



**West Yorkshire Plus Transport Fund
Gateway 1 Submission:
A629 Halifax to Huddersfield Improvements:
Phase 1 – Southern Section
November 2015**



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Introduction

This document and its series of appendices sets out the business case for a programme of transport infrastructure investments on the A629, between M62 Junction 24a Ainley Top and the Free School Lane junction, which Calderdale Metropolitan Borough Council (CMBC) wish to fund through the West Yorkshire Plus Transport Fund (WY+TF).

It comprises a Gateway 1 submission (equivalent to a Strategic Outline Business Case) for the **A629 Halifax to Huddersfield Corridor Phase 1 – Southern Section**, hereafter referred to as “the scheme” or “this scheme”.

The Phase 1 study has been split in to two separate deliverables, Phase 1a and Phase 1b. Throughout this document, where Phase 1 is referenced, it is in relation to the combined Phase 1a and Phase 1b scheme. Where one of the deliverables is being referred to in isolation, this is referenced as either Phase 1a or Phase 1b.

Phase 1a received Gateway 1 approval in March 2015 and is considered an enabling component to the wider Phase 1b works. The Phase 1a submission clearly set out the scope of works and rational for intervention and should be reviewed when interrogating the full Phase 1a scheme detail. At the Phase 1a Peer Review the economic assessment of the full Phase 1 scheme was identified as a requirement of this Phase 1b Gateway 1 submission.

The document has been prepared in accordance with the West Yorkshire Combined Authority’s (WYCA) Single Appraisal Framework, the WY+TF Assurance Framework and WebTAG guidance issued by the Department for Transport (DfT).

In line with requirements of the WY+TF Assurance Framework, the scheme fulfils the criteria for Gateway 1 consideration in that:

- Modelling work has quantified the likely impact from the intervention(s);
- Feasibility design has been completed, with a single preferred option developed;
- Initial Benefits Realisation Plan has been clearly set out;
- An outline business case for the scheme has been prepared, evidencing the strategic, economic, financial, commercial and management case for delivery;
- Added value elements from the scheme’s delivery have been identified; and
- External views from key stakeholders have been sought.

The remainder of the document is structured as follows:

- **Chapter 1: The Strategic Case**, which presents the rationale for undertaking the scheme by demonstrating the need for change and how the investment furthers the aims and objectives of not only CMBC but also the WYCA;
- **Chapter 2: The Economic Case**, which demonstrates the strengths of the scheme in terms of value-for- money and economic measures;
- **Chapter 4: The Financial Case**, which explains how the scheme costs have been derived;
- **Chapter 3: The Commercial Case**, which describes the procurement strategy underpinning the scheme while also presenting key risks; and
- **Chapter 5: The Management Case**, which highlights the strong focus on deliverability and how experience and best practice will be used to minimise their impacts.

1 Strategic Case

1.1 Business Strategy

1.1.1 Introduction

This chapter of the Gateway 1 submission clearly articulates the need for intervention, the case for change and how investment will facilitate the economic growth priorities of both the West Yorkshire Combined Authority (WYCA) and the Leeds City Region Local Enterprise Partnership (LEP). It also articulates how the aims and objectives of the scheme will enable Calderdale Metropolitan Borough Council (CMBC), as project sponsor, to fulfil its own growth ambitions, which strengthen and support the principles of the West Yorkshire Plus Transport Fund (WY+TF) and the strategic pillars of the Leeds City Region Strategic Economic Plan (SEP).

The strategic case defines policy alignment, examines the existing characteristics of the corridor (transport functionality, accessibility, integration of modes, engineering and environmental considerations) and associated influence on network operation, identifying a series of prioritised investment objectives to address those factors which act as inhibitors to growth.

These investment objectives have then been used to set a framework of prioritised scheme-level objectives, against which option development can be gauged and assessed. In this way, the optimal scheme has been defined to ensure locally-specific corridor issues are addressed in a way which contributes to headline investment ambitions of achieving sustainable economic growth by improving the competitive offer of the Leeds City Region.

1.1.2 A629 Halifax to Huddersfield Corridor Improvements

As part of the 'City Deal' between West Yorkshire, York and central government, a new Transport Fund in excess of £1bn targeted specifically to increasing housing, employment and economic growth across the region has been created. The WY+TF identified a Core 10-year Package of measures that would enable change and deliver economic growth in the short to medium-term. The package was formed around five broad programmes, which are:

- Rail and Rapid Transit;
- More efficient highway and bus networks;
- Multi-modal corridor improvements;
- Other targeted improvements to support employment; and
- Improving the highway network to support growth.

The A629 Halifax to Huddersfield Corridor comprises a multi-modal corridor improvements scheme prioritised for delivery within the first five years of the WY+TF, which has been allocated £120.6m to drive economic growth by addressing transport and accessibility issues. CMBC and Kirklees Council are jointly developing the range of interventions proposed along the corridor, which at pro forma stage envisaged:

- Road space re-allocation (bus priority) and capacity and operational improvements (particularly to allow commercial vehicles to get to their destinations quickly and efficiently);
- Major junction improvement at the A629 / A6026 Calder & Hebble junction and other key pinch points along the corridor;
- Improvements to Junction 24 of the M62 (Ainley Top);
- Improvements to the strategic accessibility and public realm within Halifax Town Centre to deliver regeneration and growth aspirations;
- Introduction of express bus services between Halifax and Huddersfield;
- Development of a Park and Ride facility at Junction 24; and
- Gating at strategic points along the corridor to manage access and flows.

In prioritising the scheme alongside others put forward at the time of the Fund's inception, justification for the investment was provided using evidence from WYCA's Urban Dynamic Model (UDM), which forecast the scheme's ability to unlock development potential in both Calderdale and Kirklees, and create 1,740 jobs by 2026. Such benefits were predicted as achievable on the back of a range of scheme outcomes, including congestion relief, reduced journey times for general traffic, improved pedestrian/cycle accessibility and a 50% reduction in end-to-end journey times for buses.

Delivery of the full corridor strategy will take a number of years to realise due to the complexity and extent of the numerous proposals. The scheme has therefore been split into a number of phases for the purposes of development, with Phases 1 and 2 prioritised for early delivery due to their greater contribution to overall scheme impacts that these components are expected to generate:

- Phase 1: Southern Section (Elland Bypass to Free School Lane)
- Phase 2: Halifax Town Centre
- Phase 3: Free School Lane into Halifax
- Phase 4: Ainley Top (M62 Junction 24) and wider strategic interventions
- Phase 5: Ainley Top into Huddersfield.

Since the original phases were identified, CMBC submitted an Exception Report to WYCA which secured approval for the development and delivery of Phase 3 to be incorporated into Phase 2, with the corresponding budget allocation transferred into Phase 1.

Within Calderdale, a total of £17.5m has been mandated for the development and delivery of the Phase 1 section. This originally envisaged delivery by March 2019. A further £57.1m has been mandated for the development and delivery of Phase 2 by March 2021.

The success of the two phases currently being progressed for early delivery within Calderdale is dependent on their ability to contribute to the wider economic impacts targeted by the A629 scheme as a whole in both Calderdale and Kirklees. Whilst the strategic case for investment in Phase 1 is therefore only justified when considered as part of the wider corridor package, WYCA has confirmed the ability to breakdown the scheme into its component phases for the purposes of initial WY+TF Gateway approvals, until such time as the scope of the full corridor interventions is known.

Each phase is therefore required to present a strong value for money case in its own right to justify development approval, whilst contributing to the corresponding proportion of GVA benefits attributed by the UDM to the relevant components.

The various A629 components currently being advanced through the Gateway process by both CMBC (Phases 1 and 2) and Kirklees Council (Phase 5) target known points of congestion and delay along the corridor. CMBC has separately secured mandate approval to review the collective benefits that these schemes will deliver, in order to complete a 'gap analysis' identifying what further interventions may be needed to achieve the total impacts forecast by the UDM for the corridor as a whole.

This review will include a viability assessment of Park and Ride facilities being introduced at Ainley Top (as originally envisaged at pro forma stage) alongside other potential engineered or policy solutions, in order to identify the optimal mix of interventions to complement those schemes already in development. Led by CMBC in partnership with Kirklees Council, this further work will clarify the scope and location of measures to be delivered as part of Phase 4, the final phase of the A629 scheme to be delivered. Since any interventions proposed as part of Phase 4 will effectively serve to unify the corridor into a single WY+TF scheme, the corresponding project-level objectives to be realised as part of this separately mandated phase reflect those established for the adjoining sections.

Whilst initially exploring potential solutions at Ainley Top (including but not limited to Park and Ride introduction), Phase 4 will also consider additional proposals necessary to achieve the bus benefits targeted by the scheme as a whole, for which an holistic corridor-wide approach to consideration is necessary. Phase 1, together with the other prioritised sections currently being worked up, has therefore been developed to ensure sufficient flexibility for the potential introduction or adaptation of measures targeting bus users once the scope of Phase 4 interventions is known. Any risk to the advancement of Phase 1 prior to the completion of this strategic review of the corridor is therefore minimised.

1.1.3 A629 Phase 1

The largest capital component of Phase 1 involves improvements to the Calder & Hebble Junction. Inbound peak hour delays (towards Halifax) at this junction result in significant journey time disbenefits. The constraint experienced serves to control the rate of traffic released to the downstream network. Prior realisation of improvements at junctions to the north is therefore essential; to avoid relocating congestion to more constrained/urbanised parts of the corridor.

As a result, and in order to accelerate delivery, the development of Phase 1 has itself been subdivided into two components (see figure 1-1):

- **Phase 1a:** Stretching from Jubilee Road in the south to Free School Lane/Skircoat Road in the north (covering the downstream network); and
- **Phase 1b:** Stretching from the Elland Bypass north of Ainley Top to Jubilee Road (including the Calder & Hebble Junction).

Phase 1a was 'fast-tracked' as an enabling package to commence delivery in 2016, whilst work to develop the more complex Calder & Hebble Junction was ongoing. Phase 1a successfully secured Gateway 1 approval in March 2015; subject to the initial benefits forecast being reassessed once Phase 1b proposals are developed. This reassessment is covered by this Gateway 1 submission.

Early delivery of Phase 1a (valued at approximately £4.5m) is desirable to ensure elimination of current network operation issues prior to delivery of Phase 1b. This will assist in efficient operation of the downstream network (Phase 1a) prior to release of traffic held at the Calder & Hebble junction, which currently acts as the principal bottleneck for traffic heading northbound along the corridor. Work on the Phase 1a element of the project is now in detailed design with the land acquisition process started.

This Gateway submission is for the full A629 Phase 1 scheme and includes:

- Optioneering and feasibility design work completed on Phase 1b since Gateway 1 approval on Phase 1a was secured; and
- Appraisal of the full Phase 1 stretch (including both Phases 1a and 1b components).

The Gateway 1 submission has been developed to include both Phase 1a and Phase 1b schemes. An understanding of the current Phase 1a proposals and the interaction with the Phase 1b proposals is provided through the application of an update to the Paramics microsimulation model developed in the Phase 1a assessment and the Calderdale Strategic Transport Model (CSTM) developed in SATURN. Re-appraisal of Phase 1a as part of this Gateway 1 submission provides a more robust assessment of expectant benefits as these can only be quantified with confidence when appraising the full Phase 1 stretch.

1.1.4 Scheme Context

Calderdale is located in Pennine West Yorkshire. An integral part of the Leeds City Region, its western boundary borders both the Manchester and Central Lancashire City Regions, as shown in Figure 1-2. It is situated within the M62 corridor, on a main Trans Pennine rail route, between the expanding and prosperous regional economies of Leeds and Manchester, and is more locally centred between Huddersfield and Bradford. This allows quick and easy access to a population in excess of 5.5 million, providing significant economic opportunities for both investors and residents.

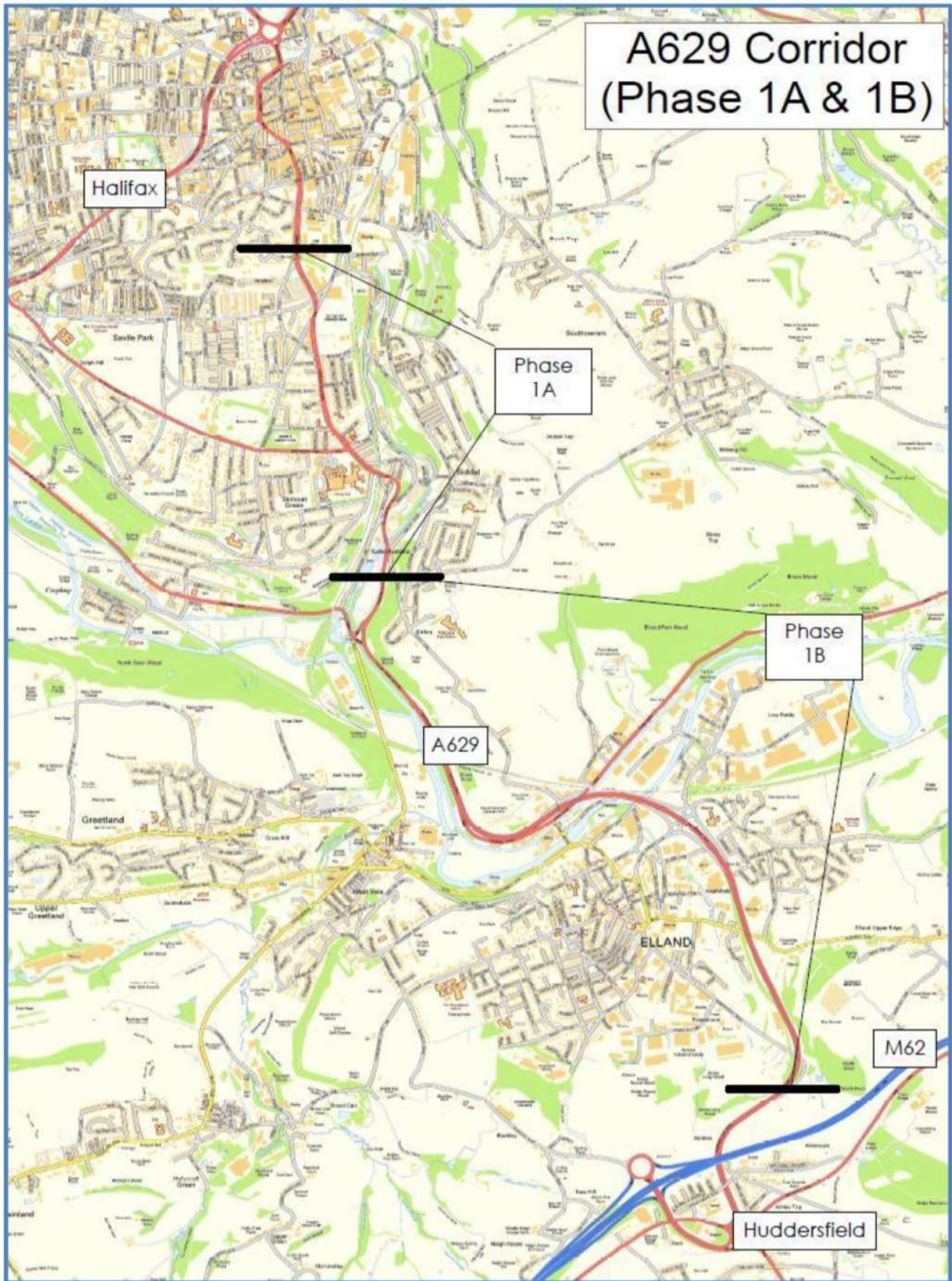


Figure 1-1 The A629 Corridor and Extent of Phase 1a and Phase 1b

Calderdale's strategic position within the Leeds City Region, with strong physical and geographical connections to Greater Manchester, provides it with significant opportunities to outperform its peers as a lynchpin within the Government's ambitions to establish the Northern Powerhouse.

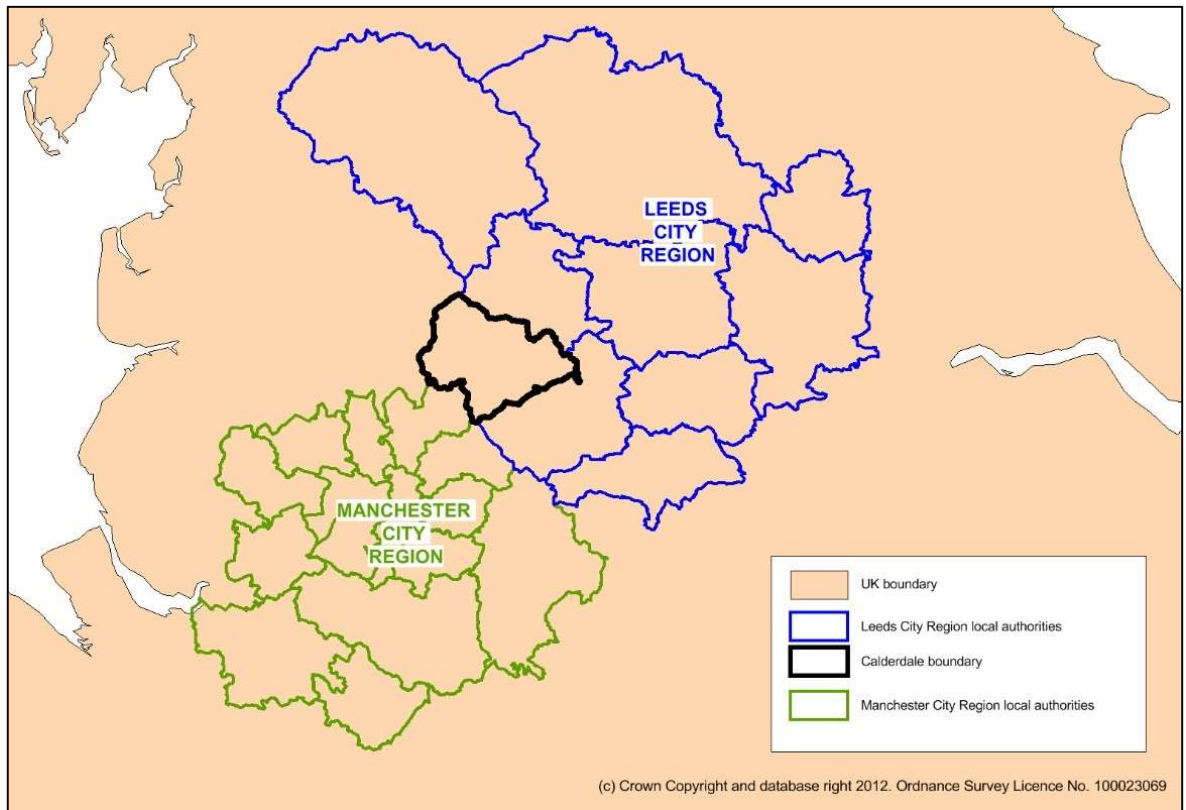


Figure 1-2 Calderdale within Leeds City Region

Capitalising upon its position and economic strengths, Calderdale has the ability to serve as a bridge for flows of investment and labour capital, to the benefit of both regional economies. Yet for this east-west axis of renaissance to be realised, improvements to both inter and intra-City Regional connectivity need to be made; enabling localities, such as Calderdale, the opportunity to specialise in their unique areas of economic strength whilst gaining access to the pan-Northern economy and its markets.

Calderdale is currently home to over 8,000 businesses and a population in excess of 200,000 people. This is expected to grow by 25,000 over the next 20 years. There are currently more than 82,000 jobs in Calderdale, yet nearly half of its residents commute to work outside the district. This is counterbalanced by a high degree of in-migration for work, particularly from neighbouring Kirklees, due to the unique range of employment opportunities that the local economy is able to offer.

Financial and business services remain major employment sectors, exemplified by Lloyds Banking Group (formerly HBOS), which employs around 6,300 people in Halifax and Copley. The agglomeration benefits that result from clustering financial and professional services together have recently seen similar businesses consolidating their national operations in Halifax, including Covea Insurance.

Similarly, advanced manufacturing remains a significant employment sector, employing nearly 20% of the resident workforce. Halifax businesses such as Weir Valves, Halcro Rock Tools and Hargreaves Foundry are recognised as leading manufactures within their respective fields.

Whilst Halifax remains the principal business centre within the District, a range of satellite centres have grown up along key arterial routes to/from the M62 corridor (see Figure 1-3), including at Copley, Lowfields Business Park and Elland. This creates significant travel demands along the main highway routes linking Halifax to the strategic road network. With major employers, such as the NHS, operating across a number of sites that span both Calderdale and Kirklees, significant cross-boundary employment flows are exacerbated by high numbers of work-related trips.

