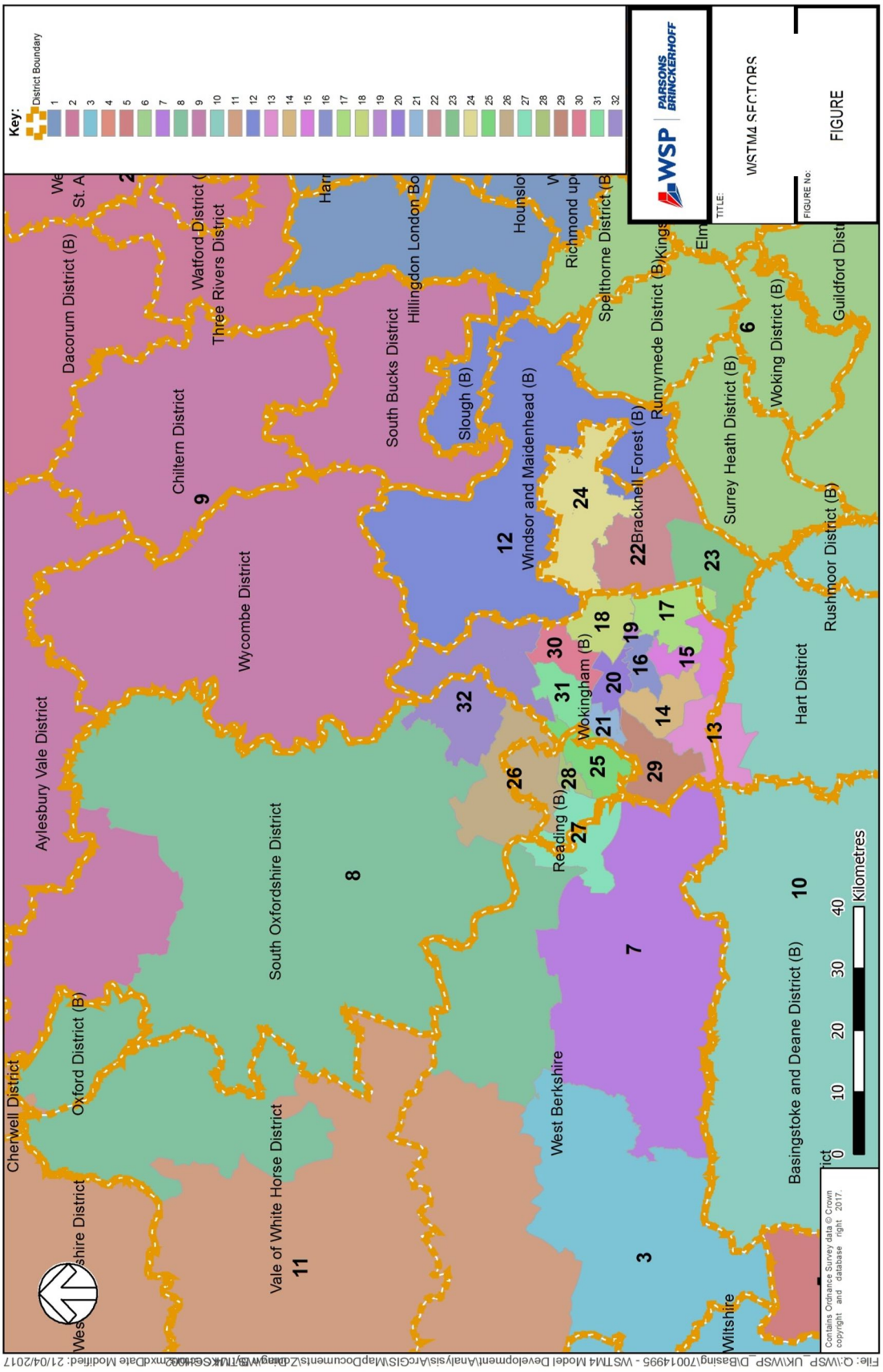


Figure 3-1 Sectoring (From Wokingham Strategic Transport Model, WSTM4)

3.5.4 Restricted capacity of current River Thames crossings has been a key challenge for resolution for almost 20 years. Solutions to this have been sought by various stakeholders since as early as 1998. A variety of studies and reports have been conducted into both the limited capacity of the existing crossings and potential solutions. The early reports, and studies conducted, include the following:

- Thames Valley Multi Model Study (TVMMS) Executive summary, Atkins (2003)
- Cross Thames Travel Study, Final Report TR (2002)
- PBA Cross Thames Report (October 2005)
- Northern Area P&R Report (2006)

3.5.5 These reports drew conclusions in relation to the following key issues:

- The River Thames acts as a natural barrier, causing severance and restricted opportunities for cross-river travel
- Severance and restricted opportunities have resulted in significant congestion issues, particularly at peak times
- Central Reading experiences high levels of congestion, especially during peak hours due to a lack of bridge capacity
- East Reading experiences high levels of congestion on the A3290/A329(M), Kings Road/London Road, Cemetery junction and the A4 London Road, due to lack of bridge capacity and congestion in Central Reading
- Saturation of capacity of the existing bridges has detrimental, negative effects on journey time, driver stress and local air quality. It also affects the ability to support sustainable economic growth
- Reading experiences poor air quality and is designated as an Air Quality Management Area (AQMA) as shown below in Figure 3-2 as a result of the pollution from congestion. NO2 levels rose on the Kings Road in east Reading during 2011, 2012 and 2013 as outlined in the Reading Borough Council Air Quality Progress Report for 2014.

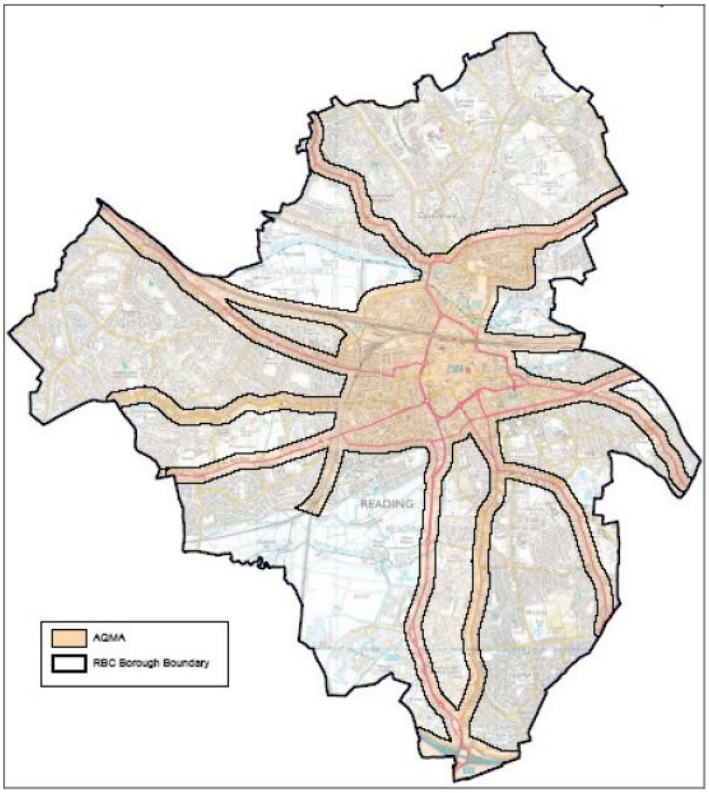


Figure 3-2 The Reading AQMA

3.5.6 The River Thames creates a significant severance issue in Berkshire due to the limited number of current river crossings. Along the section of the River Thames between Pangbourne and Henley there are only five vehicle bridges over a road distance of some 15 miles. The existing bridges are Pangbourne/Whitchurch, Caversham, Reading, Sonning and Henley. Within Reading town centre, only Caversham Bridge to the west and Reading Bridge to the east of the central area provide river crossing infrastructure.

3.5.7 Capacity is further reduced by the presence of weight and width restrictions in Pangbourne / Whitchurch and Sonning which results in greater demand for the Reading and Caversham Bridges from HGV traffic travelling north to south along Reading's Inner Distribution Road (IDR).Evidence to illustrate the existing levels of congestion within Reading and, in particular, within close proximity to the Caversham, Reading and Sonning bridges, is shown in Figure 3-3, Figure 3-4 and Figure 3-5 below.

3.5.8 Figure 3-3 has been produced using 2016 traffic data from Google Maps. It shows indicative speed data for a Tuesday at 6am, before the rush hours of 7am to 9am. The colours indicate the speed of traffic on the road:

- Green means there are no delays and traffic moves freely
- Yellow represents slower traffic conditions
- Red indicates congestion and dark red indicates nearly stopped or stop and go traffic.

3.5.9 Figure 3-3 shows relatively fast flow across the network, particularly in proximity to Caversham, Reading and Sonning Bridges. The data also shows some sections of roads and junctions where the traffic is starting to slow towards Reading town centre.

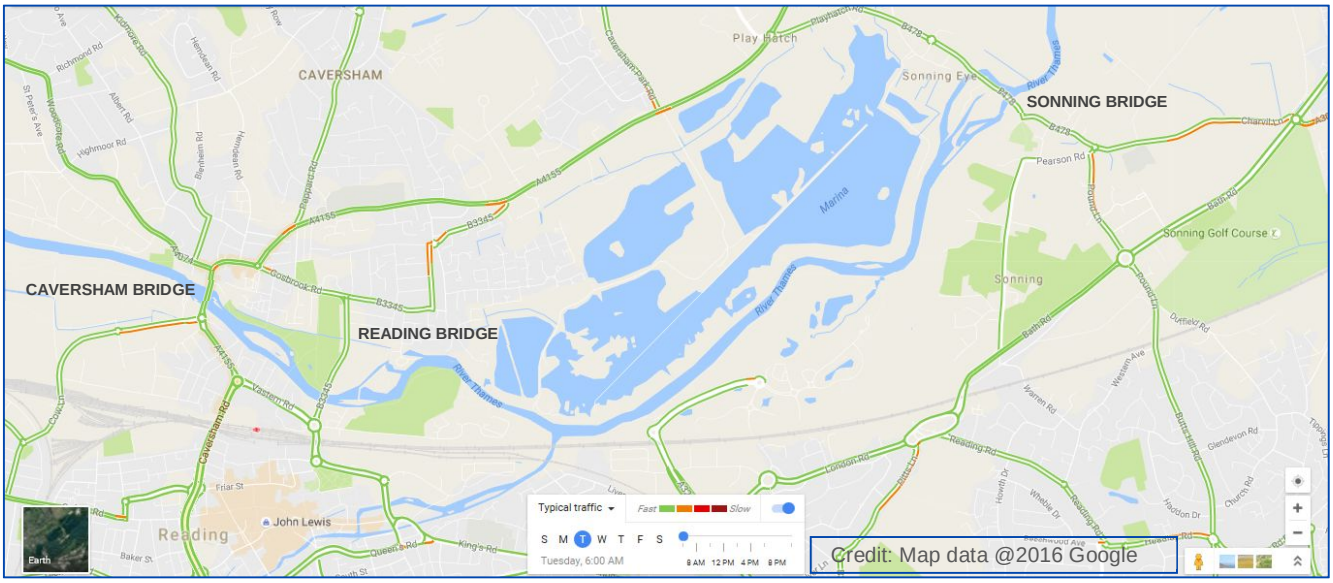


Figure 3-3 Traffic Speed Data: Typical Tuesday @ 6.00am (before AM Peak)

3.5.10 Figure 3-4 and Figure 3-5 also using 2016 traffic data from Google Maps, show indicative speed data for a Tuesday at 8:30am and at 17:30pm, i.e. during the morning and evening peak hours respectively. The links in areas around each of the bridges are now in the orange/red zone, indicating slower traffic speeds. This is particularly true for the Caversham Bridge area, which shows significantly slower traffic speeds.

