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KCC Transport Scheme Business Case Report

Sturry Link Road

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1 Introduction

1.1 SELEP Schemes – Transport Business Case Preparation

Amey has been commissioned by Kent County Council (KCC) to prepare a Transport Scheme Business Case (TBC), appropriate to the size and scope of each scheme, for each of the projects which have been allocated Local Growth Fund (LGF) finance by the South East Local Enterprise Partnership (SELEP).

1.2 Purpose of Report

The overall purpose of this TBC report is to provide a 'proportionate' justification for the LGF funding allocated to the *Sturry Link Rd (circa £6million)*. This is a predominantly highway scheme aiming to address the layout and function of the road network in and around the village of Sturry; specifically around the junction of the A28/A291 north-east of Canterbury city centre. A key aspect of the scheme is a new bridge over the railway to reduce the current use of the Sturry level crossing.

The scope of the TBC is not aligned with any specific stage of the Department for Transport (DfT) 'Transport Business Cases' procedure. Rather, it is a 'lighter touch' report in the spirit of the DfT advice for' LEP Assurance Framework' (December 2014), which agrees with using 'proportionate appraisal' appropriate to the scope of a transport scheme.

The TBC report does, however, consider the five key strands of TBC content required by DfT and HM Treasury's The Green Book, namely strategic, economic, financial, commercial and management. It also brings in other strands where relevant, such as summary of predicted scheme outcomes and scheme operational case (including design).

This TBC report may need to stand as an interim submission, justifying SELEP allocation of LGF to the *Sturry Link Rd*, but which may need to be supplemented by a further TBC submission in later financial years, as the content and delivery aspects of the scheme are resolved in greater detail.

The report broadly follows the 5-Case Model for Transport Business Case preparation, incorporating design and environmental issues as well as a summary of the overall risks in terms of project delivery and project funding approval. These risks include:

- The potential for the project to be called in for review by DfT or other bodies before it is delivered;
- The potential for challenge from stakeholders which may jeopardise or delay the project;
- The potential that a subsequent review of the project after implementation may identify issues relating to the delivery of overall outcomes (e.g. job creation or transport modal shift);

Proportionate Transport Business Case

Whilst this scheme is part of a second tranche of LEP schemes, including relatively larger schemes compared with KCC's 2015/16 LGF allocated schemes, it is still important to consider what is sufficient and proportionate.

The Sturry Link Rd scheme has been scoped, with communication with the ITE (independent technical evaluator) for SELEP. These discussions clarified the requirement for a reasonably comprehensive modelling exercise and a likely TUBA appraisal.

In addition the following will be considered:

- Address, briefly, each of the five aspects common to all stages of the TBC, namely, the strategic, economic, financial, commercial and management, cases;
- Present a clear train of logical reasoning and correlated steps for how the scheme is justified;
- Provide qualitative evidence in support of the scheme, if it is not possible or good value to assemble quantitative evidence.

1.3 Structure of the Document

This report is structured in accordance with the Department for Transport's guidance on Transport Business Case, which was updated in January 2013. Following this Introduction, the remainder of the document is structured as follows:

- Chapter 2 - Project Outline;
- Chapter 3 - the Strategic Case;
- Chapter 4 - the Economic Case (including Value for Money Statement);
- Chapter 5 - the Financial Case;
- Chapter 6 - the Commercial Case;

- Chapter 7 - the Management Case;
- Chapter 8 - Conclusions and Recommendations.

2 Project Outline

2.1 Location of the Scheme

Sturry is a village on the outskirts of Canterbury, on the A28 corridor from Thanet to East Sussex. It lies on the junction of the A291 and A28 where two main routes from the north and east join heading to the city centre. These routes pass over the Sturry level crossing on the Thanet to Ashford International line which serves Canterbury via Canterbury West.

The location of Sturry within Canterbury district is shown in **Figure 2-1,** and its location to the built-up area is given in **Figure 2-2.**

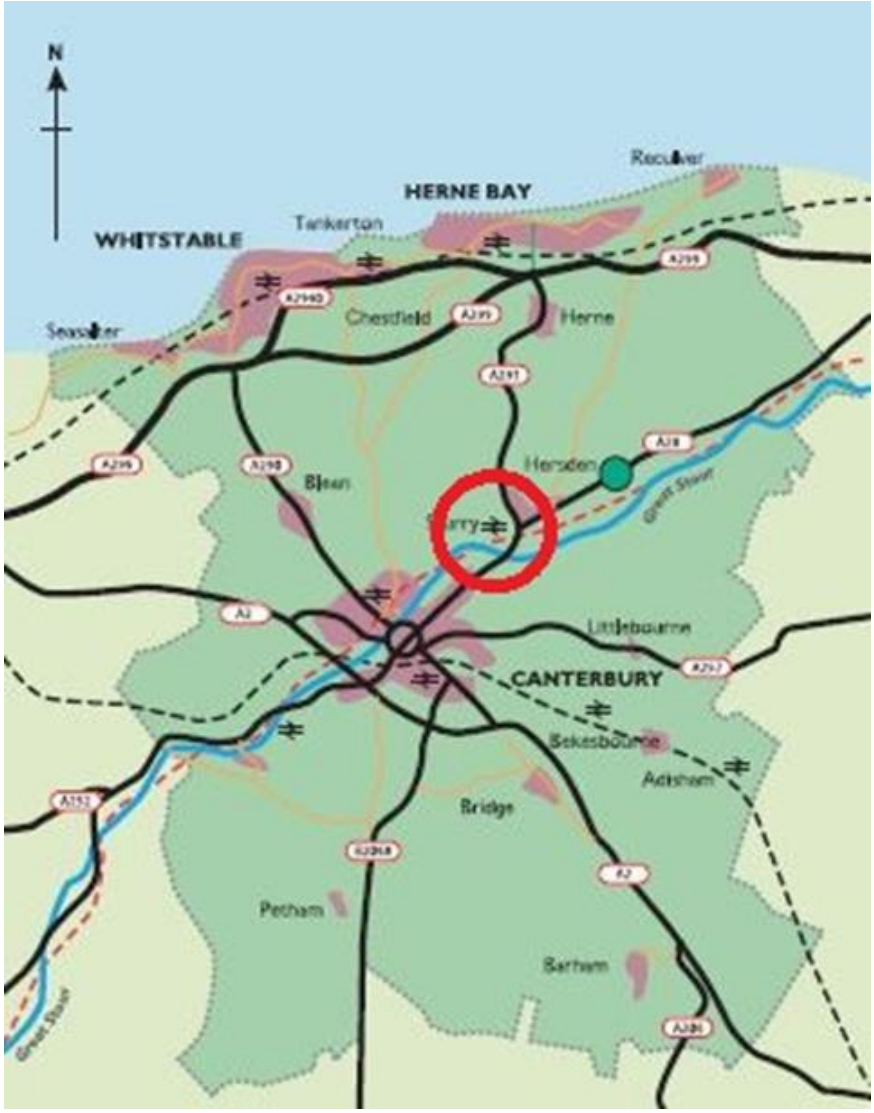


Figure 2-1 – Scheme Location

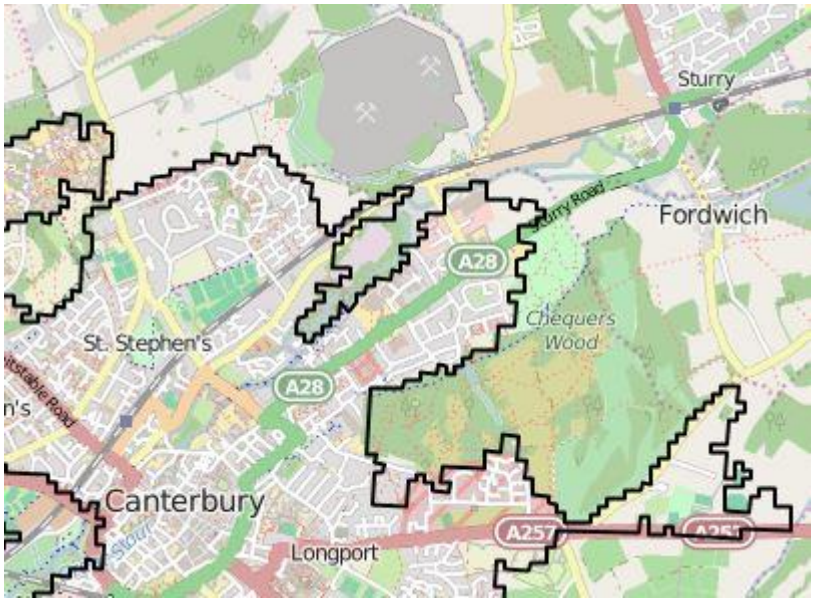


Figure 2-2 – Canterbury built-up area

2.2 Current Conditions

At present there are approximately 18,000 vehicles per day (vpd) using the level crossing at Sturry. This is the combination of traffic from Herne Bay via the A291 and Thanet via the A28 joining and heading towards Canterbury City Centre.

2.3 Scheme Layout and Function

The link road is designed to remove the need for mainline traffic on the A28 (from Thanet district) and the A291/A28 (from Herne Bay, a satellite town of Canterbury) to cross the level crossing at Sturry, by means of an alternative bridge. The indicative scheme is shown in **Figure 2-3**. Traffic then continues through the Canterbury urban area towards the city centre via the A28 or a parallel route (Broad Oak Rd). The presence of these parallel routes is discussed further later in this report.

In addition the scheme will also be able to remove some poor elements of the existing layout, relating to the proximity of junctions and other highway elements near to the level crossing. This is discussed in further detail in later chapters.

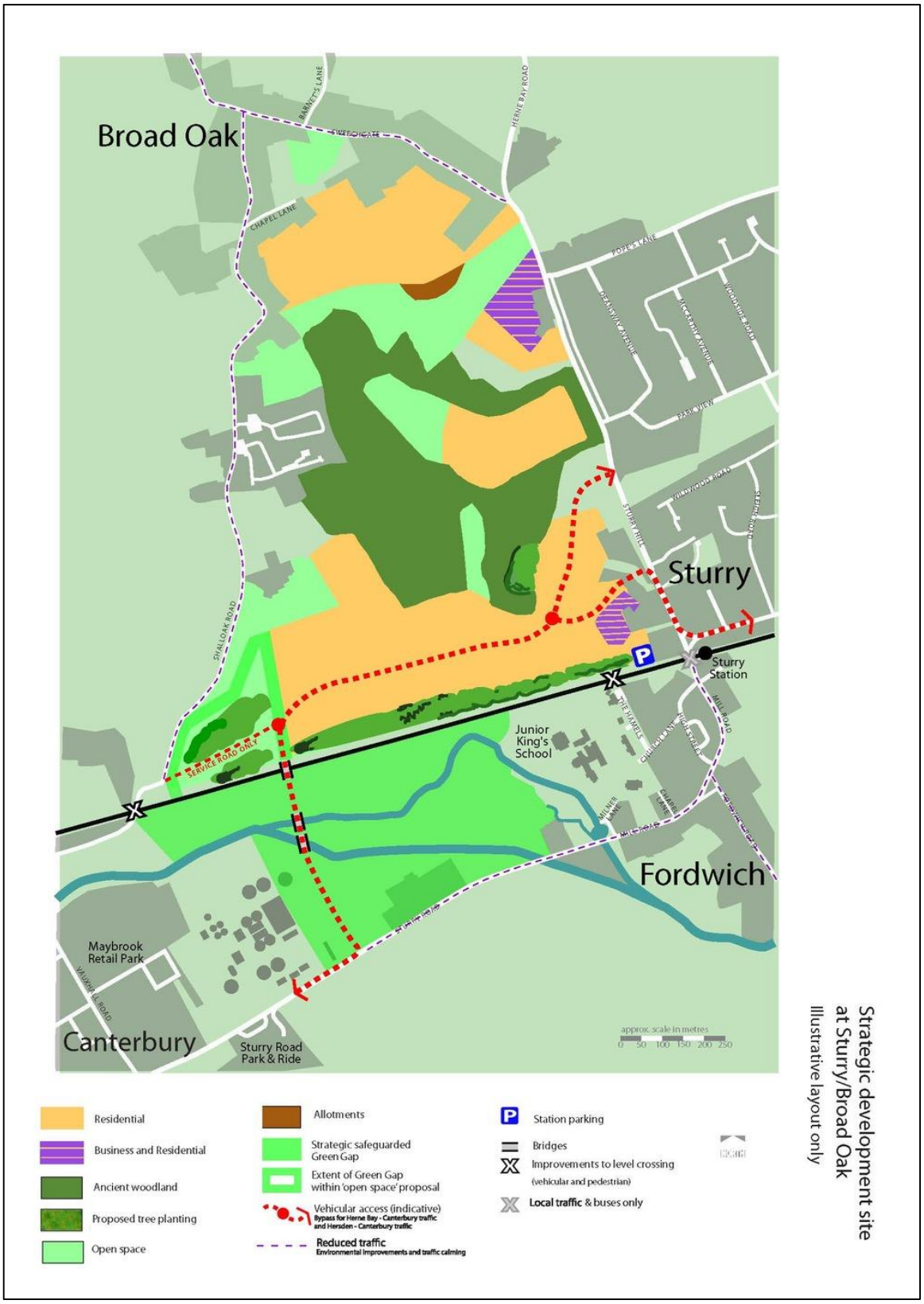


Figure 2-3 – Indicative scheme

The proposed link road will re-join the old A28 alignment near to the Sturry Rd Park-and-ride site; providing a more reliable access to the facility. There are also aspirations to improve the area around Sturry station and the surrounding bus stops.

The indicative scheme is a combined scheme connecting the A28, via a new link bridging the railway, connecting with new infrastructure within a strategic development site. The current design drawing is given as **Appendix A**

2.4 Cost of Scheme

The projected scheme cost is £29.6m.

The costing for the Sturry Link Road relates to the new infrastructure, mainly the bridge over the railway from the A28, which is located outside of the development site. It should be noted that, in terms of scheme appraisal, the overall cost of all new infrastructure will be used. There is also a variation of the scheme including an additional 'spur' near the village of Broad Oak and this cost will be included when applicable.

2.5 'Screening' Summary for Scheme LGF Bid and Supporting TBC

This report consists of a proportionate transport scheme business case in support of the LGF bid for the *Sturry Link Rd*. This means that some criteria for justifying the scheme have only been considered in a simplified way, with qualitative supporting evidence, rather than with detailed quantified appraisal. Less relevant criteria for this scheme have been largely omitted from the TBC report.

Table 2-1 gives a 'screening' summary to show how each of the transport scheme appraisal criteria specified by DfT (broadly aligned with WebTAG Appraisal Summary Table – AST) have been handled with respect to the LGF bid for the *Sturry Link Rd*. Elements can be refined or added in further submissions if required.

As will be further discussed the key appraisal is the journey time savings from modelling inputted into TUBA.

Table 2-1 'Screening' Summary for 'Proportionate' Scheme Appraisal and TBC

Scheme Impact	'Proportionate' Details Covered in this Scheme	Appraisal of Impacts	
		Quantitative	Qualitative
Economy (Travel Congestion Impacts for All Users)			
User Travel Time (congestion)	Yes – Road junction delay savings	✓	✓
User Travel Distance (operation)	Yes – but broadly neutral		
Journey Reliability (travel time variability)	Yes	✗	✓
Wider Impacts / Wider Economy			
'Growth'	Scheme allows delivery of proposed local plan numbers	**indicative**	✓
Public Accounts Impacts			
Public Accounts Cost	Yes – Outline summary of scheme costs	✓	✓
Indirect Tax Revenue	Yes – but broadly neutral	✓	✓
Environmental Impacts			
Noise	Assumed neutral	✗	✓
Air Quality	Assumed neutral	✗	✓
Greenhouse Gas	Assumed neutral	**TUBA**	
Landscape / Townscape		✗	✓
Other Environmental		✗	✗
Social / Distributional impacts			
Journey Quality		✗	**partial**
Accidents		COBALT	✓
Other SDI		✗	**some**
Door to Door Strategy for Sustainable Transport	Minor impact as highway	✗	**some**
Effective Scheme Design			
Fitness for Purpose / Successful Operation / Future Network Resilience and Resistance to Shocks	Yes – sense-check of scheme layout against intended purpose	✗	✓

3 Strategic Case

3.1 Overview

The Strategic Case outlines the overarching reasons for proposing the scheme intervention, in terms of its contribution to improving local transport and making effective use of infrastructure. A further consideration is the scheme's alignment with wider aspirations, such as a prosperous economy, an enhanced community, an attractive and sustainable environment, safer and healthier lifestyles and access to opportunities for all.

Ultimately, the Strategic Case indicates who, what, why, when, where and how, the scheme will assist.

3.2 Purpose of the Proposed Investment

The scheme is intended to provide a highway network around Sturry which can cope with both current traffic flows and extra traffic from proposed development in the north-east quadrant of Canterbury district. The scheme aims to reduce congestion, improve journey reliability, and overcome poor elements of the existing highway network.

3.3 Strategic Context

3.3.1 National Strategy: 'National Infrastructure Plan'

The Government has long-term objectives aimed at improving the economy, environment and society. These are the three tenets against which major transport infrastructure projects are assessed, and will continue to be assessed in future.