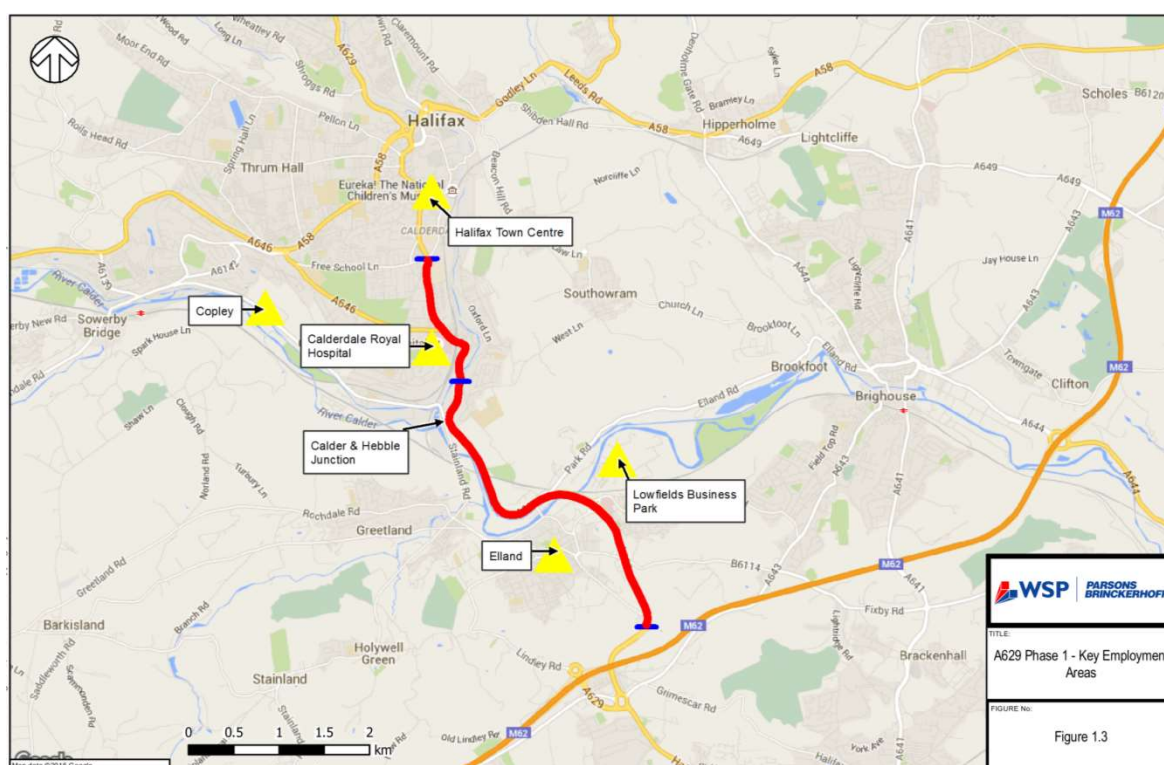


Figure 1-3 A629 Phase 1 Corridor & Key Employment Areas

The topography of the District results in the A629 and A58 corridors providing the only north-south and east-west arterial routes in the area. This lack of alternative route choices, combined with significant cross-boundary flows and a poor Halifax to Huddersfield rail service, results in high bi-directional demand on the highway network, creating congestion ‘hotspots’ at specific locations. Appetite shown by developers, such as Thornhill Estates, to realise Local Plan employment and housing growth within this accessible zone close to the M62 corridor may be expected to further exacerbate current issues. Furthermore, as the primary means of access between the motorway and the Upper Calder Valley, the A629 is required to play an increasing role in facilitating the distribution of housing growth planned elsewhere throughout the District.

Calderdale's success is therefore tempered by comparatively poor accessibility, with delays to the movement of both goods and people resulting from high volumes of trips that current business activity generates. This serves to deter future investment by major employers, due to the negative impacts on productivity that result. By way of example, Lloyds Banking Group has indicated to CMBC that further investment in its operations at both Halifax and Copley is currently unfeasible due to the detrimental impact of congestion, particularly along the A629, on its business activities.

Similarly, whilst Lowfields Business Park is currently the most successful business park within Calderdale, enjoying 100% occupancy rates, retention of current employers is becoming an issue as a result of unreliable transport links with key residential areas in Halifax from where it draws its workforce.

Detrimental impacts from poor access and connectivity are not limited to larger employers alone. With up to 80% of local businesses employing less than ten people, the competitive advantage of smaller entrepreneurial companies is being significantly eroded, placing their survival at risk to rivals benefitting from better connected locations in other part of the country.

In parallel, many of Calderdale's assets remain under exploited, due to perceived remoteness and/or the costs associated with unlocking sites rendering development commercially unviable. Significant successes have been achieved in recent years in an attempt to counteract these challenges; with funding secured from the European Regional Development Fund (ERDF) and the Homes and Communities Agency (following the transfer of responsibilities from Yorkshire Forward) to unlock land for much-needed employment space under the Sowerby Bridge Copley Valley Development Scheme.

In Halifax itself, Local Growth Fund money is being directed to address market failure at a select group of strategically important sites identified in the SEP. This will provide the stimulus needed to create an attractive environment for redevelopment; a development partner having recently been appointed for the Council's Northgate House site now that the prohibitive site clearance costs have been offset. Furthermore, significant investment from CMBC has seen construction started on a new Central Library, alongside ongoing regeneration of the Piece Hall (secured through funding from the Heritage Lottery Fund). Such schemes stand to benefit the local economy by bringing new visitors into the town and instilling confidence in the private sector that Halifax is an appealing location in which to invest.

With the commercial returns of development generally more marginal than elsewhere in the Leeds City Region, application of the Community Infrastructure Levy (CIL) to fund requisite investments in major infrastructure is not deemed to be viable in the current market. However, to deliver optimum economic returns, a high quality and accessible transport system has been shown to represent an essential requirement in order to attract and maintain business, support enterprise and overcome barriers to employment.



Figure 1-4 CMBC / LCR Catalytic Effect of Investment

Directing WY+TF investment into the A629 corridor is expected to address many of these residual accessibility constraints that serve to constrain growth in Halifax and the wider Calderdale/Kirklees area. Figure 1-4 illustrates the catalytic effect of such investment in a Leeds City Region context.

CMBC is currently working on taking forward a number of wider initiatives to help support growth in the region. These create opportunities to align delivery programmes with the WY+TF schemes to minimise construction disruption, or to implement elements of infrastructure early whilst the ground is broken (e.g. service ducting):

- **District Heat Network:** These are systems that provide cheaper, cleaner heat (hot water and space heating) to multiple buildings. CMBC is currently undertaking a feasibility study to see if such a system could be appropriate and cost-effective for Halifax town centre supported financially and technically by the Department of Energy and Climate Change and the LCR. The study will look at cost implications and technical issues in connecting different combinations of buildings, and will look to find an optimal combination which is a good investment proposition. The project will look for opportunities to align this project with road modifications and construction of new buildings in Halifax.
- **“Superfast West Yorkshire” high speed fibre broadband (Phases 1 and 2):** These two phases of the project are delivering superfast fibre broadband to tens of thousands of households and businesses across West Yorkshire and York. The project extends coverage to areas that commercially it is not viable.
- **Business Improvement District (BID):** A BID has been proposed for Halifax town centre. A BID is a business led partnership which is created through a ballot process to deliver additional services to local businesses. These can be a powerful tool for directly involving local businesses in local activities and allow the business community and local authorities to work together to improve the local trading environment.

1.1.5 Policy Alignment

Since the strategic case provides the justification for funding investment, it is essential that the headline objectives of the respective funding source are identified as the primary objectives of any proposed scheme. In the case of the WY+TF, this will ensure scheme delivery is aligned to the specific economic outcomes that the Leeds City Region Growth Deal is required to fulfil. Parallel secondary and tertiary objectives may then be developed to enable the practical comparison of option performance and ensure alignment with complementary policies at local, regional and national level.

Table 1-1 below provides a summary of the relevant policies considered applicable to influence the scheme development and optioneering process. Further detail of each policy lever is provided later within this section.

Table 1-1 Relevant Policy Context

Policy / Scheme Document		Strategic Alignment
1.	No Stone Unturned / Investing in Britain's Future	The scheme will contribute to achieving sustainable economic growth through prioritised investment to upgrade CMBC/LCR transport infrastructure
2.	Local Growth White Paper	The scheme seeks to deliver economic growth aspirations by supporting business investment and promoting economic development.
3.	The Northern Powerhouse : One Agenda, One Economy, One North	The scheme seeks to improve local transport connections to the strategic road network, affording onward connectivity within and between City Regions in line with the 'One North' vision. The scheme will contribute the ambition of providing Halifax with greater accessibility of the wider Northern economy whilst fostering specialisms within the local economy including financial services, advanced manufacturing, tourism and creative/digital industries.
4.	National Planning Policy Framework	The scheme is aligned with strategies developed to facilitate sustainable economic growth
5.	Leeds City Deal (2012)	The scheme, and associated appraisal methodology, reflects the WYCA Single Appraisal Framework (SAF) and will contribute towards evidence that is supportive of devolved investment.
6.	Leeds City Region SEP	Halifax is identified within the SEP as a strategic growth centre and is also recognised for its contribution to LCR's financial services sector. The scheme is aligned with SEP Strategic Pillar 4 'Delivering the Infrastructure for Growth'.
7.	West Yorkshire Local Transport Plan 3	The scheme will positively contribute to all three of the main objectives of the Plan – Improving connectivity to support economic activity, Contribution to the development of a sustainable transport system and Improving the quality of life of the travelling public.

Policy / Scheme Document		Strategic Alignment
8.	LCR Single Transport Plan	The new 20-year Plan, proposed to come into effect from 1 April 2016. The scheme is aligned with the headline objective of developing an effective, efficient and integrated transport network which supports sustainable and low-carbon economic growth.
9.	Calderdale Local Plan	Although the Calderdale Local Plan is not likely to be published until 2017, CMBC has ratified the revised 2015 Local Development Scheme. The scheme is aligned with the growth ambitions of Halifax Town Centre and the evolving Core Strategy, which recognise the importance of the A629 as a local investment corridor, improving connections between the economies of Calderdale and Kirklees.
10.	Calderdale Economy and Enterprise Strategy	The scheme is responsive to the framework set out in the strategy to developing the Calderdale economy whilst also achieving environmental sustainability.
11.	Kirklees Local Plan	Although the Kirklees Local Plan is not likely to be published until 2017, KMBC has ratified the revised 2015 Local Development Scheme. The scheme is aligned with the evolving Core Strategy, which recognises the importance of the A629 as a local investment corridor, improving connectivity between the economies of Kirklees and Calderdale.

1. No Stone Unturned / Investing in Britain's Future

It is important to recognise the source of funding and associated objectives. The Growth Deals evolved from Lord Heseltine's blueprint for the UK's future economic prosperity and subsequent Government response, 'Investing in Britain's Future – a strategic, long term infrastructural investment plan'.

This latter document introduced the regional Strategic Economic Plans and highlighted that the LEPs with the strongest Strategic Economic Plans that demonstrate their ability to deliver growth will gain the greatest share of the (Growth Deal) funding available. As such, it is imperative that each investment decision delivers the optimum return by targeting local, regional and nationally aligned objectives.

The Government presents Growth Deals as a revolutionary way in which to run the economy as housing, infrastructure and other funding requirements are brought together in a single pot and allocated via differing levels of devolved powers. Within West Yorkshire, whilst the WY+TF is administered separately to other Growth Deal funding on skills and infrastructure delivery, the Fund remains a cornerstone of the Leeds City Region's Growth Deal objectives, which collectively seek to ensure common economic ambitions are met.

2. Local Growth White Paper – Realising Every Place’s Potential

The White Paper sets out the Government’s economic ambition to create a fairer and more balanced economy – one that is not so dependent on a narrow range of economic sectors, is driven by private sector growth and has new business opportunities that are more evenly balanced across the country and between industries. Its proposals to do so involve putting businesses and local communities in charge of their own futures, giving greater incentives for local investment and changing the way Central Government supports and maintains growth. This approach is expected to better connect people to jobs, help them get the skills they require and equip local areas with the tools they need to create and shape dynamic and entrepreneurial local economies.

The White Paper provides the context for Local Growth Deals negotiated between Government and Local Enterprise Partnerships (LEPs), ensuring business has an environment that enables it to compete and invest through the provision of economically important infrastructure that supports each area’s comparative advantage. Since high quality transport links are recognised as essential to underpinning a successful economy, the direction of WY+TF funding towards securing such outcomes is fully aligned with these economic goals.

3. The Northern Powerhouse: One Agenda, One Economy, One North

The Northern Powerhouse vision sets out a transport strategy that will maximise the economic potential of the North, securing inward investment and capitalising upon the unique strengths each of the Northern cities is able to offer. Bringing together central and local government, national transport agencies and LEPs, the vision identifies the need for connectivity within and between the Northern City Regions to be transformed, improving journey times, capacity and resilience; enabling the North to achieve the critical mass needed for it to compete globally.

By improving access to labour and markets, the Northern Powerhouse concept fosters specialisms within the local economy. This will benefit areas such as Calderdale, where strengths in financial services and advanced manufacturing offer significant potential for economic growth.

Improved access to the strategic road and rail networks are essential to securing this vision, given the onward connectivity such networks provide to other parts of the Leeds City Region and neighbouring economic centres. Given the role the A629 provides in connecting Halifax, Copley and parts of the Upper Calder Valley with the M62, the prioritisation of WY+TF investment in the corridor may be considered an essential component for achieving this vision.

4. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published by the Department for Communities and Local Government (DCLG) in March 2012, its purpose being to simplify the planning system and enable community involvement in the process to stimulate positive growth.

The Framework defines the purpose of the planning system as contributing to the achievement of sustainable development, identifying the following three dimensions:

- **an economic role** – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;
- **a social role** – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and
- **an environmental role** – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

The NPPF presents the need for the above roles to be considered collectively, being mutually dependent, to secure enhanced standards to improve the lives of people and communities.

The A629 scheme is aligned with the core principals of NPPF as it will contribute to positively enhancing connectivity and movement within and between Calderdale and Kirklees, help stimulate sustainable economic growth to the benefit of the wider Leeds City Region, foster sustainable communities with good access to local services and promote the use of more sustainable modes to minimise environmental impacts.

5. Leeds City Deal (2012)

In response to the Leeds City Region securing City Deal (2012) and subsequent Combined Authority (2014) status, a commitment to developing a Single Appraisal Framework (SAF) was approved by HM Treasury and DfT, enabling devolved investment decisions to be made. Since becoming fully operational in April 2015, the SAF enables the LEP and WYCA effective governance of funding being made available by Central Government. The SAF is based on Green Book and WebTAG principles, proportionally applied according to the nature and complexity of the scheme being assessed.

Alongside other schemes prioritised for delivery through the WY+TF, the A629 is required to contribute to the following funding objectives:

- **Primary objective:** to maximise the increase in employment and productivity growth across West Yorkshire (irrespective of boundaries) through the delivery of transport schemes; and
- **Secondary objectives:** to improve the ability of people in every West Yorkshire district and York to access jobs, with a particular focus on those living in the most deprived communities, and to achieve a carbon neutral impact at the package level.

The initial prioritisation of schemes was undertaken using a methodology set out in the SAF that calibrates the Urban Dynamic Model (UDM) with employment forecasts predicted by the Regional Econometric Model (REM). This enables WYCA to effectively assess each scheme against the primary objective of increasing GVA and also the secondary accessibility criteria.

Since this initial prioritisation process provides the justification for funding the A629 scheme under the WY+TF, interrogation of scheme benefits through the UDM is necessary to demonstrate the scheme's continued ability to positively impact upon:

- Travel patterns, volumes and mode shares;
- Changes in land-use (housing units and employment premises);
- Changes in households, population and the workforce;
- Changes in employment (jobs filled) and the unemployment rates;
- Changes in CO2 emissions from transport activity; and
- Time saving benefits and wider economic impacts on productivity and agglomeration.

6. Leeds City Region SEP

The Strategic Economic Plan (2014) sets out the investment priorities that will enable the Leeds City Region to achieve its full economic potential. This includes a series of regeneration and housing projects where Local Growth Fund investment is predicted to overcome barriers to growth. In Calderdale, this includes gap funding clearance of the strategically important Northgate House site in Halifax to render its redevelopment commercially viable.

The SEP also recognises the role of better transport connectivity for the aims of the Plan to be realised. WY+TF schemes are therefore required to complement the wider strategic investment priorities of the SEP, ensuring alignment to a common set of strategic objectives that seek to:

- Attract new jobs and growth through infrastructural investment ;
- Realise housing growth through the delivery of infrastructural investment;
- Improve connectivity to unleash the latent potential of the northern region;
- Seamlessly better connect people, jobs and goods; and
- Maximise the investment opportunities of HS2.

Since the A629 scheme seeks to improve connectivity to strategically important growth sites in Halifax town centre, the WY+TF investment is fully aligned and complementary to wider SEP ambitions.

7. West Yorkshire LTP3

The West Yorkshire LTP3 (“My Journey”) sets out a strategy for improving local bus, road, rail, walking and cycling networks across West Yorkshire for the 15 years up to 2026. This envisages delivery of a people-focused, low-carbon transport system that supports economic activity, sustainable growth and quality of life improvements in line with the following core principles:

- **Economy** – to improve connectivity to support economic activity and growth in West Yorkshire and the Leeds City Region;
- **Low carbon** – to make substantial progress towards a low carbon, sustainable transport system for West Yorkshire, while recognising transport’s contribution to national carbon reduction plans; and
- **Quality of life** – to enhance the quality of life for people living in, working in and visiting the Leeds City Region geography.

The Plan sets out to tackle congestion and a lack of transport investment, which are considered key contributory factors to lower than average economic performance in West Yorkshire. It also aims to prepare for the predicted, post-recession growth in employment, population and housing and their impact on the reliability of the transport network.

Development of the A629 scheme is fully aligned with the above principles, complementing smaller scale investment that is proposed under the LTP in West Vale and Elland.

8. LCR Single Transport Plan

The Single Transport Plan is intended to cover the 20 year period from 2016 to 2036. Work to develop the Plan has been progressed through workshops held with the Transport Committee and Portfolio Holders, and has been informed by complementary work to develop the HS2 Connectivity Strategy and the Transport for the North (TfN) proposition. Five emerging core principles and a cross-cutting low carbon theme have been developed to provide shape and direction for the Plan:

- **One system** – involving ambitions for a ‘metro-style’ public transport network that integrates all transport modes into one system that is easily understood, easy to access by a range of options and offers quick, convenient connections. Notably, this includes expectations for journey times, frequency, capacity and quality of the network on key corridors.
- **Place shaping** – involving ambitions to realise more attractive places in which to live, work and invest, through an emphasis on encouraging more walking and cycling, improving road safety and air quality, and aligning investment in transport, public realm and regeneration.
- **Smart futures** – involving ambitions to exploit technology to improve the customer experience and to assist effective management of the transport system.
- **Inclusion** – involving ambitions to offer a high level of access by public transport.

→ **Asset management** – involving ambitions to manage the transport system in a way that offers maximum value for money and meets the needs of users.

The A629 scheme is aligned with the core principles of the Single Transport Plan; each principle being considered as part of the multi-criteria appraisal used to evaluate different scheme concepts assessed through the optioneering process.

9. Calderdale Local Plan

The Calderdale Local Plan will guide the spatial distribution of employment and housing growth throughout the District. In doing so, it provides the strategic justification for where investment in the transport network is needed in order for increased economic activity to be accommodated. Whilst the emerging principles of the Plan seek to locate employment in established business centres (such as at Copley, Elland and in Halifax town centre) due to the existing focus of the transport network and the potential agglomeration benefits that stand to be gained, constraints on key transport corridors (including the A629) need to be resolved if levels of projected growth are to be realised.

CMBC is currently in the process of streamlining production of the Local Plan and will merge the Core Strategy and Site Allocations into a single Plan document. The A629 scheme is consistent with this work in terms of the scale and distribution of employment and housing growth forecast, with future assessment years considered in testing the scheme aligned with the corresponding Local Plan period.

Current forecast assumptions are based on the projected Local Plan growth target of 18,400 dwellings being realised by 2031 (from a 2008 base), assuming the quantum of housing completions to June 2014 (the date against which Calderdale's strategic highway model is validated) have been realised. Employment growth reflects REM forecasts and settlement projections, distributed across the most viable sites identified through Calderdale's Employment Land Review.

Whilst the Plan is not currently expected to be adopted until 2017, any intervening changes that may result are predicted to intensify rather than reduce the current forecast assumptions. As such, the scheme has been developed around a conservative (rather than optimistic) Local Plan growth forecast, ensuring a robust economic case for WY+TF investment is presented. A series of alternative scenarios are considered when appraising the scheme to understand the sensitivity of forecast benefits to a range of growth projections, involving the classification of sites based on the likelihood of development coming forward, in line with accepted WebTAG criteria.

10. Calderdale Economy and Enterprise Strategy 2010-2020

The 2010-2020 Economy and Enterprise Strategy sets out a framework to support the Calderdale economy whilst also achieving environmental sustainability. Development of the A629 scheme has considered the content of this strategy and will contribute to strengthening performance across a range of its core principles.

11. Kirklees Local Plan

The scheme is consistent with the emerging content of the Kirklees Local Plan, most notably with respect to the impact of cross-boundary flows along the corridor. However, as the Plan is currently not expected to be adopted until 2017, the continuing scheme evaluation process will be mindful of Plan developments throughout the subsequent Gateway process.

1.2 Existing Problems & Issues

1.2.1 Scheme Context

The southern section of the A629 between Halifax town centre and Ainley Top serves as:

- A key regionally significant corridor connecting the inter-linked economies of Halifax and Huddersfield;
- A means of access onto the motorway network (via M62 Junction 24) for those living within Halifax and the upper Calder Valley, where significant Local Plan housing growth is forecast;
- A key route providing onward access to major employment sites at Lowfields Business Park and Copley (the latter the subject of recent ERDF investment as a means of stimulating Local Plan growth);
- A key route to Lloyds Bank Data Collecting centre in Copley and Lloyds Banking Group Northern Operations in Halifax, along with other key businesses in Calderdale such as Nestle;
- The primary access route to Calderdale Royal Hospital, a major local employer and significant attractor of healthcare trips / linked trips / emergency trips between its sister Hospital in Huddersfield; and
- A designated route for abnormal loads accessing destinations in Halifax and areas to the north from the M62.

Furthermore, the topography of the wider District focuses travel demand onto a limited number of arterial routes (including the A629), leading to a higher than average proportion of commercial vehicles.

The northern part of the Phase 1 lies within an Air Quality Management Area (AQMA, see figure 1-5); Calderdale AQMA No.1, which is described as 'an area along the A629 between 2 Elm View and 389 Huddersfield Road 'The Punch Bowl'. This AQMA has been designated for exceedances of the annual mean nitrogen dioxide (NO₂) Air Quality Strategy objective.

The air quality within the area is dominated by emissions from the vehicular traffic using the A629 and minor roads surrounding A629 and is attributed to:

- High volumes of traffic along the A629;
- A high degree of stop-start vehicular movements caused by traffic signal coordination and interaction between main road and side road traffic; and
- Particulates from large and slow moving vehicles accelerating up steep gradients (Salterhebble Hill).