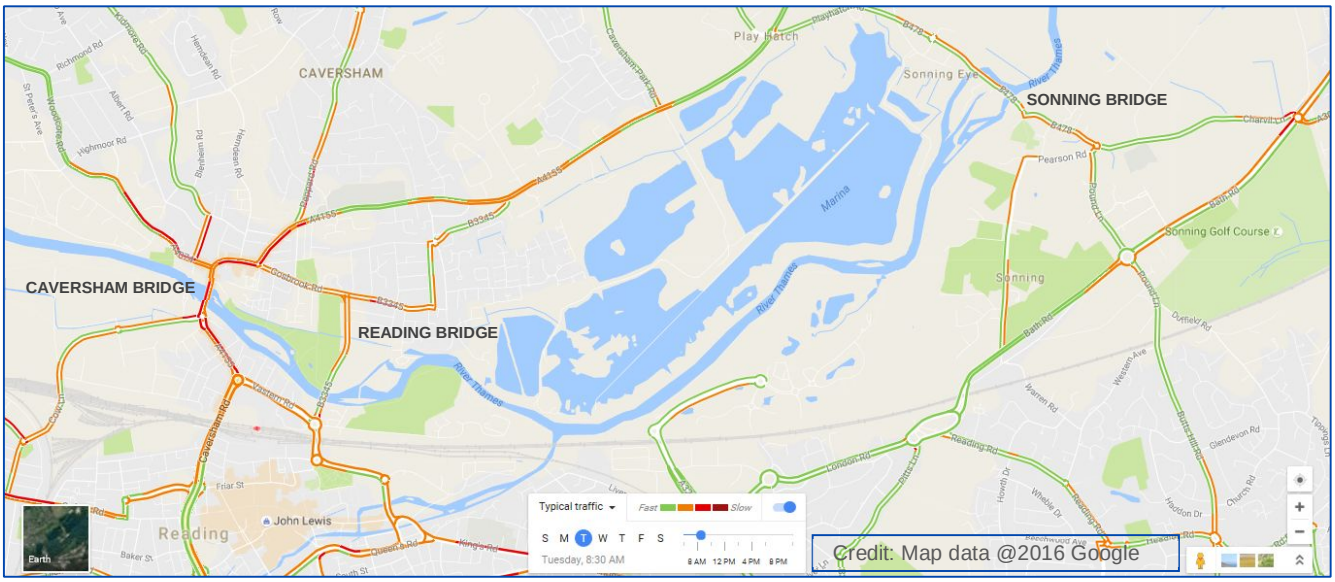


Figure 3-4 Traffic Speed Data: Typical Tuesday @ 8:30am (during AM Peak)

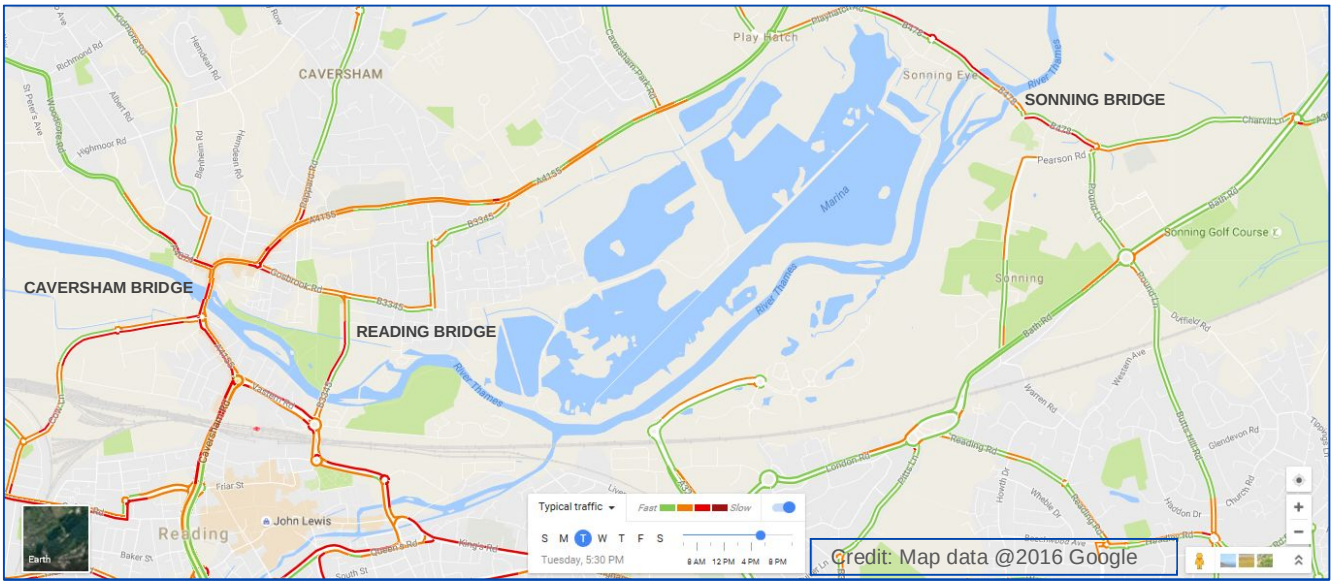


Figure 3-5 Traffic Speed Data: Typical Tuesday @ 17:30am (during PM Peak)

3.6 BACKGROUND OF SUPPORT

3.6.1 The New Crossing is part of a wider national and local commitment to improve the road network and reduce congestion at constrained locations. Stakeholder requirements identified in an early Option Appraisal Report (OAR)[6] suggest that there is demand for a New Thames Crossing to improve north to south connectivity between key residential and employment locations.

3.6.2 The Cross-Thames Travel Group (CTTG) comprises key Officers and Executives from the six main stakeholder groups (Reading Borough Council, Wokingham Borough Council, Oxfordshire County Council, South Oxfordshire County Council, TVB LEP and OxLEP). The remit of group is twofold:

- Officer Group – to work together to develop the scheme proposals to achieve the objectives with minimal impact on neighbouring authorities and to the environment
- Member Group – the decision making body.

3.6.3 The key supporters of the New Crossing are Reading Borough Council and TVB LEP, given that the existing River Thames crossings fall within their borough boundary and that key immediate issues associated with lack of river crossing capacity, congestion and poor air quality are felt most here.

3.6.4 Wokingham Borough Council is in full support of the scheme and the Wokingham Strategic Transport model (WSTM4) is being updated and utilised to model the impact of the New Crossing.

3.6.5 Oxfordshire County Council (OCC) and South Oxfordshire District Council (SODC) have their concerns, but since the northern part of the New Crossing will emerge within South Oxfordshire's boundaries, they are working with the CTTG to understand the impact of the New Crossing. The

[6] Peter Brett Associates (on behalf of the Cross Thames Steering Group), 2005, Cross Thames Travel Study

New Crossing is not a strategic priority for South Oxfordshire and it is not considered as important to the delivery of the Local Plan.

3.6.6 The key concerns of OCC and SODC are that a New Crossing will increase the number of trips in and around local settlements, having diverted from their original routes, causing congestion and increased waiting times at key junctions. Furthermore, the authorities have voiced concerns regarding the impact on planning constraints such as ecology, flood risk and landscape for example.

3.6.7 The New Crossing also has the personal interest of local MPs - The Rt. Hon. Theresa May MP, The Rt. Hon. John Redwood MP and Rob Wilson MP – and letters of support (previously submitted for the DfT's Large Local Major Transport Schemes funding application) are provided in Appendix C.

3.7 THE IMPACT OF NOT CHANGING

3.7.1 Table 3-10 demonstrates the importance of the New Crossing in helping each of the local authorities to address policy objectives and targets aimed at supporting jobs, housing growth and targeted improvements to the road network to improve traffic flow.

Table 3-10 Scheme Impact on Cross Boundary Policy Objectives

CROSS BOUNDARY POLICY OBJECTIVES	CAN THE POLICY BE ACHIEVED WITH THE NEW CROSSING?
To support jobs and housing growth and economic viability	✓
Enhancing urban connectivity	✓
Ensure new development is accessible and sustainable	✓
A transport system that enables people to move around easily, safely, sustainably and in comfort	✓
Resolve issues associated with the capacities of the bridges across the River Thames	✓
To improve road infrastructure, maintenance and targeted improvements to the road network to improve traffic flow	✓

Key: ✓ = will meet policy objective

3.7.2 The New Crossing will help to relieve congestion in central and east Reading by expanding the route choices and redistributing existing commuters using the Caversham and Reading Bridges. The New Crossing is fundamental to improving cross-Thames accessibility and improving journey times. This will facilitate a more free-moving transport network, unlocking the potential for further economic prosperity by improving the viability of planned development and the sustainable investment by employers throughout the area.

3.7.3 Providing a New Crossing will also enhance urban connectivity by reducing congestion in central Reading and reducing journey times between the Reading urban area, South Oxfordshire, Wokingham and Bracknell. A range of transport measures have been implemented in Reading in order to enhance connectivity, including the expansion of Reading railway station, the Ready Bike hire scheme and the implementation of park and ride schemes at Mereoak, the Madejski Stadium and Winnersh Triangle. These measures have had significant success in encouraging local commuters to travel using sustainable travel modes instead of travelling by car. However, the implementation of these measures has not been able to sufficiently relieve pressure on the Reading bridges and reduce congestion in central Reading. Therefore, the New Crossing is

required to achieve the policy of enhancing urban connectivity in both Reading and the surrounding areas of South Oxfordshire and Wokingham.

3.7.4 Without the proposed New Crossing, the local authorities would not achieve their policy objectives to ensure that new development is accessible and sustainable, create a transport system that enables people to move around easily, safely, sustainably and in comfort and resolve issues associated with the capacities of the existing bridges across the River Thames.

3.7.5 In addition, with nearly 36,000 new homes planned for development within the wider study area, if no alternative crossing or alternative route for sustainable travel is provided then a significant amount of pressure will be placed on the existing highway network and bridges resulting in increasing levels of congestion. This will negatively impact economic growth and cause increased levels of pollution and driver stress, not only for people living and working within Reading Borough, but for those within South Oxfordshire and Wokingham either working in Reading or travelling through to other destinations.

3.8 KEY OBJECTIVES

3.8.1 The New Crossing will derive a range of environmental and economic benefits including:

- Congestion relief across and in the locality of the existing bridge crossings, freeing up capacity for other road users
- Greater opportunity for increasing pedestrian, cycle and public transport connections to deliver positive modal shift and to support sustainable economic growth
- Reduced and more reliable journey times
- Providing greater choice for trips across the River Thames
- Overall improved air quality across the network affected by the New Crossing
- Improved resilience of the road network to flooding due to reduced demand for Sonning Bridge

3.8.2 A key concern for South Oxfordshire DC, supported by Oxfordshire CC, is the possible impact to local traffic congestion in South Oxfordshire and the negative impact on the environment including, for example, ecology, flood risk and landscape, which may be affected as a result of the New Crossing. Key additional objectives specifically identified for South Oxfordshire are:

- That the New Crossing has as few negative impacts as possible
- As little increase as possible in traffic congestion (waiting times at key junctions, etc.) in and around local settlements, e.g. Sonning Common, Binfield Heath and Shiplake
- Mitigation measures for any potential increase in traffic through South Oxfordshire to be included within the overall scope of the New Crossing scheme
- Avoiding impact to ecological resources and not increasing any other risks such as flood risk and creating as little impact to visual amenity as possible

3.8.3 The concerns of South Oxfordshire DC will be considered and mitigated during the development of the New Crossing.

3.9 MEASURES OF SUCCESS

3.9.1 The following specific outcomes are expected upon completion of the New Crossing, and can be used as a measure of its success:

- Opportunity of the key stakeholders to achieve key policy objectives

- Journey time savings and journey time reliability
- An increase in public transport and sustainable mode of travel use for cross-Thames trips
- An improvement in local air quality
- Maintaining the level of economic activity and delivery of the allocated housing numbers.

3.10 CONSTRAINTS – INITIAL FINDINGS

3.10.1 The guidance[7] for preparing a Strategic Outline Business Case requires the initial findings with regards to project "constraints", i.e. high level external/internal constraints that might include consideration of capability to deliver in-house or major contracts with providers etc. A full assessment is required in the next stage for an Outline Business Case. This is also the case for the following sections on Inter-dependencies, Stakeholders and Options appraisal.

3.10.2 The initial findings with regards to constraints associated with the delivery of the New Crossing are detailed below:

- Cross-boundary collaborative working
- Securing funding, and
- Environmental constraints

CROSS-BOUNDARY COLLABORATIVE WORKING

3.10.3 All the Local Authorities have committed to working collaboratively regarding Cross-Thames Travel issues as detailed in their policies, which have been summarised in Section 3.2.