In its National Infrastructure Plan 2014, the Government presented its vision for the UK transport system:

- Transport infrastructure can play a vital role in driving economic growth by improving the links that help to move goods and people around and by supporting the balanced, dynamic and low-carbon economy that is essential for future prosperity;
- Local transport systems must enable suburban areas to grow. The transport network must support good value and rapid movement of goods around the country. The transport system must be efficient but also resilient and responsive to infrequent an unexpected pressures; and

- Airports and ports are the gateways to international trade and the Government will work to improve the road and rail connectivity to major ports and airports.

The plan cites the importance of local infrastructure as part of economic growth. As such it introduces the Single Local Growth Fund.

3.3.2 National Strategy: 'Creating Growth, Cutting Carbon'

The White Paper 'Creating Growth, Cutting Carbon – Making Sustainable Local transport Happen' (January 2011) sets out central Governments vision for delivering a transport system which enables economic growth which also tackles climate change by reducing carbon emissions.

The strategy encourages decision making and identification of transport solutions at the local level. The paper sets out the vehicles for decentralising economic powers such as the Regional Growth Fund and the devolution of funding to local LEP's.

The Sturry Link Rd scheme is in accord with this vision as it represents a locally identified scheme to resolve existing problems and has been provisionally allocated funding from the Local Growth Fund, via the SE LEP.

3.3.3 Regional and Local Strategy

Canterbury is an urban area in one of Kent's four defined areas, namely **' East Kent'** recognised by SELEP in the 'Growth Deal and Strategic Economic Plan' (**Figure 3-1**)

- **Thames Gateway Kent** – the A2/M2 Corridor
- **East Kent** (including Ashford) – the High Speed One Growth Corridor
- **Maidstone** – the M20 Corridor
- **West Kent** – the A21 Corridor and Medway Valley

Figure 3-1 – Kent strategic areas

The role of the A28 as a county route from Thanet to East Sussex (via Canterbury and Ashford) is noted in KCC's Local Transport Plan (2011-2016) in KCC's Local Transport Plan (2011-2016). The subsequent delivery plan 'Growth without Gridlock' highlights Canterbury's challenge of reducing congestion on the A28.

Canterbury City Council (CCC) has aspirations to deliver approximately 15,600 houses between 2011 and 2031 at 780 dwellings per annum (dpa). This is potentially going to be raised to 16,000 houses at 800 dpa following the inspector's comments in Stage 1 of the Local Plan hearing. In the north-east quadrant there are five strategic sites.

The scheme is intended to conform with Government guidance to LEP on how the SEP's component transport schemes should perform and contribute towards local growth

('Growth Deals Initial Guidance for Local Enterprise Partnerships', July 2013). This centres around three themes:

- Ambition and rationale for intervention for the local area;
- Value for money;
- Delivery and risk;

3.3.4 Regional Strategy: 'LEP Assurance Framework'

The latest Government guidance for SELEP ('LEP Assurance Framework', HMT, December 2014), sets out Government expectations for how transport investments, such as the *Sturry Link Rd*, should be justified with supporting evidence in a manner 'proportionate' to the scope of the scheme and the scale of funding required.

3.4 The Case for Change

3.4.1 The Need for the Scheme

Canterbury has significant growth aspirations and will require a resilient transport network to enable them. This intended growth is to contribute to the wider growth of both Kent and SELEP.

The Sturry Link road, together with another nearby scheme (Herne Bypass), is deemed required by CCC and KCC as one of the components to provide a sufficient transport network to support the emerging Canterbury local plan and the sites in the north-east quadrant. The scheme is listed in 'Growth without Gridlock' (2014) and cross-referenced in the Canterbury District Transport Strategy 2014-2031.

The five strategic sites in the north-east quadrant are shown in **Figure 3-2**. These sites total 4,500 houses. These are detailed as Spatial Policy SP3, and are sites 2,3,4,5 and 8 (https://www.canterbury.gov.uk/media/941559/CDLP-11-Canterbury-District-Local-Plan-Publication-Draft-June-2014-with-maps-CCC.pdf)

Figure 3-2 – Local Plan Housing Sites

The Sturry (and Broad Oak) development (site 2 in Policy SP3) of 1,000 homes is being developed in conjunction with the scheme construction.

3.4.2 Employment in surrounding area

In addition to the new housing in the area, a network which is sufficient for the continued sustainable growth of the employment sites in the area is important. For example there is the Lakesview site on the A28 in Hersden. These sites have been seen as key in Canterbury recording a post-recession growth exceeding other areas (4.1%).

In this regard the scheme should be seen as an East Kent strategic fit, rather than as just a local Canterbury district one.

3.4.3 Current Transport Problems

The simplified picture is of two A-roads with flows circa 10,000 vpd joining in Sturry, and a new combined flow heading over the level crossing towards Canterbury (around 18,000 vpd).

In reality it is not quite so simplified. There are the traffic movements from Sturry itself, and some of the A291 traffic, that uses an alternative (non-classified) 'rat-run' route through Broad Oak village towards Canterbury over a different level crossing (Broad Oak). This route has a flow of around 7000 vpd, being notably high in comparison with the mainline A28 flow.

The A28 mainline flow, and the joining traffic from the A291, is constrained by the capacity of the level crossing and other downstream factors such as a pedestrian crossing and a variety of junctions serving the 'old' village, King's school, and the village of Fordwich. In addition there are a number of bus stops in the area (Stagecoach's 'Triangle' via the A291 to Herne Bay and the 'Breeze' via the A28 to Thanet), and traffic dropping off at Sturry station.

The functioning of the A291/A28 priority junction is complicated by the proximity of the level crossing, and can lead to unpredictable driver behaviour. This includes vehicles squeezing into the A291 'out' pocket and forcing into the queued A28 inbound traffic whilst the outbound flow is held at the level crossing.

All of the above factors combine during peak network conditions to cause a notable delay, as illustrated in **Figure 3-3.**

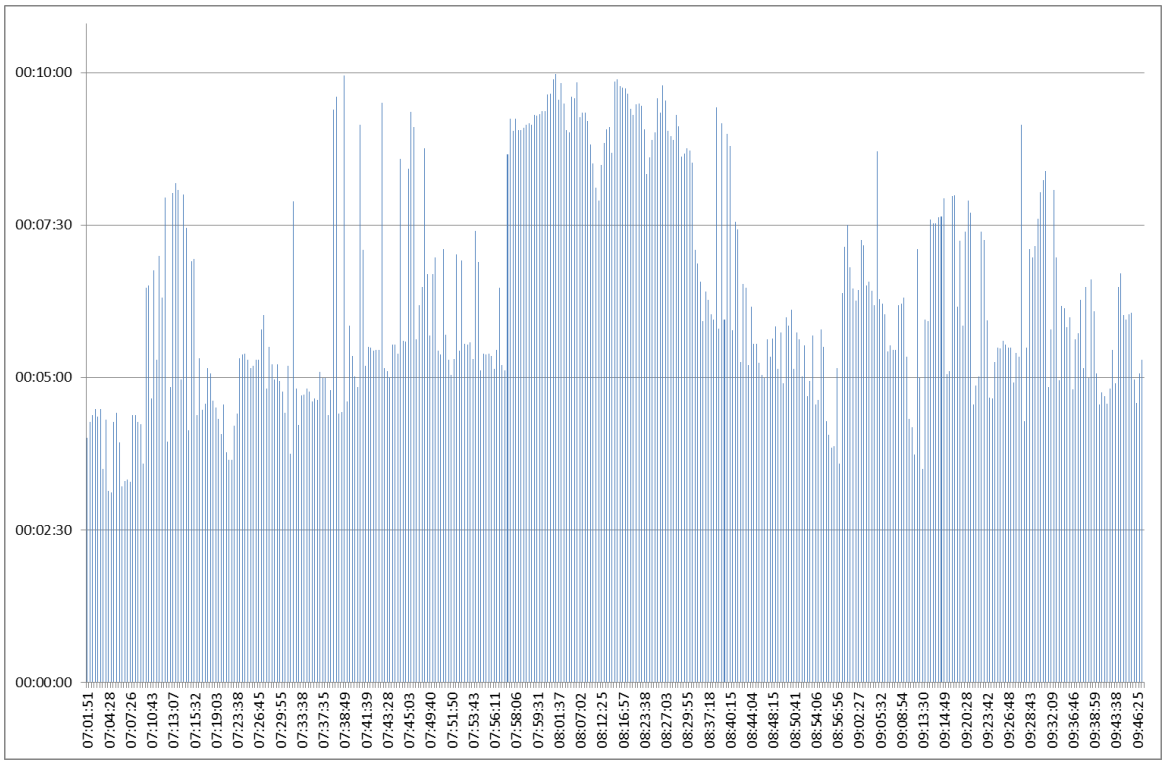


Figure 3-3 AM Peak Average Journey Times (Herne Bay Rd to Island Rd)

3.4.4 Queues

There are sustained AM queues on the A28 Island Rd, reflected in a queue survey at the A291/A28 priority junction. Due to the level crossing in near proximity this survey measured queues on the mainline A28 as well as the 'give-way' traffic on the A291. It is noted that the queue on the A28 (WB) is moving, however the considerable length and sustained nature of the queue is pertinent (**Figure 3-4**).

The PM peak exhibits lower queues in comparison on the A28, however there are queues elsewhere due to different traffic tidality and loading (**Figure 3-5**).

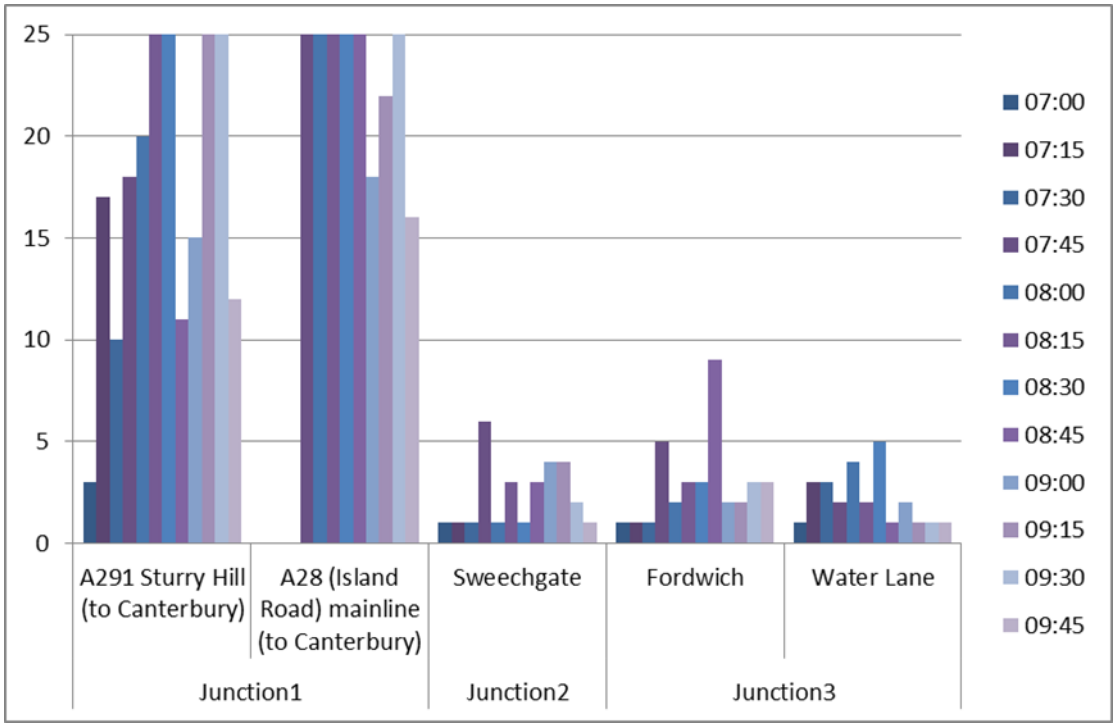


Figure 3-4 AM Peak Queue Lengths

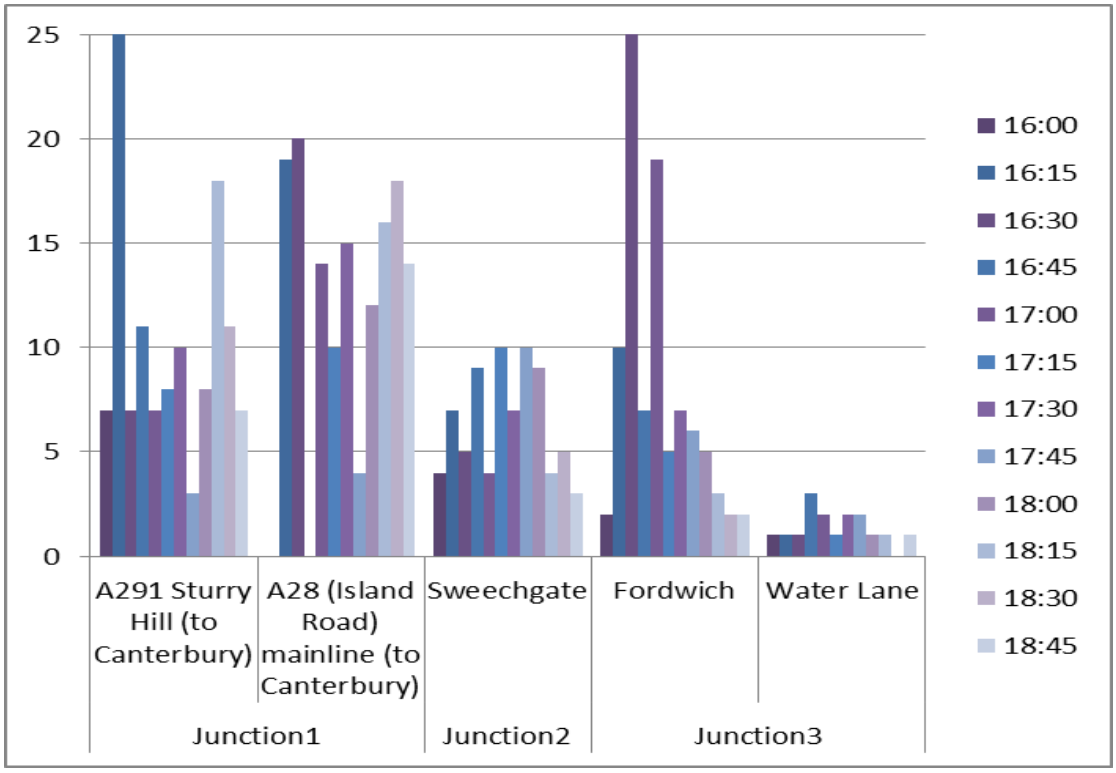


Figure 3-5 PM Peak Queue Lengths

The observed AM peak queuing is supported by the typical traffic conditions given by Google (**Figure 3-6**).

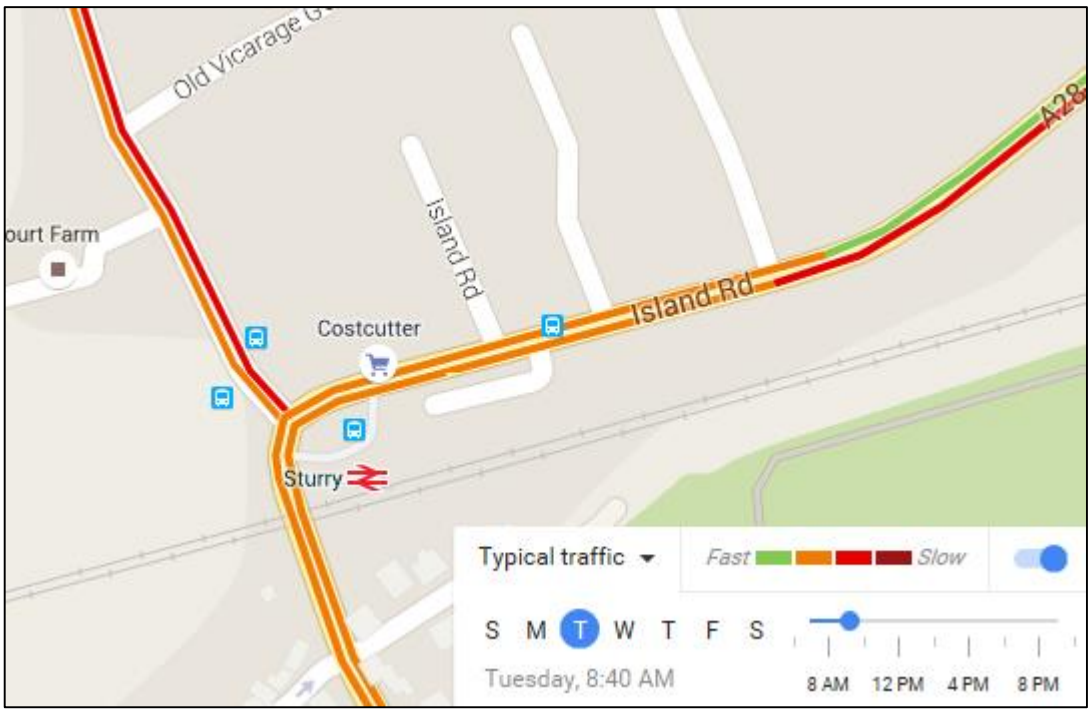


Figure 3-6 AM Peak 'Typical' Traffic Conditions by Google (Google ©)

3.4.5 Journey Time Variability

For this area, it is more important to highlight the journey time variability rather than the journey times per se. This is due to the presence of the level crossings, particularly Sturry with longer down-time, and the variability pattern that ensues due to whether the journey encountered the crossing being down. It is accepted that there are other contributory factors to the movement through the corridor but the level crossing is the key delay point. As can be seen in **Figure 3-7** the profile has a noticeable periodicity rather than either a hump or erratic pattern.