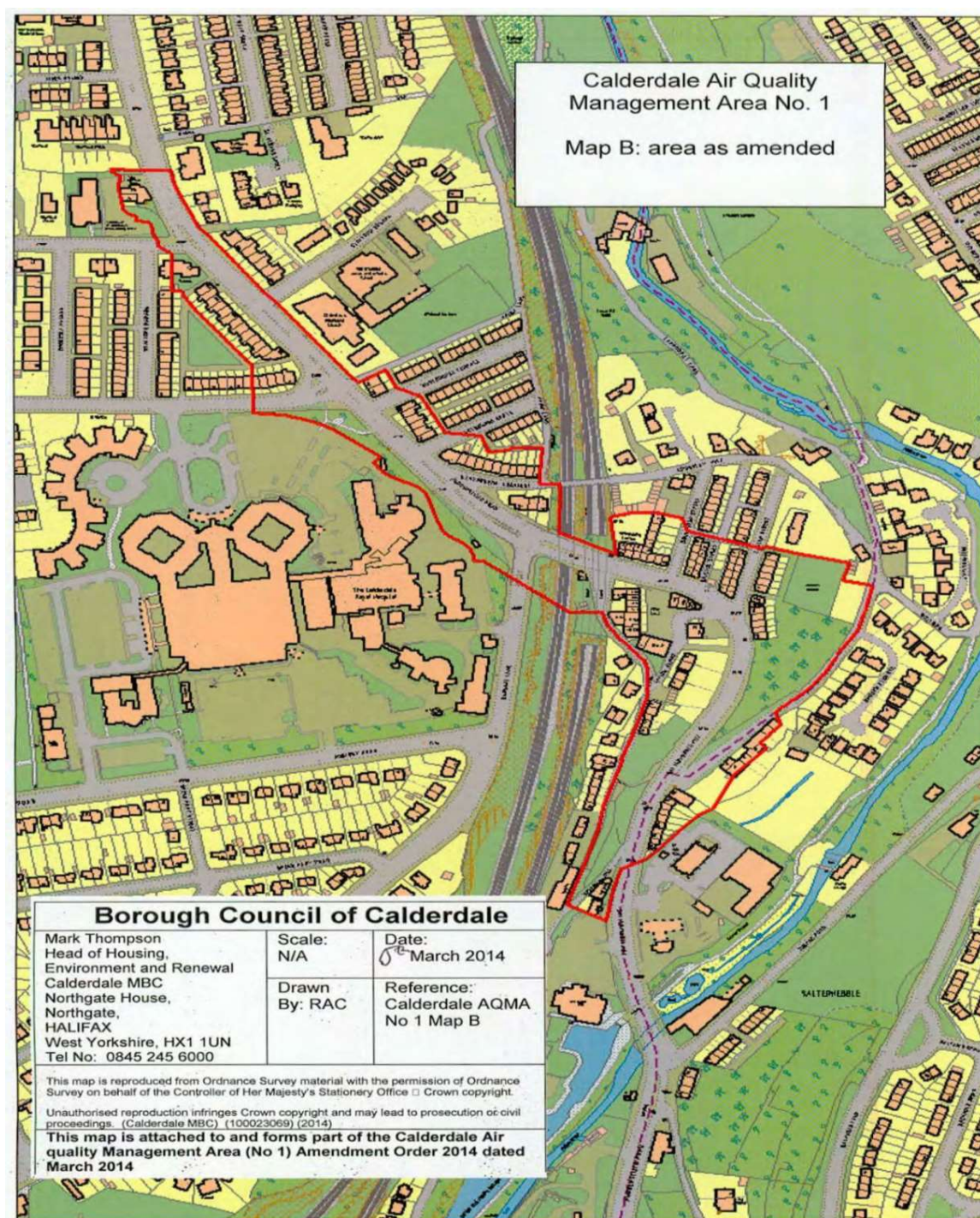


Figure 1-5 Calderdale AQMA No.1

The A629 north of Dudwell Lane also falls within a Conservation Area, limiting the scope of intervention that can be realised along this constrained element of the corridor.

The primary focus of Phase 1 is the Calder & Hebble junction at the corridor central point, which is the intersection of the A629 Elland Wood Bottom / A6026 Wakefield Road / B6112 Stainland Road. The knock-on implications of any interventions proposed need to be considered, not just on the corridor, but also on the West Vale and Copley areas, and Jubilee Road and requirements for future improvement.

The Calder & Hebble junction has significant importance as it is the first signal controlled interchange reached on the A629 after Ainley Top. It is effectively the entry point to a traffic signal managed corridor to Halifax Town Centre.

Traffic flows are significant, with the Calder & Hebble junction carrying between 4000 – 4500 vehicles per hour and operating as part of the key link between Halifax and Huddersfield and providing Halifax and Copley with access to the motorway network at Junction 24 of the M62. Inbound queue lengths reach up to 1km with passage times of 12 to 15 minutes regularly experienced. There are also concerns over the current layout as a result of the junction's collision record.

Analysis of the 2011 Census indicates there to be high numbers of people who travel in and out of Calderdale (Super Output Areas 001-027) to their usual place of work, as shown in Table 1-2 below. The Super Output Areas for the Calderdale district area defined in Appendix A.

Table 1-2 Cross-boundary Journeys to Work (Census, 2011)

Mode of Travel to Work	Trips into Calderdale	Trips out of Calderdale
Car	20,786	22,252
Train	1,072	2,392
Bus	2,067	1,538

For cross-boundary car and bus trips into and out of Calderdale, the top three locations are Kirklees, Bradford and Leeds. The A629 falls on the route to these major centres, highlighting the pressure on the A629 and Junction 24 of the M62.

For cross-boundary trips by rail the top three destinations are Leeds, Bradford and Manchester. The top three origins for trips in to Calderdale are Leeds, Bradford and Kirklees.

The analysis displayed in Table 1-2 shows the importance of the road network as the main mode of travel. Improvements to the A629 will help the reliability of the road network, encourage a modal shift towards buses and allow people to travel efficiently.

1.2.2 Existing Corridor Characteristics

The highway intersection of A629 / A6026 / B6112 forms a triangular layout with the junction of Stainland Rd / Wakefield being a mini roundabout, as illustrated below in Figure 1-6 below.

The A629 features a dual carriageway for 3.8km of its length tapering to a single lane inbound for the remaining 400m to the Calder & Hebble junction. Outbound a single lane flairs out to a dual approach with right turn lane filtering off to Wakefield Road prior to returning to two lanes at the southbound stop line.

The A6026 Wakefield Road is single carriageway to the mini roundabout with Stainland Road, passing over the Calder & Hebble Navigation via a listed bridge structure and under the Calder Valley rail line through a narrow rail bridge structure.

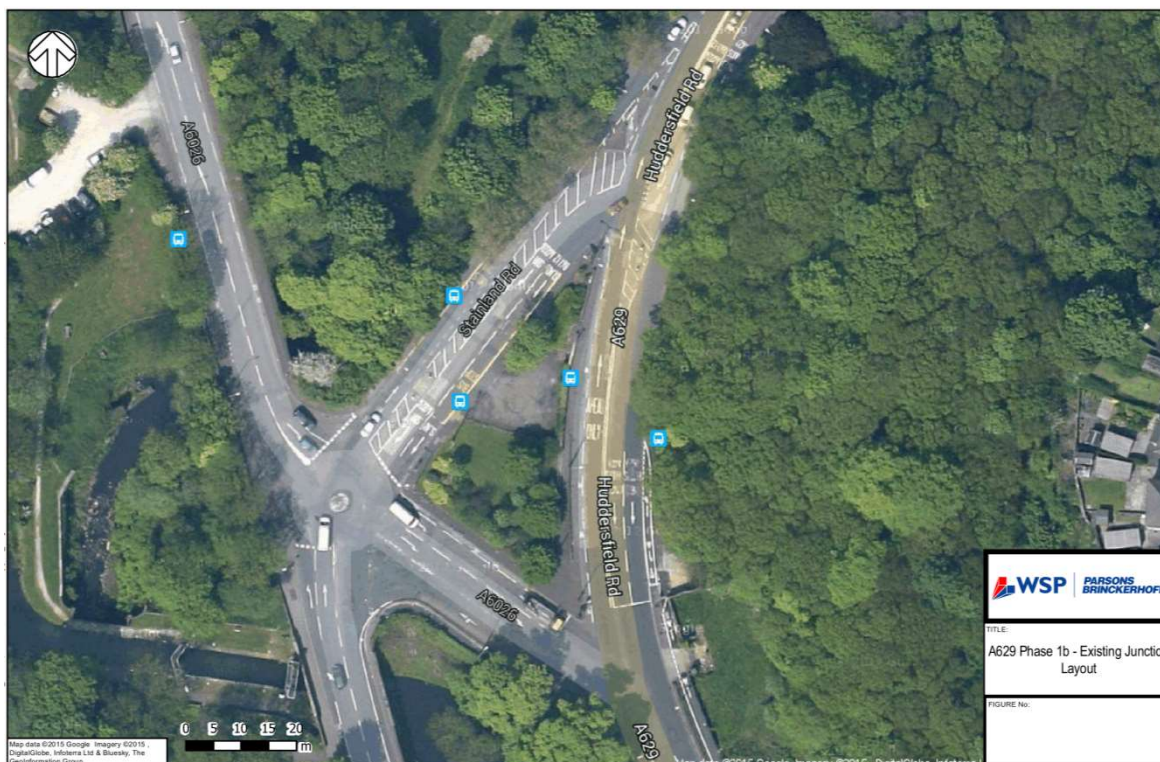


Figure 1-6 Existing Calder & Hebble Junction Layout

The B61121 Stainland Road is single carriageway to the mini roundabout with Wakefield Road, flaring to two lanes on the final approach to the junction.

The A629 inbound runs parallel to the Calder & Hebble Navigation, adjacent to a steep wooded embankment on the western side at a lower level, with steep woodland hillside on the eastern side. These not insignificant level differences have been given detailed consideration as part of the development of scheme proposals to ensure realism in terms of deliverability.

A raised historic pedestrian promenade follows the highway on the southbound side of the carriageway providing segregated facilities for pedestrians and cyclists towards Lowfields Business Park.

To the north of the junction a significant retaining wall separates the highway from adjacent sewage filter beds and the Hebble Brook.

1.2.3 Traffic Flow

The traffic flows extracted from the 2014 traffic count, converted to Passenger Car Unit (PCU) values and used to develop the local network models are provided in Table 1-3 to Table 1-5 below. PCU is a vehicle unit used for expressing highway capacity, for modelling purposes. Different vehicles are assigned different values, according to the space they take up. A car has a value of 1; smaller vehicles will have lower values, and larger vehicles will have higher values.

For traffic travelling north on the A629, in the AM peak 27% of traffic turns left to use either Stainland Road or Wakefield Road. In the interpeak and PM peak it is 26% and 28% respectively. The majority of this traffic is travelling on to Wakefield Road.

Table 1-3 2014 AM Peak Hour Traffic Flow (PCU) Matrix

	Wakefield Rd	Stainland Rd	A629 (South)	A629 (North)	Total
Wakefield Rd	0	145	505	41	691
Stainland Rd	300	0	10	719	1029
A629 (South)	334	25	2	971	1332
A629 (North)	64	354	1375	0	1793
Total	698	524	1892	1731	4845

Table 1-4 2014 Inter Peak Hour Traffic Flow (PCU) Matrix

	Wakefield Rd	Stainland Rd	A629 (South)	A629 (North)	Total
Wakefield Rd	0	116	318	57	491
Stainland Rd	113	0	45	353	511
A629 (South)	283	38	2	914	1237
A629 (North)	57	379	994	2	1432
Total	453	533	1360	1326	3671

Table 1-5 2014 PM Peak Hour Traffic Flow (PCU) Matrix

	Wakefield Rd	Stainland Rd	A629 (South)	A629 (North)	Total
Wakefield Rd	0	210	467	53	730
Stainland Rd	261	0	17	562	840
A629 (South)	370	16	1	975	1362
A629 (North)	47	426	1313	2	1788
Total	677	652	1798	1592	4720

1.2.4 Network Performance, Constraints and Issues

The primary issues along the Phase 1 route are:

- Insufficient highway capacity to keep pace with increasing population and economic growth;
- Daily problems of delay on the highway network stifling economic growth potential;
- Delays and unreliable journey times risk loss of businesses from Copley and deter wider investment;
- Delays for commercial vehicles travelling to/from M62 and the wider District;
- Slow end-to-end bus journey times contributing to declining patronage;
- Inbound peak hour delays (towards Halifax) at the Calder & Hebble junction are currently amongst the worst in West Yorkshire; and
- Impacts on emergency vehicle journey times particularly for ambulances travelling between the Huddersfield Royal Infirmary and Calderdale Royal Hospital.

The above all contribute to an increasingly inefficient highway network; resulting in unreliable travel opportunities, presenting a barrier to economic growth and quality of life to residents of both Halifax and the wider district.

In 2014, CMBC commissioned consultants to produce a Town Centre Delivery Plan to consider practical and realistic opportunities that aim to stimulate economic growth and performance in Halifax town centre. During preparation of the Delivery Plan, a number of the businesses consulted identified transport and congestion along the A629 as representing significant barriers to their growth.

Lloyds Banking Group, employing over 6,000 people, highlighted the unreliability of connections between the town and the M62, together with the lost productivity that results from delays when accessing its Data Centre at Copley. The Calderdale and Huddersfield NHS Foundation Trust, employing over 2,500 people, highlighted the compromised efficiency that results due to the delays its staff encounter when moving between sites in Calderdale and Kirklees. Nestle, with over 600 employees, highlighted that it is not currently able to service its production facility in the town via the A629, despite it affording the most direct route to the motorway network, due to the delays and congestion that result around Calder & Hebble.

There are a number of geometric factors which create the operational issues and contribute to the primary issues above. The existing Calder & Hebble junction has limited capacity for northbound traffic due to the single lane approach to the junction and the requirement to provide for both ahead and left turning traffic. This is exacerbated by the steep gradient and short link length down to the mini roundabout on Stainland Road.

In peak flow conditions, the current two to one lane merge on the northbound approach to the junction creates significant flow breakdown on the A629 and results in queues which extend over 1km in length. Flow breakdown occurs due to the single lane approach to the Calder & Hebble junction being full of traffic waiting to make ahead or left movements. Vehicles in two lanes have to slow, almost to a stop, to make the merge in turn movement.

Should demand for travel within the area materialise at predicted rates, the current congestion related issues identified will be exacerbated. Or conversely, the demand will not be generated due to a lack of confidence to invest due to the resilience of the highway network. Predicted future issues are set out in the section below.

1.2.5 Safety

A review of the five year collision history in the vicinity of the Calder & Hebble junction indicates that there are difficulties determining conflicts at the junction, which the Phase 1 improvement scheme should seek to address. In total 12 collisions were identified, 11 slight and one serious. The serious collision involved a single vehicle leaving the northbound carriageway between the Calder Hebble junction and Jubilee Road.

Two of the slight collisions were identified involving cyclists, where a car pulled out in front of a cyclist. One slight pedestrian collision occurred due to a pedestrian crossing the road inappropriately. Clear and easy to use pedestrian and cycle facilities are to form a key part of the Phase 1 improvement scheme.

The main cause of accidents in the northern section of the corridor, between Jubilee Road and Free School Lane, are:

- Vehicles turning right in to and out of side roads;
- Pedestrians crossing the road at uncontrolled crossings, or in between slow moving and queued vehicles;
- Rear end shunts at junctions; and
- Incidents involving cyclists.

1.2.6 Issues for Pedestrians & Cyclists

The Phase 1a A629 highway corridor currently has no dedicated cycle infrastructure; similarly, pedestrian crossing facilities are not comprehensive, highlighted by gaps in desire lines. Phase 1b does have dedicated cycle facilities, though pedestrian crossing infrastructure is ostensibly non-existent.

At the Free School Lane / A629 signal junction to the northern end of Phase 1 a pedestrian crossing only exists on the northern arm of the junction, with all others either not served or with uncontrolled dropped kerbs. This problem has recently been highlighted by pedestrian demand to a new Tesco express store on the southern side of junction.

Along Huddersfield Road adjacent to Spring Hall sports grounds only one uncontrolled crossing exists to serve this 400m length. Two staggered Pelican crossings then exist for next 200m length, located at Stafford Avenue and Stafford Road. Dryclough and Dudwell signal junctions have pedestrian crossings on the northern and western arms.

The Calderdale Royal Hospital is a major employer in the area and also clearly attracts a significant number of visitors and therefore is a key generator of highway trips on the network. Improved connections to pedestrian and cycle routes through the Phase 1 area could result in mode shift from private car to more sustainable modes.

Within the confines of the Calder and Hebble junction pedestrian crossing facilities are very limited with no crossings located at the Stainland Road / Wakefield Road mini roundabout. The A629 Elland Wood Bottom signals have only recently benefitted from a toucan crossing facility aimed at a cycle infrastructure upgrade under the LTP programme.

Cycle infrastructure is reasonably well served along the corridor from Elland into Halifax centre with Sustrans route 66 providing a parallel hard paved towpath route up to Calder and Hebble basin which then turns into route 68 along the Hebble Trail, a disused canal corridor reaching the town's southern border. While providing sanctuary from the principal main road traffic flows during daylight hours, the lack of street lighting prohibits winter hour use during the evening commute.

Elland Wood Bottom also features a dedicated southbound cycle path along a promenade path continuing into a new route constructed in the wide verge though to Exley Lane; count data shows during the summer periods usage peaks at 2070 cycle journeys per month with 190 pedestrians using the cycle path also; in contrast some 40,000 vehicles per day use the A629, 1.2million a month.

The corridor beyond Calder and Hebble lacks cycle infrastructure, the direction being to use Hebble Trail, however this overlooks cyclists who traverse Salterhebble Hill either to access the Hospital, Skircoat or King Cross area; although challenging given the steep gradient and vulnerable on the congested highway many cyclists use on a daily basis.

1.2.7 Issues for Public Transport

The Phase 1 area of the A629 between Free School Lane and the M62 Ainley Top roundabout is served by up to 15 buses per hour to a range of destinations, including Halifax, Huddersfield, Elland and Brighouse. In addition, a free half hourly shuttle service links Calderdale Royal Hospital with Huddersfield General Hospital, for use by patients, visitors and staff.

There are currently no express services operating directly via the A629 Elland Bypass due to the unreliability of journey times approaching the Calder & Hebble junction from the south, with all Halifax to Huddersfield services routed via Stainland Road through West Vale and Elland. However, bus journey times remain slow, due in part to the congestion issues along the Phase 1 stretch of the A629 and congestion in the West Vale area. The approximate 5 mile journey between Halifax town centre and the M62 Ainley Top is timetabled as taking 25-30 minutes.

Average, minimum and maximum journey times based on data extracted from WYCA's journey time database for Service 503 from October 2014 is provided in Table 1-6 and Table 1-7 below. There is significant variation in both northbound and southbound bus journey times throughout all peak periods, eroding journey time reliability and deterring greater use of bus services.

Table 1-6 Service 503 Huddersfield to Halifax, Ainley Top to Heath Road

A629 Northbound	AM Peak	Inter Peak	PM Peak
Average Journey Time (mins)	21	19	20
Minimum Journey Time (mins)	13	8	13
Maximum Journey Time (mins)	33	38	35

Table 1-7 Service 503 Halifax to Huddersfield, St John's Lane to Ainley Top

A629 Southbound	AM Peak	Inter Peak	PM Peak
Average Journey Time (mins)	20	19	22
Minimum Journey Time (mins)	9	8	9
Maximum Journey Time (mins)	30	28	33

An outbound bus lane is provided between Spring Hall and Dryclough Lane, operating during the evening peak period only. However, general delays and congestion where buses merge with general traffic conspire to restrict the level of journey time benefit it provides.

1.2.8 Predicted Future Issues

In order to inform the development of its WY+TF schemes, CMBC has developed a strategic transport model making use of recently collected survey data (2014), with forecasting completed as part of the Calderdale Strategic Transport Model (CSTM) project for 2016, 2021 and 2031.

These future year development scenarios have been reviewed to determine predicted transport issues on the wider CMBC highway network. Details of the CSTM base model and its validation are included within the Model Validation Report, which is provided as Appendix B.

Forecast models were developed based on agreed residential and employment growth figures provided by CMBC based on assumed Local Plan growth, along with similar information provided by KMBC and BMDC to enable the forecasting of cross-boundary trips. Full details on the forecast impacts on the wider CMBC network can be found within the CSTM Forecasting Report, which is provided as Appendix C.

The forecast models take account of committed highway improvements currently programmed by CMBC, with two schemes in particular directly linked to the A629 Phase 1 proposals. The Copley Valley Link Road to be delivered through ERDF investment, as previously mentioned, and improvements to the Rochdale Road / Stainland Road junction in West Vale to ease current congestion issues associated with vehicles travelling north on Stainland Road.

As the CSTM is being used to assess future year network performance, the highway network coverage allows for rerouting of vehicle trips across the whole modelled network based on the lowest cost route available to the vehicle. As traffic growth increases on the A629, and similarly delays increase, parallel or alternative routes become more attractive and therefore journey time increases are less than you would see in a pure corridor model of the A629. Journey times on the A629 corridor have been assessed from north of M62 Junction 24 Ainley Top to south of the junction with Hunger Hill / Oxford Road, to cover the full Phase 1 scheme area.

As a result of predicted traffic growth, journey times on the A629 in both directions are expected to increase in both directions by 2021, with increases continuing to 2031. Table 1-8 to Table 1-10 below demonstrate the anticipated journey time change in the AM, Interpeak and PM peak hours on the A629. Due to the application of traffic signal optimisation in the CSTM forecast models (without proposed Phase 1 scheme) there is a slight reduction in southbound journey time shown in 2016 on the corridor. This also takes account of parallel routes becoming more attractive due to improved junction performance.

By the first full year after scheme opening, 2021, northbound journey times are predicted to increase by 21% in the AM Peak Hour, 12% in the Interpeak Hour and 15% in the PM Peak Hour. Southbound journey times are predicted to increase by 6% in the AM Peak Hour, 4% in the Interpeak Hour and 13% in the PM Peak Hour.

By 2031, northbound journey times are predicted to increase by 38% in the AM Peak Hour, 20% in the Interpeak Hour and 27% in the PM Peak Hour. Southbound journey times are predicted to increase by 18% in the AM Peak Hour, 8% in the Interpeak Hour and 30% in the PM Peak Hour.