3.10.4 The SODC Core Strategy (2012) states that "alternative river crossings need to be explored and SODC will continue to work with the local authorities on both sides of the river".

3.10.5 The Reading LDF Core Strategy states that they will support "measures to improve Cross-Thames-Travel, which may include a bridge, which will be developed with adjoining authorities to provide alternatives for north-south movement across the river".

3.10.6 In the Oxfordshire LTP4, OCC state that they will "continue to work with Berkshire Councils on the potential for additional river crossing capacity at Reading, taking into account the potential for impacts on the local road network form the increased traffic flow across the river".

SECURING FUNDING

3.10.7 A constraint which has restricted capability to deliver the project has been securing funding. Funding was previously secured through the Transport Innovation Fund (2009) – which secured Government Funding for the 'Third Thames Crossing'. This funding was subsequently rescinded when the Transport Innovation Fund was abolished and replaced by the urban challenge fund in March 2010.

ENVIRONMENTAL CONSTRAINTS

3.10.8 Peter Brett Associates (PBA) were appointed by WBC to provide advice on the likely environmental constraints which may affect the New Crossing.

[7] DfT, The Transport Business Cases, January 2013

3.10.9 Appendix D to Appendix H provide detailed assessment of several environmental disciplines which have informed the DfT's TAG appraisal. These also discuss the potential for environmental effects to be mitigated through an informed design and appropriate mitigation measures.

3.10.10 The initial assessment identified that key environmental constraints include:

- Landfill to the south of the New Crossing, and
- The crossing's proximity to highly sensitive controlled waters and underlying groundwater in direct continuity with the River Thames.

3.10.11 PBA recommend that consideration should to be given to the water environment in the development of a New Crossing in order to include mitigation embedded within the design. However, PBA have also concluded that these constraints would not preclude development at the preferred location and that the effects would be able to be mitigated to either minor adverse or negligible.

3.11 INTER-DEPENDENCIES – INITIAL FINDINGS

3.11.1 Through discussion with the key stakeholders it is anticipated at this stage that any factors affecting successful delivery of the New Crossing will be minimal. At this early stage, possible factors include additional highway works and junction improvement works to the north side of the bridge where it will link in with A4155 Henley Road and Caversham Park Road junction.

3.11.2 Initial findings with respect to scheme risks and risk mitigation are considered in greater detail as part of the Management Case (Chapter 7). The successful delivery of the New Crossing is dependent on these risks either not arising or being sufficiently mitigated so that the scheme remains unaffected. A full assessment of risk and mitigation is required for the next Outline stage of business case preparation.

3.12 PARTNER ORGANISATIONS AND STAKEHOLDERS – INITIAL FINDINGS

3.12.1 The stakeholders comprise the local authorities which the New Crossing passes through and who are contributing to the Strategic Outline Business Case funding:

- Reading Borough Council
- Wokingham Borough Council
- South Oxfordshire District Council
- Oxfordshire County Council
- The Thames Valley Berkshire Local Enterprise Partnership (TVB LEP)
- Oxfordshire Local Enterprise Partnership (OxLEP).

3.12.2 Other key stakeholders include local MP's, local councillors, local businesses and local resident groups. As the plans for the New Crossing emerge and should the decision be taken to proceed to an Outline Business Case, appropriate levels of consultation will be programmed and undertaken with each of the stakeholder groups.

3.12.3 Joint working at officer level is conducted through the CTTG, and regular engagement with senior Councillors and MPs: Theresa May (Maidenhead) and Rob Wilson (Reading East) on the south bank and John Howell (Henley) on the north bank.

3.13 OPTIONS APPRAISAL – INITIAL FINDINGS

LOCATION OPTIONS

3.13.1 A substantial amount of development work has been undertaken to identify suitable locations for the New Crossing. The reports detailed in paragraph 3.5.4 identified three key options which were considered in high-level planning terms and assessed in relation to environmental, engineering, transport modelling and planning constraint.

3.13.2 The options are shown on Figure 3-6 and described below:

- Option 1: Western Option, between A4074 (north) to Oxford Road (south);
- Option 2: Central Option, between A4155 (north) to Thames Valley Park (south); and
- Option 3: Eastern Option, between A4155 (north) to Sonning A4 (south).

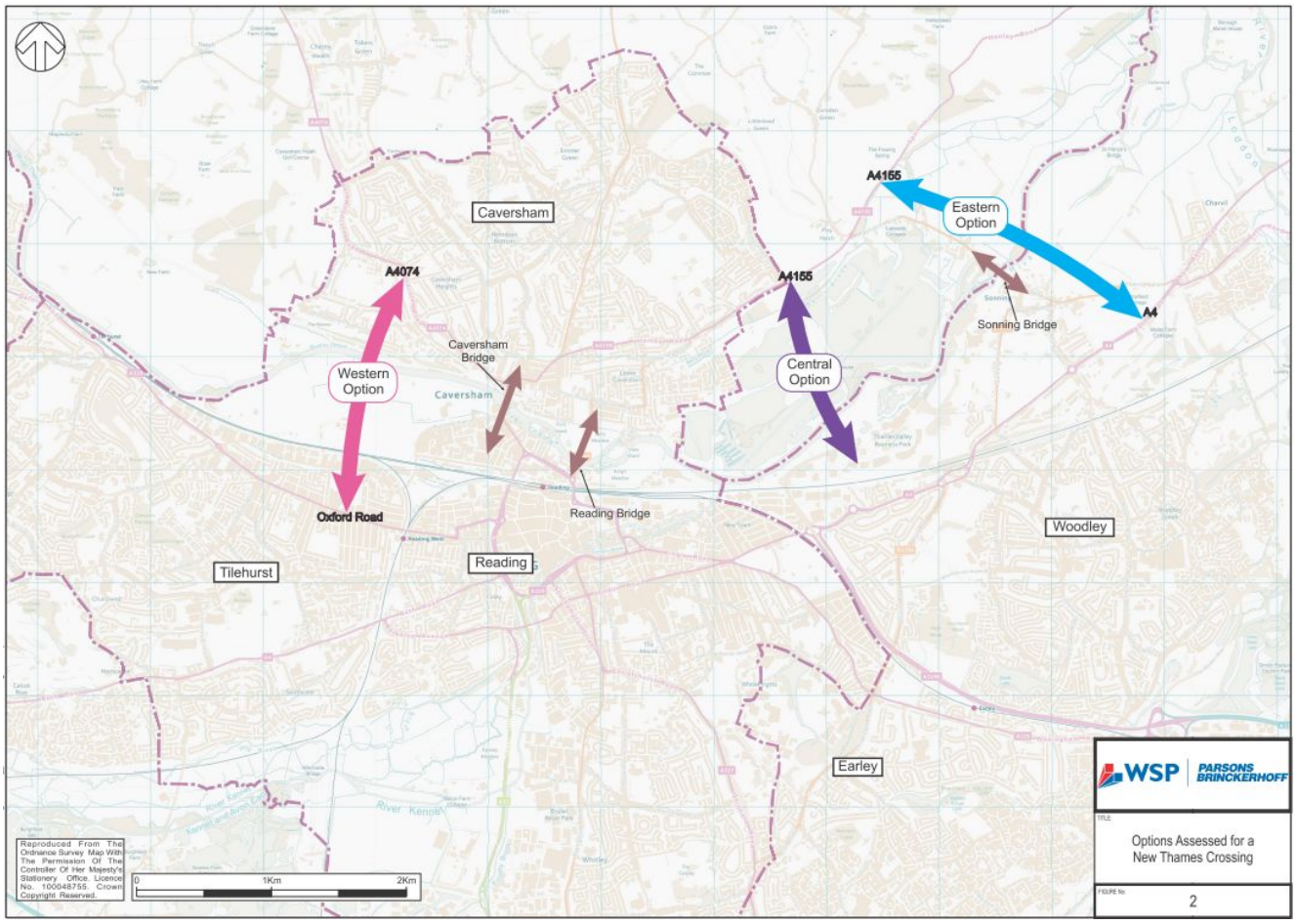


Figure 3-6 Options Assessed for the New Thames Crossing East of Reading

3.13.3 A high-level appraisal of each of the three options was undertaken as part of the Options Review. The planning, environmental and engineering reviews concluded that Option 2 reflected the preferred option. The appraisal was carried out having regard to function and deliverability, looking at the main issues concerning planning, environmental, engineering and transport issues:

- Planning Constraints: review of planning policies, land designations and constraints to establish implications

- Environmental Issues: preliminary review of potential impacts in terms of material assets, biodiversity, water and soil, air and potential effects on human health
- Engineering: assessment of the likely highway improvements required to connect a bridge crossing to the current highway
- Transport modelling: of each crossing scenario and associated highway alterations.

3.13.4 The two options that were ruled out as a result of the previous option testing work were:

- Option 1: Western Option, between A4074 (north) to Oxford Road (south)
- Option 3: Eastern Option, between A4155 (north) to Sonning A4 (south).

3.13.5 Option 1 was the subject of further consideration, but was dismissed due to the following reasons:

- Extensive property CPOs required
- Extensive property demolition
- Route passes through an Area of Outstanding Natural Beauty
- Route draws traffic through an urban area.

3.13.6 Option 3 was also dismissed in consideration of the following:

- Route passes through a number of conservation areas including Sonning Village
- Longest route length at 3km, with associated high costs.

3.13.7 The benefits of Option 2: Central Option, compared to Options 1 and Option 3 are:

- Route does not pass through any designated areas
- Shortest route length required at approx. 1.5km (Option 1: 2.8km; Option 3: 3km)
- Lowest cost of construction
- Offers the overall highest and most balanced increase in usage across the River Thames for the peak hours (8am-9am and 5pm-6pm).

3.13.8 Since the production of these early studies, three further major studies have been undertaken regarding a new crossing to the east of Reading town centre (referred to as the Central Option):

- Options Review (2005) - established the preferred location of the crossing at Thames Valley Park (TVP)
- Berkshire Strategic Transport Capacity Building Project (2007) - provided a refresh and an update of the TVP crossing option for liaison with the Berkshire Unitary Authorities
- Transport Innovation Fund (2009) - secured government funding for the TIF project which included the Thames River Crossing; however funding was subsequently removed when the TIF was rescinded.

3.13.9 The Options Review (2005) established that the preferred location for a crossing was between the Thames Valley Park Drive in east Reading and the A4155 Henley Road/Caversham Park Road junction, north of the river. The New Crossing would extend for a distance of one mile across the River Thames and the Caversham Lakes. The bridge element would span from Sherriff's Boathouse to the south bank of the River Thames. The current proposal is that the New Crossing will support a single carriageway road with segregated bus lanes, footways and cycleways. This was established as the preferred configuration.

PROPOSED NEW THAMES CROSSING EAST OF READING

3.13.10 The alignment of the New Crossing is shown in Figure 3-7. The proposed crossing departs from the roundabout junction on the edge of Thames Valley Park and heads north across the water meadow flood plain, crossing the channel of the River Thames on a skew as the road bends to the north west. The road then crosses an intermediate peninsular before crossing the expanse of the Redgrave Pincent Rowing Lake. It then descends to ground level and follows the line of the existing access road until it joins with the A4155 Henley Road at the junction with Caversham Park Road.

3.13.11 A bridge structure span arrangements are anticipated to involve a viaduct of shorter spans across the water meadows, a clear span of the River Thames, two intermediate spans across the peninsular, a clear span over the rowing lake and a final span as the deck returns to ground level on the north. Maximum headway over the River Thames is expected to be no more than the next bridge up stream (George Street) in Reading, which is approximately 5.4m. Maximum span lengths are expected to be circa 120-130m over the River Thames and the rowing lake, with an overall bridge structure length including approach spans of approximately 700m.