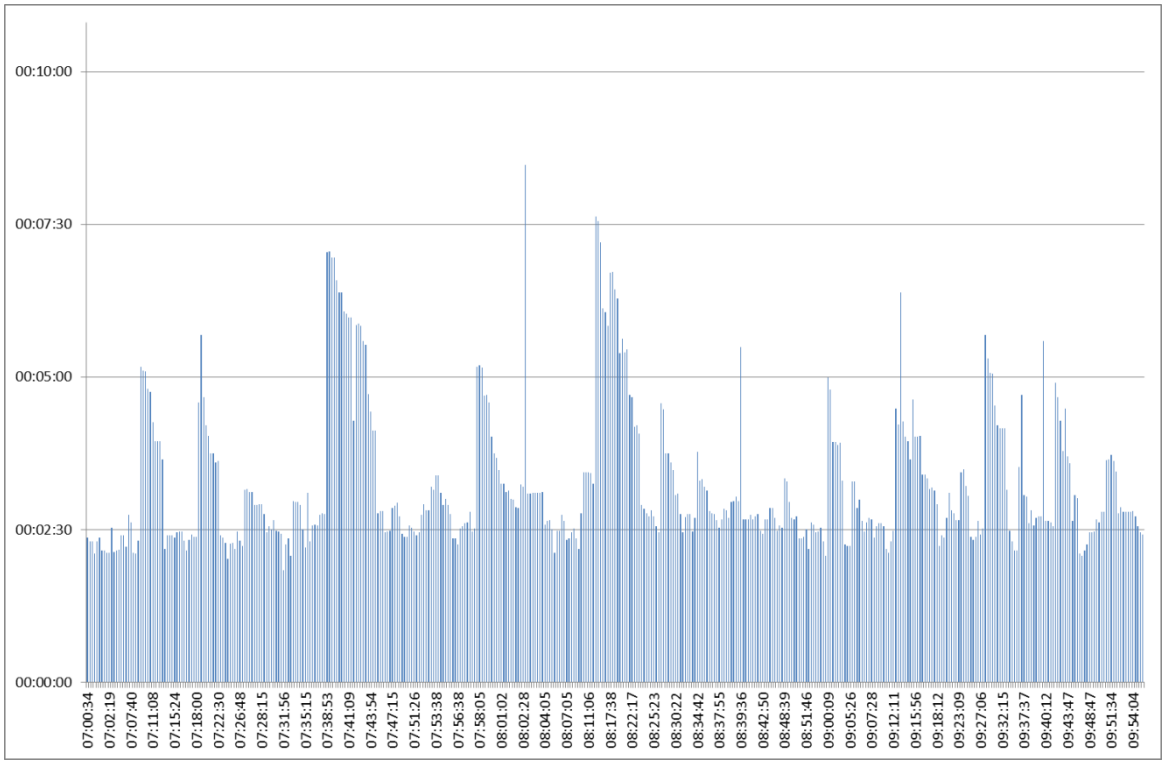


Figure 3-7 AM (ANPR) Journey Times from Sturry Rd to Island Rd

3.4.6 Level Crossings

Whilst Network Rail could not provide confirmation of how many level crossings are currently situated on 'A' roads, it is assumed that it is a relatively rare occurrence. Other examples in the South-East are the A265 in Etchingham (East Sussex) and A286 in Chichester (West Sussex).

The Sturry Level Crossing has a high vehicle flow. In a search of Network Rail's database it is in the top ten highest flows in the UK. This is given as **Table 3-1**.

Table 3-1 Traffic Flows at Level Crossings Data from Network Rail database

Boston Bypass	Boston District (B)	29916
Reigate	Reigate and Banstead District (B)	22518
Harlescott	Shrewsbury CP	20250
Walton Street	City of Kingston upon Hull (B)	20182
Llanbadarn Fawr	Llanbadarn Fawr Community	19710
Cherry Tree	Beverley CP	18010
Sturry	Sturry CP	17928
Malton	Norton-on-Derwent CP	17225
Low Gates	Northallerton CP	17121
Oulton Broad North	Waveney District	16092

Of these instances of level crossings with high traffic flows, the Sturry level crossing has the highest number of trains per day.

The crossing is on the Thanet to Ashford International line which serves Canterbury via Canterbury West. The line has both classic and High-speed (HS1) Domestic services. On average, six trains pass each hour resulting in five or six level crossing activations of approximately 2.5-3 minutes in length.

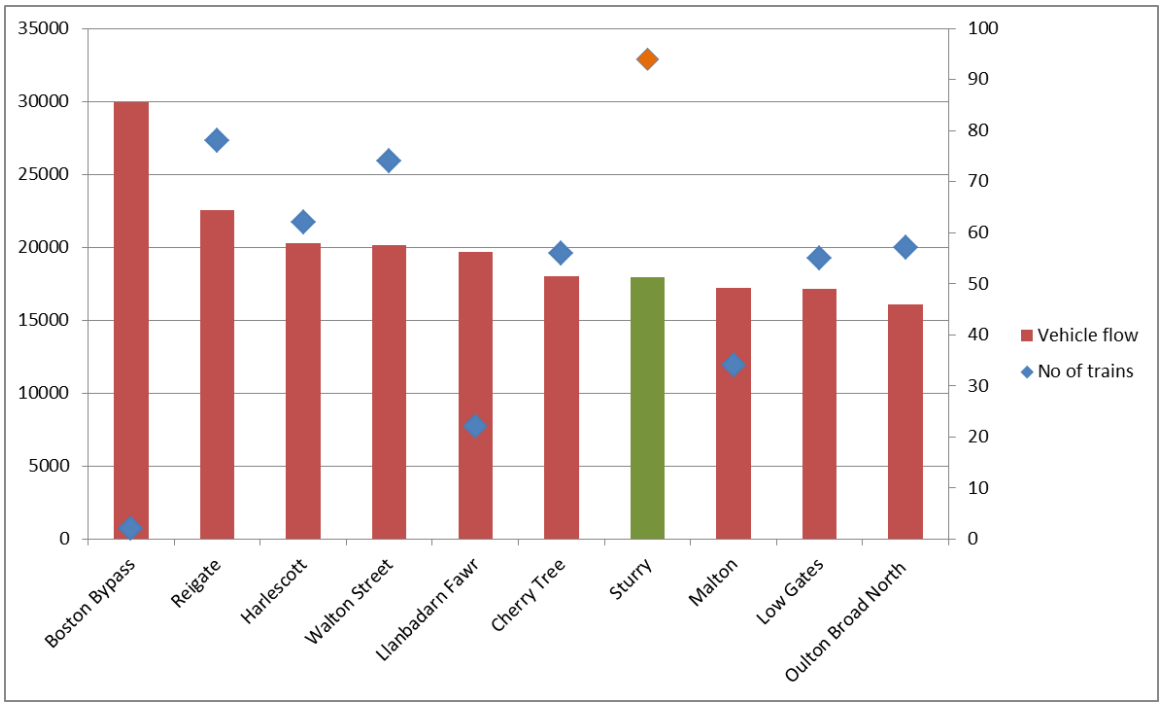


Figure 3-8 Traffic Flow/Train Frequency at Level Crossings

In addition the two level crossings adjacent to the scheme, Sturry and Broad Oak, have been compared against other Kent level crossings. **Figure 3-9** shows Broad Oak level crossing also has a notably high flow; with the combined corridor therefore being very significant in this regard.

The scheme would add to the reducing of traffic flows over level crossings in Kent and Medway; after the completion of the bridge on the A228 in 2012 removing Stoke crossing as a trafficked route.

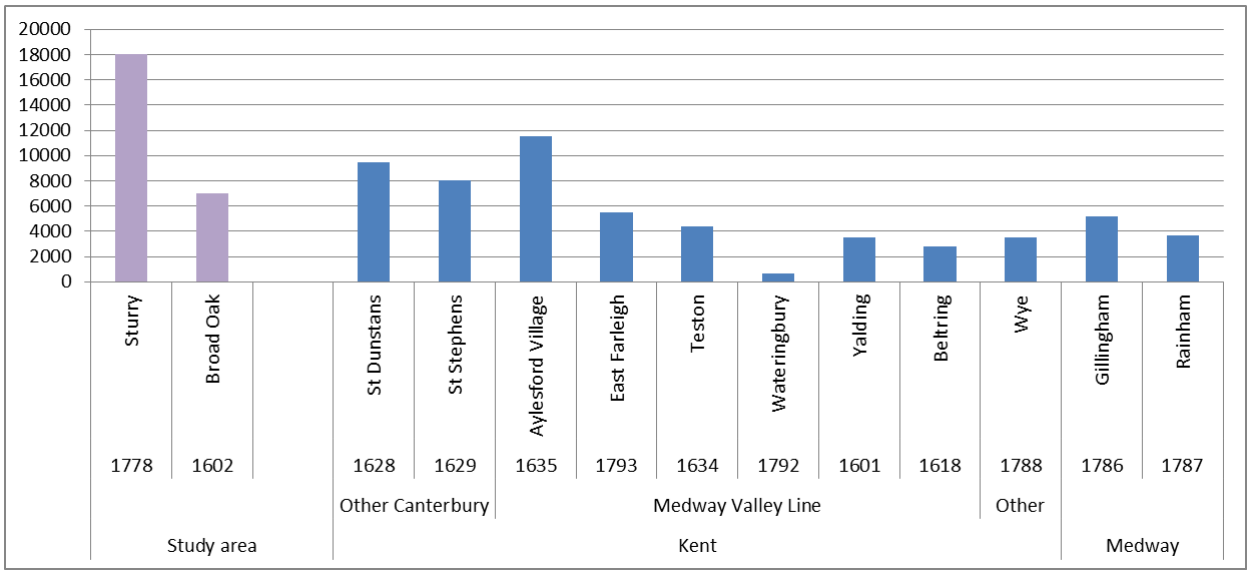


Figure 3-9 Traffic Flows at Kent Level Crossings

Network Rail assesses level crossing risk based on the following categories:

> Individual risk - which applies only to crossing users. The score is presented as a letter ranging from A to M where A is the highest value and M is the lowest.

> Collective risk - which considers the total risk for all people who use the crossing, including: pedestrians, road vehicle drivers, train staff and passengers. The score is presented as a number ranging from 1 to 13 where 1 is the highest value and 13 is the lowest. This 'collective risk' score is the most important part when prioritising crossings.

The Network Rail risk categories are given for the two crossings in **Table 3-2**. On the collective risk scale (all users rather than crossing users) both crossings are in the higher three risk ratings, however both score a little lower in the individual risk category.

Sturry level crossing also has 900 pedestrian and cyclist movements.

Table 3-2 Network Rail Risk Categories

	Collective risk (1 to 13)	**Individual risk (A to M)**
Broad Oak	2	E
Sturry	3	H

3.4.7 Accidents

The accident plot for the study area is given as **Appendix B**.

There is an accident cluster at the junction of the A291/Sweechgate (**Figure 3-10**). This seems to be caused by the excessive use of Sweechgate as an alternative route to the A291.

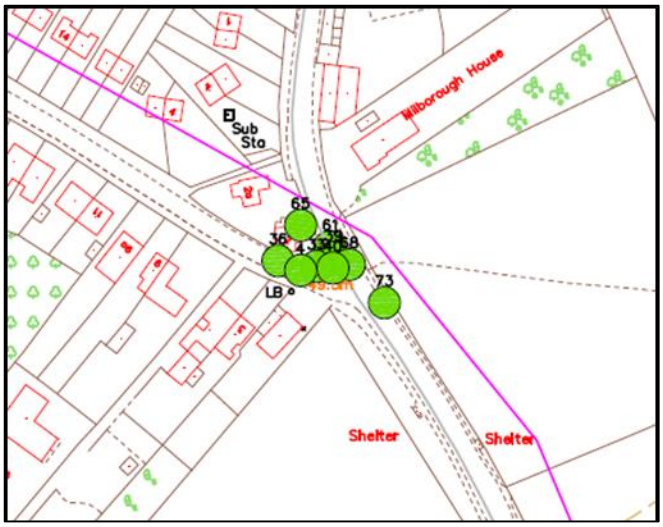


Figure 3-10 Accident cluster at Sweechgate

In addition the accidents on the alternative route have a higher proportion of severe accidents (**Figure 3-11).**

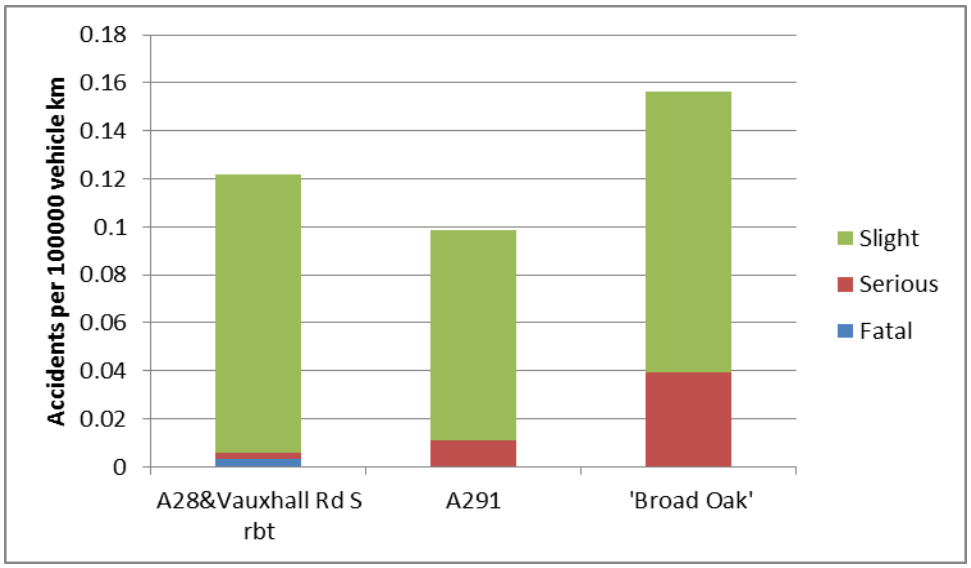


Figure 3-11 Accidents by severity

In terms of road users or themes of accidents, no particular trends are apparent; with accidents varying from involving pedestrians, cyclists, buses, turning, stopping at shops, and parked cars.

3.4.8 Air Quality

Sturry is a little outside of the Canterbury Air Quality Management Area (AQMA), which is contained to the urban area.

However, there has been some additional monitoring of other areas. Sturry itself has not been monitored but nearby Herne has. There is some evidence, via diffusion tubes (DT25 Herne Street), of excessive NO_2 and monitoring is on-going. It is considered reasonable to assume, due to similar conditions, that Sturry has comparable environmental conditions.

3.4.9 JTI project

There are also possibilities that the introduction of the Sturry Link Road can assist in the delivery of the Journey Time Improvements (JTI) project for rail services between Ashford and Ramsgate. The Sturry Link Road delivery is expected to help Phase 2 of this project.

3.4.10 Likely Impact of No Change

The Canterbury Local Plan presupposes the delivery of the link road, and if it is not forthcoming the local plan development quantum will be brought into question.

If direct Government funding (LGF) is not forthcoming; the transport strategy for the local plan could potentially be found to be unsound; and a reduced quantum may be appropriate.

Table 3-3 summarises the current and future problems that the scheme is intended to solve.

Table 3-3 – Summary of Problems

Summary of Identified Problem Issues to be Resolved by the Scheme				
Strategic / Local Context & Primary / Secondary Problem		**Identified Problem Issue**	**Details of Problems (e.g. Type, Scale, Timeframe, Affected Groups and Impact Severity)**	
Strategic / Localised	Primary / Secondary		**Existing Problems**	**Future Problems**
Localised	Primary	Localised congestion	Link capacity of level crossing	Growth numbers will add to current delays
	Secondary	Poor elements of existing design	Proximity of junctions to level crossing	
Strategic	Primary	Wider network rat-running	A291 to Canterbury traffic uses alternative route through Broad Oak village	Increase rat-running
	Secondary			

3.5 Scheme Objectives and Scope

3.5.1 Objectives

Table 3-4 summarises the broad scheme objectives / identified problems and intended outcomes.

Table 3-4 Summary of Objectives

Scheme Objective to be Achieved	Main benefits for Respective Stakeholders
Objective 1 Improve operation of Sturry highway network	**Users** Improved journey time and reliability **Cyclists / Local users** Improved journey quality on original alignment **Local Authorities,** Improved attractiveness of the area for inward investment and job creation Improved attractiveness of the area for housing **Developers and Employers** Ability to develop schemes without excessive planning conditions Ability to create employment and attract employees **Network Rail** Less traffic over level crossing **Residents of Sturry and Broad Oak** Less traffic / improved noise and air quality

Scheme Objective to be Achieved	Main benefits for Respective Stakeholders
Objective 2 Remove poor elements of existing layout	**Users** Improved journey quality.
Objective 3 Provide transport system which can deliver local plan	**SELEP** Canterbury District can assist in delivering housing growth
Objective 4 Enhance use of Park-and-ride	**Users** A more reliable arrival at the Sturry Rd park-and-ride. **Bus operator** Increased patronage **Local Authorities** Improved use of sustainable modes

3.5.2 Scope

Table 3-5 summarises the scope of the project.