Table 1-8 A629 (Phase 1) AM Peak Hour Journey Time Comparison, Base & Do-Nothing

AM	2014		2016		2021		2031	
Route	A629 NB	A629 SB	A629 NB	A629 SB	A629 NB	A629 SB	A629 NB	A629 SB
Journey Time (secs)	819	550	850	547	990	584	1131	651
Difference (secs)			31	-3	171	34	312	102
% Difference			3.74%	-0.56%	20.82%	6.25%	38.11%	18.47%

Table 1-9 A629 (Phase 1) Interpeak Hour Journey Time Comparison, Base & Do-Nothing

IP	2014		2016		2021		2031	
Route	A629 NB	A629 SB	A629 NB	A629 SB	A629 NB	A629 SB	A629 NB	A629 SB
Journey Time (secs)	567	512	609	526	636	534	678	553
Difference (secs)			41	14	68	23	110	41
% Difference			7.29%	2.74%	12.00%	4.42%	19.46%	8.03%

Table 1-10 A629 (Phase 1) PM Peak Hour Journey Time Comparison, Base & Do-Nothing

PM	2014		2016		2021		2031	
Route	A629 NB	A629 SB	A629 NB	A629 SB	A629 NB	A629 SB	A629 NB	A629 SB
Journey Time (secs)	713	616	771	644	817	693	906	802
Difference (secs)			58	28	104	77	193	185
% Difference			8.14%	4.50%	14.64%	12.43%	27.08%	30.06%

A graphical comparison of northbound and southbound peak hour journey times on the A629 from north of M62 Junction 24 Ainley Top to south of the junction with Hunger Hill / Oxford Road is presented in Figure 1-7 to Figure 1-9, between 2014, 2016, 2021 and 2031.

The graphs demonstrate the progressive worsening between the assessment years for northbound journeys, approximately 100 seconds increase by 2021 and 200 seconds increase by 2031 in the AM Peak Hour.

Southbound journey times slightly increase by 20 seconds to 2021, but then experience a jump by almost 100 seconds to 2031. The PM Peak Hour sees approximately 170 seconds increase in northbound journey time and 200 seconds increase in southbound journey time at 2031.

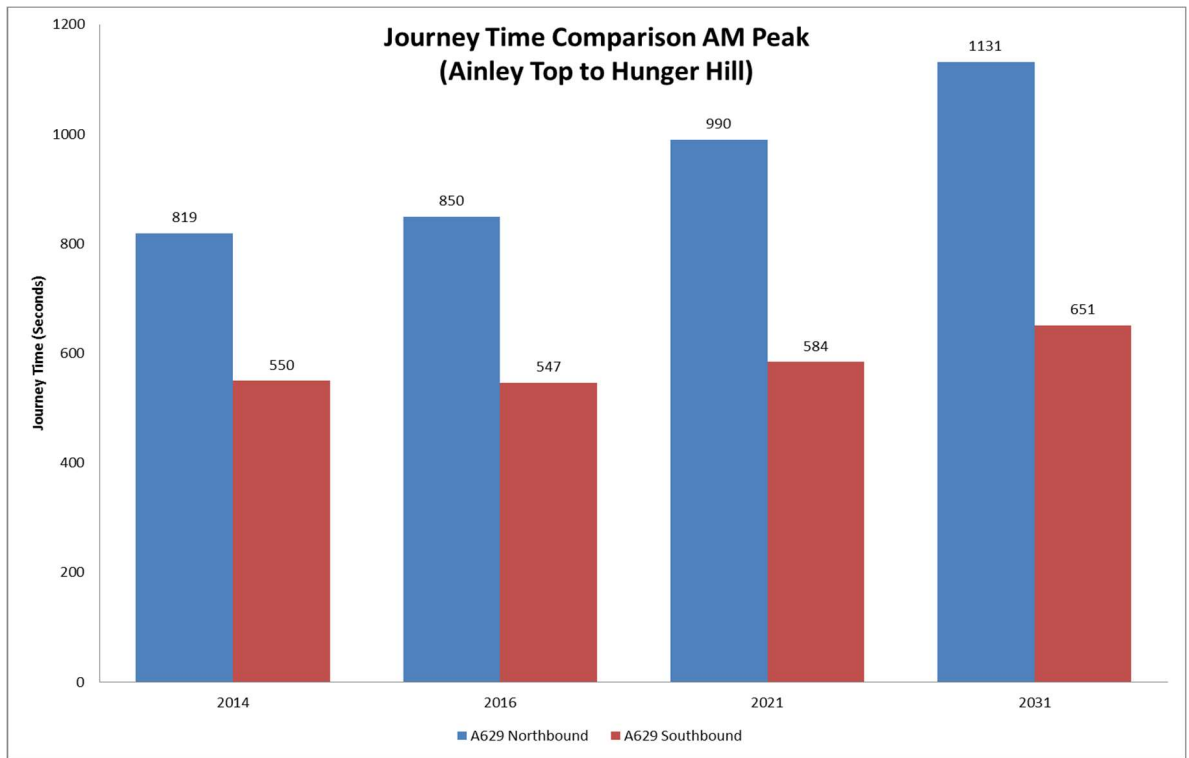


Figure 1-7 A629 (Phase 1) AM Peak Journey Time Comparison, Base & Do-Nothing

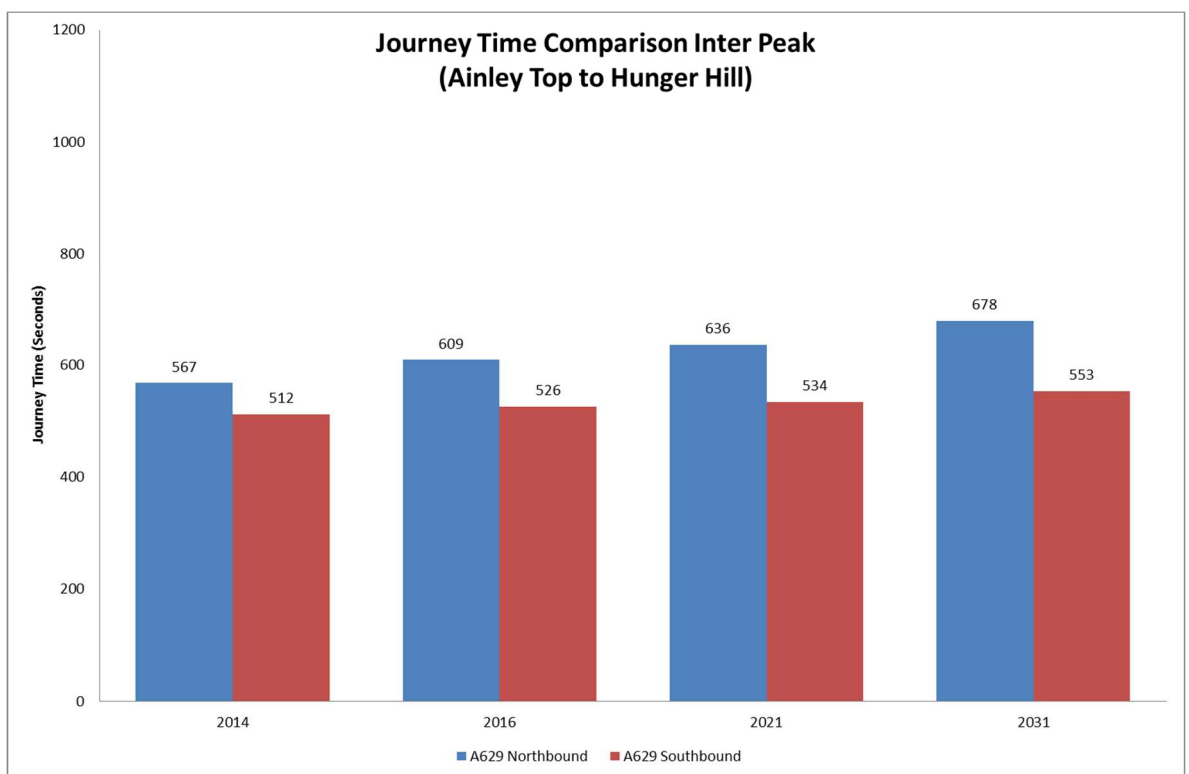


Figure 1-8 A629 (Phase 1) Interpeak Journey Time Comparison, Base & Do-Nothing

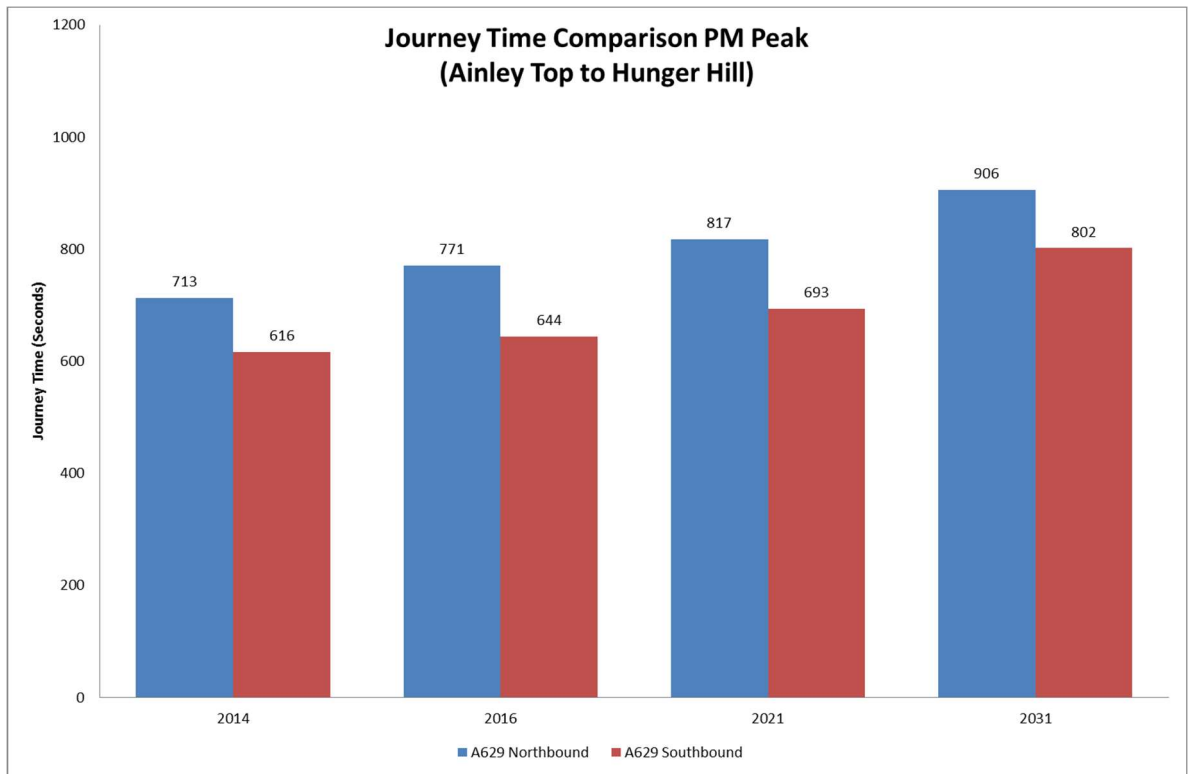


Figure 1-9 A629 (Phase 1) PM Peak Journey Time Comparison, Base & Do-Nothing

1.3 Scheme Objectives

As part of the development of the Phase 1b scheme, the objectives set as part of the successful Phase 1a Gateway 1 submission have been revised and supplemented to allow for the assessment of Phase 1 in full within this Gateway 1 submission. This has been carried out in line with the Issues and Objectives Matrix, included as Appendix D to this submission, which defined the overall scheme objectives for the A629 as part of the scheme mandate.

This ensures not only policy alignment, but also that the objectives are specific (and transparent), measurable, achievable, realistic and time bound to provide the evidence for both the benefit realisation process (assess the return on investment) and to demonstrate a track record of success to maximise the potential of securing future funding at a local and regional level. This expanded set of objectives for Phase 1 is defined as follows:

- Deliver optimal capacity on the A629 corridor (people and goods);
- Improve accessibility to Calderdale's key employment sites;
- Interventions to be supportive of housing growth;
- Enhance journey time reliability, particularly for public transport users;
- Minimise impact on future revenue budgets;
- Maintain and improve existing network operation for all road users;
- Enhance provision for sustainable modes;
- Reduce bi-directional journey times for all modes on A629 corridor; and
- Improve air quality.

To ensure the application of the above objectives when assessing the suitability of proposed scheme concepts was transparent, delivered maximum value and was aligned with the strategic objectives of the funding sources, a bespoke option sifting toolkit (Multi Criteria Appraisal Toolkit - MCAT) was developed to sift the early scheme concept options. This application of this toolkit is described in Section 1.10.

1.4 Measures for success

Phase 1, as a component of the full A629 Halifax to Huddersfield corridor, can be considered a success if it contributes to the overall vision of the corridor, which is to unlock development potential and the creation of 1740 jobs by 2026. Phase 1 seeks to ensure compatibility with the remaining phases of work on the corridor and to deliver the overall vision through congestion relief at identified hotspots within the Phase 1 area and a reduction in journey times.

Unlocking development potential and creation of 1740 jobs by 2026 are specific impacts targeted by the A629 corridor scheme and therefore are direct measures of success which can be evaluated. Congestion relief and 50% reduction in bus journey times are targeted outcomes of the scheme that can be monitored as part of the required monitoring and evaluation process.

Additionally, any intervention will be successful if it contributes to the impacts of the overall strategic vision for the Phase 1 element of the corridor. However, as these will take several years to materialise as they are in a large part dependent on realisation of other phases of the scheme, it is the outcomes that will be used to assess if the A629 corridor is on track to meet targeted benefits.

Outcomes:

- Accessibility to and from Halifax and Huddersfield, key employment areas, such as Copley as well;
- Accessibility/severance between surrounding business and residential areas is improved;
- Increased cycle mode share to key attractors on the A629 corridor;
- Reduced levels of delay and queuing on the A629 through the Calder & Hebble junction for all modes;
- Reduced levels of 'rat-running' through West Vale area, Siddal and Exley;
- Increased vehicle throughput;
- Decrease in public transport journey time variability;
- Decrease in end to end corridor journey times; and
- Improvement in air quality.

Impacts:

- Increase in jobs;
- Increase in GVA;
- Increase in household completions and
- Positive Public Health Impact.

The metrics for measuring success will further be developed as the A629 scheme evolves throughout the Gateway processes as part of the development of a Benefits Realisation Plan.

Although in isolation the Phase 1 study has been shown to deliver strong economic benefits in its own right, as it forms only part of the overall A629 corridor proposal, it is not expected that it will wholly achieve the vision of the corridor as a standalone scheme. Once each constituent part of the corridor package is implemented, all will come together to deliver the overall vision, ideally with the whole being greater than the sum of the parts as each phase of the works is being developed to be complementary to one another taking account of the previous and parallel workstreams. As part of the Gateway process, we can get an approximation of what each component phase should contribute to overall delivery, in reality, it is only when all the phases come together collectively can the net economic impact be fully realised.

It is expected that Phase 1 will contribute to a reduction in bi-directional bus journey times, relieve congestion at the existing pinch point of the Calder & Hebble junction particularly in the northbound direction, and with the Phase 1a Salterhebble Hill widening contribute to alleviation of southbound congestion. The improvements in journey time and congestion relief will help to unlock development sites and facilitate greater access to existing and proposed employment sites in Halifax Town Centre and at Copley, Lowfields Business Park, Elland and across the border in Kirklees.

1.5 Scope

1.5.1 Outline of Phase 1a Proposals

An outline of the Phase 1a proposals is provided below, with full details available in the Phase 1a Gateway 1 submission and scheme drawings included as Appendix E to this report:

- **Jubilee Road to Dudwell Lane:** Widening to form two lanes outbound from the current two-to-one merge at Chapel Lane as far as the interface with the adjoining Phase 1b section, including provision of a shared use cycle / footway uphill on the western side of the road, introduce right turn lane in to Rookey Lane, and upgrade to footway provision and entry radii at junction with Bankhouse Lane.
- **Dudwell Lane Junction:** Relocate pedestrian crossing on Dudwell Lane and realign approach to the junction to maximise operational efficiency, new bus layby on southbound exit of junction to maximise the provision of two lanes through the junction, and provision of advanced stop lines (ASLs) for cyclists on all approaches to signal stop lines, including continuous cycle lane between Dudwell Lane and Dryclough Lane junctions.

- **Dryclough Lane Junction:** Ban right turn in to Dryclough Lane from Huddersfield Road North, reduce number of traffic signal phases from three to two, widen Dryclough Lane to provide two lanes for right turning traffic onto the A629 southbound, introduce new left turn slip for inbound traffic turning onto Dryclough Lane, introduction of residents' parking bay on Dryclough Lane to ensure traffic lanes are not obstructed, and the provision of advanced stop lines (ASLs) for cyclists on all approaches to signal stop lines.
- **Dryclough Lane to Shaw Hill / Free School Lane:** Introduce continuous inbound advisory cycle lane, involving carriageway widening at the northern end, introduce new southbound advisory cycle lane between Shaw Hill junction and start of existing bus lane at Skircoat Green Road, widen the existing outbound bus lane to 4.5 metres to accommodate both cyclists and buses, conversion of the existing staggered pedestrian crossings outside Copperfield House and the junction with Stafford Road to straight across crossings, extend two lanes inbound to Stafford Place.
- **Shaw Hill / Free School Lane Junction:** Closure of a short section of Huddersfield Road (between Shaw Hill and A629 Skircoat Road), redirecting Shaw Hill traffic through a single 4-arm intersection at Free School Lane/Huddersfield Road/Skircoat Road, Skircoat Road inbound approach widened to become 3 lanes, Shaw Hill widened to become 2 lanes on its westbound approach, existing banned right turn from Skircoat Road to Free School Lane, provision of new pedestrian crossings on all approaches, introduce landscaping on south east corner of junction, cycle path to bypass the traffic signals outbound from Shaw Hill on the A629.
- **Corridor Treatment:** Improvements to cycle facilities to provide inbound cyclists with a cohesive network that links to the hospital as well as Halifax town centre, All bus stop infrastructure shall be upgraded to quality bus corridor standards including real time information, development of a comprehensive hospital signing strategy, involving the introduction of new fixed and variable message signs to make better use of car parking capacity.

1.5.2 Outline of Phase 1b Proposals

Phase 1b will deliver improvements on the A629 corridor, specifically targeting the current pinch point of the Calder & Hebble junction. The recommended option has been developed in combination with the Phase 1a proposals to ensure both elements of the work package are complementary. Section 1.8 outlines the scheme optioneering process and how the recommended scheme was identified.

Scheme drawings for the recommend scheme are included in Appendix F (see also figure 1-10) to this submission. An outline of highway changes for the Phase 1b scheme proposal is provided below:

- Extinguishment of the existing link between the A629 and the current mini roundabout at Stainland Road / Wakefield Road;
- Removal of the current A629 signal controlled junction at A6026 / A629 Elland Wood Bottom;

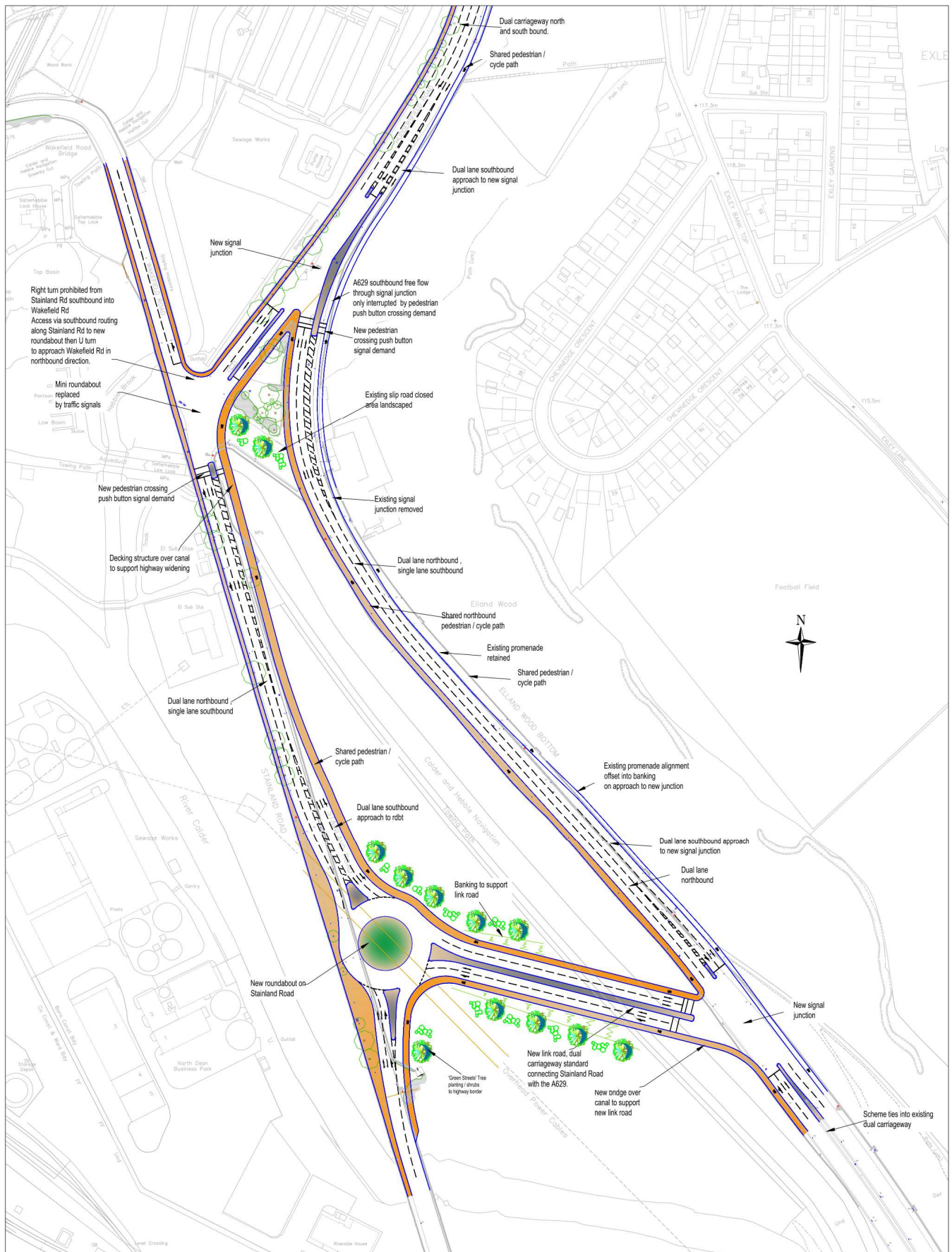


Figure 1-10 Proposed Phase 1b Scheme

- A new highway link between the A629 and Stainland Road located across the parcel of land north of the River Calder, incorporating:
 - A new structure over the Calder & Hebble Navigation to facilitate access between the A629 and Stainland Road;
 - Earthworks to achieve level difference required between Stainland Road and A629; Traffic signal junction at the new A629 junction to the eastern side of the new link. Northbound movements from the A629 to Stainland Road / Wakefield Road will use the new link, there is no southbound right turn permitted at this junction, the new link road only provides for southbound movements on the A629; and
 - A new roundabout at the Stainland Road junction to the western side of the new link, with all movements permitted between the three approaches to the junction.
- Green Street infrastructure corridor planting on new link and improved Stainland Road;
- Widening to two traffic lanes northbound on the A629 to continue the existing two lane provision northbound on the A629 through to the Calder & Hebble junction;
- Widening to the east of the A629 to facilitate a segregated single lane southbound through the Calder & Hebble junction, with widening facilitating two full lanes southbound on the approach to the new junction on the A629 at the new link;
- A new signal controlled junction at Stainland Road / Wakefield Road / A629 to replace the existing mini roundabout. This junction bans the existing right turn movement from the A629 to Wakefield Road, with movements requirement to be completed via the new roundabout at the western end of the A629 / Stainland Road link;
- A new structure over the Calder & Hebble Navigation south of the existing mini roundabout to facilitate widening to two full northbound lanes plus a flare on the approach to the new junction, and a single lane southbound;
- Widening to the east of the existing Stainland Road alignment for facilitate two northbound lanes and one southbound lane;
- Realignment and widening to two northbound and one southbound lane on Stainland Road north of the existing River Calder bridge to connect to the new roundabout proposed at the western side of the new link between the A629 / Stainland Road;
- To tie in to the Phase 1a proposals, the highway between the Calder & Hebble junction and Jubilee Road is two lanes in either direction immediately to the north of the Calder & Hebble junction, with the northbound carriageway merging to a single lane approach to the Jubilee Road junction to facilitate a right turn storage area for northbound movements in to Jubilee Road.