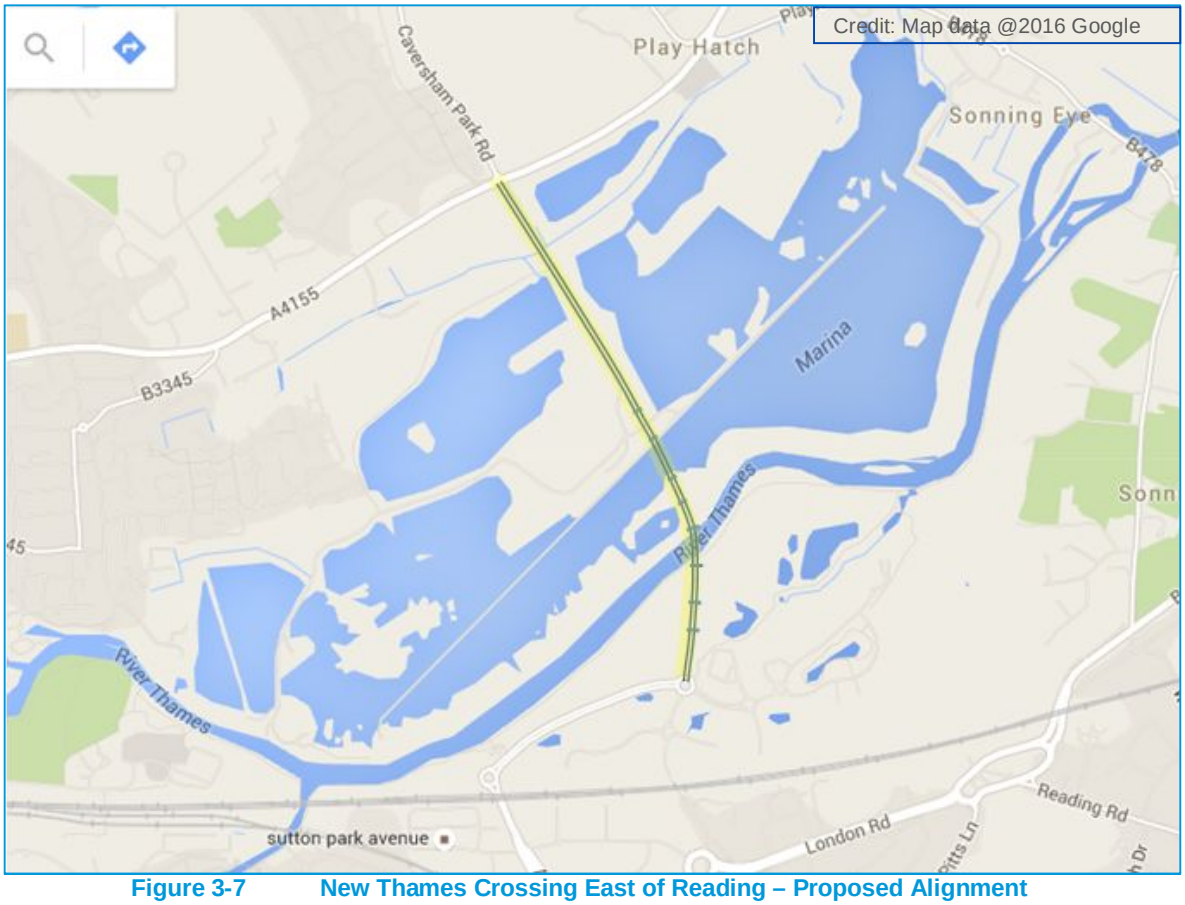


Figure 3-7 New Thames Crossing East of Reading – Proposed Alignment

3.13.12 Table 3-11 identifies the key infrastructure elements for the New Crossing, taken from previous design work undertaken by PBA in 2007. There has been no update / review of the design more recently and so the detail in Table 3-11 should be considered to be indicative.

Table 3-11 Summary of Key Infrastructure Requirements for the New Thames Crossing East of Reading

CROSSING SECTION	KEY INFRASTRUCTURE ELEMENTS
A4155 Henley Road / Caversham Lakes junction	New signalised junction for the A4155 Henley Road / Caversham Lakes / Caversham Park Road junction
Caversham Lakes Road (800m)	Widening and resurfacing of current carriageway to accommodate shared footways/cycleways and bus lanes.
Redgrave – Pinsent Rowing Club to the south bank of the Thames (500m)	Construction of 500m Bridge from Redgrave Pinsent Rowing club to the south bank of the River Thames at the Thames Valley Business Park.
South bank of the River Thames to TVP Roundabout (300m)	Construction of a new road with shared footway / cycleways and bus lanes.
Thames Valley Park Drive roundabout	Connection of the New Crossing to the Thames Valley business park roundabout, creating a 4th arm.
Thames Valley Park Drive	Traffic management improvements.
London Road Junction	Junction improvements.

3.13.13 Should it be agreed that the New Crossing will be taken to Outline Business Case, the current proposals will be reviewed and a more detailed design will be developed to more accurately inform the development of the scheme and individual project costs. The various elements of the New Crossing are shown on Figure 3-8.

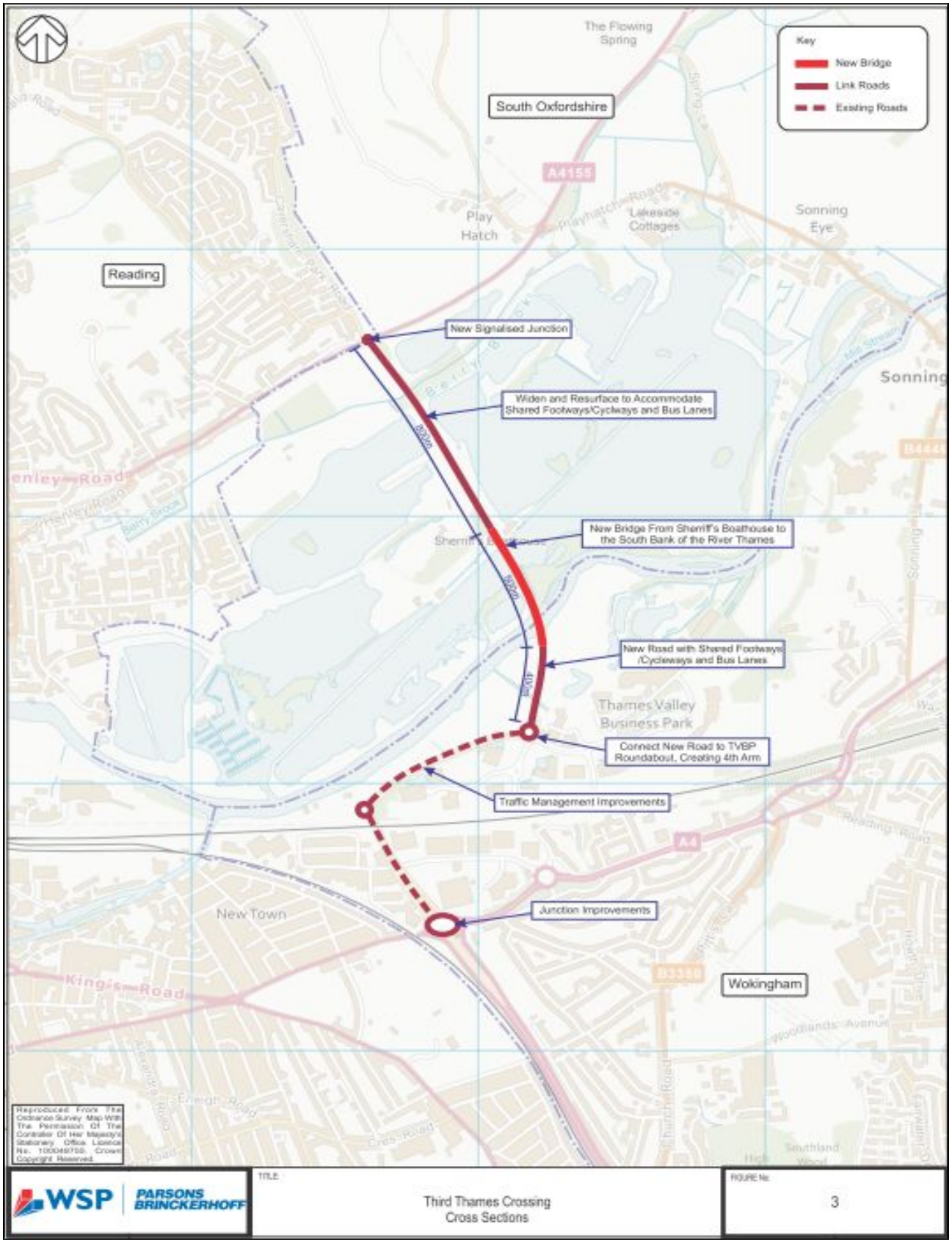


Figure 3-8 Elements of the New Thames Crossing East of Reading

4 ECONOMIC CASE

4.1 INTRODUCTION

4.1.1 An assessment of the economic case is undertaken to ensure that all features of the scheme are assessed and that they fulfil the Treasury's requirements for appraisal and demonstrating value for money (VfM). The economic appraisal has been carried in accordance with Treasury Green Book and DfT's TAG. The outputs from the appraisal are presented in the form of an Appraisal Summary Table (AST) and supporting documents further in this section and Appendix I.

4.2 OPTIONS APPRAISED

4.2.1 It has been requested by the Cross-Thames Travel Group that the following three crossing options are considered in the assessment:

- Option 1: assumes a single two-lane carriageway crossing and associated improvements at the A4155 Henley Rd / Caversham Park Rd signalised junction in the north and the Thames Valley Park Drive roundabout in the South
- Option 2: based on Option 1 but it also assumes that an electronic tolling system will be in place with a single journey crossing charge being:
  - Cars - £2
  - LGV - £3
  - HGV - £6
- Option 3: This is a public transport package option, which assumes a dual four-lane carriageway crossing (two lanes each way with one lane dedicated to buses only), conversion of one of the existing southbound lanes to a tidal flow bus lane on Reading Bridge, East Reading Mass Rapid Transit route and P&R to north Reading.

4.3 APPROACH TO ASSESSING VALUE FOR MONEY / ASSUMPTIONS

4.3.1 The approach to assessing VfM is largely determined by the nature of the problems and opportunities being addressed and the benefits that accrue to the scheme as a result. The New Crossing is expected to produce economic benefits across a range of areas, including:

- Reduced journey times, operating costs and accidents
- Environmental impact benefits
- Reliability benefits for road users
- Accessibility benefits for pedestrians and cyclists
- Wider Economic benefits.

4.3.2 For the SOBC only the benefits in the first category have been assessed. A modelling suite and supporting processes have been designed to report benefits across these areas:

- Wokingham Strategic Transport Model (WSTM4)
- Transport User Benefit Appraisal (TUBA) model 1.9.7
- Cost and Benefit to Accidents – Light Touch (COBALT) model version 2013_02.

EVIDENCE BASE

4.3.3 The Wokingham Strategic Transport Model 4 (WSTM4) has been used as the basis for the scheme assessment. The base year of the WSTM4 is 2015 and the forecasts were completed for 2026. The models have been developed to represent average weekday AM peak hour (08:00 - 09:00), Inter peak hour (average 10:00 – 16:00) and PM peak hour (17:00 - 18:00).

4.3.4 WSTM4 consists of the following sub-models:

- Highway model
- Public Transport (PT) model
- Variable Demand Model (VDM)

4.3.5 The WSTM4 fully modelled area is bounded by the M40 in the north, by the M25 in the east, by the M3 in the south and by the A339 and A34 in the west. The area has been chosen to build a traffic model that covers a sufficient area to accurately model the reassignment and redistribution effects that are likely to be produced by the New Crossing.

4.3.6 The model development has followed the guidance provided in the DfT's TAG with the base year model validated to a high degree of accuracy. The model development is fully described within the following documents:

- WSTM4. Data Collection Report (February 2017)
- WSTM4. Local Model Validation Report (February 2017)

4.3.7 The approach to forecasting is provided within:

- New Thames Crossing East of Reading Forecasting Report, May 2017.