Table 3-5 – Summary of Project Scope

Items Within and Outside the Scope of the Scheme Project		
Item of Interest	**Details Within Scope of the Scheme**	**Details Outside Scope of the Scheme**
Functioning of local highway network	Delays at approaches and within network including level crossing	Wider network operation
Local plan delivery	Proportion of delivery quantum (North-eastern quadrant of district)	Balance of delivery quantum

There is minimal opportunity to reduce the scope of the scheme project, as the factors causing congestion, including the level crossing, are close together and highly interacted and entwined. Minor improvements may alleviate current conditions. However, this would be limited and at the expense of the local plan delivery.

3.6 Determining Success of the Scheme

Fulfilment of certain successful performance criteria, together with negotiating a number of essential hurdles to fund and deliver the scheme, can be regarded as 'Critical Success Factors' (CSF) for the *Sturry Link Rd*, in accordance with HM Treasury's 'The Green Book' (July 2011).

3.6.1 Critical Success Factors

There are several 'Critical Success Factors' (CSF) that will determine if the *Sturry Link Rd* can be introduced satisfactorily. These CSF are essentially a combination of performance, finance and delivery assurances, as suggested in HM Treasury's 'The Green Book' (2011) and which can be assessed qualitatively and broadly aligned under the five criteria of the 'Transport Business Cases' (DfT, January 2013).

The CSFs for the Sturry Link Rd project have been selected and categorised as follows:

- **CSF1: Strategic Fit**
  - Will reduce congestion in critical area;
  - Will enable housing and employment development;
- **CSF 2: Prosperous and Sustainable Economy and Value for Money**
  - Will reduce cost of travel and increases journey reliability for scheme users;
  - Will maximise return on investment, striking a balance between the cost of delivery and the cost to the economy of non-delivery;
- **CSF 3: Affordable Finance**
  - Can be delivered within the likely capital funding available;
  - Can be afforded, in terms of financing revenue liabilities within current budgets;
- **CSF 4: Achievable Construction**
  - Can be delivered using current engineering and technological solutions;
  - Can be procured through accepted methods of commissioning;
- **CRF 5: Manageable Implementation and Operation**
  - Can be delivered within the timeframe of available funding;
  - Can be operated satisfactorily in accordance with its intended remit.

3.6.2 Successful Performance Criteria

Some of the critical success factors for the *Sturry Link Rd* relate to the operational performance of the intervention.

For this scheme the key operational parts are a successful re-design of the A28/A291 junction introducing efficient signals and an improved design considering all modes.

3.6.3 Measurement of Successful Scheme Performance

Scheme monitoring and evaluation is discussed in Section 7.10 of this report..

3.7 Constraints and Dependencies

3.7.1 Scheme Constraints

Engineering challenge

A bridge over the railway is a significant engineering challenge, reflected in the scheme costs. In addition the alignment crosses the Great Stour River and the associated riparian environment.

Network Rail Liaison

KCC have entered into a Basic Services Agreement with Network Rail and have had early high level discussions about the project. KCC are in the process of completing the Front End Pack required by Network Rail. To minimise the impact to Network Rail the proposed viaduct would overfly the rail boundaries minimising the need for possessions of the railway.

KCC have experience of delivering projects involving Network Rail, and will employ consultants and contractors that also have experience and knowledge of Network Rail procedures.

In addition to the bridge, proposed alterations to the junction between the A28 and A291 will require discussions with Network Rail in order to ensure the proposals do not interfere with the safe operation of the Sturry Level Crossing**.**

Environment Agency Liaison

Early discussions have been held with the Environment Agency to obtain their views on the form of bridge and the impact on the Great Stour and its flood plain. Initial preferences were:

- The bridge should maintain continuity of the flood plain
- Columns and piles are preferred as the support of the structure rather than abutments and embankments
- Both branches of the Great Stour are classified as a main river and will require access for maintenance

- With columns spanning the flood plain the EA would be less concerned about modelling the river with the bridge structure in place. With embankments detailed modelling would be required.

Feasibility designs of various forms of structures have been carried out and a high level impact assessment undertaken. The conclusion was that the bridge would need to be a viaduct crossing both branches of the Great Stour, its flood plain as well as the railway. The viaduct option has been included in the cost estimate.

The benefits of the viaduct option are:

- Minimal impact on the flood plain and flood storage
- Minimal impact on river flows
- Reduces need and extent of any land required to provide flood storage compensation
- Piled foundations and columns reduce the risks associated with construction over poor ground.
- Reduces the quantity of imported fill necessary to construct the road.

A viaduct, removes the key concerns raised by the EA reduces the risk of objection and provides an engineered solution within the site constraints.

Combined scheme and development

The scheme is being delivered in co-operation with the developer promoting the Sturry / Broad Oak site (1,000 houses). The financial implications are detailed in the financial case. The dependency of the 1,000 homes on the scheme is covered in the appraisal assumptions (section 4.3.2).

3.7.2 Scheme Dependencies

As highlighted, the current 'scheme' is working in tandem with a developer site and its new road network. Therefore in terms of current funding aspirations both elements need to be delivered. If the developer site does not proceed, the scheme would be 'shelved'.

This combined scheme can be considered as stand-alone. However, there are other improvements to the local network that are working as a package to deliver the local plan quantum.

The scheme can provide a more reliable car-leg to the park and ride site at Sturry Rd, located beyond Sturry towards Canterbury on the A28. However to be effective in enhancing park and ride usage the bus leg needs to be addressed by measures to improve the Sturry Rd bus lanes for the journey to the city centre. This is dealt with in another LGF funded scheme ('Sturry Rd Integrated Transport Package').

To deliver all of the named sites in the north-east quadrant, a bypass is being promoted of the village of Herne further out of Canterbury on the A291. These sites will maximise the 'value for money' by providing a greater number of users.

3.8 Stakeholders and Interests

Stakeholders are identified and a stakeholder-strategy introduced in a later chapter.

4 Economic Case

4.1 Overview

The Economic Case provides evidence of how the scheme is predicted to perform, in relation to its stated objectives, identified problems and targeted outcomes. It considers the relative performance of possible scheme options, in order to determine the optimum scheme. Ultimately, the Economic Case determines if the proposed scheme is a viable investment, whose strengths outweigh its weaknesses and which provides good value for money.

The predicted scheme appraisal focuses on those aspects of scheme performance that are relevant to the nature of the intervention. However, we do acknowledge the strands of assessment that are required under various pieces of statutory guidance (e.g. DfT WebTAG, VfM Assessment, LSTF; HM Treasury 'Green Book').

The *Sturry Link Rd* is being assessed from VISSIM results of the travel time of the highway-network comparing the 'with' and 'without' scheme scenarios. These results are available for the AM and PM peaks. The method used was, predominantly, a TUBA calculation for travel time savings. The VISSIM path files were converted into matrices in excel using pivot tables.

The scope for the VISSIM model was presented to the incumbent ITE prior to the modelling being undertaken. The modelling reports, LMVR and forecasting report are available. The model coverage for the links and the zones are shown in **Figure 4-1**. The VISSIM Origin-Destination matrix was constructed from a commissioned ANPR survey.

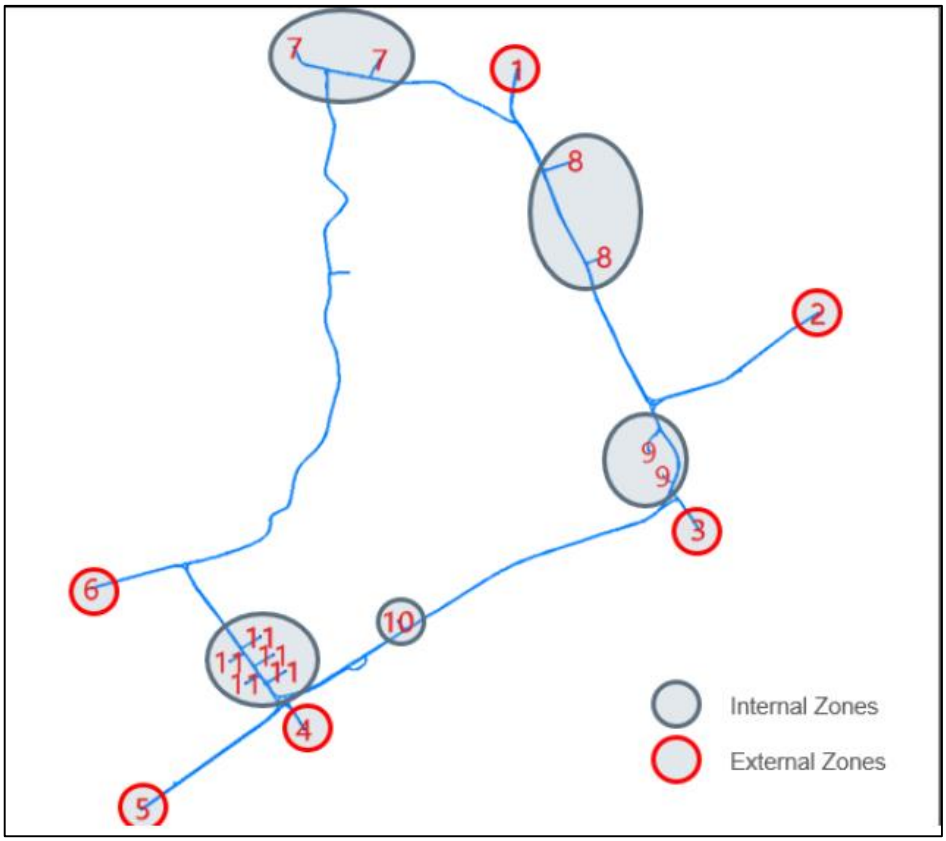


Figure 4-1 VISSIM coverage (links and zones)

In accordance with the requirements of HM Treasury's Green Book 'Appraisal and Evaluation in Central Government', (July 2011), this section of the TBC report gives an appraisal of the scheme options that have been considered as possible solutions to the project objectives and problems identified in the strategic case.

4.2 Background

Achievement of the scheme objectives is intended to resolve the identified transport problems and result in the anticipated stakeholder benefits. Evidence is needed to determine if these predicted outcomes are attainable and this is appraised in the 'Economic Case'.

This appraisal is focused on predicting the scheme's performance against the selected success criteria.

A subsequent part of the Economic Case is to predict the scheme's ability to satisfy its Critical Success Factors (CSF) which represent a combination of performance, funding and delivery expectations, in line with HM Treasury guidance. These CSFs are categorised according to Strategic Fit, Value for Money, Achievability, Affordability and Timescale, reflecting the 5-case TBC model. They enable the scheme and its options to be appraised and compared in order to identify the most effective solutions.

The following subsections describe the scheme options, their advantages and disadvantages and whether they have shown sufficient merit to take forward for more detailed economic appraisal. A summary of the options, mapped against the scheme objectives and CSFs is provided.

Following this, the approach towards more detailed economic appraisal is described, followed by the scheme option appraisal itself.

An Appraisal Summary Table, setting out the key issues relevant to this scheme is provided. Although some aspects of this (including the economic appraisal) have been explored in outline at this initial stage, other aspects will not be explored in detail until a later Transport Business Case stage, if necessary.

4.3 Appraisal Assumptions

With devolution of major scheme approval to Local Enterprise Partnerships, it is important that an approach to appraisal is used that gives regard to local priorities (especially in enabling investment, job creation and housing construction). This must be done with due regard to standard practice, which in transport terms means the use of WebTAG guidance. Discussions with the Department for Transport have indicated that a 'proportionate' approach to WebTAG should be used. Kent County Council has held discussions with the South East Local Enterprise Partnership, in the light of Government Guidance, on how the appraisal of devolved small major schemes should be handled ('Growth Deals Initial Guidance for Local Enterprise Partnerships', HM Government July 2013).

The following assumptions have been made during transport modelling and appraisal of the preferred scheme;

TUBA

- TUBA version 1.9.5
- AM and PM peak hours have been weighted as two hour periods and annualised over 253 days (see below). As the benefits are being claimed for non-modelled periods, the matrices included part of the pre-load to be a more robust estimate. Also, it is noted that there is evidence for some inter-peak and Saturday benefits but these have been excluded.
- Two forecast years entered into TUBA, opening and forecast year. Opening year has been assumed to be the same as base. Forecast year reflects local plan horizon year. The TUBA runs used the model scenarios excluding dependent housing (Scenarios A and D in Webtag A2.3).
- 60 year appraisal
- Standard TUBA economics parameter file used.
- Traffic flows assumed to be all cars. This is reasonable as average vehicle VOT are similar and there are no specific differences for HGV costs.

Modelling

- Downstream capacity outside of modelled area assumed not to be a limiting factor. The first downstream junctions inbound to Canterbury (Vauxhall Rd roundabouts) have been included in the modelled area.
- Average vehicle hours extracted, with the journey time variability from the level crossing ignored in quantitative appraisal terms.
- Estimate of 'with-scheme' signal timings
- No variable demand responses, particularly trip distribution have been included.
- Future year growth established from first principles based on working TAs from the development sites in the north-east quadrant, plus a small TEMPRO uplift to reflect other factors, using the alternative planning assumptions to remove double-counting.

Scheme costs

- Combined scheme cost, and commensurate developer contribution, included in TUBA input. Further detailed in financial case, including 'Treatment of scheme costs' (WebTAG A1.2).

- Effect of roadworks during construction based on QUADRO indicative values. This is detailed more below.
- Notional major maintenance of £10million included.
- Optimism bias of 15% - 'conditional approval' level. The optimism bias has been assumed to be allocated to the public purse, with the developer contribution assumed fixed.
- GDP adjustment to 2010 prices (undiscounted) (for TUBA) taken from WebTAG data book.
- Stage of preparation (for TUBA) noted as Public Consultation.
- Sunk costs are excluded and deemed subsumed into normal council operations (as per WebTAG A1.2 Scheme costs).

Other

- Noise and air quality not monetised (see below).
- Simplified COBALT exercise undertaken (see below).
- Dependent housing. Detailed more below.

4.3.1 TUBA modelled periods

The AM and PM peak hour models have each been assumed to be representative of 120mins. Journey time data of current conditions was investigated to check that this is reasonable. Whilst there are elements of 'peakiness' in some movements, overall the assumption is sufficiently robust. In addition, as previously mentioned, the skims were created including part of the model pre-load to be more representative.

4.3.2 Dependent housing

Consideration has been given to how best address the appraisal of dependent housing. As the required basis the four steps in WebTAG A2.3 were investigated. It seemed appropriate to adopt a simpler approach.

The Sturry/ Broad Oak development being delivered in tandem with the scheme is regarded as dependent housing. The other sites have been assumed as non-dependent.

This is only an appraisal assumption and not a basis of any planning considerations.

4.3.3 Roadworks during construction

It is accepted that roadworks during construction, could be considered as part of appraisal. This could either be by use of QUADRO, more historically or for the SRN; or the 'active' congested assignment package, in this case VISSIM. However for this scheme the large proportion of the construction works will be offline to the existing network. Furthermore the ongoing maintenance will be absorbed into KCC's on-going asset management.

Consideration was given by reference to DMRB Volume 14 and TAG A1.3 (section10). It is worth noting that this process is neither a go/no-go nor a route sifting exercise.

KCC understand the importance of minimising the delay and need to consider the elements of the design particularly:

- On the western side of the area, there is a new roundabout on the A28 Mill Road (disruption to a link flow of 20,000vpd)
- On the eastern side, there is the signalising the A28/A291 junction; and adding the A291 links to the link road.
- Adding Broad Oak Link
- Minimising increased use of Shalloak Rd
- Working with Stagecoach to ensure smooth running of bus services.
- Working with Network Rail / proximity to level crossing.

A possible approach could be to complete the link road between A291 and Mill Rd, removing the A291 inbound traffic from the level crossing area, and then complete the A28 Island Rd connections to the link road.

It will also be important to coordinate any shuttle working with the level crossing down-time, and to a lesser extent the pedestrian crossing; and to ensure there is no blocking back caused by hampered right-turns due to queued traffic (e.g. the right turns for inbound traffic into the industrial estates on Mill Rd could be blocked by outbound queuing in the shuttled working).

For this scheme it has been deemed reasonable to apply an estimate using representative values from QUADRO. Six months of shuttle working has been assumed. Although there is potential for reassignment, via the alternative route, this has been dismissed as it assumed KCC would not encourage that approach. Whilst it may be better from a travel time perspective it could encourage more accidents.

4.3.4 On-going maintenance

It is generally assumed that the maintenance of the link road will be subsumed into KCC's ongoing network asset management. However, a major re-surfacing has been included in the TUBA run. This was assumed at £10 million.

4.3.5 Noise and air quality

There is a change in alignment of the transport corridor. However it is noted that this is alongside the existing rail corridor; and will not detrimentally affect many residential properties. Some impact is likely to Greenfields (Shooting school) and the Telephone Exchange on the A291, and the industrial area on the A28.