An outline of pedestrian and cycle changes for the Phase 1b scheme proposal is provided below:

- A staggered toucan crossing is proposed across the northern side of the new traffic signal controlled junction on the A629 facilitating access to the new link road;
- A staggered toucan crossing is also proposed across the eastern side of the new link road at the new traffic signal controlled junction;

- A shared footway / cycleway is provided on the northern side of the new link road, continuing on the eastern side of Stainland Road to the new signal controlled junction at Stainland Road / Wakefield Road / A629.
- A straight across toucan crossing is proposed across the Wakefield Road arm of the new signal controlled junction at Stainland Road / Wakefield Road / A629;
- East to west staggered toucan crossing facilities are proposed at the new traffic signal controlled junction where Stainland Road and the A629 meet;
- Connections in to the Hebble Trail / Canal Tow Path at northern end of Stainland Road to replace existing connections;
- The existing raised promenade on the eastern side of the A629 is to remain, but will require realignment in parts to facilitate the widening on the A629;
- The provision of Advanced Stop Lines (ASLs) for cyclists has been considered within the Phase 1b proposals, but due to relatively flat nature of the Phase 1b area, short link lengths at certain locations, and the impact on junction operation in terms of capacity, it was determined that ASLs were not required.

An outline of public transport changes for the Phase 1b scheme proposal is provided below:

- Due to the overall network enhancements in journey time provided by the proposed scheme, no physical public transport infrastructure (i.e. bus lanes) is recommended or required as part of the scheme;
- The existing bus stops located on the link between Stainland Road and the A629 are proposed to be relocated south of the new junction at Stainland Road / Wakefield Road / A629;
- The existing northbound bus layby on the A629 within the Calder & Hebble junction will remain on the approach to the new traffic signal controlled junction where Stainland Road and the A629 meet;
- The existing southbound bus stop on the A629 within the Calder & Hebble junction will need to be relocated north of its existing location to ensure it is at a location where a stopped bus can be passed, i.e. a two lane section of highway;
- Following the A629 Phase 4 assessment, the allocation of highway space and requirement for the provision of public transport infrastructure across the full length of the A629 corridor will be reconsidered. Flexibility in junction operation has been built into the proposed Phase 1 scheme to take account of future interaction with Phase 4.

1.6 Constraints and Interdependencies

As part of the full A629 corridor, the Gateway 1 submission for Phase 2 – Halifax Town Centre is being developed in parallel to this for Phase 1. There are significant links between the two Phases of corridor works and this has been taken in to account as part of the development of both submissions.

Following Gateway 1 approval of both, detailed consideration will need to be given to how the two Phases interact as a package of works, with associated modelling taking place to supplement the independent modelling already completed. The limitations or alterations to vehicle movements within Halifax Town Centre will likely have impacts on how the A629 (Phase 1) and other key corridors in to the town are required to operate and manage/control vehicle access to the town centre. This has already been assessed as part of the Phase 2 study using the same CSTM model applied as part of this Phase 1 Gateway submission.

With the two phases being developed in parallel, early identification of the linkages and interdependencies between Phase 1 and Phase 2 has been key to ensure both phases contribute to the overall vision of the corridor and that the two phases do not compete to reduce the overall benefit of the corridor scheme.

This also applies the remaining two phases (4 & 5) to be delivered later in the fund programme, which are currently planned for delivery by March 2021. The design of Phase 1 and 2, and subsequent phases, need to account for changes in demand (and potential increases in the number of buses and bus users) that are expected to result from the delivery of schemes in Kirklees which unlock corridor constraints at critical junctions such as Calvary Arms.

The future year impacts assessment has already identified that the existing southbound bus lane on the A629 between Skircoat Green Road and Stafford Square becomes a constraining factor on network performance by 2031 due to the traffic demand for the A629 being restricted to a single lane alongside the bus lane. The Phase 4 assessment will consider the value and merit of priority lanes along the A629 as part of a full corridor strategy.

CMBC, Kirklees Council and Bradford Council are also promoting a corridor improvement scheme under the WY+TF along the A641 between Bradford, Brighouse and Huddersfield. Work on the scheme is yet to be initiated, due to its planned delivery later in the WY+TF programme.

The Chancellor's Autumn Statement in December 2014 announced funding for upgrade of the M62 to a 'smart motorway' between Junctions 20 and 25. The potential development of a new motorway junction on the A641 corridor (Junction 24a) is currently being considered by Highways England working with KMBC and CMBC. In the event that the new junction is taken forward, delivery of the A641 WY+TF scheme is likely to be reprioritised. Whilst realisation of a new motorway junction on a corridor parallel to the A629 could result in changes to corridor demand further south, it is not anticipated to affect traffic flow in the Phase 1 scheme area, given the northern divergence of the two corridors to serve different onward destinations.

At pro forma stage potential schemes for later implementation included the provision of an express bus service between Halifax and Huddersfield, and provision of a Park & Ride facility close to junction 24 of the M62. These amongst others will be considered as part of the Phase 4 assessment, and whilst these are subject to further investigation and development in due course, at this stage it is prudent to ensure that measures implemented in Phase 1 are adaptable to accommodate a greater number of buses should this be required.

As identified within the original Phase 1a Gateway submission, there is interdependency with the hospital car parking strategy, as access to / from these car parks has a significant impact on traffic flows and junction operation in the phase 1a section. Therefore a collaborative approach with the NHS Trust has been adopted to achieve mutually desirable outcomes.

The Phase 1 proposals associated with the Salterhebble Hill widening include limited alterations to the Jubilee Road junction with the A629. Any alterations to these proposals need to be considered as part of the future assessment of Phase 1 and Phase 2 in combination and the corridor management approach to traffic on the A629 between the Calder & Hebble junction and Halifax Town Centre as part of Phase 4. Therefore, at this stage, no significant intervention is proposed at the Jubilee Road junction. This location will be revisited as part of Phase 4 and subject to an options assessment exercise following the approval of Phase 1 and Phase 2 Gateway 1 submissions.

The scheme will seek to compliment and integrate with other West Yorkshire wide WY+TF schemes that are currently being developed including the Highways Efficiency Bus Package (HEBP) and Urban Traffic Management and Control (UTMC) projects as these come forward.

1.7 Stakeholders

As part of the development of the overall Phase 1 scheme consultation has already begun with main stakeholders contacted that present a risk to delivery. At this stage, consultation and engagement is at a more advanced stage with the Phase 1a elements of the works as it is not appropriate to consult more widely on Phase 1b until a viable scheme with Gateway 1 approval is identified. This ensures that expectations are managed and risks are minimised.

As part of the Phase 1 scheme, engagement and consultation has already been undertaken, and will continue, with:

- CMBC;
- West Yorkshire Combined Authority;
- Calderdale & Huddersfield NHS Trust;
- Sustrans;
- Kirklees Council;
- Adjacent land owners;
- Canal and River Trust.

In addition to those already consulted, the following list of further stakeholders has been identified, which need to be consulted formally in due course as the scheme progresses through the Gateway process:

- Bus Operators;
- Network Rail;

- Utilities companies;
- Environment Agency;
- Historic England;
- Emergency Services;
- Natural England.

It is proposed that a consultation and communication plan be actioned at the earliest possible time once Gateway 1 approval has been secured. This will minimise the impact of this work package on the overall programme and be responsive to regulatory procedures. A stakeholder analysis, communication plan and branded materials are currently being developed for the programme in Calderdale. Further information on this is available in Section 5.4.2.

The scheme requires third party land to deliver the new link road and widening proposed on the A629 and Stainland Road. CMBC has already begun negotiations with the relevant land owner given the acquisition of land presents the biggest risk to the scheme. The requirement for two new structures over the Calder & Hebble Navigation will require detailed engagement and permissions from the Canal and Rivers Trust, to whom an initial approach has been made in advance of the Gateway 1 submission. Given the proximity to the overhead power lines, initial contact with National Grid has also been made in advance of the Gateway 1 submission, with detailed discussions to follow.

Land acquisition and interaction with the power lines have been identified in the Risk Register as key items, but are not considered to be barriers to delivery, although there are potential cost implications associated with mitigation of these risks, i.e. increased land purchase costs or additional construction costs associated with avoidance of the overhead power lines.

The requirement for removal of existing trees (and TPO's) and planting will need to be discussed internally within CMBC as part of the planning process alongside any additional planning requirements for the scheme; acoustics, air quality, arboriculture, historic environment, etc. In addition to this, appropriate internal CMBC processes to achieve a stopping up order for the closed link between the A629 / Stainland Road / Wakefield Road will be required.

1.8 Options

1.8.1 Intervention Identification

A detailed constraints and opportunities exercise identified the existing and predicted future operational issues associated with the Phase 1b study area as set out in Section 1.6 of this Strategic Case. This process identified key targets for any proposed scheme to address, to not only achieve the overall scheme objectives, but to specifically address the issues identified. A series of intervention concepts were identified during the constraints and opportunities exercise and formed the basis of seven initial scheme concepts discussed in the following sections:

- New junction(s) created between the A629 and Stainland Road, including re-alignment of A629 where required;

- Localised widening to A629 to create additional northbound capacity (East / West side);
- Reallocation of existing road space in vicinity / on approach to junction;
- Traffic priority measures: Bus measures along Stainland, HOV / 2+ on A629;
- Specific movement restrictions / provisions – junction and study area wide – Pedestrians, Public Transport, Cycles, Freight, general traffic;
- At grade direct link between A629 and Wakefield Road;
- Widening engineering to promote / deter use of alternative routes, e.g. Rochdale Road link through to Elland.

At this initial stage in the process, the concepts were wide ranging to ensure that all possible solutions were considered for assessment to address the objectives of the scheme prior to the concept sifting process using a bespoke Multi-Criteria Appraisal Toolkit. The detail of each of the seven concepts is set out in the ***Option Development & Sifting Report (WSP|PB, October 2015)*** contained within Appendix G.

Scheme Concepts 1, 2, 3 and 7 are briefly discussed below as these were not considered suitable for progression as preferred concepts. Scheme Concepts 4, 5 and 6 are covered in detail below, with accompanying concept sketches, as they were identified as a preferred scheme to take forward to detailed consideration.

1.8.2 Scheme Concepts 1, 2, 3 and 7

- **Scheme Concept 1:** Large roundabout configuration at existing junction location. Grade separation of northbound A629 movements. A629 southbound movements bypass new roundabout junction. New link between A629 and Stainland Road.
- **Scheme Concept 2:** Grade separation of northbound and southbound A629 movements. Multiple junctions created to allow grade separation of movements. New link between A629 and Stainland Road.
- **Scheme Concept 3:** Large gyratory junction with a cut through link for the A629.
- **Scheme Concept 7:** All northbound A629 traffic pulled on to improved Stainland Road link to separate out Northbound and Southbound movements on the A629. Southbound traffic on the A629 would be free flow. Two roundabouts to manage conflicting vehicle movements at the junctions with Stainland Road.

1.8.3 Scheme Concept 4

Concept 4 (see figure 1-11) allows the A629 to remain relatively untouched apart from a new junction created on the A629 with a new link between A629 and Stainland Road. The proposed highway link between A629 and Stainland Road would require a bridging structure across the Calder & Hebble Navigation (CHN) and an earthworks structure to connect it with a junction with Stainland Road. Isolated junction modelling and wider assessments using the Paramics model helped determine whether a roundabout or signal controlled junction is preferable at the end of the new link to Stainland Road.

The existing mini roundabout is replaced with a signal controlled T-junction to facilitate movements between Wakefield Road, Stainland Road and the A629. The existing short steep link between the A629 and Stainland Road is removed as this movement is facilitated by the new A629-Stainland Road link.

There is a need for new structure or widening to the existing bridge structure across the CHN to facilitate widening on Stainland Road permitting two northbound lanes to the new signal controlled junction. The existing bridging structure across the Hebble Brook would be sufficient for accommodating Wakefield Road within this scheme concept.

To provide management of traffic on the A629 and to control the merge of vehicles from/to Stainland Road and Wakefield Road, a signal controlled junction is proposed at the location of the current southbound A629 right turn to Stainland Road.

Working as much as possible with the existing layout, this scheme targets the location that is considered to be the most significant problem with current operation, the short link between the A629 and Stainland Road, with the aim of removing the capacity constraint it currently creates.

Key concerns with this concept are:

- Suitable ability to manage the traffic on the remaining link between the A629 and Stainland Road.
- Being able to provide sufficient capacity for the predicted growth given the limited increase in link capacity.

1.8.4 Scheme Concept 5

In concept 5 (see figure 1-12) the proposed highway link between A629 and Stainland Road requires a bridging structure across the CHN and an earthworks structure to connect it with Stainland Road.

This concept indicates the provision of a signal controlled junction at the end of the new link road. Isolated junction modelling and wider assessments using the Paramics model helped determine whether a roundabout or signal controlled junction is preferable at the end of the new link to Stainland Road.

Only northbound movements are permitted on Stainland Road after the junction with the proposed link road. The existing on slip from Stainland Road to the A629 is proposed to be used as a bus priority route, with all general traffic sent north on the existing Wakefield Road link.

A new link between Wakefield Road and the A629 across the Yorkshire Water Salterhebble site, with signal controlled junctions at each end requires a bridging structure across the CHN and the Hebble Brook. This link provides for two-way movement between the A629 and Wakefield Road (including northbound Stainland Road traffic).



Figure 1-12 Scheme Concept 5

This scheme has benefits in that the new links can generally be constructed offline, without any significant impact on the corridor. Key concerns with this concept are:

- The deliverability and construction works required to deliver the Wakefield Road / A629 link.
- Maintenance requirements associated with the Wakefield Road / A629 link.
- Being able to provide sufficient capacity for the predicted growth given the movements permitted and the proposed use of one-way sections.

1.8.5 Scheme Concept 6

In concept 6 (see figure 1-13) the proposed highway link between the A629 and Stainland Road requires a bridging structure across the CHN and an earthworks structure to connect it with Stainland Road. All Stainland Road traffic for the A629 would use the new link between the two roads.

This concept indicates the provision of a signal controlled junction at the end of the new link road. Isolated junction modelling and wider assessments using the Paramics model helped determine whether a roundabout or signal controlled junction is preferable at the end of the new link to Stainland Road.

The scheme makes use of the existing junction layout to facilitate priority bus movements between Stainland Road and the A629 on the current north east facing link.

A new link is proposed, requiring a bridge structure over the Hebble Brook and the underpass slip to the northbound A629, between Wakefield Road and the A629, to facilitate movements between the two. This allows grade separation of conflicting movements at the junction. A roundabout at the connection to the A629 is shown; however the most appropriate form of junction was determined through detailed modelling.

The roundabout circulatory carriageway encroaches into the hillside east of the existing A629 alignment and passes through the historic electricity sub-station. It is likely a retaining wall would be required to retain Elland Wood / Exley Bank.

Key concerns with this concept are:

- The deliverability and construction works required to deliver the Wakefield Road / A629 link.
- Achieving the level difference required between the grade-separated movements.
- Delivering a junction between the A629 and Wakefield Road with sufficient capacity for the predicted growth.



Figure 1-13 Scheme Concept 6

1.8.6 Scheme Concept Sifting

A Multi-Criteria Appraisal Toolkit (MCAT) was developed to provide an appraisal link from strategic level objectives to corridor and scheme level objectives and sets out a robust methodology for high level intervention appraisal. Full details of the development and application of the MCAT is set out in the ***Option Development & Sifting Report (WSP|PB, October 2015)*** contained within Appendix G.

The MCAT was built up from 20 separate sifting mechanisms based around the five key criteria of Economic Growth, Financial, Environmental, Social & Distribution and Management Case. Each of the key criteria and associated sifting mechanism carries a weighting based on its overall importance in determining the suitability of each scheme concept.

A concept sifting workshop was held on Thursday 14th May 2015 to agree the ranking of the seven scheme options utilising the MCAT. With representatives in attendance from across Council disciplines, detailed consideration was given to the realism of each of the concepts from an interdependency and scheme delivery point of view. The process identified the preferred options to be progressed to detailed modelling assessment.

The key points discussed at the sifting workshop centred on the following questions for each of the seven scheme concepts:

- Potential on-street operation;
- Construction requirements;
- Maintenance requirements;
- Scope for public transport priority; and
- Scope for provision of non-motorised user facilities.

The full results of the sifting process are presented in Appendix G. The three preferred scheme concepts following the sifting process are identified below:

- **Concept 4:** New two-way link provided from Stainland Rd to A629, with closure of A6026 link at existing junction location.
- **Concept 5:** New two-way link provided from Stainland Rd to A629 with closure of A6026 link at existing junction. New direct link from Wakefield Rd to A629. Elements of single direction running on Stainland Road, with bus priority.
- **Concept 6:** New two-way link provided from Stainland Rd to A629. Bus priority link. Grade separated roundabout junction to replace existing junction connecting Wakefield Road and A629.

There were a number of common themes as to why the three options scored highly:

- Deliverability;
- Making best use of the existing highway network and highway land ownership;
- Offline construction of new links to minimise the impact on corridor operation;

- Ability to manage and control traffic on the corridor;
- Scope for public transport priority.

Table 1-11 below summarises the Appraisal Score allocated to each of the concepts and presents this alongside the Weighted Appraisal Score. If a scheme concept ranked first against all 20 sifting criteria, i.e. was considered the best performing, then it would achieve a score of 20 (20 x 1) points. If a scheme concept ranked last against all sifting criteria it would achieve a score of 140 (20 x 7) points. The importance weighting applied to each of the sifting criteria is then applied to the appraisal score to calculate the weighted appraisal score and therefore to identify the best performing concepts.

Based on the results of the sifting process, Concepts 4, 5 and 6 are ranked as the best performing concepts. The same three scheme concepts also rank in the same top three order when the weighting criteria is applied to the sifting scores. The remaining four scheme concepts all switch ranking position when the weighting criteria is applied. The three preferred scheme concepts were progressed to detailed modelling assessment.

Table 1-11 Agreed Combined Scheme Sifting Results

Concept	Appraisal Score		Weighted Appraisal Score	
	Score	Ranking	Score	Ranking
<i>Lowest Ranking</i>	140		700	
<i>Highest Ranking</i>	20		100	
1	101	5	486	4
2	120	7	569	6
3	97	4	510	5
4	33	1	167	1
5	39	2	192	2
6	56	3	297	3
7	114	6	580	7

1.8.7 Initial Option Testing

The three preferred scheme concepts, identified through scheme option sifting, were progressed to detailed modelling assessment making use of industry standard modelling software; LinSig, Junctions 8, and Paramics, with the primary aim of identifying the preferred option to take forward to the next phase of the study.

Full details of preferred option testing and development is contained within the ***Preferred Option Testing Report (WSP|PB, October 2015)*** contained within Appendix H. The sections below summarise the development of the preferred scheme concepts through to the identification of the preferred option.

The initial scheme concept sketches can be found in Appendix F and should be used for reference, as required, when interpreting the results of the initial option testing discussed below. Table 1-12 below presents a summary of LinSig performance statistics as referenced in the following sections.

Practical Reserve Capacity (PRC) is presented as a percentage (%), and Delay is presented as pcuHrs. PRC is the percentage value of spare capacity across the junction in the modelled period. Delay is the total delay experienced by all vehicles across the modelled period.

Table 1-12 Initial Option Testing Results Summary

Option	2014 AM		2014 PM		2031 AM		2031 PM	
	PRC	Delay	PRC	Delay	PRC	Delay	PRC	Delay
Existing Layout	-33.1	121.71	-19.6	101.64	-118.5	488.54	-47.4	415.89
Option 4 – with Roundabout	27.0	35.17	25.8	35.14	4.9	55.94	7.1	53.82
Option 4 – with Signals	6.9	42.77	22.9	41.26	-1.3	72.99	7.1	65.73
Option 5	17.2	56.91	5.6	55.12	1.8	86.8	-8.2	88.2
Option 6 – with Roundabout	-17.1	154.94	-12.8	114.96				
Option 6 – with Signals	-33.0	384.51	-25.9	271.74				

Existing Layout: To provide a performance comparison against the existing junction layout, a calibrated base model was developed in LinSig (with Junctions 8 coefficients for priority movements) and tested with 2014 and predicted 2031 traffic flow. The existing junction is shown to be significantly over capacity based on existing flow levels, with traffic growth only exacerbating existing issues. The results in Table 1-12 show the junction operating at approximately 33% and 20% over capacity in the AM and PM peak hours at 2014 (PRC of -33.1% and -19.6% respectively).