4.3.8 Car and public transport growth was obtained through the use of TEMPRO, a software tool that provides projections of growth over time for use in transport models based on outputs from the National Trip End Model (NTEM). The NTEM dataset represents the Department's standard assumptions about growth in demand. The NTEM dataset makes no assumptions about whether or not individual developments go ahead. For example, the NTEM dataset takes no account of whether the Chalgrove Airfield site for new 3,500 homes north-west of Henley-on-Thames will be built or not. The spatial distribution of travel demand requires consideration of local uncertainty in a form of a site-by-site assessment in the area of detailed modelling. The probability of each site being built will be considered through development of an uncertainty log should the scheme is progressed to the Outline Business Case stage.

IMPACT OF THE NEW CROSSING

4.3.9 The New Thames Crossing East of Reading Forecasting Report (May 2017) provides an analysis of the impact of the scheme proposals upon the transport network assessed in terms of:

- Traffic flows and flow differences on key links and across a selection of screenlines
- Journey time performance on selected routes.

4.3.10 All options provide a reduction in the level of traffic on each of the existing bridges in Reading as well as the Sonning Bridge. The introduction of the New Crossing is forecast to attract traffic to the A3290 predominantly on the section between the M4 J10 and the Thames Valley Park (TVP) roundabout resulting in increases in journey times along the A3290. The journey times are also likely to increase on the A4155 Henley Road as extra vehicles are drawn into the area attracted by the new river crossing. Despite the journey time increases on these two routes the scheme is estimated to bring reduced travel times across a wider network.

4.3.11 The new river crossing is likely to generate new trips as well as attract traffic from a wider area currently using existing Thames river crossings between Goring and Henley-on-Thames. Option 1 (two-lane crossing) is estimated to attract 2,231 vehicles in the AM peak hour and around 2,511 vehicles in the PM peak hour. Option 2 (four-lane crossing with enhanced public transport provision) is predicted to attract slightly less traffic than Option 1: 2,197 and 2,001 vehicles in the AM peak and PM peak correspondingly. Option 3 (toll option) is likely to attract the least number of people with the demand reaching 678 vehicles in the AM peak and 466 in the PM peak hour.

4.3.12 An increase in HGV movements through the Thames crossings across a wider area is marginal and is unlikely to exceed 20 vehicles with the highest increased forecast for Option 3, PM peak. However, individual links may show relatively high increases in HGV volumes e.g. the A3290.

4.3.13 The roads in South Oxfordshire crossed by the screenline shown in Figure 4-1 are predicted to carry less traffic across all options apart from the evening peak movement in Option 2 as summarised in Table 4-1 for Option 1, Table 4-2 for Option 2 and Table 4-3 for Option 3. The reduction may be due to longer distance traffic diverting away from the area with the road capacity in Reading taken by more local vehicles diverting to the New Crossing from the existing Thames river crossings between Goring and Henley-on-Thames.

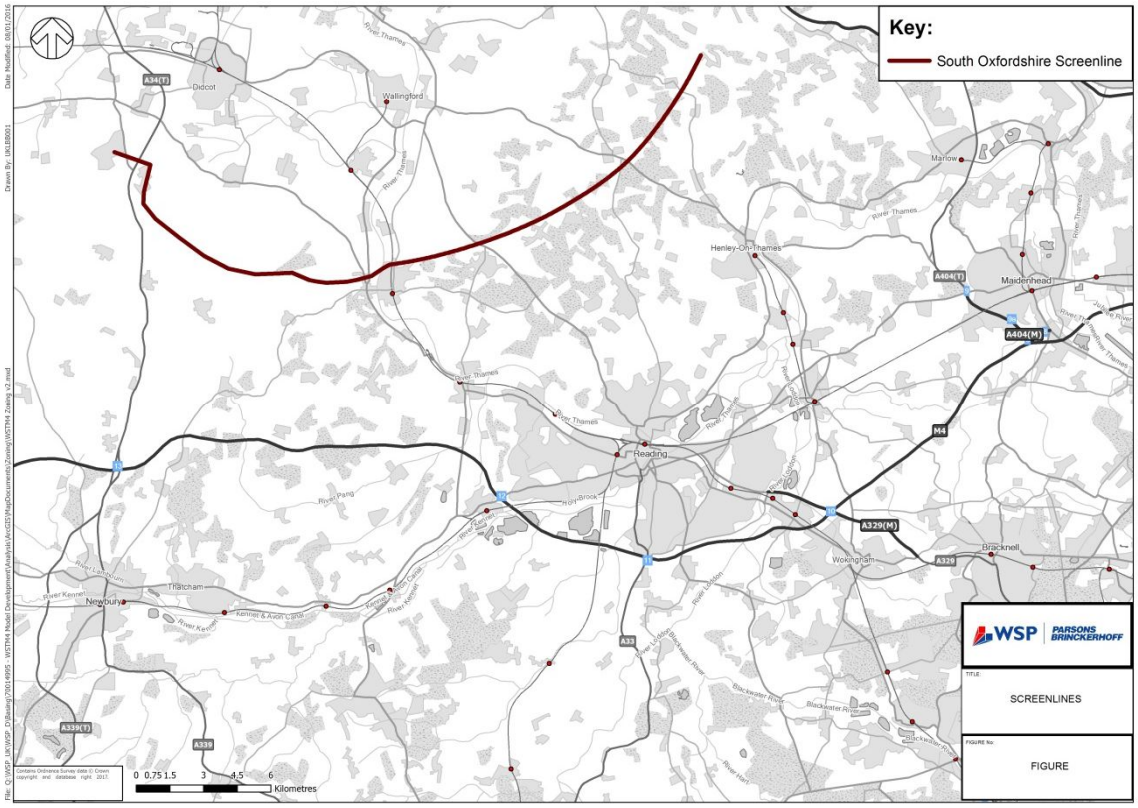


Figure 4-1 South Oxfordshire screenline for traffic flow analysis

Table 4-1 Flow changes across South Oxfordshire screenline. Option 1

			2015	Option 1 No scheme	Option 1 with scheme	'with scheme' minus 'no scheme'	
AM							
SL6	South Oxfordshire	SB	4,446	4,824	4,735	-89	-1.8%
SL6	South Oxfordshire	NB	4,437	5,024	4,936	-87	-1.7%
IP							
SL6	South Oxfordshire	SB	2,933	3,292	3,292	0	0.0%
SL6	South Oxfordshire	NB	2,976	3,377	3,366	-11	-0.3%
PM							
SL6	South Oxfordshire	SB	4,720	5,205	5,176	-29	-0.6%
SL6	South Oxfordshire	NB	4,487	4,885	4,856	-29	-0.6%

Table 4-2 Flow changes across South Oxfordshire screenline. Option 2

			2015	Option 2 No scheme	Option 2 with scheme	'with scheme' minus 'no scheme'	
AM							
SL6	South Oxfordshire	SB	4,446	4,824	4,800	-24	-0.5%
SL6	South Oxfordshire	NB	4,437	5,024	5,007	-16	-0.3%
IP							
SL6	South Oxfordshire	SB	2,933	3,292	3,289	-3	-0.1%
SL6	South Oxfordshire	NB	2,976	3,377	3,367	-10	-0.3%
PM							
SL6	South Oxfordshire	SB	4,720	5,205	5,230	25	0.5%
SL6	South Oxfordshire	NB	4,487	4,885	4,902	17	0.3%

Table 4-3 Flow changes across South Oxfordshire screenline. Option 3

			2015	Option 3 No scheme	Option 3 with scheme	'with scheme' minus 'no scheme'	
AM							
SL6	South Oxfordshire	SB	4,446	4,824	4,689	-136	-2.8%
SL6	South Oxfordshire	NB	4,437	5,024	4,893	-131	-2.6%
IP							
SL6	South Oxfordshire	SB	2,933	3,292	3,277	-15	-0.5%
SL6	South Oxfordshire	NB	2,976	3,377	3,314	-63	-1.9%
PM							
SL6	South Oxfordshire	SB	4,720	5,205	5,180	-25	-0.5%
SL6	South Oxfordshire	NB	4,487	4,885	4,785	-100	-2.0%

4.3.14 Despite the overall reduction in traffic along the South Oxfordshire screenline, some roads forming the screenline are forecast to show a reduction in traffic whereas others show an increase. The changes are detailed in Appendix B. In absolute terms the differences are relatively low and range between -71 vehicles (B481 between A4130 and Rotherhithe Street, AM peak, Option 3, Southbound) and 34 vehicles (A4074 Red Lane between B471 and Icknield Rd, PM peak, Option 1, Eastbound).

4.3.15 The variations in traffic flows on South Oxfordshire roads are more noticeable in areas located closer to the New Crossing. The scheme is forecast to result in a reduction in traffic on the routes to, from and through Henley-on-Thames, particularly along the A4155 just south of the railway station reaching their highest in AM in Option 1 (-152 vehicles in the northbound direction and -128 vehicles in the southbound direction).

4.3.16 The impact of the New Crossing on roads in Sonning Common is mixed with some routes are forecast to show an increase in traffic and with others to show a reduction in traffic. The changes vary across different options and time peaks and are detailed on the figures included within Appendix B to Appendix D of the Forecasting Report. To provide an indication of the level of changes, AM Option 1 flow changes around Sonning Common are forecast to range between -17 and 60 vehicles and PM Option 1 flows changes range between -27 and 41 vehicles.

4.3.17 There is no evidence to suggest that the New Crossing may attract longer distance strategic movements from M40 and M4 to South Oxfordshire highway network.

KEY APPRAISAL ASSUMPTIONS

4.3.18 The options have been appraised using the methodologies recommended by the DfT's TAG for Transport Schemes and Treasury's Green Book, using the most up to date parameters from November 2016.

4.3.19 The key appraisal assumptions have been listed in Table 4-4.

Table 4-4 Key Appraisal Assumptions

CRITERIA	ASSUMPTIONS	SOURCE
Discount rate	3.5% 0-30 years 3.0% 31-75 years	TAG <date>
Opening year	2026	General assumption
Base year	2010	DfT Base Year
Appraisal years	60 years	Based on asset life
Forecast year	2086	60 years from opening
Capital expenditure	100% in 2026	General assumption

4.3.20 The New Crossing is considered to be an asset with an indefinite life, with maintenance and renewal taking place as required. Scheme appraisal has therefore been undertaken for a 60-year period in accordance with HM Treasury's Green Book, from the assumed scheme opening in 2026.

4.3.1 The outputs produced by the WSTM4 represent an average weekday AM peak, Inter peak and PM peak hours. In order to annualise these periods to average Monday-Friday weekdays, an adjustment factor was derived based on average Automatic Traffic Counts (ATCs) in the fully modelled area. Bank holidays or weekends are not represented in the economic assessment. The annualisation factors applied are shown in Table 4-5.

Table 4-5 Annualisation factors

TIME PERIOD	PEAK HOUR TO PEAK PERIOD FACTOR	NO. OF WEEKDAYS IN YEAR	ANNUALISATION FACTOR
AM 08:00-09:00	2.617	253	662
IP Ave 10:00-16:00	6	253	1518
PM 17:00-18:00	2.753	253	696

4.3.2 Scheme cost is the best estimate of the capital cost of the scheme (from producing a SOBC to scheme construction) and is detailed in section 5.2 of this document.

APPROACH TO ECONOMIC ASSESSMENT

4.3.3 The Transport Users Benefit Appraisal (TUBA) program compares the operation of the 'Without the Scheme' (Do Minimum, DM) and 'With the Scheme' (Do Something, DS), for the three options in the forecast year to compute the value of savings in vehicle travel time and distance. Version 1.9.7 of the TUBA program has been used in the appraisal.

4.3.4 Trip matrices were checked to ensure that they were consistent across scenarios and forecast years, and benefits in each time period were checked to ensure they were consistent with expectations.

4.4 APPRAISAL SUMMARY TABLE – INITIAL FINDINGS

4.4.1 The Appraisal Summary Table (AST), which can be found in Appendix I**,** is a summary of the key aspects of the economic case. The AST focuses on the four key appraisal areas:

- Economy
- Environmental
- Social
- Public accounts.

4.4.2 Supporting the AST is a range of specific worksheets relating to the appraisal areas. These can also be found in Appendix I:

- Transport Economic Efficiency (TEE) Table
- Public Account Table
- Analysis of Monetised Costs and Benefits (AMCB) Table

ECONOMY AND SOCIAL

VALUE OF JOURNEY TIME CHANGES

4.4.3 Journey time savings have been assessed using the DfT's TUBA program. The results show that each Option is likely to generate savings in Journey Times across all user classes (Business, Commuting and Other). Option 1 is estimated to results in the highest journey time savings, followed by Option 3 and Option 2, which is forecast to generate the lowest value of journey time changes.