Environmental consultants will be involved with the design process for both the KCC scheme and the development site, but at this stage no further appraisal of noise and air quality is included. If deemed necessary an updated business case will include these aspects.

There is an expectation that the overall change will be broadly beneficial with the improvements through Broad Oak village.

4.4 Scheme Options Considered

Whilst the economic appraisal will be limited to the 'preferred' option this section gives an overview of the sifting of options.

4.4.1 Option 1: Do Nothing

Description

Current situation

Conclusion

Option 1: Not relevant for appraisal, as excludes committed interventions and growth. Confirms 'the case for change'.

4.4.2 Option 2: Do Minimum

Description

Background growth, excluding dependent development, is applied to current network and other committed interventions.

This could include converting A291 / Sweechgate junction to a roundabout.

Advantages

- No need for scheme funding.
- Addresses accident cluster at A291/Sweechgate.

Disadvantages

- Existing situation likely to worsen and dependent housing not delivered.

Conclusion

Option 2: Not carried forward, but used as 'baseline' for appraisal.

4.4.3 Option 3a: Do Something (Low-cost options 1)

Description

Public transport and active modes interventions. Includes Demand Management/Smarter choices.

Advantages

- Possibility of lower cost and promotes the sustainability agenda.

Disadvantages

- This would be insufficient for the highway network in this area. Such options would be part of 'locking-in' the benefits of a highway scheme. There is a focus on enhancing the use of park and ride in conjunction with a highway scheme.

Conclusion

Option 3a: Rejected

4.4.4 Option 3b: Do Something (Low-cost options 2)

Description

Modifications to current network

Advantages

- Possibility of a lower cost option.

Disadvantages

- This would be insufficient for the highway network in this area and would be detrimental to the growth aspirations.

Conclusion

Option 3b: Rejected

4.4.5 Option 4: Do Something (Sturry Link Road without Broad Oak Link)

Description

Bridge over railway to bypass mainline traffic using Sturry Level Crossing. This would be in the viaduct from as identified in 3.7

Advantages

- Provides a highway network which can deliver local plan sites.
- Reduces vehicle flow over level crossing and through village; improving journey quality for cyclists, pedestrians, and local traffic.
- Reduces delay to vehicles through Sturry.
- Improved air quality in village.
- Reduced rat-running through Broad Oak.

Disadvantages

- Some landscape and environmental impact.
- Risk of funnelling too much traffic into a downstream capacity point at Vauxhall Rd.

Conclusion

Option 4: Extended to Option 5, after modelling exercise

4.4.6 Option 5: Do Something (Sturry Link Road with Broad Oak Link)

Description

As Option 4 but with additional link.

Advantages

- Provides a connection from the link road to a secondary parallel route into Canterbury. This allows traffic to cross Vauxhall Rd at the northern roundabout and use a parallel route through the urban area, rather than funnelling all A28 traffic through the southern roundabout. This should also reduce 'rat-running' through Broad Oak even further; as the alignment becomes the best route for more destinations in the urban area.

Disadvantages

- Cost due to increased new highway infrastructure and engineering requirements.

Conclusion

Option 5: Preferred

4.4.7 Option 6: Do Something (Broad Oak Link south of railway)

Description

As Option 5 but with additional link south of railway.

Advantages

- Possibilities of closure of level crossing.

Disadvantages

- Excessive cost due to either second railway crossing, or additional link being built as a viaduct over flood plain.

Conclusion

Option 6: Rejected

Options 4 and 5 also have variations including a wider bridge structure to accommodate potential road space for a bus lane, and potentially a dedicated approach to the park-and-ride. The design is proceeding assuming this extra width, and the costs have included the additional items (circa £2m).

Table 4-1 gives a summary of the above review of scheme options, in terms of the objectives and critical success factors for the scheme:

Table 4-1 - Summary of Scheme Option Assessment and Sifting

Reference to:	**Option 1/2**	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Option 6**
Description of Option:	**Do Nothing**	**Do Minimum**	**Low-cost options**	**Sturry Link Road**	**Sturry Link Road with Broad Oak Link**	**Broad Oak Link south of railway**
Improve operation of transport system	×	×	×	✓	✓✓	✓✓✓
Remove poor elements of existing layout	×	✓ **(partial)**	×	✓	✓	✓
Provide transport system which can deliver local plan	×	×	×	✓	✓	✓
Affordable finance	✓	✓	✓	✓	✓	×
Summary	**Reference**		**Discounted**	**See Option 5**	**Preferred**	**Discounted**

4.5 Economic Case Content and Method

The appraisal criteria for the scheme and the overall approach used to assess these are as shown in **Table 4-2**.

Table 4-2 – Appraisal Criteria for Assessing Core Scheme Performance

Appraisal Criteria	Direct/ Indirect Impact Appraisal	Approach Used to Assess Core Scheme Performance Items
Journey time savings	Direct	VISSIM modelling to feed TUBA
Improved layout and journey perception	Indirect	Qualitative
Wider Economic Impacts	Indirect	Ensuring viable transport strategy for emerging local plan

The Economic Case for this scheme is focused on:

- Assessing the direct, localised, economic efficiency and prosperity benefits of the scheme.
- Qualitatively appraising the wider scheme benefits, in terms of enabling planned developments and other major transport schemes in the area and complementary sustainable transport schemes.
- Offsetting the scheme benefits against the direct scheme capital costs, (i.e. construction costs, not accounting for the costs of any complementary investments).

As set out in the Strategic Case, this scheme will be important for supporting the development of jobs and housing in the local area. For the purposes of this scheme, the direct employment benefits (i.e. people employed in constructing the scheme) have not been calculated, although these may be assessed as part of the direct jobs generated by the LGF programme as a whole.

As previously highlighted, the economic appraisal has been undertaken against only two options:

- Do Minimum - reference case with the scheme not delivered; and
- Do Something - with delivery of the proposed scheme option.

4.6 Preferred Scheme Option

The link road with an additional link to Broad Oak, north of railway, has been selected as the preferred option, and a brief commentary highlights the reasons.

Operational – This option maintains the use of two corridors of traffic towards the City Centre. This is understood to be the basis of successful network operation. This routing is illustrated in Figure 4-2.

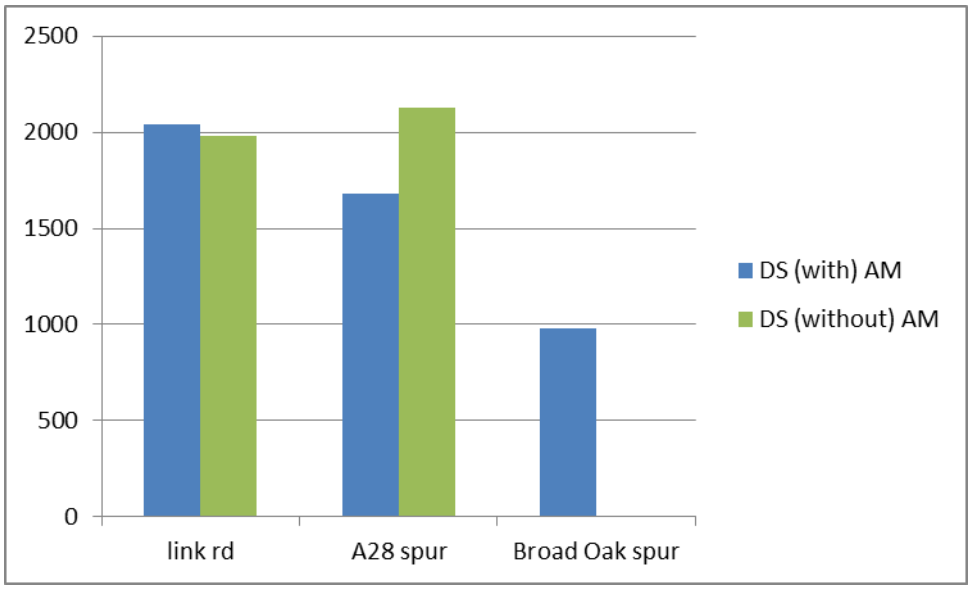


Figure 4-2 Flow comparison with/without additional link

Cost – Avoids excessive costs of a link to the south of a railway that would incur from either a second bridge or viaduct structure.

Objectives – In conjunction with other measures, can help deliver necessary infrastructure for delivering local plan. The scheme is also complementary to sustainable transport objectives.

4.7 Scheme Option Localised Performance

This section summarises the predicted performance of scheme options to understand the scheme layout's fitness for purpose.

Table 4-3 compares localised scheme performance against the do minimum. This is reported as vehicle hours which work as a proxy for journey time savings through the study area.

Table 4-3 – Localised Scheme Performance Compared with Do Minimum Reference Case

Scenario	Key Performance Indicators	Unit	AM	PM
Do-Minimum (opening year)	Performance indicators for Congestion Relief road schemes (VISSIM total hours)	Veh-hrs	858	975
Do-Something (opening year)			778	982
Do-Minimum (forecast year)			1314	1652
Do-Something (forecast year)			1099	1411

The scheme has a more beneficial effect in the opening year on the AM situation, noting the PM is broadly neutral at this point. This is in-line with expectations due to the nature of the pinch-point at the A28/A291 junction. The inbound traffic, higher with the AM tidality, has a give-way requirement from the A291 that is not extant for the outbound.

In the forecast year, with the additional growth, both time peaks show benefits.

4.8 Scheme Performance Risk and Outcome Sensitivity

It should be noted that the current scheme design has a limitation with regard to a new signalised junction to replace the current A28/A291 junction. With the current proposal there is potential blocking back on the old A28 over the level crossing to the extent that traffic is hindered reaching the new link road when the level crossing is in operation (illustrated as Figure 4-3). This blocking back prevents use of green time at the new signals at the A28/A291 junction. Due to the tidality this is more pertinent in the AM, and leads to an underestimate of benefits.

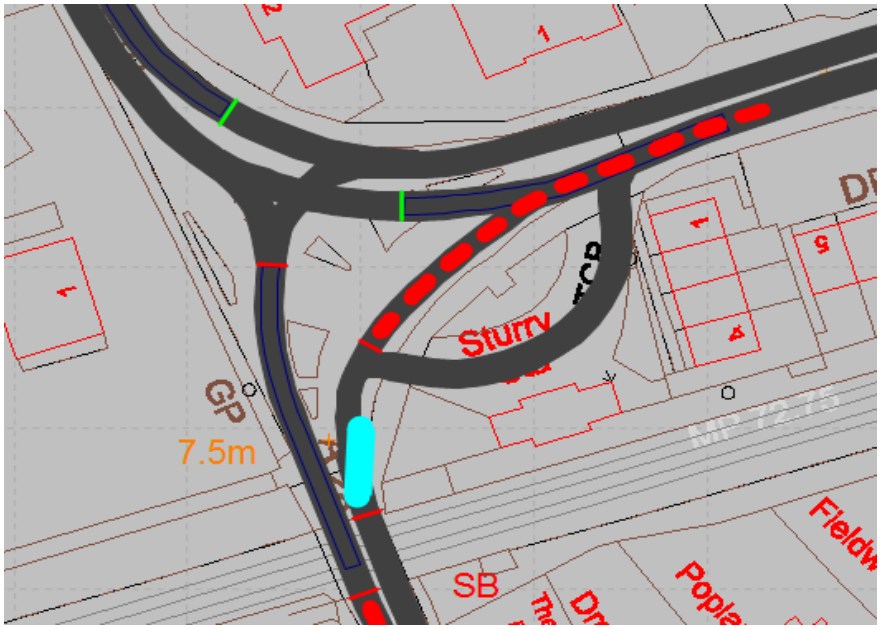


Figure 4-3 Design limitation

This limitation manifests in both the modelling and the design.

In the modelling the driver behaviour does not update, in terms of routing, if the driver is trying to use the old A28 instead of the new link road.

In the current design the stacking capacity is only about five vehicles. If either the stop line can be moved closer to the railway, albeit at some detriment to buses, or a longer flare can be introduced then greater benefits will ensue.

Further investigation is currently being undertaken by KCC and Amey to identify an optimal solution at this junction to eliminate/reduce this limitation.

4.9 Accident Appraisal

A small COBALT exercise was undertaken to ascertain potential accident benefits. This was kept to a simple spreadsheet exercise to determine the inputs, with link flows approximated to AADT. This was based on Option 4 which can be reasonably used as a simplification of the preferred option. This network has also kept distance neutral between origin-destinations; and assumed that the Vauxhall Rd roundabouts would be unchanged in combined accident terms.

The exercise has only been done as an approximation due to the limitation of assessing the benefits of reducing traffic crossing the level crossings, which in the coding were assumed to be junctions. Some of the smaller conflict points, local access points and Fordwich Rd, have been ignored. In addition user-inputs were used to reflect the accident cluster at Sweechgate and on the alternative route.

The breakdown and the simple network representation is given in Appendix D.

The results give evidence for a small uplift in the PVB/BCR, but not a greatly meaningful difference. A working value of circa £0.75m as an uplift to the PVB is stated. However, due to the possible variability of this small number it is not being included in the initial BCR.

This result being only slightly beneficial is logical, as there are benefits from traffic being on better highway infrastructure offset against the traffic using more junctions.

4.10 Other Social / Distributional Impacts

Social and distributional impacts have been given an appropriate consideration. It is noted that the scheme is assumed to have minimal impacts. As a predominantly highway scheme certain impacts are largely ignored, such as personal security and personal affordability.

Social impacts are summarised in the Appraisal Summary Table (AST) as per usual. It was felt unwieldy to add an extra Appendix for a distributional impacts pro-forma, keeping relevant comments in the narrative and in the AST.

Two points are worth highlighting. Firstly, there is the potential benefit from a more reliable bus service; noting bus users are often in the low income groups. This would be further enhanced by improvements to Sturry station and the surrounding bus stops; becoming more in keeping with a public transport hub/interchange. Secondly, traffic flow will be moved away from the local pedestrian / cycling movements in Sturry. This should provide a safer, more pleasant environment.

4.11 Appraisal Summary Table

A qualitative / quantitative assessment of predicted scheme performance against WebTAG appraisal criteria has been completed using an Appraisal Summary Table (AST) which is attached as Appendix B.

For this highway scheme a quantitative measure has been calculated for travel time savings (TUBA). In addition a small potential uplift for accident savings (COBALT) is noted. There are also qualitative statements for other key items.

4.12 Present Value Outcomes from Economic Appraisal

Table 4-4 shows summary of AMCB based on the TUBA results. As recommended in WebTAG (A2.3) benefits of dependent housing are not included in the AMCB.

Table 4-4 – Summary of Analysis of Monetised Costs and Benefits

Scheme Summary Analysis of Monetised Costs and Benefits (Present values and prices)	
Net Outcome for: **Do-Something Preferred Scheme minus Do Minimum**	**Present Values (£ 000s)**
User Present Value Benefit (PVB)	57,415
Capital Present Value Cost (PVC)	25,077
Scheme Net Present Value (NPV) = PVB - PVC	32,338
Scheme Initial Benefit to Cost Ratio (BCR) = PVB/PVC	2.3

4.13 TUBA output (results and warnings)

As the benefits of the scheme are derived from the TUBA run, some additional comments are given.

The TUBA warnings have been investigated. Although this is not necessarily required, as 'rule of a half' violations do not apply for fixed matrices, they were useful to check modelling results were credible.

It is noted that for this exercise we are looking at a 'large scheme in a small network' so it is likely to be less sensitive to model convergence. Modelling results can be supplied.

As indicated from the vehicle-hours quoted earlier, the AM peak is initially deriving the higher benefits. The time periods become comparable in the later year, although it has been noted that the AM is likely to be underestimated. The pattern of the benefits is shown in Figure 4-4.

The disaggregation of the benefits has been inspected for anomalies and credibility. The number of zones was small enough to use the zones as sectors in TUBA.

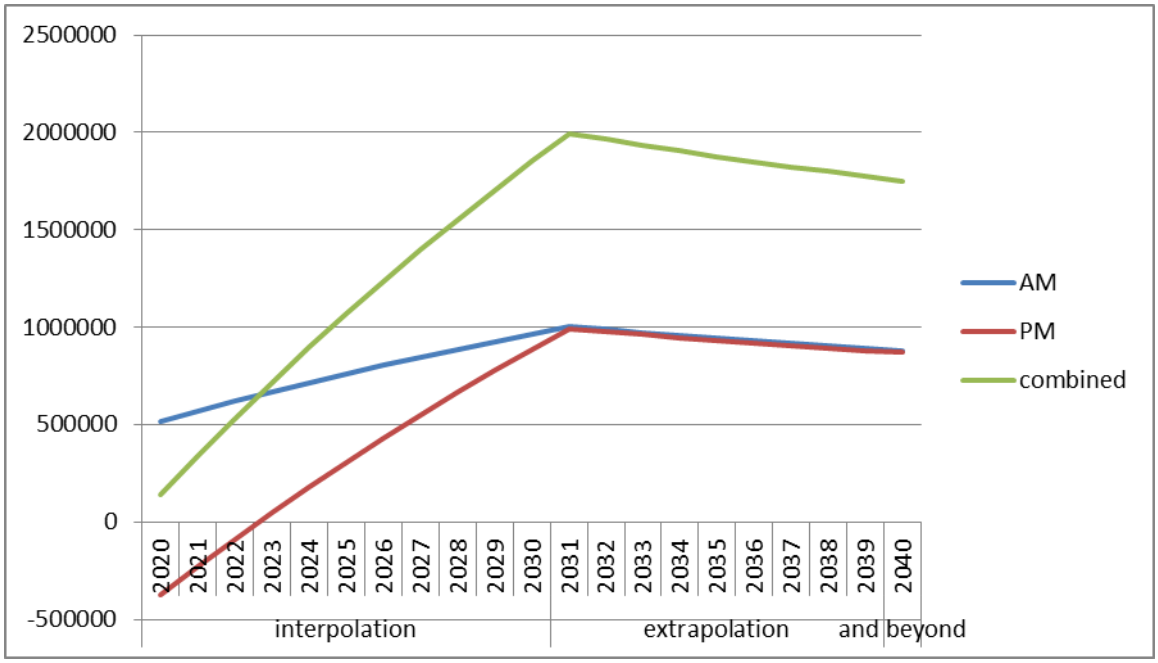


Figure 4-4 Benefits over years

4.14 Sensitivity testing

Sensitivity testing was undertaken with regards to the TUBA modelled hours, and the level of optimism bias.