Option 4 – with Roundabout: The development of Option 4 was focussed on two different junction type solutions for the western end of the new link between Stainland Road and the A629. The two options tested were a traffic signal controlled T-junction and a priority roundabout.

A key consideration in the assessment of the two Option 4 variations is the provision for the movement from the A629 Southbound to Wakefield Road. The conflicting movements at the location of the existing mini-roundabout significantly impacts on the scope for increased capacity at the junction. The recommendation for this movement, given its low flow level compared to other movements through the junction, is that it is catered for via an alternative route either completing the movement turning at the new Stainland Road roundabout or travelling south on the A629 to utilise the new link road.

Two lanes northbound and southbound are required on the A629 at the junction with the new link road to accommodate traffic to 2031 levels. The new link and roundabout have two lanes, with two lane flared approaches to the roundabout from both directions on Stainland Road. Two lanes northbound on Stainland Road with flaring to a third lane on approach to the Wakefield Road / Stainland Road junction maximises the performance of the junction.

At the northern junction on the A629, the southbound movement is only stopped for pedestrians and shows to perform well with a single lane, with a further separate lane for the right turn to Stainland Road / Wakefield Rd.

One of the key benefits of the network in this option is the flexibility in the cycle time which can run as low as 60 seconds, reducing overall delay to traffic which in turn reduces queue lengths at the junctions. All signalised junctions have simple two stage operation to allow an even split in green time allocation.

The results in Table 1-12 show the new junctions operating at approximately 5% and 7% spare capacity in the AM and PM peak hours at 2031 (PRC of 4.9% and 7.1% respectively). Achieving this level of capacity based on anticipated 2031 traffic flow levels allows the scheme to meet the defined objectives of optimal capacity on the A629 corridor and enhanced journey times and journey time reliability.

Option 4 – with Signals: This option adopts the same overall scheme layout as the 'with Roundabout' option, except the provision of traffic signal control at the junction of the new link and Stainland Road.

One of the key benefits of this variant is the ability to have full control over the network at each junction, with the network initially being run at a 60 second cycle time during opening year and 80 seconds in future year. All signalised junctions have a simple two stage operation to allow an even split in green time allocation.

The key additional requirement with this option is facilitating a right turn from the A629 southbound to the new link to cater for movements to Wakefield Road. This requires the provision of a right turn storage area in the centre of the junction which cannot impact on the two lane northbound and southbound flow. To achieve this, further widening is required on the A629. In addition, unless a third traffic signal stage is added to the junction operation, the right turning vehicles would be required to complete the movement accepting gaps in the northbound traffic flow. The addition of a third stage has a significant detriment to the operation of the junction.

The results in Table 1-12 show the new junctions operating at approximately -1% and 7% spare capacity in the AM and PM peak hours at 2031 (PRC of -1.3% and 7.1% respectively). This poorer operational performance, combined with the safety concerns associated with the A629 southbound right turn, leads to the option being less attractive than the 'with Roundabout' option. The design requirements of this option reduce the resilience of the network and therefore reduce the level to which the scheme can meet the scheme objectives.

Option 5: The network comprises four signalised junctions in each corner of the network with a bus priority link provided between Stainland Road and the A629. The bus link is provided to make best use of retained and otherwise redundant highway infrastructure, and to provide journey time advantage to buses.

The A629 requires two lanes in both directions; Stainland Road requires two lanes northbound, flaring to three at the new Wakefield Road junction and a single lane southbound throughout. Both new links, between the A629 and Stainland Road and Wakefield Road, require two lanes in each direction. The optimal cycle time is 100 seconds in 2031 as additional green time is required to overcome capacity constraints.

The results in Table 1-12 show the new junctions operating at approximately 2% and -8% spare capacity in the AM and PM peak hours at 2031 (PRC of 1.8% and -8.2% respectively). The junction of the new link and Stainland Road is shown to operate over capacity in the PM 2031 assessment. The level of queuing, and the associated interaction of these queues with wider network operation, result in a scheme option that cannot deliver optimal capacity on the A629 corridor and therefore does not meet the scheme objectives as well as 'Option 4 – with roundabout'.

Option 6: This option comprises six junctions in total, four to the north and two to the south. A roundabout was incorporated on to the A629 to deal with the conflict from Wakefield Road, and two signalised junctions to manage the conflict between Stainland Road and the A629. The roundabout junction requires two lanes on all approaches. All staging and phases was undertaken in accordance with best practice

The junctions are shown to be over capacity on the A629 approaches to the roundabout even in the base year. In addition, queuing on the Wakefield Road approach to the roundabout cannot be accommodated without blocking back to the Wakefield Road / Stainland Road junction. The short link lengths between the interacting junctions of the roundabout and the signal controlled junction facilitating movements to Stainland Road from the A629 result in blocking back through both junctions. The option was also tested with traffic signal control instead of a roundabout; however this delivered no capacity enhancement.

The results in Table 1-12 show the junction operating at approximately 17% and 13% over capacity in the AM and PM peak hours at 2014 when a roundabout is considered. When signals were tested to replace the roundabout, the junctions were shown to operate at approximately 33% and 26% over capacity in the AM and PM peak hours at 2014. Accordingly, Option 6 did not provide enough network improvement to warrant further testing in the 2031 scenarios.

1.8.8 Initial Option Testing Summary

Option 4 (with roundabout) provided the greatest theoretical level of benefit of all scheme options considered and was selected as the preferred option. Option 4 (with signalised junction) did not provide as much operational capacity in the AM peak hour and creates more vehicle delay across all assessment periods.

Option 5 doesn't deliver sufficient spare capacity or operational flexibility in the 2031 assessments to be progressed as a preferred option. Based on initial testing, it creates over double the amount of vehicle delay of Option 4 in the AM peak hour and an additional 35 hours of vehicle delay in the PM peak hour. In addition, there are considerable engineering factors which make Option 5 unattractive given the limited highway capacity performance; the need to create two new highway links across third party land with associated cost implications, when compared to a single new link proposal within Option 4.

Option 6 was shown to significantly underperform based on 2014 flow levels and therefore was not considered suitable for progression as a preferred option.

2 Economic Case

2.1 Introduction

A total of £17.5m has been mandated as part of the WY+TF for the development of the A629 Phase 1 section planned for delivery by March 2019. A further £57.1m has been mandated for the development and delivery of Phase 2 by March 2021.

Whilst the full A629 scheme in its entirety will ultimately require assessment as a single scheme in the Urban Dynamic Model (UDM), WYCA has confirmed the ability to breakdown the scheme into its component phases for the purposes of initial WY+TF Gateway approvals, until such time as the scope of the full corridor interventions is known.

Each phase is therefore required to present a strong value for money case in its own right to justify development approval, whilst contributing to the corresponding proportion of GVA benefits attributed by the UDM to the relevant components.

The WY+TF Assurance Framework is applicable to all projects within the fund, with proportionate appraisal approaches applied based on a sliding scale determined by scheme value. As the Phase 1 element of the A629 corridor is valued at **£22,128,542**, a Light Touch Appraisal has been completed (see table 2-1) in line with scheme being valued between £20m - £50m and with the scheme complexity level (medium). A WebTAG compliant business case will be developed at Gateway 2 in line with the nature and complexity of the scheme.

Table 2-1 WY+TF Scheme Complexity Assessment

Complexity	Cost (£m)		
	Low (<£20m)	Medium	High (>£50m)
Low	BCR simple appraisal	BCR simple appraisal	Full WebTAG compliant business case, GVA Assessment
Medium	BCR, GVA, Wider Benefits Appraisal	Full WebTAG compliant business case, GVA Assessment*	Full WebTAG compliant business case, GVA Assessment
High	Full WebTAG compliant business case, GVA Assessment	Full WebTAG compliant business case, GVA Assessment	Full WebTAG compliant business case, GVA Assessment

*Full WebTAG would be required at Gateway 2.

Therefore, in line with the requirements of the fund, economic appraisal of the scheme has been undertaken in two parts; a DfT WebTAG compliant Value for Money statement based on Present Value Benefits (PVB) and Costs (PVC) to derive a scheme Benefit Cost Ratio (BCR); and a UDM Assessment to calculate anticipated GVA benefits.

Whilst the BCR provides a useful tool to assess the scheme's value and impact in transport terms, the UDM assessment provides the confidence needed to ensure the investment will go on to achieve wider economic goals.

Throughout the development of the preferred option, various modelling packages have been used to aid scheme optioneering and to test the impact of the scheme on the A629 corridor. For the basis of quantifying scheme impact, and economic assessment, the Calderdale Strategic Transport Model (CSTM) SATURN model has been used as this provides a validated base scenario and future year forecast scenarios based on anticipated growth assumptions aligned to local plan aspirations.

For this Gateway 1 submission it was not considered suitable to undertake assessment of modal transfer through the application of variable demand modelling. Any wholesale transfer onto bus (or other modes) is unlikely to be achievable until the full package of corridor interventions is realised and/or the wider feasibility of establishing an express bus service is demonstrated (Phase 4). This wider assessment of the full corridor strategy will examine the potential for an increase in bus mode share to result as a consequence of the combined package of measures proposed across all phases. In the absence of a local mode choice model, it is expected that this will involve application of the DfT's DIADEM software.

Journey time savings for all vehicles have been captured using the CSTM model undertaking scheme testing at 2016 (Phase 1a), 2021 (Phase 1a & 1b), and 2031 (Phase 1a & 1b), and comparing against the previously agreed forecast scenario models for the same assessment years. The SATURN derived highway impacts have been input into DfT's Transport Users Benefit Appraisal (TUBA) software to calculate a PVB for road users.

GVA impacts have been calculated in partnership with WYCA using the UDM, to remain consistent with other schemes in the WY+TF programme and initial prioritisation of schemes. In line with the required input information requested by WYCA, journey time savings for commuting vehicles have been captured from the CSTM models and provided input in to the UDM model.

Using WebTAG (Unit A5.1 and Data Book) derived spreadsheet modelling the economic benefits of the cycle infrastructure proposed has been calculated. In particular, in the Phase 1a section the continuous provision of on and off highway cycle lane along the western side of the A629 between Bankhouse Lane and Free School Lane. Cycle benefits have been calculated over a 10 year assessment period.

2.2 Options Appraised

2.2.1 Introduction

The predominate benefit from the proposed Phase 1b scheme is highway associated journey time benefits. The following section identifies the refinement of the preferred option and sets out the forecast journey time impacts.

2.2.2 Preferred Option Refinement

Following identification of Option 4 (with Roundabout) as the preferred option, detailed consideration was given to its performance through initial option testing, with alterations to the scheme identified to allow the addition of pedestrian and cycle facilities and to maximise the performance of the junctions.

The two traffic signal controlled junctions of Wakefield Road / Stainland Road / A629 to the north of the scheme were altered to run as a single junction, running on two stage streams to allow greater coordination of traffic flow over the short interim links between the A629 and Stainland Road.

For ease of reference, rather than reporting on the junctions as a whole, the performance of each of the three junctions within the preferred option are reported in Table 2-2 below, with the following references as shown in Figure 2-1:

- Junction A – Wakefield Road / A629 / Stainland Road;
- Junction B – Stainland Road / New Link; and
- Junction C – A629 Southern Junction (New Link).

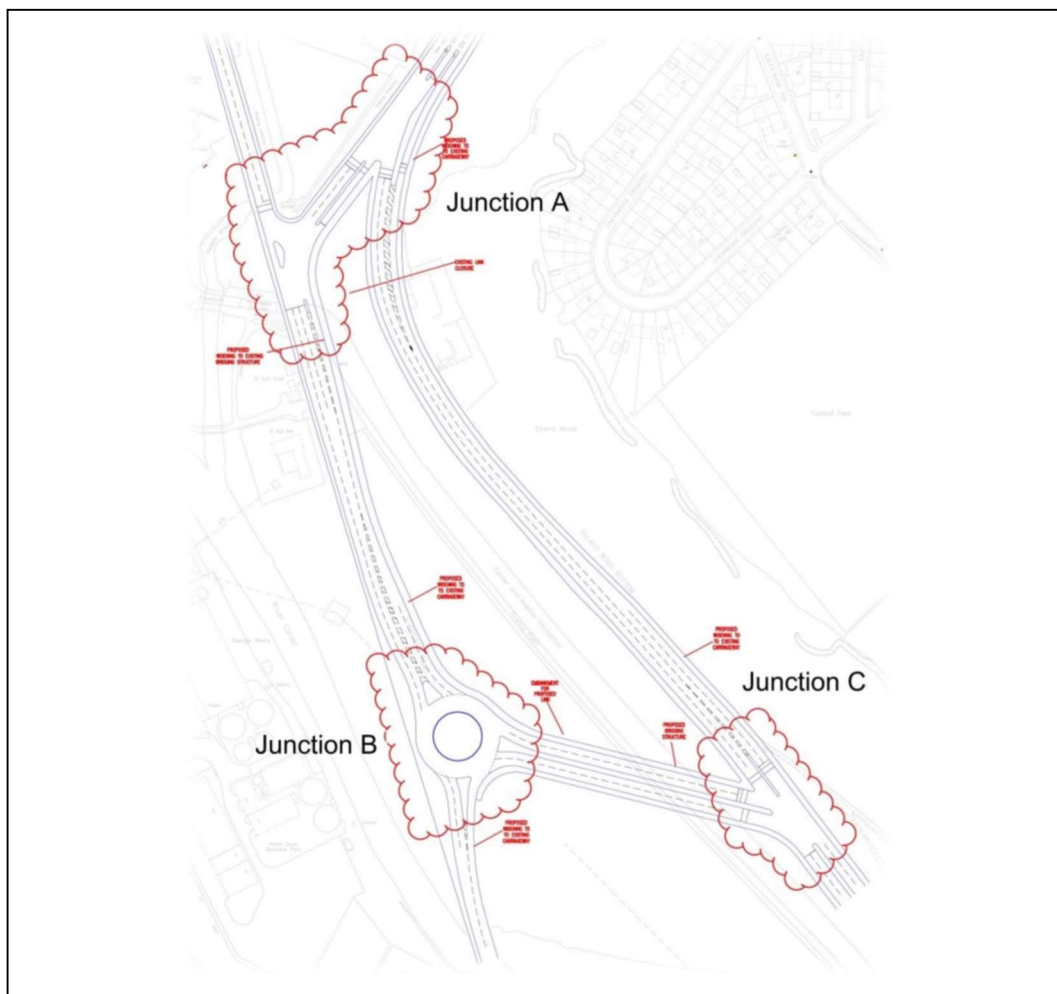


Figure 2-1 Initial Option Testing Results Summary

The proposed diversion of movements between the southbound A629 and Wakefield Road to generate greater operational capacity for mainline A629 movements was tested in significant detail given the implications any restrictions in movement may have in light of significant growth aspirations at Copley. The decision to recommend this movement be completed via the proposed new roundabout at the junction of Stainland Road and the new link was based on interrogation of:

- Capacity at Junction A;
- Cycle time requirements at Junction A;
- Interaction of traffic with pedestrian and cycle movements; and
- Journey time for movements between Wakefield Road and the A629.

The inclusion of a direct right turn facility at Junction A results in the following impacts on network operation and therefore a reduced ability to deliver optimal capacity on the A629, a key scheme objective:

- A reduction in spare capacity;
- A reduction in operations flexibility;
- An increase to the required cycle time across all assessment periods;
- An increase in the average delay per vehicle across the entire network; and
- An increase the total vehicle delay of vehicles performing the movements between Wakefield Road and the A629 North.

Table 2-2 Initial Option Testing Results Summary

2031 AM Peak Hour	Junction A		Junction B		Junction C	
Option	PRC	Delay	PRC	Delay	PRC	Delay
Option 4 – without direct right turn	6.8	29.5	52.0	2.1	4.9	18.5
Option 4 – with direct right turn	0.1	35.9	51.9	1.9	4.9	20.6
2031 PM Peak Hour	Junction A		Junction B		Junction C	
Option	PRC	Delay	PRC	Delay	PRC	Delay
Option 4 – without direct right turn	8.0	25.8	36.8	2.4	10.8	19.2
Option 4 – with direct right turn	-2.5	34.3	45.8	2.1	10.8	18.3

The final preferred option consists of:

- Extinguishment of the existing link between the A629 and the current mini roundabout;
- Removal of the current A629 signal controlled junction;
- Widening to two traffic lanes in each direction along the A629;
- Widening to two northbound and one southbound lane on Stainland Road, with additional flare lengths on approach to junctions and associated widening of the existing structure over the canal;
- A new signal controlled junction at Stainland Road / A629;
- A new signal controlled junction at Stainland Road / Wakefield Road with the direct right turn into Wakefield Road prohibited; and
- A new highway link between the A629 and Stainland Road incorporating new traffic signals at the eastern A629 junction, a structure over the canal and a new roundabout at the Stainland Road junction.

End to end journey times along the A629 to cover the full Phase 1 section of the corridor (Hunger Hill to the north side of Ainley Top) have been extracted from the CSTM model.

Scheme testing at 2016 (Phase 1a), 2021 (Phase 1a & 1b), and 2031 (Phase 1a & 1b), and comparing against the forecast scenario models for the same assessment years developed based on the latest planning assumptions available at the time of scheme testing.

The results are presented in Table 2-3 below, with Figure 2-2 to Figure 2-3 providing a graphic representation of the journey time comparison between the 'with' and 'without scheme' scenarios at 2031.

Table 2-3 A629 Phase 1 End to End Journey Time Comparison (in seconds)

	Time Period	A629 Northbound			A629 Southbound		
		Without Scheme	With Scheme	Difference	Without Scheme	With Scheme	Difference
2014	AM	819			550		
	IP	567			512		
	PM	713			616		
2016 (Phase 1a)	AM	846	836	-10	537	506	-31
	IP	594	584	-10	509	483	-26
	PM	753	766	13	649	572	-77
2021 (Phase 1a + 1b)	AM	920	689	-231	570	522	-49
	IP	617	517	-100	523	484	-39
	PM	796	569	-227	706	596	-110
2031 (Phase 1a + 1b)	AM	1019	810	-209	647	543	-103
	IP	650	538	-112	544	493	-52
	PM	883	598	-285	810	678	-132

Comparing the same assessment year for the 'with' and 'without scheme' scenarios demonstrates significant journey time savings through the implementation of the Phase 1 scheme. At 2016 when the Phase 1a enabling component of the scheme is introduced there is limited impact on the A629 northbound route, due to the slight junction changes proposed at Dudwell Lane and Dryclough Lane and the junction redesign at Free School Lane. Southbound journey times in the PM Peak Hour in particular see a strong impact from the scheme, with a 77 second journey time reduction forecast.

At 2021 once both Phase 1 components are delivered, there are significant journey time benefits forecast in both directions on the A629 through the increase in capacity delivered by the scheme. At 2031, in the southbound direction, the flow level on the A629 corridor reaches the link capacity available in the single lane alongside the section of the existing southbound bus lane. This limits the extent at which the scheme can provide benefits over and above those shown in the tables above and below. As part of the A629 Phase 4 study, the application of bus lanes on the A629 and the allocation of overall highway space will be reviewed.