Table 4-6 Value of Journey Time Changes

BENEFIT	OPTION 1	OPTION 2	OPTION 3
	Two-lane	**Toll option**	**A public transport "package"**
Travel time savings	£207,871,000	£235,000	£109,272,000

ACCIDENTS

4.4.4 Accident savings benefits have been assessed using the COBALT tool (version 2013_02), the DfT's standard tool for accident saving benefits in line with WebTAG Unit A4.1. The COBALT assessment is based on modelled WSTM4 flows comparing the option scenarios against the Do Minimum scenario i.e. without the New Crossing. The default accident rates have been used as opposed to observed accident rates.

4.4.5 The outputs in terms of changes in absolute number of accidents and changes in a monetary value of those accidents are summarised in Table 4-7.

Table 4-7 Summary of Accident Benefits

	OPTION 1	OPTION 2	OPTION 3
	Two-lane	**Toll option**	**A public transport "package"**
Total Accident Benefits Saved by Scheme	-£4,260,900	-£365,100	£6,433,800
Total Accidents Saved by Scheme	-87	-15	112
Total Casualties Saved by Scheme	-130	-14	154

4.4.6 COBALT shows an increase in the "total accident benefits saved by scheme" for Option 1 and Option 2 due to the journeys induced by constructing the New Crossing. The number of "total accident benefits saved by scheme" is estimated to reduce in Option 3 as a proportion of existing highway users' shift for the whole of part of their journey to public transport.

ENVIRONMENTAL

4.4.7 DfT's TAG Unit A3 identifies that there are eight environmental aspects which should be considered in the environmental appraisal. These are:

- Noise
- Air Quality
- Greenhouse Gases
- Landscape
- Townscape
- Historical Environment
- Biodiversity
- Water Environment.

4.4.8 Appendix I contains all of the worksheets for the environmental appraisals undertaken, which have informed the AST included within the same Appendix.

4.4.9 In support of the environmental appraisal, technical reports for some disciplines have been produced to provide more detailed information including the methodology for assessment, sources of information used, and detailed assessment of potential environmental effects which may arise from the New Crossing at the proposed location.

4.4.10 The proposed crossing would provide environmental benefits to residential areas currently used by excessive amounts of commuter traffic. These would include Sonning, central Caversham, central Reading and East Reading.

4.4.11 The following summarises the key findings of the environmental appraisal for each discipline currently assessed and provides reference to any supporting documents.

NOISE (OPTION 1 ONLY[8])

4.4.12 The impact on the noise climate in the surrounding areas of the scheme is based on the change in noise levels at noise sensitive receptors due to a change in the volumes of road traffic generated by the development.

4.4.13 A preliminary review has been undertaken of the traffic flow data for the Do Something and Do Minimum scenarios in the 2026 opening year. Changes in noise are likely to occur along links in close vicinity of the scheme due to the local redistribution of traffic, and also across the wider strategic road network due to improvements to access that will be achieved by the New Crossing.

4.4.14 The changes in noise levels will be both beneficial and adverse across the modelled network, as some links will experience increases in traffic flows and others will experience a decrease. The extent of these changes has been initially reviewed with regards to the impact scale provided in Design Manual for Roads and Bridges (DMRB). It is likely that the changes in noise will be minor beneficial and minor adverse in terms of significance, when tested against the DMRB's assessment criteria, set out in Volume 11.

4.4.15 The roads in the wider network, which are further away from the New Crossing and are predicted to experience a change in flows will see a much smaller increase or decrease in noise levels. The effects on noise sensitive receptors are therefore likely to be negligible.

4.4.16 A full quantitative assessment will be undertaken as part of the next stage of the assessment, in support of the future Outline Business Case for the New Crossing. This will verify that the worst case effects are minor adverse or minor beneficial in significance, and that much of the network will experience negligible changes (either positive or negative) in noise levels. It will also enable a qualitative analysis of where changes are due to an increase or decrease in levels.

AIR QUALITY (OPTION 1 ONLY[9])

4.4.17 The proposed scheme will lead to a redistribution of traffic, with the most significant changes in flows occurring in the immediate vicinity of the roads that connect into the New Crossing at the southern and northern ends, as well as on the bridge itself (as a completely new link). Changes in

[8] Likely to be the worst case scenario from the point of view of the impact of traffic on air quality, noise and greenhouse gases.
[9] Likely to be the worst case scenario from the point of view of the impact of traffic on air quality, noise and greenhouse gases.

vehicle flows will lead to changes in emissions and therefore pollutant concentrations in the vicinity of the roads affected.

4.4.18 The changes in air quality will be both beneficial and adverse, as some links will experience increases in traffic flows and others will experience a decrease.

4.4.19 The location of the New Crossing is not within an Air Quality Management Area and the route of the crossing does not bring it close to any sensitive receptor locations. The effect of emissions from traffic using the New Crossing itself on air quality is therefore unlikely to be significant.

4.4.20 At the southern end of the crossing approach, along the A329M and the Thames Valley Park road there are no residential receptors located in close proximity to the road. Whilst predicted changes in traffic on these road links are significant, they are unlikely to lead to any significant adverse effects on air quality.

4.4.21 At the northern end of the bridge approach, the most notable changes in traffic flow are estimated to occur along Caversham Park Road to the north, Henley Road towards Caversham and Henley Road northwards.

4.4.22 Some residential receptors along Caversham Park Road are set back from the carriageway edge in places due to the presence of a service road. The road is not within the Reading AQMA. Again, whilst changes in traffic are significant along Caversham Park Road, the changes are unlikely to have significant effects on air quality receptors.

4.4.23 Henley Road towards Caversham is within the Reading AQMA although this is as a result of the road being a strategic route into and out of Reading, rather than high pollutant concentrations at residential properties close to the road itself. Changes in traffic are significant on the A4155 up until Prospect Street within Caversham where, following the junction with Peppard Road, the changes in traffic are not significant. Between the junction of the crossing approach road with Henley Road and Prospect Street the residential properties are typically set back from the carriageway edge. The change in traffic on this section of road is therefore unlikely to have a significant effect on air quality receptors.

4.4.24 Henley Road to the east of the intersection with the proposed new road is not within an AQMA and there are no residential properties close to the road. Changes in traffic flows are significant, but there is a predicted reduction in traffic on this road link and therefore the effect will be beneficial. Overall, the beneficial effect is unlikely to be significant due to the lack of receptors affected.

4.4.25 The roads further away from the scheme which are predicted to experience a change in flows will see much smaller changes in air quality. The effects on the wider network are therefore unlikely to be significant.

4.4.26 A full quantitative assessment will be undertaken as part of the next stage of the assessment, in support of the future Outline Business Case for the New Crossing. This will verify the air quality effects anticipated as a result of the proposed New Crossing.

GREENHOUSE GASES (OPTION 1 ONLY[10])

4.4.27 The effect on greenhouse gas emissions will be related to the distance travelled by vehicles on the road network in conjunction with the speed of those vehicles. Qualitatively, it is considered

[10] Likely to be the worst case scenario from the point of view of the impact of traffic on air quality, noise and greenhouse gases.

that the New Crossing will improve the efficiency of the strategic road network, thereby reducing the overall distance travelled by road users. This is likely to lead to an overall reduction in congestion and an increase in vehicle average speed.

4.4.28 The effect of reductions in congestion are likely to be positive in terms of fuel use (and therefore greenhouse gas emissions), however, an increase in average speed may lead to increased fuel use as vehicles are able to move faster on the existing road network. These two effects, to some degree, will negate one another such that the most significant change in terms of the magnitude of greenhouse gas emissions will be associated with the change in distance travelled. Overall therefore, it is anticipated that there will be a reduction in greenhouse gas emissions over the Do Minimum scenario.

LANDSCAPE AND TOWNSCAPE

4.4.29 A TAG landscape, townscape and visual appraisal (WLTVA) of the proposed New Crossing has been undertaken as part of the consideration of potential effects upon environmental capital.

4.4.30 The WLTVA (Appendix F) was undertaken in accordance with the approach to landscape and townscape assessment as set out in Chapter 6 'Impacts on Landscape' and Chapter 7 'Impacts on Townscape', TAG Unit A3 'Environmental Impact Appraisal' (December 2015, DfT). The methodology for the WLTVA is also based on professional experience and follows the principles of the Landscape Institute / Institute of Environmental Management and Assessment 'Guidelines for Landscape and Visual Impact Assessment' (3rd Edition, 2013).

4.4.31 The WLTVA examines the role of the existing site proposed for the New Crossing in the landscape/ townscape, the likely extent of visibility from key public approaches to the New Crossing and appraises the changes to landscape and townscape features, landscape and townscape character and key viewpoints.

4.4.32 The New Crossing scheme has been assessed in three character zone areas. Effects are summarised as follows:

- Character Zone 1: The overall summary assessment score for the character zone is appraised as being **slight adverse** townscape effects. This arises as a result of the loss of mature trees and hedgerows, the enlarged junction and increased signage and traffic.
- Character Zone 2 and 3: The overall summary assessment score is appraised as being a **moderate adverse** landscape effect for both character zones. For CZ2 this arises as a result of the introduction of a large-scale, intrusive structure throughout the length of the character zone, the loss of mature vegetation and the loss of visual amenity and remoteness, which is a defining feature of the character zone. For CZ3 it arises as a result of the introduction of a large-scale, intrusive structure across the character zone, the loss of mature vegetation and visual amenity.

4.4.33 The overall assessment of the impact of the scheme on the landscape is **Moderate Adverse** and townscape is **Slight Adverse.**

HISTORIC ENVIRONMENT

4.4.34 A technical note has been provided which gives a high level assessment of potential impacts to the historic environment which may result from the implementation of the New Crossing (see Appendix E). It considers all aspects of the historic environment, including built heritage remains (such as listed buildings and registered parks and gardens) and buried archaeological remains.

4.4.35 The area around the study site has a number of listed buildings which may be affected, including at Sonning, Sonning Eye and Play Hatch. The scale of any effects is in most cases unlikely to be

more than negligible to slight adverse. With appropriate input into design and assessment, it is clear that any effects could be made acceptable.

4.4.36 Caversham Registered Park is designated at grade II, and includes 5 listed buildings, including the main house, all of which are designated at grade II. The house is prominent, and is visible from a number of locations in the wider area. The house also benefits from long views southwards, which include the area of the study site. Depending on the sensitivity of the view, the New Crossing may lead to a slight loss of significance to the main house and park (NHLE 1113560 and 1000524 respectively) by affecting views out from the park and also potentially some views of the house.

4.4.37 To minimise harm, future proposals should be informed by a robust heritage assessment and site visit, which can provide a views analysis and inform the design of the New Crossing. This should ensure that any harm would be no more than slight adverse.

4.4.38 The study site has the potential for remains of archaeological interest, particularly at the northern and southern extremities, where land has not yet been truncated by gravel extraction. Effects to any remains are likely to be moderate to large adverse, as construction of the New Crossing would have a major direct impact resulting in loss of features, but adequate mitigation could be specified, and any residual effects would likely be slight adverse to negligible, depending on the exact nature of the remains.

4.4.39 It is possible that the reduction in traffic flows could have a beneficial effect on the setting of the Sonning Conservation Area. However, this would need to be determined through further historic environment assessment in order to show the degree to which traffic flows already effect the setting of the conservation area, and whether there is sufficient traffic reduction on roads within it compared with baseline levels to provide a beneficial effect.

4.4.40 The overall assessment of the impact of the scheme for Historic Environment is **Moderate Adverse**.

BIODIVERSITY

4.4.41 An ecological constraints study has been completed in support of the appraisal of potential effects on biodiversity for the New Crossing. See Appendix D for the Ecological Constraints Study.