TUBA modelled hours:

Whilst the use of each of the peak hours to represent two hours seems reasonable including reflecting off-peak and weekend, a sensitivity test was undertaken for both by decreasing to 1½ hours and increasing to 2½ hours. The BCR varies from 1.4 to 3.2. Even though the BCR would be only 1.4 if the benefits would only accrued for the lower modelled hours, this excludes other monetised benefits that would enhance the BCR, such as accident benefits. Furthermore no planning gain is included in the BCR at this stage.

Optimism bias:

The costs are relatively well developed, and still include a sizeable risk allocation (this is discussed in the Financial Case). Therefore the 15% optimism bias used is deemed robust. However a sensitivity test of 44% was undertaken reflecting a BCR of 1.5. Once again the aforementioned additional benefits, which would increase the BCR, should be considered. Therefore extreme cost escalation does not diminish the value for money of the scheme.

4.15 Planning Gain / TEC

As previously mentioned, planning gain can be quantified but should not be included in the AMCB. The assessment can, however, be drawn into the 'value for money' statement. This is step 4 in the WebTAGA2.3 – dependent housing assessment.

A simple approach has been used to quantify both the planning gain from the 1,000 dependent houses and to offset the Transport External Costs (TEC). The housing included is consistent with the dependent housing assumption.

The WebTAG worksheet for calculating impact of housing has calculated the planning gain, and TECs calculated using the Marginal External Cost Method. Rather than extracting from the model output, which would have constrained additional vehicle kilometres to the network, a first principle has been undertaken assuming the development trips have a measurable impact for 5 km.

The results are:-

- Planning gain : £23m (Slight beneficial)
- TEC : calculated as £11m.
- Net Panning Gain: circa £12 million.

As it is a relatively low number of houses, it is not surprising that both the planning gain and the TECs are of a low order of magnitude.

4.16 Adjusted BCR / Value for Money Statement

An initial BCR was calculated as 2.3 based on the TUBA results. As a highway scheme this is mainly journey-time savings based. It is noted that noise and air quality disbenefits have not been monetised and the COBA-LT results have not been included. The initial BCR suggests a high value-for-money.

In terms of an adjusted BCR there are three key components, wider impacts and dependent development, journey reliability and environmental (landscape and ecology).

It has not been seen necessary to adjust the BCR but the three items are reaffirmed as part of the VfM statement.

A planning gain would be generated from the 1,000 houses of around £23m which would enhance the BCR. A simple, and relatively pessimistic, approximation of TECs suggests only accruing 50% of the planning gain. This gives further surety of the BCR translating, with other considerations, to a high value for money.

For this scheme, there are two elements to journey time reliability. Firstly there is the general variability caused by congested conditions. Secondly there is the specific pattern of the level crossing. In terms of the adjusted BCR, the first point can be addressed by a small uplift in the travel time savings, with the 5% suggested in 'Value for Money Assessment: Advice Note for Local Transport Decision Makers' seeming reasonable (a ready-reckoner calculation, based on WebTAG A1.3, is also in this order of magnitude, if not higher). The second point, about the level crossing, is noted as an additional unquantified benefit, with fewer users being impeded by the level crossing.

In terms of environmental impacts, the scheme does require some land-take but this is generally alongside the existing railway. There will also be some visual intrusion due to the bridge structures. However this is near an industrial area and will not be a severe negative impact. In addition, there are no significant ecological impacts noted. The wider impact of the development side is not part of this report; being commensurate with the site's planning application and the Canterbury local plan.

There are some other beneficial factors which should be mentioned. The scheme could facilitate a greater number of trains as more level crossing 'downtime' might be achievable. Also, as mentioned, in the SDI there are possible bus user benefits both in terms of access and journey time.

4.16.1 Overall VfM Category

Overall Final VfM Category (considering risk and sensitivities): High

This category considers the points covered in this report, including the initial and adjusted BCRs. It is a balanced view which considers both disbenefits, such as non-monetised environmental factors, and positive points such as the possibility of additional benefits from improved design.

5 Financial Case

5.1 Overview

The Financial Case for the *Sturry Link Rd* gives an itemised breakdown of the expected project cost components and the time profile for the transport investment. It considers if these capital costs are affordable from public accounts at the times when the costs will arise. It also identifies where contributions of anticipated funding will be obtained, to meet the scheme costs and it assesses the breakdown of funds between available sources and by year and considers how secure these funds are likely to be. Finally, it reviews the risks associated with the scheme investment and examines possible mitigation.

5.2 Project Costs

This section considers the capital costs associated with the proposed scheme investment. This is for the viaduct option as identified in 3.7.

5.2.1 Scheme Elements

The 'combined' scheme is in four notable parts :

1) The bridge over the railway (the LEP scheme) £28.5 million.
2) The new network through the developer controlled site. This is developer funded, comprised of three links of £8.5m, £3.5m and £2m.
3) The new signalised junction £1.1 million.
4) The additional link (as described in Option 5) £4.1 million. This is an extension to the network the developer is providing.

For consistency with the modelling and appraisal, all four elements have been included in the costing of the 'scheme' in the *Economic case*.

It is noted that part 2 (and the additional link - part 4) is, to a large extent, a scheme by itself. This is being delivered by the developer of the 1,000 houses, previously described as the dependent housing, as the access road for the site. This will then be adopted by the county council to complete the link road with the other elements. This wider planning implication is not considered further here. It is considered further in the *Management case*.

Developer contribution consists of both delivering portion 2 and a contribution towards 1, 3 and 4. As will be clarified the developer is expected to pay for the balance of the costs excluding the LGF contribution.

5.2.2 Breakdown of Project Costs

Table 5-1 shows the itemised breakdown of scheme capital costs, including both construction costs and other costs for the KCC elements. These were provided by KCC's cost consultants and are in correct for 2016. The construction costs are further itemised in Appendix E. The key divisions of the cost are shown in Figure 5-1. The costs for the developer's network are not included here.

The itemised elements (Appendix E) consider the implications of both working with Network Rail and construction in a floodplain/riparian environment. This reflects the acknowledged engineering challenges and the liaison with Network Rail and Environment Agency as highlighted in 3.7.

Table 5-1 Cost Breakdown

Cost Element		Bridge 1Q20	New signalised junction 1Q20
TOTAL CONSTRUCTION COST		£13,009,925	£488,658
Developing Business Case		£210,000	£0
Outline Design		£350,000	£0
Planning & Consultation Costs		£720,000	£0
Detailed Design Fees	7%	£910,695	£34,206
Supervision Fees	6%	£780,596	£29,320
Surveys & Studies		£60,000	£25,000
Archaeology Studies		£20,000	£5,000
Ecology Studies		£35,000	£0
Demolitions		£46,000	£0
Advance Works		£60,000	£0
Utilities		£250,000	£50,000
Accommodation Works		£180,000	£0
Highway Landscape Manitenance		£80,000	£0
KCC Direct Costs		£337,500	£15,000
KCC Legal Costs		£55,000	£5,000
KCC Clerk of Works		£70,200	£0
Land Costs		£600,000	£0
Flood Compensation Land		£600,000	£0
LCA Part 1 Costs		£25,000	£45,000
Lane Rental		£56,000	£32,000
Commuted Sums		£1,000,000	£0
KCC Adoption Fees	6.5%	£0	£31,763
Funder Monitoring		£10,000	£0
Network Rail			
Possessions		£250,000	£10,000
Design Supervision		£475,000	£20,000
TOC Compensation		£25,000	£5,000
Track Monitoring		£50,000	£10,000
Sundry Costs		£70,000	£10,000
Risks	25%	£4,958,979	£198,546
Sub-Total		£25,294,894	£1,014,493
Inflation - Refer to Heading for Start Date)		£3,173,120.93	£115,922.63
AL ESTIMATED PROJECT COST (excluding VAT)		**£28,468,015**	**£1,130,416**

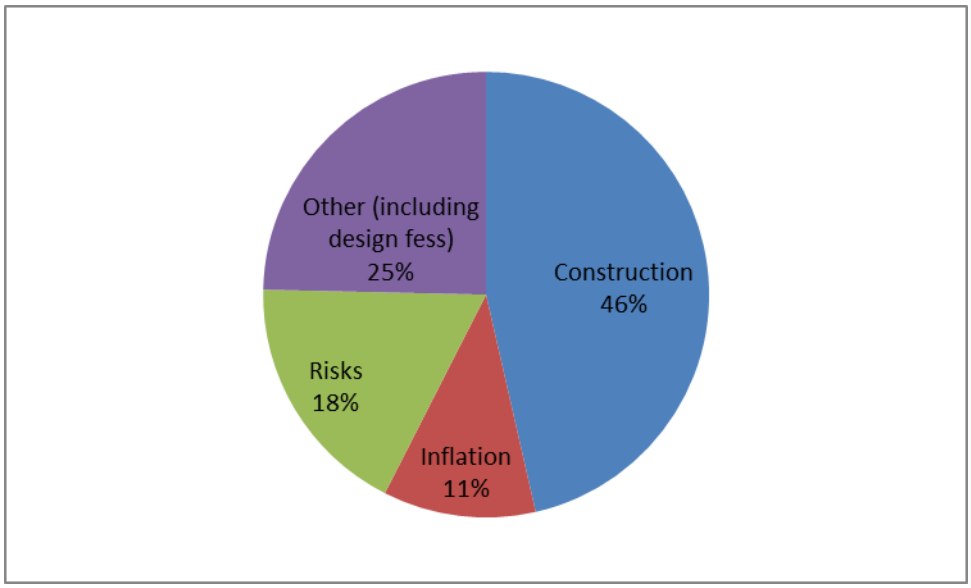


Figure 5-1 Breakdown of scheme costs

'Sunk costs' are assumed to have been absorbed within normal operations of the 'transport planning / project delivery' teams as part of ongoing preparedness.

5.2.3 Treatment of Scheme Costs

The basic scheme costs are used, with some subtle differences, in both the financial case and the economic case.

For completeness, the steps are listed here:

- deriving a base cost estimate - including real cost increases;
- adjustment for risk (both cases), and optimism bias (economic case);
- re-basing the price base to the Department's base year (economic case);
- discounting to the Department's base year (economic case);
- converting to the market prices unit of account (economic case).

5.2.4 Inflation

The scheme costs have been adjusted to include inflation at £4.8m. For the scheme, the bridge and the signalised junction assume the first quarter of 2020 for the required adjustment year. The indices used in the calculation provided by the cost consultant are given below:

Indices:	
Base Date:	4Q15
BCIS All IN TPI @ Base Date:	274
Construction Commencement Date: (1Q18)	305
Construction Commencement Date: (1Q19)	322
Construction Commencement Date: (1Q20)	339

5.2.5 Risk and Contingency

A Quantified Risk Assessment (QRA) has been undertaken which is included in Appendix J. This equates to a risk allowance of 25% across the project.

The outline design has been developed and costed with a viaduct to overfly both the flood plain and Network Rail land to mitigate the design risks as far as practicable.

5.3 Project Funding

This section considers the capital funding requirements and commitments for the proposed scheme investment.

5.3.1 Sources of Funding

The earmarked LGF funding to be released from SELEP is £5.9m, £1m to be released in 2016-17, and £2.45m in each of 2017-18 and 2018-19. Figure 5-2 shows the LGF funding in relation to the scheme costs.

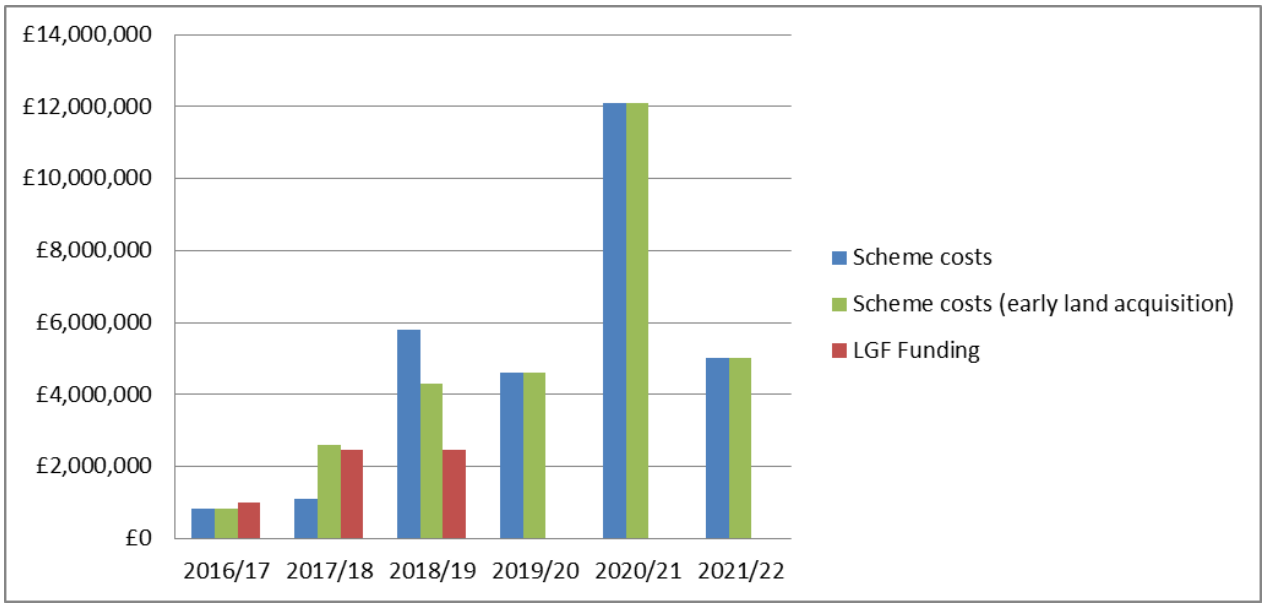


Figure 5-2 LGF Funding

As mentioned the balance of the scheme costs is to be provided by the developer. The majority of the funding is to be provided by the Sturry/Broad Oak Developers (Site 2), with additional funding from 'North of Hersden (Site 8). In addition, the developer for Herne Bay Golf Club (site 4) has forward-funded £250,000 in 2015-16. The profile is attached as Appendix H, highlighting the build-out required for the developer to provide the scheme funding.

This payment schedule has been 'agreed in principle' with the developers and letters of assurance from the developers with regards to their funding contribution to the scheme are provided in Appendix I.

5.3.2 Security and Earliest Availability of Funds

'Heads of terms' / 'Memorandum of Understanding' are being arranged between KCC and the developer.

The developer will underwrite up to £3m costs if the scheme does not proceed but spending has occurred.

5.4 Financial Risk Management Strategy

This section examines the risks associated with the costs and financial requirements of the Sturry Link Rd. It considers the mitigation that may be needed to handle the identified risks, if they arise.

5.4.1 Risks to the Scheme Cost Estimate and Funding Strategy

Table 5-2 shows the financial risk assessment.

Table 5-2 – Scheme Financial Risk Assessment

Qualitative Financial Risk Assessment										
Scheme Financial Risk Item	**Likelihood of Risk Arising (✓)**			**Impact Severity (✓)**			**Predicted Effect on Scheme Delivery & Outcome (✓)**			**Suggested Mitigation**
	Low	**Medium**	**High**	**Slight**	**Moderate**	**Severe**	**Slight**	**Moderate**	**Severe**	
Unforeseen increase in scheme cost reduces the VfM (i.e. BCR nearer to 1.0 'low')	✓				✓			✓		Amend preferred scheme design content to reduce scheme cost and increase VfM / BCR
Earmarked / secured funds do not cover current scheme capital cost	✓					✓		✓		Lobby for additional funds from existing / new contributors. Consider reapportioning from other KCC schemes.
Majority of fund allocation is from a single source, not spread out		✓				✓		✓		'Heads of terms' to be completed before KCC commit excessive expenditure.
Majority of fund allocation is from Government LGF, giving poor 'leverage'	✓			✓			✓			Seek additional private sector and local public sector fund contributions
Main funding award depends upon sound scheme transport business case, which is not currently achievable	✓			✓				✓		Assemble additional supporting evidence for the scheme and prepare a Transport Business Case to a standard sufficient to confirm funding award
Government policy change disables a planned funding source	✓				✓			✓		None available

6 Commercial Case

6.1 Overview

The Commercial Case for the *Sturry Link Rd* provides evidence that the proposed investment can be procured, implemented and operated in a viable and sustainable way. The aim is to achieve best value during the process, by engaging with the commercial market.