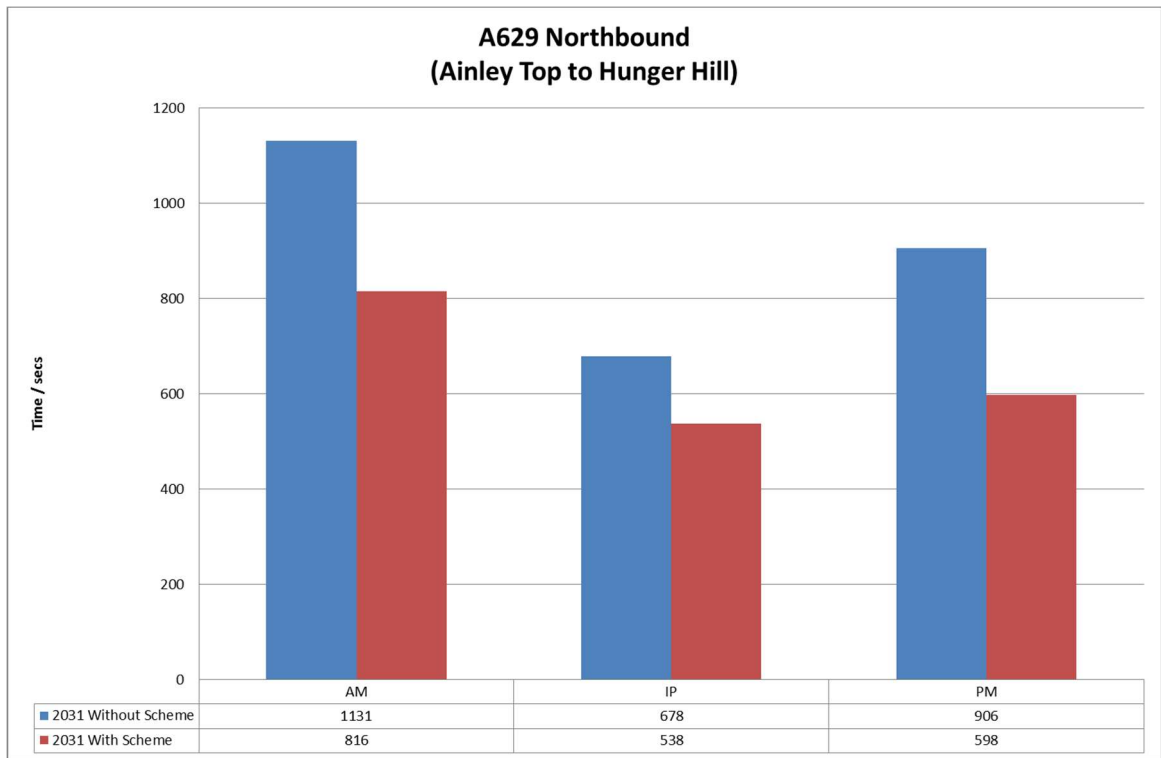


Figure 2-2 A629 Phase 1 Northbound 2031 Journey Time Comparison

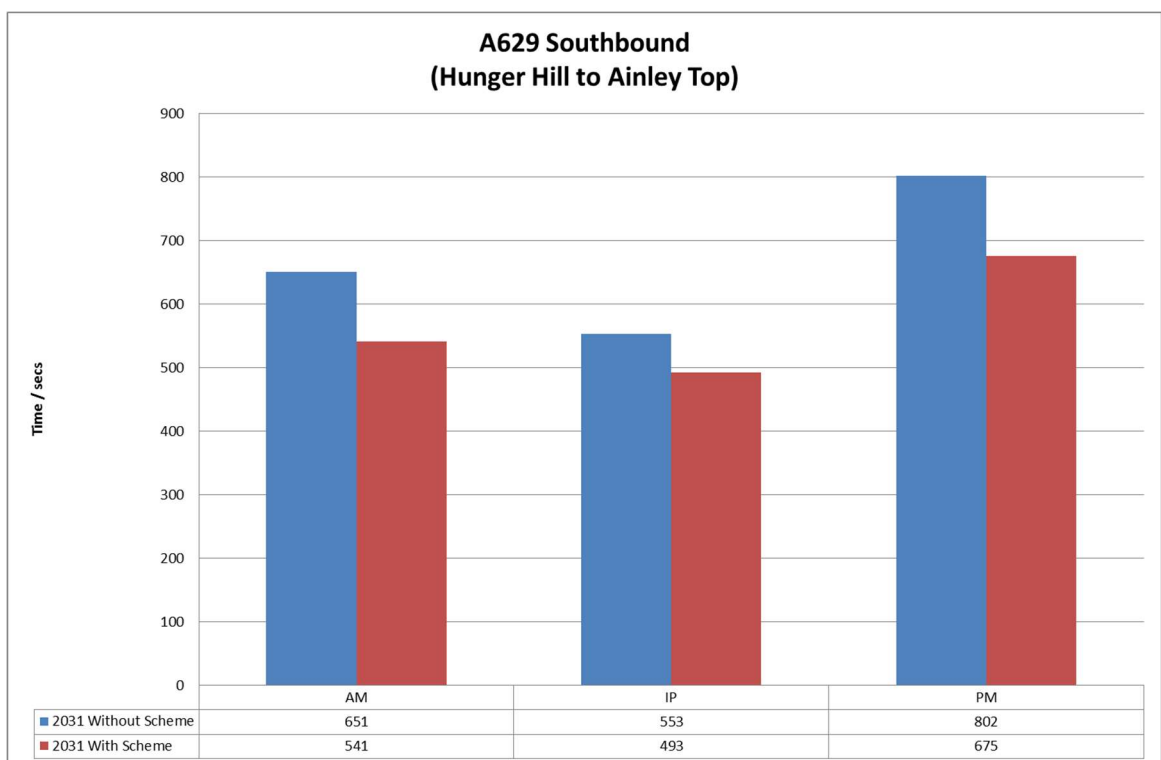


Figure 2-3 A629 Phase 1 Southbound 2031 Journey Time Comparison

Journey time comparison graphs for all modelled years are provided in Appendix I, alongside a comparison of future year performance against existing journey times, which is summarised in Table 2-4 and Table 2-5 below for northbound and southbound journey times on the A629.

By 2021 and 2031 with the full Phase 1 scheme implemented, the scheme is shown to deliver journey time improvements for northbound trips over those currently experienced on the A629 corridor. The same is applicable for southbound trips on the A629 corridor in the AM and Interpeak hours.

However, as mentioned previously, the flow level on the A629 corridor reaches the link capacity available in the single lane alongside the section of the existing southbound bus lane in the PM peak hour. By accounting for growth of over 350 vehicles between 2014 and 2031, this limits the extent at which the scheme can provide benefits over and above current (2014) journey times experienced. It should be remembered that the scheme provides significant like for like (2031 with and without scheme) benefits in the PM peak hour for southbound journeys. The Phase 4 assessment will consider the value and merit of priority lanes along the A629 as part of a full corridor strategy.

Table 2-4 A629 Northbound Future Year Comparison to Base (in seconds)

Time Period	2014 Without Scheme	2016 With Scheme	Difference	2021 With Scheme	Difference	2031 With Scheme	Difference
AM	819	836	17	689	-130	810	-9
IP	567	584	16	517	-51	538	-30
PM	713	766	53	569	-144	598	-115

Table 2-5 A629 Southbound Future Year Comparison to Base (in seconds)

Time Period	2014 Without Scheme	2016 With Scheme	Difference	2021 With Scheme	Difference	2031 With Scheme	Difference
AM	550	506	-44	522	-28	543	-6
IP	512	483	-28	484	-28	493	-19
PM	616	572	-44	596	-20	678	61

2.3 Assumptions

The following assumptions have been made as part of the economic assessment process. Where appropriate, this is in line with WebTAG and the TUBA User Manual:

- Scheme opening year 2016/2017 – A629 Phase 1a, 2020 – A629 Phase 1b:
 - Modelling for 2016 (Phase 1a);
 - Modelling for 2021 (Phase 1a and Phase 1b); and
 - Modelling for 2031 (Phase 1a and Phase 1b).
- Scheme costs are estimated in 2015 prices with inflation applied to scheme costs based on anticipated spend profile;
- All costs discounted to 2010 market prices within TUBA;
- All benefits are present values discounted to 2010 in 2010 prices;
- 60 year assessment period from initial scheme opening (2016); and
- Annualisation factors of 506 for AM and PM and 1518 for Interpeak:
 - AM & PM – 2 x Modelled Peak Hour x 253 working days; and
 - IP – 6 x Modelled Peak Hour x 253 working days.

- Optimism Bias applied to scheme cost at 44% based on current stage of scheme development.

2.4 Sensitivity and Risk Profile

The estimated scheme costs have been derived from a costing exercise outlined in the Financial Case, which includes allowance for risk and optimism bias in accordance with DfT guidance.

A number of sensitivity tests have been carried out on the economic appraisal of the combined A629 Phase 1 scheme. These tests are twofold:

- Core, Low and Alternative growth assumptions derived as part of the development of the CSTM forecast models, available as part of the assessment of WY+TF schemes for CMBC; and
- Cost sensitivity assumptions based on the application of optimism bias, operational and maintenance costs.

Core Growth Assumptions: WebTAG Unit M4.3 stipulates a “Core Scenario” should be defined which is based on the most “unbiased and realistic set of assumptions” that will form the central case for appraising a scheme. The Core Scenario has been defined by including all developments from 2016 and 2021 deemed to be ‘Near Certain’ and ‘More than Likely’. No developments categorised as ‘Near Certain’ and ‘More than Likely’ were defined post 2021 and therefore TEMPRO growth has been applied to meet the defined housing growth total of 15,537 additional homes. From a development perspective, committed proposals or existent planning permissions, and aspirational future land uses with proposals currently in development have been included in the core growth scenario.

Alternative scenarios can also be defined which have different supply and/or demand assumptions from the core scenario. The differences in the alternative scenarios will reflect the uncertainties in assumptions made within the core scenario.

Low Growth Assumptions: The low growth scenario was developed based on the Core Strategy Preferred Options Document from autumn 2012. This defined a target of 10,062 additional homes. The distribution of development is the same as the core growth assumptions, but limited to the lower level of development. From a development perspective, committed proposals or existent planning permissions, and aspirational future land uses with proposals currently in development have been included in the low growth scenario.

Alternative Growth Assumptions: The alternative growth scenario was developed based on the emerging local plan figures derived from the 2008 to 2031 local plan period. This defined a target of 14,708 additional homes based on the number of completions to June 2014, the base month and year for the CSTM base model. From a development perspective, committed proposals or existent planning permissions, and aspirational future land uses with proposals currently in development have been included in the alternative growth scenario. In addition, aspirational future development land uses with no formal proposals currently in development have been included.

The application of the CSTM forecast models allow the economic assessment to take account of scope for vehicle rerouting on the wider local highway network in both the 'with scheme' and 'without scheme' assessments, based on the perceived cost of using alternative route choices.

2.5 Value for Money Statement

2.5.1 Introduction

A Value for Money (VfM) assessment has been undertaken for the combined Phase 1a and Phase 1b section of the A629 Corridor. At this stage only monetised values for scheme costs, travel time, vehicle operating costs, tax changes, cycle benefits and Gross Value Added have been included in the assessment. Other monetised impacts such as accidents and environmental (air quality, noise and greenhouse gases) will follow at the next Gateway stage, along with non-monetised and distributional impacts.

Department for Transport guidance recommends that the initial VfM category is identified based upon the BCR of the scheme, using monetised impacts as detailed above. These categories are:

- Poor VfM if BCR is below 1.0
- Low VfM if the BCR is between 1.0 and 1.5
- Medium VfM if the BCR is between 1.5 and 2
- High VfM if the BCR is between 2.0 and 4.0
- Very High VfM if the BCR is greater than 4.0

The BCR represents the amount of benefits of the scheme being bought for every £1.00 of cost and is calculated by dividing the PVB by the PVC.

2.5.2 Scheme Costs

The total anticipated scheme costs including allowance for risk, but without optimism bias, has been calculated for the combined A629 Phase 1 scheme at a total of **£22,128,542**.

The 2015 scheme costs presented in Table 2-6 include 44% Optimism Bias (in line with WebTAG unit A1.2 Table 8) and values for maintenance and operation of the scheme over the 60 year assessment period, which has been calculated at approximately £6.4m in 2015 prices.

Table 2-6 Scheme Costs

Costs	Value (£000s)
Scheme costs (2015 prices)	22,129
Scheme costs (2015 prices) - 44% Optimism Bias	31,665
Scheme costs (2015 prices) - 44% Optimism Bias, Maintenance & Operation Costs	38,073

For the purposes of the core BCR assessment, the scheme costs have been calculated based on 2015 prices with allowance for risk, optimism bias, and maintenance and operation costs. The inclusion of optimism bias and maintenance and operation costs in the core assessment is related to ensuring a robust assessment at this stage of whole life costs of the scheme.

Given the complexity of the scheme, and the current stage of development, application of 44% optimism bias is appropriate although not anticipated to be fully utilised as the scheme progresses through the detailed design process and greater cost certainty is achieved. Maintenance and Operation costs, although not covered by the WY+TF and for CMBC to fund, are realistic costs associated with the implementation of the scheme and therefore should be considered as part of the core assessment.

The final scheme costs are subjected to deflation (to convert to 2010 costs), adjusted to account for indirect taxation and finally the cost profile is discounted to 2010. This process is undertaken within TUBA (see tables below) and produces the final PVC for each scenario tested.

Additional TUBA assessment tests based on scheme cost variations and varying growth assumptions have been undertaken using TUBA and are reported in the section below:

- **Core Scenario:** Core Growth Assumptions, 44% Optimism Bias, Maintenance and Operation Costs;
- **Sensitivity Test 1:** Core Growth Assumptions, 44% Optimism Bias, no Maintenance and Operation Costs;
- **Sensitivity Test 2:** Core Growth Assumptions, no Optimism Bias or Maintenance and Operation Costs;
- **Sensitivity Test 3:** Low Growth Assumptions, 44% Optimism Bias, Maintenance and Operation Costs; and
- **Sensitivity Test 4:** High Growth Assumptions, 44% Optimism Bias, Maintenance and Operation Costs.

2.5.3 TUBA Assessment

TUBA is transport economic appraisal software developed by Atkins Limited on behalf of the DfT. The purpose of TUBA is to carry out transport scheme economic appraisal in accordance with the DfT's published guidance in units A.1 of the WebTAG guidance. It implements a 'willingness to pay' approach to economic appraisal for multi-modal schemes with fixed or variable demand.

The outputs of the SATURN model were used by TUBA to produce values for PVB, PVC, Net Present Value and BCR. Tables for Transport Economic Efficiency (TEE) Benefits and Analysis of Monetised Costs and Benefits (AMCB) are provided in full in Appendix J, with the details summarised in the sections below.

Core Scenario

The outputs from TUBA are given in Table 2-7 below for the Core Scenario test, which represents the Core Scenario as detailed in DfT TAG Unit M4. The BCR of the scheme is 5.89, based on highway user benefits alone, which indicates that the scheme offers Very High Value for Money based on the DfT guidance criteria.

Table 2-7 TUBA outputs for Core Scenario

Cost Indicator	Value (£000s)
Present Value of Benefits (PVB)	166,281
Present Value of Costs (PVC)	28,245
Net Present Value (NPV)	138,036
Benefit to Cost Ratio (BCR)	5.89

Note all entries are in present values discounted to 2010, in 2010 prices.

The majority of the benefits generated are associated with travel time savings for business and non-business road users. There is also a small benefit associated with vehicle operating costs brought about by shorter journeys and thus using less fuel.

Sensitivity 1 – Core Growth Assumptions, 44% Optimism Bias, no Maintenance and Operation Costs

The outputs from TUBA are given in Table 2-8 below for Sensitivity Test 1 and take account of an adjustment to the assumed scheme costs. The PVC has been reduced to take account of the removal of Operational and Maintenance Costs to give a picture of the value for money of the scheme from a WY+TF point of view, given the fund does not provide ongoing revenue support associated with a scheme.

As expected, with the reduction in PVC the BCR of the scheme increases to 6.35, which continues to indicate that the scheme offers Very High Value for Money, based on the DfT guidance criteria.

Table 2-8 TUBA outputs for Sensitivity Test 1

Cost Indicator	Value (£000s)
Present Value of Benefits (PVB)	166,281
Present Value of Costs (PVC)	26,196
Net Present Value (NPV)	140,085
Benefit to Cost Ratio (BCR)	6.35

Note all entries are in present values discounted to 2010, in 2010 prices.

Sensitivity 2 – Core Growth Assumptions, no Optimism Bias or Maintenance and Operation Costs

The outputs from TUBA are given in Table 2-9 below for Sensitivity Test 2 and take account of a further adjustment to the assumed scheme costs. The PVC has been reduced to take account of the removal of Optimism Bias and Operational and Maintenance Costs. This allows an assessment of the proposed scheme based solely on the currently anticipated scheme costs to be funded by the WY+TF.

As expected, with the further reduction in PVC the BCR of the scheme increases to 9.08, which continues to indicate that the scheme offers Very High Value for Money, based on the DfT guidance criteria.

Table 2-9 TUBA outputs for Sensitivity Test 2

Cost Indicator	Value (£000s)
Present Value of Benefits (PVB)	166,281
Present Value of Costs (PVC)	18,309
Net Present Value (NPV)	147,972
Benefit to Cost Ratio (BCR)	9.08

Note all entries are in present values discounted to 2010, in 2010 prices.

Sensitivity 3 – Low Growth Assumptions, 44% Optimism Bias, Maintenance and Operation Costs

The outputs from TUBA are given in Table 2-10 below for Sensitivity Test 3. This test is based on a lower level of assumed growth based on the CSTM forecast models available. This assumes a similar level of employment development as the Core growth assumptions, but a lower level of overall housing development.

The lower level of growth, and therefore demand, results in a slight reduction in the scheme BCR as there are less vehicles in the network to benefit from the proposed scheme. The slight drop in BCR compared to the Core Scenario is very positive given the development assumptions (growth) in the low growth assumptions (10,062 households) equate to approximately two thirds of the core growth assumptions (15,537 households).

Table 2-10 TUBA outputs for Sensitivity Test 3

Cost Indicator	Value (£000s)
Present Value of Benefits (PVB)	161,246
Present Value of Costs (PVC)	28,245
Net Present Value (NPV)	133,001
Benefit to Cost Ratio (BCR)	5.71

Note all entries are in present values discounted to 2010, in 2010 prices.

Sensitivity 4 – Alternative Growth Assumptions, 44% Optimism Bias, Maintenance and Operation Costs

The outputs from TUBA are given in Table 2-11 below for Sensitivity Test 4. This test is based on a higher level of assumed growth based on the CSTM forecast models available. This assumes a similar level of housing development as the Core growth assumptions, but a higher level of overall employment development, in particular in Halifax Town Centre.

The higher level of growth in terms of employment development, and therefore demand, results in a slight increase in the scheme BCR as there are more vehicles in the network to benefit from the proposed scheme.

Table 2-11 TUBA outputs for Sensitivity Test 4

Cost Indicator	Value (£000s)
Present Value of Benefits (PVB)	176,858
Present Value of Costs (PVC)	28,245
Net Present Value (NPV)	148,613
Benefit to Cost Ratio (BCR)	6.26

Note all entries are in present values discounted to 2010, in 2010 prices.

2.5.4 Urban Dynamic Model Assessment

The journey time savings for commuting vehicles brought about by the scheme have also been assessed through the refinement of inputs to WYCA's UDM. The input provided comprises journey time differences with and without the proposed A629 Phase 1 scheme for commuting trips in 2021 (first full scheme opening year) AM peak as taken from the SATURN model.

The journey time differences calculated between SATURN origin and destination zones were aligned to the UDM zoning system. Where multiple SATURN zones were contained within one UDM zone a trip weighted average journey time difference was calculated. Where multiple UDM zones were contained within one SATURN zone the journey time difference was duplicated for all UDM zones. Only journey time differences for trips into, within and out of Calderdale district were used taking account of the wider impact on the local highway network, and removing zone pairs on the extremities of the model.

The output GVA metrics produced by the UDM are given in Table 2-12 below. Benefits are presented for the forecast year of 2026, along with the full programme test results. In isolation the Phase 1 scheme is calculated to generate an additional 345 jobs and £27.6m per annum of GVA benefits. This compares well against the initial UDM run for the scheme at pro forma stage.

Table 2-12 UDM Test Results

Scheme Test	West Yorkshire Jobs	GVA p.a. 2009 Prices
Current full A629 package	+1,740	+£126.8m
Phase 1 pro forma scheme [Test 6]	+366	
Phase 1 scheme	+345	+£27.6m
Combined Phase 1 and Phase 2	+873	+£68.3m

An increase in employment capacity within the town centre, identified as part of the Phase 2 Gateway 1 submission, has been input into the UDM alongside the generalised cost impacts of the A629 Phase 2 scheme to derive an estimate of combined economic impact in terms of job creation and GVA uplift alongside the Phase 1 proposals.

The UDM assessment indicates the creation of a further 528 jobs across West Yorkshire and an increase in GVA of £40.7 million per annum as a result of the infrastructure elements of Phase 2 alongside the Phase 1 scheme in 2026, as shown in Table 2-12 above.

2.5.5 Public Transport Benefits

Bus journey time savings have been assumed to be in line with the improvements to commuting traffic as no specific bus priority measures are included in the preferred scheme option at this time to generate extra over benefits for buses. However, the scheme delivers strong performance both from a Value for Money and GVA assessment point of view, which would only be enhanced by the detailed assessment of the positive impact of the scheme on bus passengers.

Full assessment of the impact of the A629 full corridor package will be completed as part of the Phase 4 package by CMBC. Phase 4 will review the collective benefits that the currently prioritised schemes will deliver, in order to complete a 'gap analysis' identifying what further interventions may be needed to achieve the total impacts forecast by the UDM for the corridor as a whole.

Phase 4 will consider additional proposals necessary to achieve the bus benefits targeted by the scheme as a whole, for which a holistic corridor-wide approach will be applied. Phase 1, together with the other prioritised sections currently being worked up, has therefore been developed to ensure sufficient flexibility for the potential introduction or adaptation of measures targeting bus users once the scope of Phase 4 interventions is known.

2.5.6 Cycle Benefits

As part of Phase 1a of the scheme it is proposed provide a combination of on carriageway cycle lanes and off-carriageway shared use cycle path along the A629 between Bankhouse Lane and Free School Lane. Forecast economic benefits for the following impacts have been determined using:

- User Benefits
- Business Benefits
- Health Benefits
- Marginal External Cost Savings
- Wider Economic Benefit

Collisions disbenefits were not evaluated as no Personal Injury Collision Data was available at the time.

The economic benefits of the cycling improvements along Scheme 1a on the A629 over the 10 year scheme life is summarised in Table 2-13. A detailed assessment is included as Appendix K. The 10 year scheme life is in keeping with the period typically used for UK cycling scheme appraisals. All monetary values are in are in present values discounted to 2010, in 2010 prices.

Table 2-13 Cycling Economic Benefits

Benefit Type	Benefit Amount
User Benefits	£51,700
Health Benefits	£223,000
Business Benefits	£32,650
Collisions	£0
Marginal External Cost Savings	£76,890
Total Present Value of Benefits	£384,240

Additionally, it is estimated that the scheme will generate a Wider Economic Benefit of £74,930 over the 10 year scheme life.

2.5.7 Value for Money Summary

The BCR of the scheme is 5.89 which indicates that the scheme offers Very High Value for Money based on the DfT guidance criteria. The present value of benefits is £166.3m.

Directly targeting the defined scheme objective of the creation of jobs and improving accessibility to key employment sites, the scheme can potentially also generate an additional 345 jobs and £27.6m per annum of GVA benefits (as calculated by WYCA UDM for forecast year 2026) not incorporated in the BCR.

The scheme also generates benefits from the cycle infrastructure provided. A 10 year scheme appraisal results in £384,240 benefits directly from the scheme and an additional £74,930 to the wider economy.

An Appraisal Summary Table is provided as Appendix L. At this stage monetised impacts such as collisions and environmental, have not been included in the assessment. Additionally all non-monetised impacts of the scheme have yet to be considered but will only strengthen the scheme further.

At this stage there is the scheme has not been progressed to sufficient detail to undertake an assessment of the potential impact of construction works. As the scheme progressed through detailed design as part of the Gateway 2 process, a Construction Management Plan and detail of construction phasing will be available to inform an assessment of the impact of construction.

An allowance has been made within the scheme costs for the provision of Green Infrastructure and it is acknowledged that the schemes to be delivered as part of the WY+TF should be seen to raise the bar in terms of Green Infrastructure provision. As the scheme develops through Gateway 2 the application of valuation tools available, such as *The Green Infrastructure Valuation Toolkit* and *i-Tree*, will be key to quantifying the benefits associated with the anticipated outlay in infrastructure.

3 Financial Case

3.1 Introduction

This Chapter presents the Financial Case for the full Phase 1 element of the A629 corridor package. It sets out the calculation of the proposed scheme costs, and therefore the funds requested from the West Yorkshire Plus Transport Fund (WY+TF). The total outturn costs and expenditure profile are presented.