4.4.42 For the purpose of this study, an area encompassing the alignment of the proposed New Crossing with a 50 m buffer was used. Three statutory designated sites with local designations for nature conservation were identified within 2 km of the Site. Of these, the closest was located approximately 1.6 km south east. Nine non-statutory designated areas were identified within 2 km of the Site. Of these, Henley Road Gravel Pits Local Wildlife Site (LWS) was located on-site.

4.4.43 A number of Habitats of Principal Importance (HPI) were identified within 2 km of the scheme. Of these, two were located on-site: ‘eutrophic standing waters’ and ‘deciduous woodland’. A variety of broad habitat types were recorded within the study area during a site walkover survey. These varied in intrinsic ecological value and their potential to support protected or notable species.

4.4.44 Of the habitats present, the following were identified as, or having the potential to qualify as, HPI: hedgerows (these might also qualify as ‘Important’ under the Hedgerows Regulations, 1997); eutrophic standing waters; open mosaic habitats on previously developed land; and lowland mixed deciduous woodland.

4.4.45 Furthermore, the habitats present were identified to have the potential to support the following protected and notable species: bats, European otter, badger, breeding and over-wintering birds, reptiles, hedgehogs and invertebrates.

4.4.46 The overall assessment of the impact of the scheme on biodiversity is **Moderate Adverse**.

WATER ENVIRONMENT

4.4.47 In support of the TAG assessment for the Water Environment, a Flood Risk Scoping Assessment and a Controlled Waters Impact Appraisal have been undertaken and are provided in Appendix G and Appendix H.

4.4.48 There is potential for the proposed development to affect the following key water resources within the study area: the River Thames (including Berry Brook); the floodplain; groundwater; and Caversham Lakes (stillwaters). Potential effects range from negligible to moderate adverse when considering the range of features which may be affected; although it is considered that most effects could be adequately mitigated through an appropriate design.

4.4.49 It is recommended that mitigation measures should be adopted as part of the future design and construction to ensure there is no adverse impact on flood risk in the vicinity of the site. The River Thames channel and floodplain across which the scheme route would fully traverse plays a key role in providing flood storage and conveyance and if this is compromised it could increase flood risk to communities upstream. Assuming suitable mitigation measures are adopted within the design based on the new EA climate change guidance requirements, it is expected that the significance of potential impacts would be low to insignificant in the majority of cases. Such impacts would need to be considered and verified through detailed hydraulic modelling in due course.

4.4.50 Mitigation measures should also be adopted as part of any future design of the New Crossing to ensure the protection of groundwater quality in the vicinity of the site. These should ensure the integrity of nearby landfills are not compromised and that preferential contamination pathways are not created via piling for example. Assuming mitigation measures are adopted through careful design and construction it is expected that the significance of potential impacts would be low to insignificant in the majority of cases. Ongoing construction phase and post construction validation should take place to verify this.

4.4.51 The overall assessment of the impact of the scheme on the water environment is **Slight Adverse**.

4.5 VALUE FOR MONEY STATEMENT – INITIAL FINDINGS

4.5.1 Appraisal results are tabulated in Table 4-8.

Table 4-8 60 Year Appraisal Results (2010 prices)

	OPTION 1	OPTION 2	OPTION 3
60 Year appraisal (PV £m)	Two-lane river crossing	Toll option	A public transport "package"
Accidents	-£4.261m	-£0.365m	£6.434m
Greenhouse gases	-£1.001m	-£0.470m	£4.016m
Economic Efficiency: Consumer Users (Commuting)	£67.708m	£3,293m	£43.551m
Economic Efficiency: Consumer Users (Other)	£73.125m	-£17.111m	£37.459m
Economic Efficiency: Business Users and Providers	£70.871m	£16.397m	£50.414m
Wider Public Finances (Indirect Tax Revenues)	£2.003m	£0.931m	-£8.068m
Present Value of Benefits	£208.445m	£2.656m	£133.807m
Broad Transport Budget	£76.743m	£78.858m	£114.753m
Present Value of Costs	£76.743m	£78.858m	£114.753m
Net Present Value (NPV)	£131.702m	-£76.202m	£19.054m
Benefit to Cost Ratio (BCR)	2.72	0.03	1.17

4.5.2 The Economic Efficiency of the Transport System (TEE) tables, Public Accounts (PA) tables and Analysis of Monetised Costs and Benefits (AMCB) tables are included within Appendix I.

4.5.3 The DfT's "Value for money assessment: advice note for local transport decision makers" guidance indicates a range of value for money categories that vary according to the Benefit to Cost Ratio (BCR) of the scheme. The value for money categories are shown in Table 4-9.

Table 4-9 DfT Value for Money Categories

BCR RANGE	VALUE FOR MONEY CATEGORY
< 1.0	Poor
1.0 – 1.5	Low
1.5 – 2.0	Medium
2.0 – 4.0	High
> 4.0	Very High

4.5.4 The economic performance demonstrates that Option 1 (two-lane crossing) is estimated to have a BCR value of 2.72 and thus represents a high value for money when compared against the DfT classification.

4.5.5 Option 2 (two-lane crossing with a single journey crossing charge) is estimated to generate low benefits and a BCR of 0.03 indicating the option may provide a poor value for money. The poor BCR is attributed to the lower use of the New Crossing due to the reluctance of drivers to pay the toll charge, which for cars would be £20 per 5 day week for return trips.

4.5.6 It should however be noted that estimating toll road demand is a complex matter and the results highlighted are the only options that have been tested for the purpose of this report. Further modelling, should it be required, could develop this option further, as the trips generated are dependent on the level of toll. A further modelling assessment of the appropriate level of toll to

generate the optimum BCR would take a significant time and would have been disproportionately expensive given the scope and brief of this report.

4.5.7 The accuracy of any future forecasts can be further improved through further demand segmentation (for example, by income) and inclusion of area specific information about people's willingness to pay (usually collected through stated-preference surveys). The inclusion of operator revenue may also increase the BCR for this option.

4.5.8 Option 3 is predicted to generate a BCR of 1.17 (Low VfM) indicating that the benefits of the public transport package may not be able to outweigh the additional cost required to construct the four-lane crossing and implement other public transport improvements. However there may be additional revenue to public transport operators due to increased public transport use.

5 FINANCIAL CASE

5.1 INTRODUCTION

5.1.1 The DfT's guidance document, 'The Transport Business Cases' outlines the areas that should be covered as part of the Transport Business Case documentation. In accordance with this, this chapter provides details about the necessary elements required to achieve compliance in the Financial Case. These are:

- The project's anticipated costs
- Details of the budgets and funding cover.

5.2 COSTS – INITIAL FINDINGS

5.2.1 In 2013 TVB LEP assessed that the New Crossing required funding of £74.4 million for a single carriageway option and £90 million for a dual carriageway. This cost estimate was based upon a commencement year of 2015 for feasibility studies and the scheme opening in 2025. The timescales which this cost estimate is based upon are displayed in Table 5-1.

Table 5-1 Timescales for TVB LEP Cost Estimate

Item	Provisional Programme
Feasibility	2015 – 2016
Planning Application/Inquiry	2017 – 2019
Detailed Design	2020 – 2021
Tendering	2022
Construction	2023 – 2025
Opening Year	2025

Source: TVB LEP 2013

5.2.2 A breakdown of the required funding which was calculated based upon the above timescales is provided in Table 5-2.

Table 5-2 Scheme Costings for the New Thames Crossing East of Reading

Item	Budget (£m)
Feasibility / Options Review	0.5
Planning Application / Inquiry	5
Detailed Design / Tender	1.9
Project Fees	7
Construction (Single Deck)	60
Budget Estimate (Single carriageway)	**74.4**
Option for Additional Capacity (Dual carriageway)	+15
Cost with Additional Capacity	**90.0**

Source: TVB LEP 2013

5.2.3 More recently in July 2016 Wokingham Borough Council (in partnership with Reading Borough Council, Oxfordshire County Council and South Oxfordshire District Council through the Cross-Thames Travel Group) submitted to DfT a Large Local Major Transport Schemes (LLMTS) funding bid, which included the best estimate of the capital cost for Option 1 (from producing an Outline Business Case to scheme construction). This is reproduced in Table 5-3.

5.2.4 The overall project cost for a single carriageway crossing (Option 1) is approximate at this stage and estimated to be around £109,9 million for a single carriageway option. The cost includes an estimate of risk /contingency and optimism bias uplift of 30.4%.

Table 5-3 Option 1 Scheme Costings (source: LLMITS funding bid, July 2016)

	COSTS, £K
Construction Total	£89,936
Lands Total	£506
Part 1 Claims Total	£1,150
Preparation & Supervision Total	£18,300
TOTAL	**£109,892**

5.2.5 Option 2 (toll option) and Option 3 (public transport package) scheme costs were estimated post the LLMTS submission, are approximate and detailed in Table 5-4 and Table 5-5.

Table 5-4 Option 2 Scheme Costings

	COSTS, £K
Construction Total	£93,066
Lands Total	£506
Part 1 Claims Total	£1,150
Preparation & Supervision Total	£18,300
TOTAL	**£113,022**

Table 5-5 Option 3 Scheme Costings

	COSTS, £K
Construction Total	£143,901
Lands Total	£608
Part 1 Claims Total	£1,150
Preparation & Supervision Total	£20,130
TOTAL	**£165,788**

5.2.6 If the project is to be progressed to the Outline Business Case stage preliminary design and costing work will be undertaken.

5.3 FUNDING COVER – INITIAL FINDINGS

5.3.1 The present SOBC is funded by members of the Cross-Thames Travel Group split as follows:

- Oxfordshire County Council – £20,000
- Reading Borough Council - £20,000
- Wokingham Borough Council - £20,000
- South Oxfordshire District Council - £10,000
- TVB LEP - £10,000

- Oxfordshire LEP - £0

5.3.2 The development of the SOBC relies on the availability of a robust evidence base and the updated WBC's strategic transport model (WSTM4) fulfils this purpose. The model update, costing £200k, has been funded solely by Wokingham Borough Council.

5.3.3 Further funding required to take the scheme to the next stage of the assessment process was sought though DfT's LLMTS funding bid. Unfortunately the bid was unsuccessful with a priority given to schemes with some local contribution and shorter full business case completion times. DfT have confirmed that the scheme promoter would be eligible to apply for funding during the next round (programme entry stage). This will be for the development of the Full Business Case and capital funding to deliver the scheme and will require a completed Outline Business Case. The deadline for this round of funding is December 2017.

5.3.4 The New Crossing funding cover will be further explored should the scheme be progressed to the Outline Business Case stage.

6 COMMERCIAL CASE

6.1 INTRODUCTION

6.1.1 The DfT's guidance document, 'The Transport Business Cases' outlines the areas that should be covered as part of the Transport Business Case documentation. The necessary elements required in the Commercial Case to achieve compliance are:

- Output based specification
- Procurement strategy
- Sourcing options
- Payment mechanisms
- Pricing framework and charging mechanisms
- Risk allocation and transfer
- Contract length
- Contract management.

6.1.2 For a Strategic Outline Business Case only the Output Based Specification and Procurement Strategy are required in outline format, i.e. initial findings. Some other elements of the requirements have been drafted to assist with future development of the Outline and Full Business Case.

6.1.3 The Commercial Case will be developed following the outline set out below:

- Set the procurement objectives, outcomes and constraints
- Identify potential procurement / purchasing options
- Assess the procurement options in terms of pros and cons, as a rationale for selecting the preferred sourcing option
- Confirm the preferred payment mechanism and pricing framework
- Assess how different types of risk might be apportioned / shared, with risks allocated to the party best placed to manage them.

6.2 OUTPUT BASED SPECIFICATION – INITIAL FINDINGS

6.2.1 The successful delivery of the New Crossing objectives at an outturn cost within the allocated budget will be determined by a wide range of factors which go beyond the chosen approach to the procurement strategy for the delivery of the scheme. For example, the form of contract on its own will not determine whether the project is successful. Factors which will contribute to a successful outcome of delivery within budget include:

- Clarity of objectives and common understanding by all parties
- Robustness of cost estimates
- Adequacy of the risk pot including allowance for inflation
- Effectiveness of project control processes including Gateways
- Quality of the design, specification and contract documents

- Engagement of the supply chain and timing of the procurement processes
- Compliance with Procurement Regulations and avoidance of procedural challenges
- Appropriateness of the selection process and selection criteria
- Robustness of the tender assessment process
- Adequacy of the tender sum to deliver requirements
- Clear understanding and allocation of contractual risks allied to a fair and transparent risk management process
- Effectiveness of partnership and team working during construction
- Quality of the project and contract management
- Alignment of contractual performance incentives between the Employer and Contractor
- Early Contractor Involvement
- Effectiveness of dispute avoidance and resolution procedures
- Availability of the necessary resources.