6.2 Expected Outcomes from the Commercial Strategy

The outcomes which the commercial strategy must deliver are to:

- Confirm that procedures are available to procure the scheme successfully;
- Check that available / allocated capital funds will cover contractor and construction costs;
- Verify that risk allowance is sufficient;
- Ensure that arrangements have been made to handle cost overruns;

6.3 Scheme Procurement Strategy

Procurement Options

KCC have identified two procurement options for the delivery of their LEP funded schemes. The alternative options are:

<u>Full OJEU tender</u>

This option is required for schemes with an estimated value of over £4,322,012.

KCC will then need to opt for an 'open' tender, where anyone may submit a tender, or a 'restricted' tender, where a Pre-Qualification is used to whittle down the open market to a pre-determined number of tenderers. This process takes approximately one month and the first part is a 47 day minimum period for KCC to publish a contract notice on the OJEU website.

The minimum tender period is 6 weeks but could be longer for larger schemes. Once the tenders are received they must be assessed and a preferred supplier identified. There is a mandatory 10 day 'standstill' period, during which unsuccessful tenderers may challenge the intention to award to the preferred contractor.

Delivery through existing Amey Highways Term Maintenance Contract (HTMC)

This option is strictly not procurement as the HTMC is an existing contract. The HTMC is based on a Schedule of Rates agreed at the inception of the contract. The price for each individual scheme is determined by identifying the quantities of each required item into a Bill of Quantities. Amey may price 'star' items if no rate already exists for the required item. If the scope of a specific scheme is different from the item coverage within the HTMC contract a new rate can be negotiated.

Preferred Procurement Option

The preferred procurement route for the Sturry Link Rd scheme is full OJEU tender. This option has been selected as the value of the scheme, £29m, is greater than the OJEU scheme value threshold.

6.4 Commercial Risk Assessment

Table 6-1 shows the commercial risk assessment

Table 6-1 – Scheme Commercial Risk Assessment

Scheme Commercial Risk Item	Likelihood of Risk Arising (✓)			Impact Severity (✓)			Predicted Effect on Scheme Procurement, Delivery & Operation (✓)			Immediate Bearer of Risk and Suggested Mitigation
	Low	Medium	High	Slight	Moderate	Severe	Slight	Moderate	Severe	
Scheme construction is delayed and costs increase, owing to unexpected engineering difficulties.		✓				✓		✓		Kent CC, as scheme promoter, bears the risk. Ensure that scheme development, design, procurement and construction procedures are sufficiently robust to minimise likelihood of construction difficulties.

7 Management Case

7.1 Overview

The Management Case outlines how the proposed scheme and its intended outcomes will be delivered successfully. It gives assurances that the scheme content, programme, resources, impacts, problems, affected groups and decision makers, will all be handled appropriately, to ensure that the scheme is ultimately successful. It also covers monitoring of the scheme.

7.2 Approach to Scheme Development and Delivery

Outline the approach that will be followed, to verify that the scheme can be successfully delivered, i.e. show that the management approach will;

- Confirm the problems and scheme issues that are being considered and the problem-handling strategies that are being applied, to assure that the scheme can be delivered satisfactorily;
- Justify the measurement scales and thresholds that will be used to assess problem issues and scheme performance outcomes;
- Verify that the proposed scheme design will be satisfactory and fit-for-purpose;
- Ensure that favourable scheme performance will be judged by robust appraisal against accepted criteria;
- Assure that suitable funding sources are available;
- Show that a procurement, construction and operation strategy is being developed;
- Check that project risks are identified, handled and mitigated effectively; and
- Confirm that appropriate evaluation techniques will be introduced, to measure the scheme's success, after implementation.

Although not fully defined at this stage, the project is likely to be managed in house by PRINCE2 trained and experienced Kent County Council staff, using a well-established governance structure, which has been successfully applied to deliver other transport improvement schemes.

7.3 Evidence of Previously Successful Scheme Management Strategy

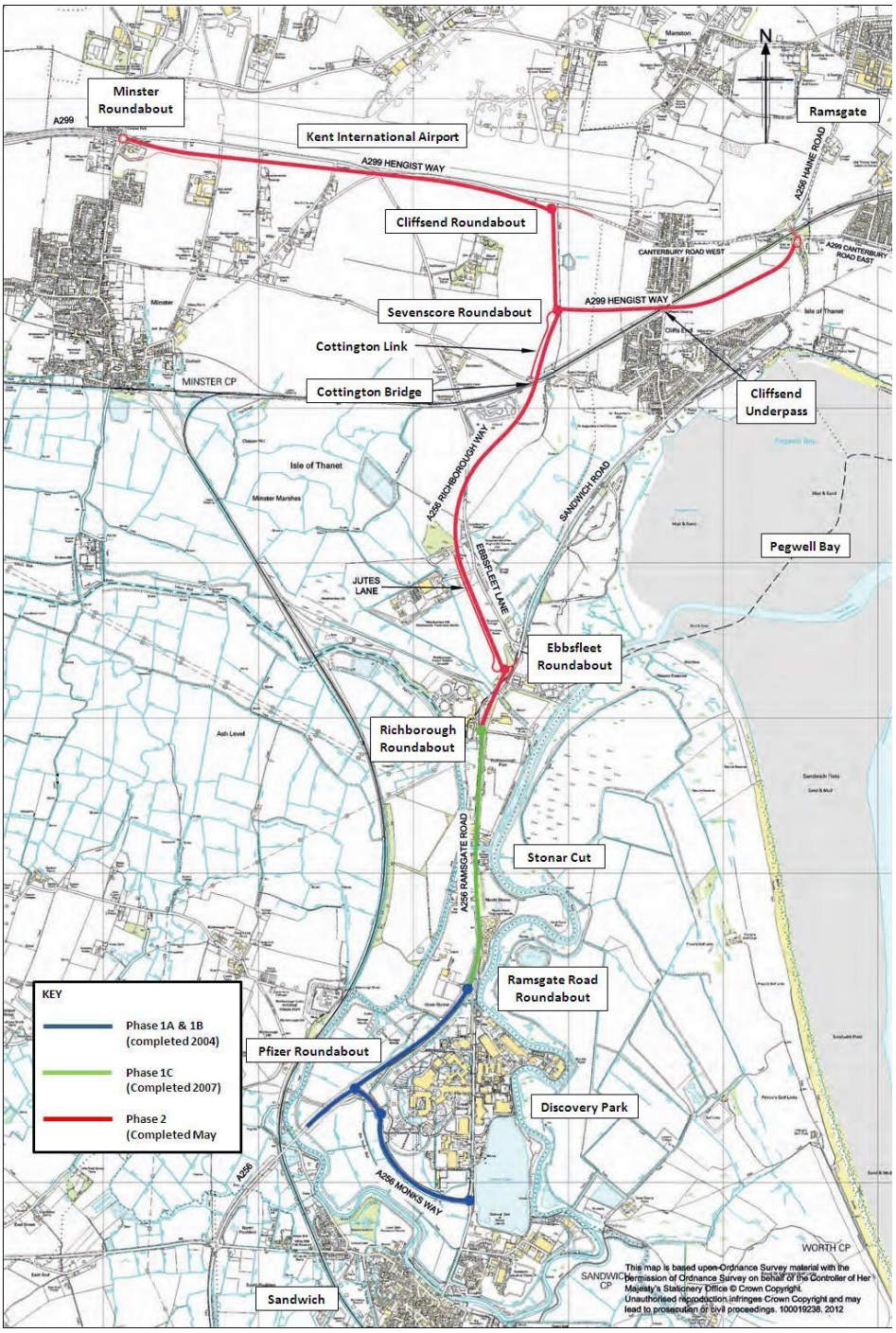
KCC have a successful track record of delivering major transport schemes within the county. The most recent of which were the East Kent Access Phase 2 (EKA2) and Sittingbourne Northern Relief Road schemes (SNRR).

The EKA2 scheme, completed in May 2012, was designed to support economic development, job creation and social regeneration, improving access with high quality connections between the urban centres, transport hubs and development sites in East Kent. The overall objectives of the scheme were to unlock the development potential of the area, attract inward investment and maximise job opportunities for local people. The extent of the scheme is shown in **Figure 7-1.**

The scheme was successfully delivered within budget and ahead of programme through the adoption of a robust management approach similar to that set out above to deliver the Sturry Link Rd scheme. The total value of the scheme was £87.0m of which £81.25m was funded by Central Government.

The intended scheme outcomes are currently being monitored but the intended benefits of the scheme are anticipated to be realised.

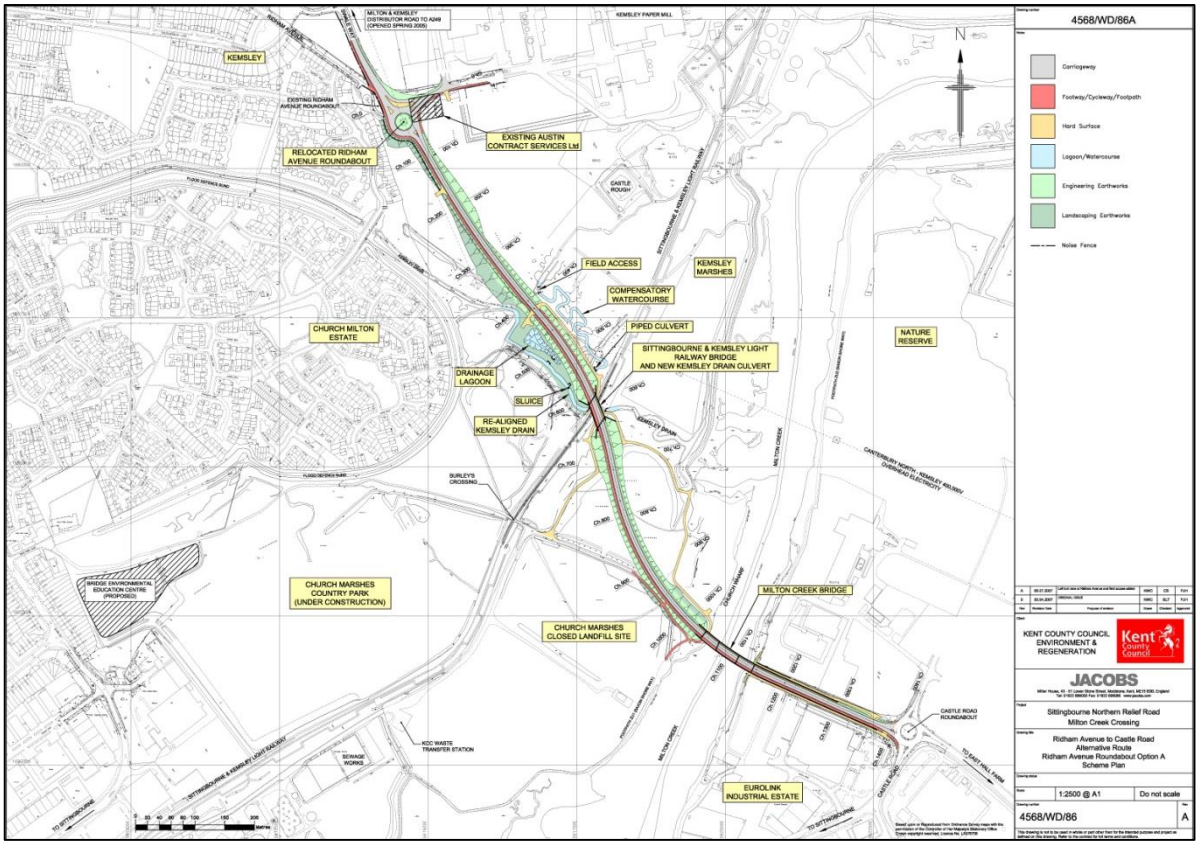
Figure 7-1 – EKA2 Scheme Layout



The SNRR scheme, completed in December 2011, was designed to remove the severance caused by Milton Creek and give direct access to the A249 trunk road for existing and new development areas, thereby relieving Sittingbourne town centre.

The delivered scheme is shown in **Figure 7-2** below:

Figure 7-2 – SNRR Scheme Layout



The project is an excellent example of multi agencies working towards a common aim. The scheme was funded by the Homes & Communities Agency in its Thames Gateway (Kent) regeneration role, by the Department of Transport in its support of local major schemes and by private sector S106 contributions. The scheme was delivered under budget and to programme.

Both the EKA2 and SNRR schemes have since been awarded regional Institute of Civil Engineers (ICE) Excellence Awards.

7.4 Key Project Work Stages and Tasks

A programme is given as Appendix G. The key stages identified are:

- Initial scheme design / Business Case (underway)
- Feasibility work (completed)
- Land Acquisition (negotiations underway)
- Public Consultation (Sep 2016)
- Planning consent (application being developed) – see 7.6

- Statutory orders (early 2017)
- Detailed design (2017-18)
- Procurement / Tendering (2018-19)
- Environmental surveys (Ecology underway / other surveys being coordinated)
- Construction – Mobilisation Oct 2019, Construction Jan 2020, Close Down Activities Oct 2021)
- Monitoring (part of wider LEP schemes programme)

The programme has been established by KCC in conjunction with the developers. It is an evolving document aimed to synchronise the different planning, development and construction aspects.

7.5 Project Governance, Roles and Responsibilities

KCC have set up a clear and robust structure to provide accountability and an effective decision making process for the management of the LEP funded schemes. Each scheme will have a designated project manager (Richard Shelton for Sturry Link Rd) who will be an appropriately trained and experienced member of KCC staff.

Figure 7-3 provides an outline of the overall governance structure implemented to manage the delivery of each scheme.

A detailed breakdown of the meetings (along with the attendees, scope and output of each) which make up the established governance process is set out below.

Project Steering Group (PSG) Meetings

PSG meetings are held fortnightly to discuss individual progress on each scheme and are chaired by KCC Project Managers (PMs). Attendees include representatives from each stage of the LEP scheme (i.e. KCC Bid Team, KCC sponsor, KCC PMs, Amey design team and construction manager). Progress is discussed in technical detail raising any issues or concerns for all to action. A progress report, minutes of meeting and an update on programme dates are provided ahead of the Programme Board (PB) meeting for collation and production of the Highlight Report.

Figure 7-3 – KCC Project Governance Structure

Bid / Design / Construction	High level Agenda	Frequency	Attendees	Format	Scope	Agenda Items	Key Deliverables/Feedback	Templates
Sponsoring Group	Bid Design Construction	Monthly - Can be called in emergency if required	**Chair: TR** BC/RW/MG Supported by IPM attendees as required	Face to face meeting, rotating venue	To discuss programme (i.e. high level progress/preview next steps and discuss and resolve issues.	LEP programme (high level) progress to date Programme Financial reporting Next steps Issues/Risk/Change Actions	Minutes of Meeting Action/Decision Log Output distributed to MG	**Agenda** **Minutes** **Decision list**
Sponsoring Group Progress Report	Decisions Needed	Monthly	MG/JW	Report	To record outstanding actions/issues that require a decision made by the board		Action list ready for the Steering Group	**Action List**
Programme Board Meeting	Bid Design Construction	Monthly	**Chair: MG** MG/KCC Promoters/KCC PMs/ AQ or RC/SW/PC/JW	Face to face meeting, rotating venue	To discuss progress/preview next steps and discuss and resolve issues	LEP programme progress to date Project financial reporting Next steps Issues/Risk/Change Actions	Minutes of Meeting Action List Output distributed to all attendees	**Agenda** **Minutes**
Highlight Report	Identify key points for Programme Meeting	Monthly	JW/MG	Face to face meeting/report	JW to collate and streamline all reports highlighting areas of interest for the programme meeting. To be fed back to MG by report/meeting		Highlight report for MG to use for Programme Meeting. Highlight report shared with PR attendees.	**Highlight Report**
Steering Group Meeting	Progress Update	Monthly/Fortnightly as required	**Chair: KCC PMs** All input staff - KCC Bidding/KCC Promoters/KCC PMs/Amey Design/TMC/JW	Face to face meeting	Individual meetings per project (including each stage of the LEP process to discuss progress in detail).	LEP project progress to date/MS Programme Project financial reporting Issues/Risk/Change Actions	MS Programme Update Progress update in template for each project	**Progress Report**

List of Initials:

BC	Barbara Cooper
RW	Roger Wilkin
TR	Tim Read
MG	Mary Gillett
AQ	Andrew Quilter
RC	Richard Cowling
SW	Steve Whittaker
PC	Paul Couchman
JW	Joanne Whittaker

Highlight Report

The Progress Reports sent by the KCC PMs comprise of the following updates; general progress, project finances, issues, risks and governance meeting dates. The Highlight Report identifies any areas of concern or where decisions are required by the PB meeting or higher to the KCC LEP Programme Manager. An agreed version of the Highlight Report is issued to the PB meeting attendees during the meeting.