6.2.2 These can be grouped into the following broad categories:

- Project objectives
- Cost estimating
- Risk management
- Project governance
- Form of contract
- Supplier selection
- Performance management
- Resource capacity and capability.

6.3 PROCUREMENT STRATEGY – INITIAL FINDINGS

6.3.1 Following on from output based specification the procurement strategy action needs to be managed, developed and recorded in the dynamic context of the development of the scheme itself.

6.3.2 This is based on the experience that assumptions made at a point in time may well change during future scheme development. Therefore continually reviewing the baseline and developed assumptions, and crucially being prepared to challenge and change when counterfactual evidence to the assumptions is identified, should result in the procurement being as closely aligned to the scheme objectives as possible.

6.3.3 It is recognised that the form of procurement itself plays a considerable role in the behaviour and team culture that is likely to be manifest during the physical delivery of the scheme. This is based on experience that people and organisations will both take less risk and react negatively or cautiously to issues requiring change and negotiation; if procurement and particularly the contractual terms and conditions are alien to them.

6.3.4 There are a number of key elements in the development of a successful procurement strategy:

- Approval by the Stakeholders and the Department for Transport, including the preferred strategy and financial analysis

- Distillation of stakeholder objectives into tangible, measurable and achievable Employer's requirements
- Timing and type of engagement with Contractors/Providers
- Assessment of NEC contract options
- Market engagement and market testing
- Consideration, management and mitigation of the prevailing market conditions at the time of procurement and projected through the contract period.

6.4 RISK ALLOCATION AND TRANSFER – NOT REQUIRED FOR SOBC

6.4.1 This element is not required for the Strategic Outline Business Case. For subsequent cases this section will include consideration of:

- Risk management plan
- Risk management organisation
- Key project risks

7 MANAGEMENT CASE

7.1 INTRODUCTION

7.1.1 The DfT's guidance document, 'The Transport Business Cases' outlines the areas that should be covered as part of the Transport Business Case documentation. The necessary elements required in the Management Case to achieve compliance are:

- Programme and project dependencies
- Governance
- Communications and stakeholder management
- Risk management strategy
- Contract management
- Monitoring and evaluation.

7.1.2 The management approach will be developed following the outline set out below:

- Set the appropriate governance structure to ensure outcomes and objectives are met
- Identify and plan for the key approval milestones ensuring information is provided in good time so as to not delay the programme
- Assess how the delivery process will be managed to achieve the optimum financial and impact performance.

7.2 EVIDENCE OF SIMILAR PROJECTS

7.2.1 The stakeholder local authorities have successfully delivered significant infrastructure projects and improvements. Significant schemes which they have successfully delivered include the following:

- Congestion relief improvements to Junction 10 of the M4 Motorway (cost: approximately £5 million)
- The Station Link Road (cost: approximately £5 million)
- M4 Junction 11: £65m project to transform Junction 11, to reduce congestion and increase public transport provision, pedestrian footways and cycle lanes. The project opened in Summer 2010
- Reading station redevelopment (completed in 2015): £897m improvement project delivered in partnership with Network Rail and DfT. The project is complete and delivered five new platforms, two entrances, a new link bridge and retail outlets. The improvements have delivered improved capacity and allowed Reading Borough Council to secure ongoing sustainable economic growth.
- Reading station interchanges: £12m redevelopment of north, south west and south east interchanges delivered by Reading Borough Council.
- Reading LSTF Partnership Project: £25m package of sustainable transport schemes within the Reading urban area delivered by Reading Borough Council and partners.

7.3 PROGRAMME AND PROJECT DEPENDENCIES – INITIAL FINDINGS

7.3.1 A fixed programme for the New Crossing is yet to be defined and will largely be influenced by the detailed design work at the Outline Business Case stage.

7.3.2 However, LLMTS funding bid identified an indicative programme which has been reproduced in Figure 7-1.

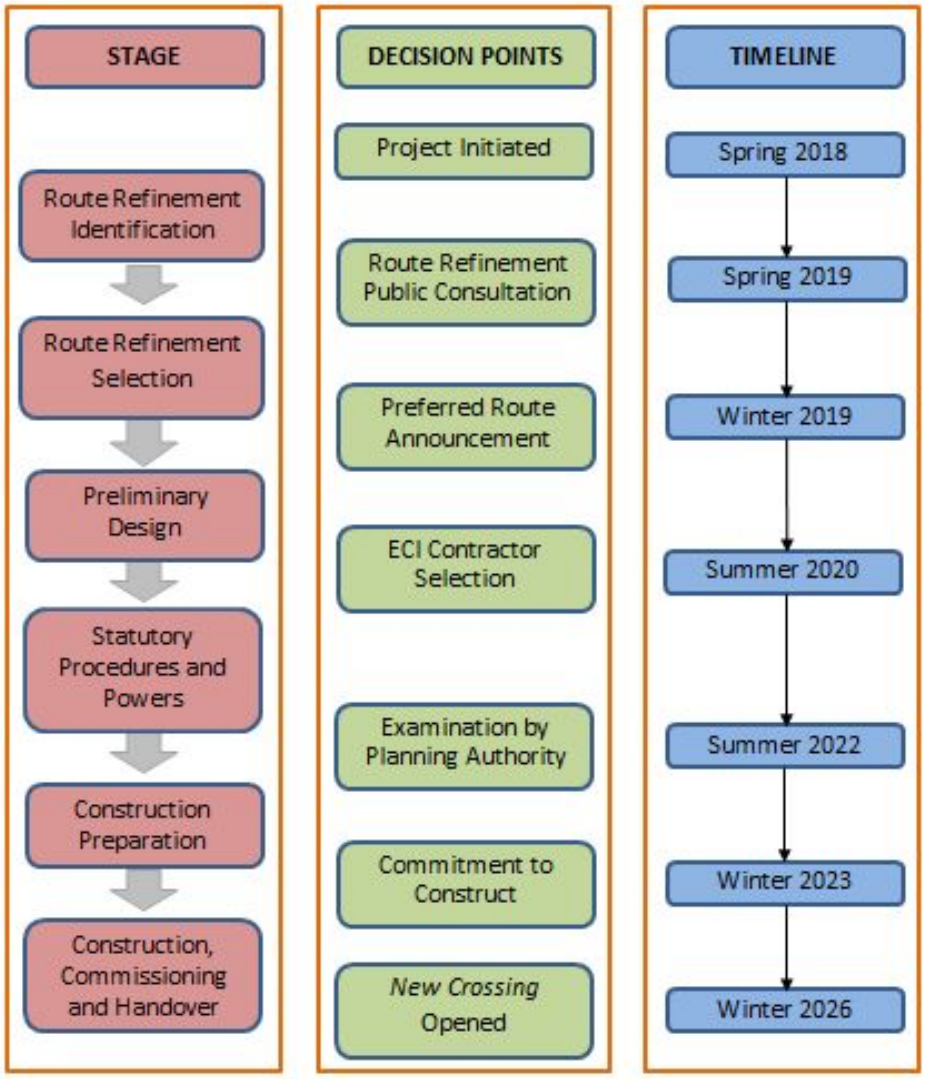


Figure 7-1 Indicative Programme

7.4 GOVERNANCE, ORGANISATIONAL STRUCTURE AND ROLES

7.4.1 The Local Stakeholder authorities (Wokingham BC, Reading BC, Oxfordshire CC, and South Oxfordshire DC), TVB LEP and OxLEP has formed the Cross-Thames Working Group and agreed a defined governance structure, that will be established to take this scheme forward and to completion. The governance structure is set out below:

- Officer Group – to work together to develop the scheme proposals to achieve the objectives with minimal impact on neighbouring authorities and to the environment

- Member Group – the decision making body.

7.4.2 Wokingham Borough Council will act as Project Sponsor. This role will lead the CTTG and report directly to the Berkshire Strategic Transport Forum.

7.4.3 As the New Crossing scheme sponsor, Wokingham BC is responsible for the management of the Strategic Outline Business Case. This includes, inter alia, sharing information and data in a timely manner with the three other local authorities, and where appropriate, the two LEPs. The supporting local authorities and organisations are responsible for submitting timely responses to Wokingham BC, attending meetings of the CTTG and facilitating progress.

7.4.4 Wokingham BC will act as treasurer and guarantor of the resources necessary to progress the New Crossing.

7.4.5 There is no Joint Committee or other body with a remit to give formal approvals. When formal approval is required, it will be coordinated through the CTTG and granted (or not) individually by the appropriate decision making representative in each local authority and LEP.

7.4.6 In the event that the New Crossing proceeds to capital investment, it is anticipated that a DfT-operated assurance framework will be used, rather than the local arrangements put in place by TVB LEP and OxLEP for approving Growth Deal schemes.

7.5 ASSURANCE AND APPROVALS PLAN

7.5.1 A “Gateway Process” will be used as the mechanism for assessing the scheme at critical stages in its lifecycle prior to commencing the next stage. The use of the Gateway process enables:

- Realistic and achievable targets to ensure successful delivery
- Deployment of relevant skills and competencies to a project
- Compliance with best practice
- Key stakeholder input and understanding
- Scheme feedback through lessons learnt
- A visible audit trail.

7.5.2 The Gateway will be built into the scheme programme and will be monitored by the Project Sponsor and reported to the Cross-Thames Travel Group.

7.6 COMMUNICATIONS AND STAKEHOLDER MANAGEMENT – INITIAL FINDINGS

7.6.1 The key objectives of stakeholder management are to:

- Keep stakeholders aware of the scheme’s development and progress
- Meet statutory requirements (such as Section 278 / 38 and Environment Agency consents)
- Increase public and stakeholder awareness of the scheme through local publicity, website etc
- Provide information and support to those affected by the scheme during construction and operation.

7.6.2 The CTTG or sponsor will ensure a programme of regular meetings take place with the contractors and designers, to ensure that the scheme is on target.

7.6.3 An overarching communications strategy will be developed and managed by the Sponsor, with support from the nominated CTTG. This will ensure a coordinated approach to communicating with, and managing, stakeholders. The strategy will include ongoing regular meetings with relevant internal and external stakeholders.

7.7 PROGRAMME / SCHEME REPORTING – INITIAL FINDINGS

7.7.1 Responsibility for accurate, timely and appropriate communications within the team rests with the Sponsor. Nominated officials / Project Manager has a responsibility to provide this information when required. The Sponsor will then ensure that this information is reported to the Berkshire Strategic Transport Forum and TVB LEP through scheduled meetings.

7.7.2 The Sponsor is responsible for keeping the Lead Members aware of the development of the scheme towards meeting its objectives. Nominated officials / Project Manager of the Working Group will disseminate this information within their own authority.

7.8 RISK MANAGEMENT STRATEGY – INITIAL FINDINGS

7.8.1 The full details of the risk management strategy will be provided in the Outline Business Case. The risk management strategy will include the following:

- A quantified risk assessment
- A risk register containing all risks associated with the scheme
- A cumulative distribution for forecast risk.

7.8.2 The key financial or funding risks have been identified and are summarised below:

- Failure to identify a funding strategy
- Failure to obtain funding
- Delay in obtaining funding
- Inaccurate inflation allowance
- Change to VAT
- Inaccurate fee estimations
- Failure to identify appropriate market costs or works estimation
- Poor financial control.

7.9 OPTIONS

7.9.1 The processes and procedures by which this scheme is governed and controlled will be in accordance with the PRINCE2 approach to project management.

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- Department for Communities and Local Government (2012) National Planning Policy Framework, DCLG, London.
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- Thames Valley Berkshire Local Enterprise Partnership (2014) Thames Valley Berkshire: Delivering national growth, locally – Strategic Economic Plan, 2015/16-2020/21, Thames Valley Berkshire LEP.