Programme Board (PB) Meeting

The PB meeting is held monthly and is chaired by the KCC LEP Programme Manager. Attendees include representatives from all three stages of the schemes (i.e. KCC LEP Management, KCC LEP Bidding, KCC Sponsors, KCC PMs, Amey Account Manager, Amey Technical Advisors, Amey Construction representatives). This meeting discusses project progress to date, drilling into detail if there is an issue or action (as identified in the PSG meeting), financial progress, next steps and actions. Outputs of this meeting are the Highlight Report and the minutes of meeting.

Escalation Report

A list of actions and decisions that the PB meeting was unable to resolve is prepared ready for the Sponsoring Group (SG) meeting to discuss and ultimately resolve.

Sponsoring Group (SG) Meeting

The SG is held monthly and will be chaired by Tim Read (KCC Head of Transportation). Attendees are Barbara Cooper (Corporate Director), Roger Wilkin (Director of Highways, Transportation and Waste), Tim Read and Mary Gillett (KCC Major Projects Planning Manager). This meeting discusses high-level programme progress to date, financial progress, next steps and closes out any actions from the escalation report. Output is sent to Mary Gillett for distribution. Technical advisors are invited if necessary to expand upon an issue. All actions from the start of this meeting cycle are to be closed out by the SG when they meet (i.e. no actions roll over to subsequent meetings).

7.6 Communication and Stakeholder Management Strategy

Figure 7-4 shows the engagement approach to be used for various different stakeholders and interest groups. As mentioned consultation is a key milestone in the programme.

There is clearly an important coordination between the Transport Authority (KCC), the developer for the Sturry/Broad Oak site, and the Planning Authority (Canterbury City Council). This is required to ensure a combined delivery of the link road and the 1,000 houses. KCC envisage there will be one planning application for the Sturry Link Road, with a joint EIA prepared with the developers of the Sturry and Broad Oak developments. The intention is to submit a planning application in Oct 2016.

The scheme will require planning consent from Kent County Council as the Planning Authority.

In support of a planning application it should be noted that the scheme is included in the Canterbury District Local Plan 2014 Draft Publication, Policy T14 currently being examined by public consultation.

Policy T14 - Sturry Link Road states

'The Council will seek to implement a Sturry Relief Road as identified on the Proposals Map. Any development proposals that might prejudice this route will be resisted. Contributions to this relief road will be sought from appropriate developments as set out in Policy SP3.'

The funding model has been previously outlined in the Financial Case. This will be enforced by including into S106 agreements with Canterbury City Council.

In addition to the transport surveys and the transport modelling provided as the basis for the Strategic Case and Economic Case, the developer has also funded and made available the topological survey and environmental/ecological survey.

The liaison with Network Rail and Environment Agency has been previously mentioned.

It is appreciated that if the development does not proceed, the link road is unlikely to be delivered.

Figure 7-4 – Stakeholder Management Plan

Itemise Stakeholders to be Handled in Accordance with Interest / Influence Matrix		
High	**To be Passively Monitored:**	**To be Actively Engaged and Managed:** Canterbury City Council Developer for Sturry / Broad Oak Site SELEP / DfT Network Rail SouthEastern
Stakeholder Influence	**To be Passively Conciliated:** Local population	**To be Actively Informed:** Local businesses Environment Agency Bus Operators (Stagecoach) Other developers
Low	Low — Stakeholder Interest — High	

7.7 Contract Management

Outline how the scheme developer, implementer and operator contracts will be successfully managed, to provide best value, quality assurance and timely delivery.

7.8 Project Risk Management and Contingency Plan

Risk Management Strategy

Project risk is managed as an on-going process as part of the scheme governance structure, as set out in section 7.2 of this report. A scheme risk register is maintained and updated at each of the two-weekly Project Steering Group meetings. Responsibility for the risk register being maintained is held by the KCC PM and is reported as part of the monthly Progress Reports.

Any high residual impact risks are then identified on the highlight report for discussion at the Programme Board (PB) meeting. Required mitigation measures are discussed and agreed at the PB meeting and actioned by the KCC PM as appropriate.

An example scheme risk register is shown in **Figure 7-5** below:

Figure 7-5 – Project Delivery Programme

Table 7-1 shows a summary of the project risk assessment. This includes aspects from all elements of the business case, and also adds 'operational' and 'scheme performance' elements.

Table 7-1 – Project Risk Assessment

Project Risk Management Strategy					
Risk Category	**Risk Description**	**Likelihood of Risk Arising (Score 1-5)**	**Severity of Impact (Score 1-5)**	**Risk Score = Likelihood x Impact Severity**	**Proposed Risk Mitigation and Contingency Action**
Scheme Transport Business Case Approval	SELEP / DfT requires more quantified evidence for Economic Case Value for Money, rather than qualitative assessment	2	4	8	Assemble as much available evidence of scheme VfM before submitting
Design –	Safety	1	5	5	On-going safety audits to confirm design appropriate
Design	Issues with statutory, design, procurement or environmental surveys	2	4	8	Address at early stage (use risk register)
Funding	Not forthcoming	1	5	5	Ongoing discussions with funding bodies, developer and SELEP
Delivery	Developer's link roads are delayed	1	5	5	Scheme withdrawn
Operational	Blocking back	1	4	4	To be enhanced during design and negotiations with Network Rail
Scheme performance	Downstream capacity erodes benefits	2	3	6	Further study being undertaken in relation to Vauxhall Rd roundabouts
Overall					
Key to Risk-Likelihood and Impact-Severity Scoring Categories: Very Low 1.0; Low 2.0; Moderate 3.0; High 4.0; Very High 5.0;					

7.9 Project Assurance

KCC have provided a section 151 letter which is given as Appendix F.

7.10 Scheme Monitoring

KCC are committed to monitoring, evaluating and reporting the scheme post-opening.

The current data for travel times, via ANPR, through the network can be repeated post-opening. If required, KCC could also undertake 'moving observer' surveys.

In addition pre-opening data for Accidents and Air Quality is available and can also be repeated post-opening.

A congestion relief scheme it would be appropriate to compare traffic flows so that the changes in delay are put into context. A repeat of the ANPR survey would provide this.

Table 7-2 shows the scheme monitoring plan.

The acceptability will be judged on the predictions supporting the economic case and on delivering the scheme objectives. The expected improvements in junction operation are shown as **Figure 7-6** and **Figure 7-7**.

Table 7-2 – Scheme Monitoring, Evaluation and Benefits Realisation Plan

Expected Benefit	Measure	Owner	Outcome/impacts	Review timescale	Review Method
Travel-time improvement	Journey-time	KCC		One and five year post-opening	Repeat ANPR / queue surveys
New housing	Completions	CCC	Delivery of local plan		On-going Housing monitoring
Accidents	KSI	KCC			On-going Accident Monitoring
Air Quality	Nitrogen Dioxide	CCC			On-going measurements
n/a	Traffic Flows	KCC		One and five year post-opening	Repeat ANPR survey

Figure 7-6 Expected benefits (AM)

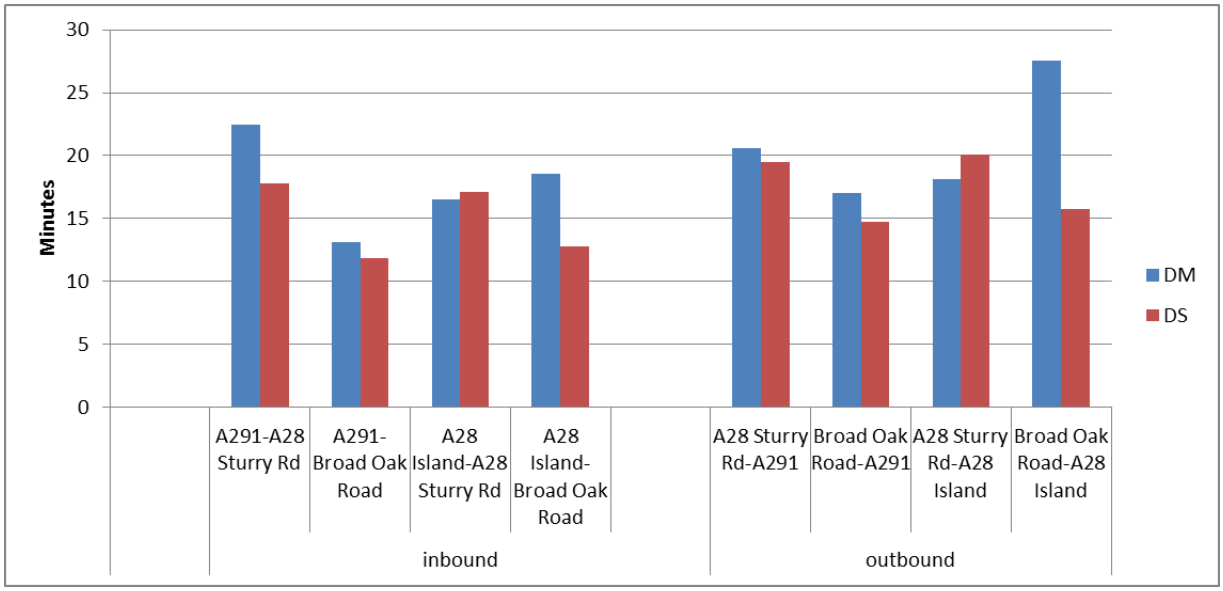


Figure 7-7 Expected benefits (PM)

8 Conclusions and Recommendations

8.1 Conclusions

The scheme provides an affordable and deliverable scheme that can overcome the existing problem of congestion in the Sturry area caused by variety of factors including the level crossing and the A28/A291 junction. It will also provide sufficient network to deliver the 4,500 houses in the north-east quadrant of Canterbury, an important quantum in delivering the Canterbury Local Plan.

The scheme is worthwhile from a 'value for money' standpoint. It is worthwhile noting that there is a significant developer contribution, and a high value infrastructure project is being delivered with a 'minimal' ask to public finances.

8.2 Recommended Next Steps

The development and delivery of the scheme should be approved and should proceed. Elements of the business case can be updated a required.

8.3 Value for Money Statement

The 'value for money' statement in this report suggests a 'high' value for money. This should be revisited if scheme costs escalate, or significant environmental factors become apparent.

8.4 Funding Recommendation

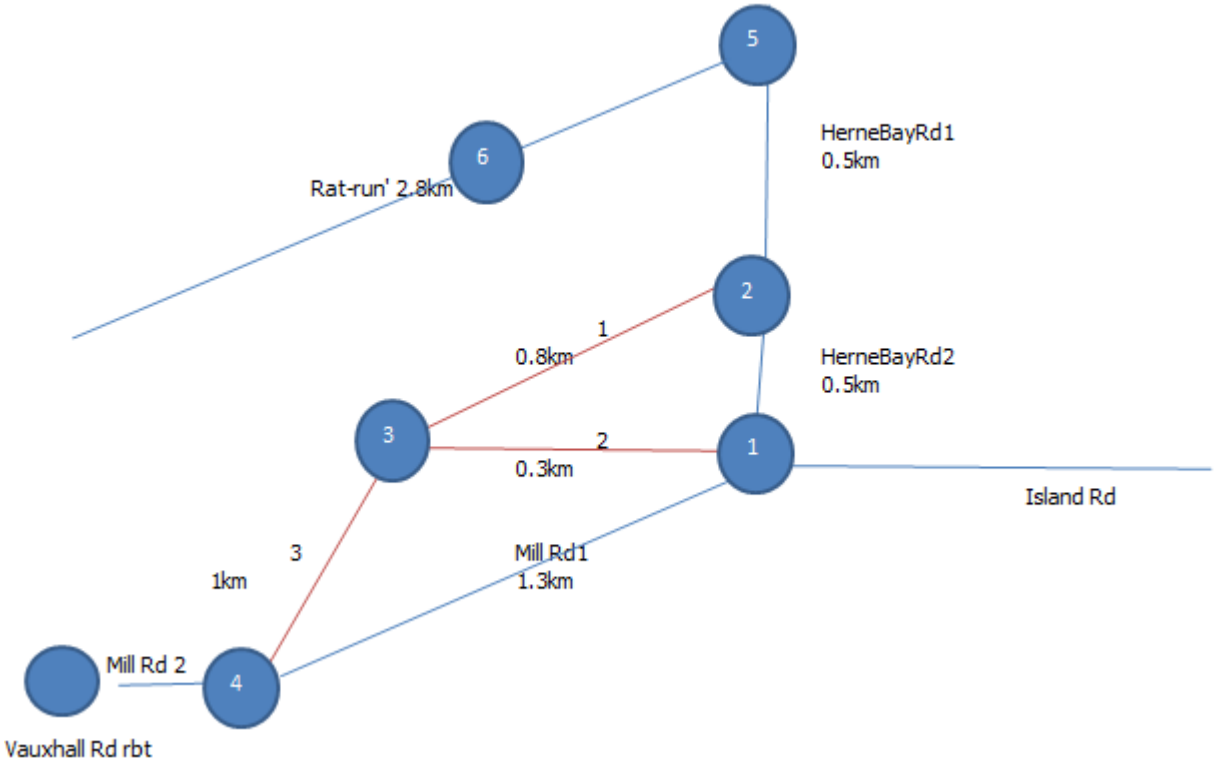
The £5.9m funding requirement from SELEP should be released to KCC.

Appendix A Scheme Drawing

Appendix B Appraisal Summary Table

Appendix C Accident plot

Appendix D COBALT results



[Section 2.1] Link Accident Statistics

Link Name	Without-Scheme Number of Accidents 2015	2030	Total	Total Cost	With-Scheme Number of Accidents 2015	2030	Total	Total Cost	Benefits Number of Accidents 2015	2030	Total	Total Benefit
HerneBayRd1	0.4	0.3	18.0	1,133.8	0.4	0.4	20.8	1,308.1	0.0	0.0	-2.8	-174.3
HerneBayRd2	0.4	0.3	18.0	1,133.8	0.2	0.1	4.6	297.0	0.2	0.2	13.5	836.9
MillRd1	1.8	1.4	83.6	5,255.8	1.1	0.4	26.4	1,702.7	0.6	1.0	57.2	3,553.0
MillRd2	0.6	0.5	30.5	1,918.8	0.7	0.6	33.3	2,094.5	0.0	0.0	-2.8	-175.7
IslandRd	0.8	0.6	37.6	2,366.2	0.8	0.6	37.6	2,366.2	0.0	0.0	0.0	0.0
LinkRd1	0.0	0.0	0.0	0.0	0.0	0.4	21.2	1,275.7	0.0	-0.4	-21.2	-1,275.7
LinkRd2	0.0	0.0	0.0	0.0	0.0	0.1	3.3	198.4	0.0	-0.1	-3.3	-198.4
LinkRd3	0.0	0.0	0.0	0.0	0.0	0.7	39.0	2,343.8	0.0	-0.7	-39.0	-2,343.8
RatRun	1.9	2.2	128.3	8,004.6	1.4	1.5	83.9	5,241.8	0.5	0.8	44.5	2,762.8
Total	5.8	5.5	316.2	19,813.0	4.6	4.7	270.1	16,828.2	1.2	0.7	46.0	2,984.8

Costs and benefits discounted to 2010 in multiples of a thousand pounds.

[Section 2.2] Junction Accident Statistics

Junction Name	Without-Scheme Number of Accidents 2015	2030	Total	Total Cost	With-Scheme Number of Accidents 2015	2030	Total	Total Cost	Benefits Number of Accidents 2015	2030	Total	Total Benefit
J1	1.8	2.0	120.6	5,856.4	0.9	0.0	2.9	196.4	0.9	2.0	117.8	5,660.0
J1DS	0.0	0.0	0.0	0.0	0.0	1.2	68.4	3,111.2	0.0	-1.2	-68.4	-3,111.2
J2	0.0	0.0	0.0	0.0	0.0	0.9	51.6	2,437.0	0.0	-0.9	-51.6	-2,437.0
J3	0.0	0.0	0.0	0.0	0.0	0.7	39.9	1,598.9	0.0	-0.7	-39.9	-1,598.9
J4	0.0	0.0	0.0	0.0	0.0	1.6	87.8	4,124.0	0.0	-1.6	-87.8	-4,124.0
LCSturry	0.8	0.9	52.4	2,550.1	0.7	0.5	30.5	1,498.0	0.2	0.4	21.9	1,052.2
J5	1.2	1.4	82.5	4,008.2	0.9	0.0	3.3	223.8	0.4	1.4	79.3	3,784.4
J5DS	0.7	0.7	39.4	1,921.2	0.9	1.2	68.0	3,294.5	-0.2	-0.5	-28.7	-1,373.4
LCBroadOak	0.4	0.5	28.6	1,388.2	0.3	0.4	23.5	1,142.1	0.1	0.1	5.1	246.1
J6	0.3	0.3	17.4	846.3	0.3	0.4	23.5	1,142.1	-0.1	-0.1	-6.1	-295.8
Total	5.2	5.7	341.0	16,570.4	4.0	7.0	399.4	18,767.8	1.2	-1.2	-58.4	-2,197.4

Costs and benefits discounted to 2010 in multiples of a thousand pounds.

Appendix E Construction cost breakdown

Appendix F Section 151 Letter

Appendix G Programme

Appendix H Non-LGF Funding

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Appendix I Developer Letters of Assurance

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Appendix J Quantified Risk Assessment