The costs for Phase 1a, as set out in the Financial Case of the successful Gateway 1 submission in March 2015, are combined to present a single Phase 1 scheme cost for use in the economic assessment. The economic assessment takes account of Optimism Bias and Future Gateway 2 & 3 delivery costs.

3.2 Costs

3.2.1 Phase 1a Approved Costs

The total scheme cost for Phase 1a as set out in the successful Gateway 1 submission is set out in Table 3-1 below.

Table 3-1 Phase 1a Scheme Costs

Task	Cost Estimate
Construction Cost	£1,969,006
Land Acquisition	£600,000
Design Fees & Supervision Costs	£356,901
Risk (5%)	£146,532
Phase 1a Scheme Cost	£3,072,439
Preparation cost to Gateway 1	£150,000
Phase 1a Scheme Cost (including Sunk Costs)	£3,222,439
Optimism Bias (44%)	£1,351,873
Total Phase 1a Costs	£4,574,312

3.2.2 Phase 1b Construction Cost Estimate

The construction cost estimate has been developed based on construction rates benchmarked against recently delivered schemes in the area uplifted to 2015 prices. The estimate has been derived establishing quantities of materials and by preparing a bill of quantities.

Lump sum items have been included to take account of costs for utilities diversions, geotechnical and structural works, which have been calculated based on recent consultant experience of delivering similar works given the current (concept) stage of scheme design. Table 3-2 below provides a breakdown of the construction costs for Phase 1b, excluding future Gateway Submission delivery costs, risk and optimism bias and totals **£11,461,494**.

Table 3-2 Phase 1b Construction Costs (2015 Prices)

Task	Cost Estimate
Highways Infrastructure	£2,136,245
Signing, Lighting and Signals	£715,000
Utilities Diversion	£750,000
Structural Works	£4,600,000
Geotechnical Works	£550,000
Land Acquisition	£800,000
Phase 1b Construction Cost Sub-Total	£9,551,245
Contractor Preliminaries	£1,910,249
Phase 1b Construction Cost Total	£11,461,494

Given the extent of the scheme, there is a requirement for land acquisition outside the ownership of CMBC to facilitate the new highway link between the A629 and Stainland Road, widening to Stainland Road and widening to the A629.

Land acquisition costs are indicative only and based upon purchase price of principal plot by a developer during 2104. The District Valuation Office has been appointed to provide a current market assessment and any cost deviation will be reported verbally at Peer Review. It is anticipated that engagement will be required with four separate land owners, which are identified on the plan in Appendix M:

- Yorkshire Electricity;
- Canal and Rivers Trust;
- Elland Hall Farm; and
- New Bank Garden Centre Ltd.

CMBC has already begun negotiations with New Bank Garden Centre Ltd in relation to the land required to deliver the new highway link between the A629 and Stainland Road. This is because the acquisition of this parcel of land represents the biggest risk to scheme delivery and was subject to a pending planning application for new retail / restaurant business, now averted.

3.2.3 Phase 1b Contract Management

An allowance of 4% of the construction cost has been made to take account of Contract Management associated with the delivery of the scheme. This is in line with the assumptions made at scheme pro forma stage and in line with the approach adopted in other comparable schemes.

3.2.4 Phase 1b Risk Assessment

An assessment of risk has been undertaken in the form of a Risk Register, which is included as Appendix N. The Risk Register has been populated using an assessment of the impact of the risks in terms of cost and time within a range, an estimate of the likelihood of occurrence and a derivation of the probability resulting in a risk allowance.

A comprehensive risk identification exercise has been undertaken. However, given the nature of the risks, we don't feel we are in a position to quantify the cost of them until intrusive ground investigation works have been completed. As such, we are retaining a 20% allowance for risk, of the construction and contract management cost, as adopted at pro forma stage, as this is felt to represent the most robust allowance for risk given the information currently available.

At Gateway 2 once the scheme design has been progressed to a detailed design level, a Quantified Risk Assessment (QRA) will be completed.

3.2.5 Phase 1b Scheme Cost Estimate

Table 3-3 below summarises the scheme cost estimate for Phase 1b, based on the construction cost and above allowances for risk and contract management.

Table 3-3 Phase 1b Scheme Cost Estimate

Task	Cost Estimate
Construction Cost Estimate	£11,461,494
Contract Management (4%)	£458,460
Risk contingency (20%)	£2,383,991
Phase 1b Scheme Cost Estimate	£14,303,945

3.2.6 Inflation

Once the base cost estimate was prepared, an allowance for construction price inflation was applied to the current market costs inflating the construction rates and allowances from Quarter 2 prices 2015 to mid-point for construction works across the delivery of the Phase 1 scheme. Inflation has been applied to capital costs using tender price inflation for the construction industry taken from BCIS All In Tender Price Indices as published by the RICS.

Table 3-4 provides a breakdown by delivery year of the base cost estimate with inflation for the Phase 1b element of the scheme.

Table 3-4 Breakdown of Phase 1b Scheme Cost Estimate with Inflation

Year	Base Cost	Inflation Applied	Value of Inflation	Inflated Cost
2016	-	8.60%	-	-
2017	£800,000	13.92%	£111,360	£911,360
2018	£7,707,097	19.92%	£1,535,254	£9,242,351
2019	£5,796,847	26.31%	£1,525,151	£7,321,998
Total	£14,303,945		£3,171,764	£17,475,709

3.2.7 Phase 1b Design Fees

An allowance of 10% of the base costs for construction, risk, and contract management, has been made to take account of design and other professional fees including sunk costs to date. This equates to £1,430,394, inclusive of the £305,000 of costs incurred to date to deliver the Phase 1b Gateway 1 submission, which is in line with expectations given the design work that is yet to be complete.

This takes account of costs sunk to achieve Gateway 1 submission, CMBC costs, public consultation, and consultant costs associated with the progression through the Gateway 2 and 3 processes. This is in line with the assumptions made at scheme pro forma stage. Therefore the required draw down requested from the WY+TF to progress Phase 1b through to Gateway 2 and Gateway 3 submission is **£1,125,394**.

3.2.8 Phase 1 Scheme Cost Estimate

Table 3-5 below summarises the total cost estimate for Phase 1, based on the above allowances for risk, contract management and design fees, plus the approved costs for Phase 1a. The total Phase 1 scheme cost estimate, **£22,128,542**, is the value CMBC is bidding for from the WY+TF.

Table 3-5 Phase 1 Scheme Cost Estimate

Task	Cost Estimate
Phase 1a:	
Phase 1a Scheme Cost	£3,072,439
Preparation cost to Gateway 1 (sunk costs to date)	£150,000
Phase 1a Total	£3,222,439
Phase 1b:	
Inflated Scheme Cost Estimate	£17,475,709
Sunk Costs to date	£305,000
Design Fees (10%) (less sunk costs to date)	£1,125,394
Phase 1b Total	£18,906,103
Total	£22,128,542

Whilst it is acknowledged that the scheme cost estimate is in excess of the Phase 1 mandate at £17.5m, at this stage there is no requirement for an increase in the overall A629 corridor budget given the scope of works still to be determined as part of the Phase 4 study.

The scheme has been developed throughout with the scheme mandate in mind, based on the minimum level of intervention required to deliver the network improvements to at least achieve the GVA benefits derived at scheme pro forma stage, and is therefore considered to be the minimum costs necessary to deliver a viable Phase 1 scheme. There is not considered to be a lower cost alternative option that would deliver the required scheme benefits to achieve a BCR in excess of 2.0 derived through travel time benefits to address existing issues.

Due to the complexity of the network, when the scheme mandate was produced there was a significant lack of clarity about the level of intervention required at the Calder & Hebble junction to accommodate the existing and forecast traffic demand. Therefore, the mandated scheme value was based on the best available information at the time, in advance of any highway modelling works and detailed consideration of construction costs and risks.

The proposed scheme includes a significant allowance for risk at this stage (20%) and inflation (26.31%), with allowance for Optimism Bias also set out below, and has been demonstrated in the Economic Case to deliver significant benefits and very high value for money. As the scheme is developed through detailed design it will seek to minimise the financial draw down requirement these cost components.

In addition, with the subsequent Phase 4 component yet to be developed for the A629, it is considered that there is the potential to transfer funds between the A629 corridor phases without impacting on the overall scheme cost for the corridor as a whole.

3.2.9 Optimism Bias

Evidence suggests that there is a demonstrated, systematic, tendency for project appraisers to be overly optimistic, and so to redress this tendency, guidance suggests that appraisers should make explicit, empirically based adjustments to the estimates of a project's costs, benefits, and duration.

HM Treasury Green Book supplementary guidance sets out the recommended values of Optimism Bias to apply, depending on the type of project and the level of detailed design work that has been undertaken.

For this scheme, and the current stage in its development, the recommended level of Optimism Bias is 44%. A review of the scheme design following the costing process was undertaken with a view to allowing a reduction in Optimism Bias on certain scheme elements. However, given the current stage of works and the detail of the scheme yet to be clarified as the scheme moves through preliminary and detailed design at Gateway 2, we do not feel that there is sufficient justification to reduce the Optimism Bias level at this stage.

Guidance suggests that Optimism Bias should be applied to costs after accounting for the cost of risk mitigation. Table 3-6 provides a summary of the scheme cost estimate and the calculation of Optimism Bias at 44%.

The inclusion of Optimism Bias in the scheme appraisal presents a robust approach as it shows the scheme to offer very high value for money even under a 'worst case' cost scenario. The Total Phase 1 scheme cost estimate including allowance for Optimism Bias is **£31,644,900**.

Whilst the WYCA, and the WY+TF, is required to make allowances for the potential requirement of scheme promoters to draw down Optimism Bias up to the values stated in circumstances where it is justified (i.e. due to issues that would be unforeseen at feasibility stage), CMBC recognises that any case for drawdown of Optimism Bias budgets will require prior WYCA approval.

Table 3-6 Phase 1 Scheme Cost Estimate with Adjustment for Optimism Bias

Task	Cost Estimate
Phase 1a Scheme Cost Estimate (less sunk costs)	£3,072,439
Phase 1b Scheme Cost Estimate (less sunk costs)	£18,601,103
Sub-Total	£21,673,542
Optimism Bias (44%)	£9,536,358
Sub-Total	£31,209,900
Sunk costs to date (1a & 1b)	£455,000
Total	£31,644,900

3.2.10 Phase 1 Anticipated Spend Profile

Table 3-7 below provides a summary of the anticipated spend profile of the combined Phase 1 scheme based on the total scheme cost. Figure 3-1 provides a graphical summary. The cost profile is split based on the following criteria:

- **Construction:** All construction costs associated with the scheme;
- **Land Acquisition:** All costs associated with Land Acquisition;
- **Preparation:** Contractor Preliminaries;
- **Supervisory:** Contract Management;
- **Development:** Project management and consultancy costs associated with the progression through the Gateway 2 and 3 processes; and
- **Existing Costs:** Costs accrued to date to achieve Gateway 1 submission.

Table 3-7 Phase 1 Yearly Spend Profile (£million)

Year	0	1	2	3	4	Total
	2014/2015	2016	2017	2018	2019	
Construction		0.519	1.558	6.677	7.032	15.787
Land Acquisition		0.600	0.911			1.511
Preparation		0.038		2.291		2.329
Supervisory		0.025	0.075	0.275	0.290	0.664
Development		0.820	0.563			1.382
Existing Costs	0.455					0.455
Total	0.455	2.002	3.107	9.242	7.322	22.129

Table 3-8 below provides a percentage summary of the anticipated spend profile based on the total scheme cost.

Table 3-8 Phase 1 Spend Profile by Percentage of Scheme Cost

Year	0	1	2	3	4	Total
	2014/2015	2016	2017	2018	2019	
Construction		2.35%	7.04%	30.17%	31.78%	71.34%
Land Acquisition		2.71%	4.12%			6.83%
Preparation		0.17%		10.35%		10.52%
Supervisory		0.11%	0.34%	1.24%	1.31%	3.00%
Development		3.70%	2.54%			6.25%
Existing Costs	2.06%					2.06%
Total	2.06%	9.05%	14.04%	41.77%	33.09%	100.00%

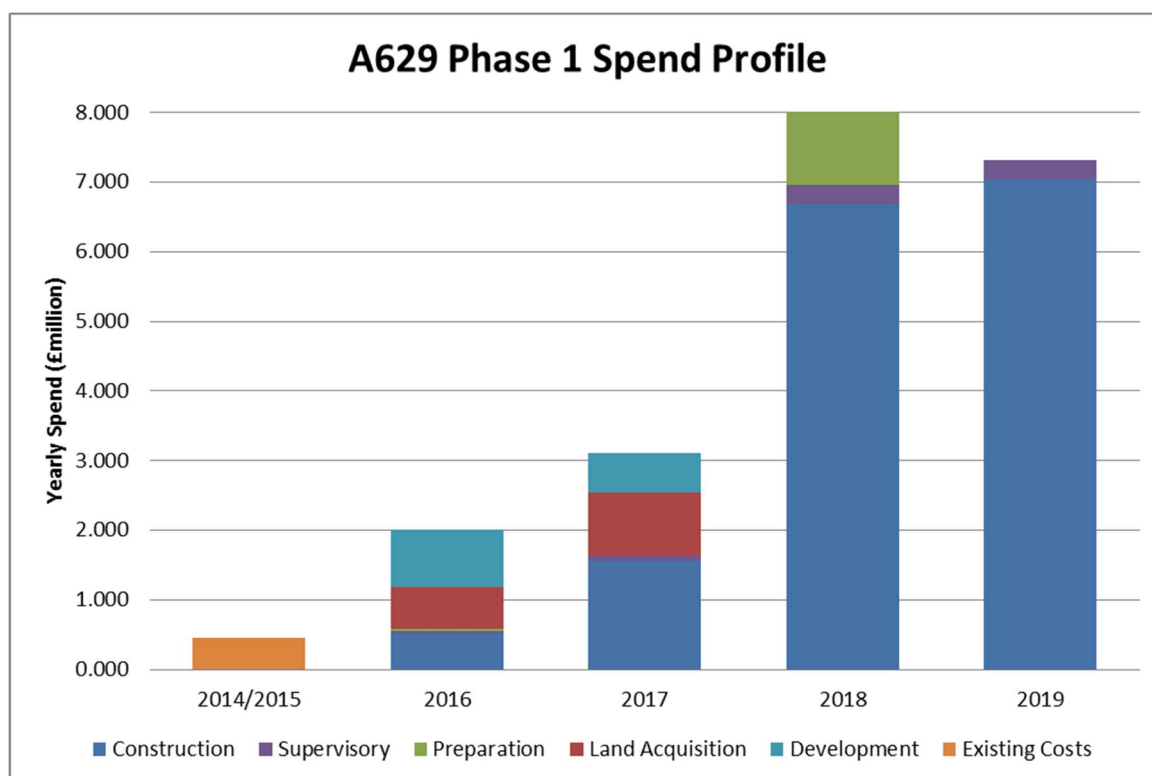


Figure 3-1 Phase 1 Yearly Spend Profile (£million)

3.2.11 Ongoing Scheme Costs

The main construction contracts for each phase of the scheme will each include a period for defects rectification and aftercare. The ongoing operation and maintenance liabilities will fall to CMBC for the highway, footway and public realm works.

Initial work to quantify whole life costs has been completed and shared with CMBC's Maintenance Team taking account of the new infrastructure to be provided by the scheme, thereby ensuring the Council is fully aware of its future revenue obligations.

Taking account of the requirements set out below, operational costs of £280,000 and Maintenance costs of £6.1m, in 2015 prices, have been included in the scheme assessment. These costs are subject to change as the scheme design progresses and the form of construction and therefore maintenance requirements alter.

- **Operation:** Traffic Signals / Street Lighting; and
- **Maintenance:** Carriageway / Structures / Traffic Signals / Traffic Signs / Road Markings / Street Lighting.

As the Phase 1 scheme is set within the existing highway networks, the removal or replacement of existing infrastructure; such as Traffic Signals, Street Lighting, Retaining Walls, and Carriageway Surfacing will be required; as well as new construction works to facilitate the link road and highway widening.

The scheme costs accrued at this stage for replacement of the existing infrastructure with new can be considered to offset or delay upcoming or future maintenance costs associated with the existing infrastructure.

3.2.12 Funding Strategy

It is envisaged that the scheme will be 100% funded through the WY+TF, and all allocations to date have taken into account this assumption. The aim of the funding strategy, however, will be to minimise the call on the WY+TF allocation.

Alternative funding sources will continue to be explored by CMBC as the scheme passes through the Gateway stages. Possible alternative sources of funding identified at this stage include:

- **Developer Contributions:** The scheme assists in opening up and enhancing existing access to key development sites across Halifax Town Centre and Copley. As the implementation of the scheme moves forward, there may be opportunities to seek individual developer contributions on a site-by-site basis, application of Community Infrastructure Levy (CIL), or to develop an enhanced proposal that satisfies the objectives of this scheme as well as the individual development.
- **European Structural Funds:** The WYCA has placed great emphasis in its Local Growth Deal on the importance of green infrastructure and how this can support quality of life and economic growth, with the aim of drawing down EU funding for an area-wide approach to improving green infrastructure. As the detailed design of the Phase 1 scheme is progressed at Gateway 2 stage, there is an expectation that green infrastructure will form a key part of the design, linking to associated works in the town centre and also enhancing the connection between the highway and off-highway networks (e.g. Hebble Trail).

- **Local Sustainable Transport Fund:** The Phase 1 and Phase 2 elements of the A629 corridor both take account of the desire to improve pedestrian and cycle penetration between the town centre and other key attractors. The WYCA has been successful with previous funding bids for major cycle improvements in Leeds and Bradford, and it is hoped that this approach can be rolled out across the whole of West Yorkshire, including Halifax. This could include supporting the cycle improvements as part of the Phase 1 scheme or drawing further benefits from the scheme by improving connections between the A629 and parallel cycle routes.
- **Energy Accelerator:** £640,000 of Growth Deal funding has been approved by the West Yorkshire and York Investment Committee for the LEP's Energy Accelerator programme as identified in the SEP. A bid is currently being developed that will leverage in an additional £5.4m of ELENA funding from the European Investment Bank. ELENA provides revenue funding to develop projects to an investment ready stage, focussing on schemes that deliver low carbon and energy efficiency benefits. CMBC is working with the LEP to identify schemes in the WY+TF that could deliver added benefits through the development of low carbon technology from the outset.

It is also acknowledged that there may be alterations to the mechanism for the WY+TF in the future too, particularly as further agreements on devolution are reached, which may include retention of business rate income, thereby allowing additional borrowing, either for specific schemes, or across geographical areas.

As indicated, all of these funding sources, and any other that are seen as applicable will be kept under review, and an update on their possible contributions to the scheme reported at each Gateway stage.

4 Commercial Case

4.1 Introduction

This chapter presents the Commercial Case for the scheme. It provides evidence on the commercial viability of the scheme and the procurement strategies that will be used to engage the market. It describes the financial implications of the proposed procurement strategies, including evidence of risk allocation and transfer, contract and implementation timescales.

4.2 Procurement Strategy

4.2.1 Phasing

Delivery of works associated with Phase 1 of the A629 corridor scheme will be phased to take account of the Phase 1a and Phase 1b sections, with 1a being an enabling component for 1b and therefore in line for delivery in advance of 1b. Phase 1a is being designed in house by CMBC, with consultant support for specialist UTC and Structural Engineering deliverables; work is currently underway. Delivery of Phase 1a is likely to be through a tender process or via an alternative route to market (possibly YORcivil).

The delivery of the Phase 1b scheme is expected to follow a number of broad phases following Gateway 1 approval, some of which will run in parallel:

- Preliminary Design;
- Traffic modelling and Business Case development for Gateway 2:
 - Additional modelling following development of scheme design; and
 - Business case updated to take account of any scheme changes and greater certainty of scheme costs, risks and environmental assessments.
- Environmental / land remediation assessment;
- Planning Application;
- Detailed Design Appointment;
- Land Acquisition;
- 3rd party accommodation works / Utility diversions; and
- Highway and Structures Construction.

Construction of the scheme will need to follow a sequential approach, for a number of reasons, but primarily to maintain the integrity of the existing highway network during the works, as far as possible, in order to minimise disruption and to accommodate dependencies between ground preparation, bridge structures and highway construction.

4.2.2 Procurement

Work has been undertaken to establish a procurement model for the WY+TF by WYCA to establish consistency in the way in which services are procured in order to assist

timely scheme delivery, improve on efficiencies and offer cost reductions across the whole WY+TF programme.

A preferred option was agreed in July 2015 and in line to be operational by July 2016. This approach is a new arrangement along the lines of an amended collaborative model ensuring that the market provides access to all of the required skills to deliver the WY+TF programme, including a Programme Management Office function.

The WYCA procurement model will not be available to CMBC in time to enable the procurement of design support services for the progression of the Phase 1b element of the scheme. Work on the development of the scheme is required to commence in advance of Gateway 1 approval to help maintain the project programme identified in Section 4.4, and therefore in advance of the July 2016 implementation date

When assessing the procurement options available it is important to understand that the parameters of time, cost and quality work against each other; for instance if high quality is required on the project, then it pulls against the other elements of cost, time and risk, i.e. to achieve high quality greater elements of time and cost will be required. In a similar manner, procurement options respond to each of these elements in a different way.

The preferred procurement strategy for Phase 1b will be agreed following the Gateway 1 submission. This allows a period of time prior to receipt of a Gateway 1 approval decision to enact the preferred procurement approach. The preliminary design of the scheme can be progressed, with a better understanding of the delivery constraints identified, therefore helping to inform the most suitable procurement approach.

Taking the potential procurement routes available for delivering a scheme (Phase 1b) of this nature, the current CMBC recommendation is either to follow a Traditional Two Stage or Design and Build route. At this stage, both routes are viable options for CMBC until a more detailed understanding of the challenges associated with the delivery can be garnered from the preliminary design process.

Traditional Two Stage is a conventional path which typically sees the appointment of consultants for, design, cost management and contract administration, which results in design liability staying with the design team. The contractor's remit extends to construction only and the management of their sub-contracting supply chain. It accelerates the process through overlapping the design and tendering process. Design is still completed prior to construction, but the contractor is appointed in two stages.

Design and Build uses a single contractor as the sole point of responsibility to the Client for the design, management and delivery of the construction project in accordance with pre-defined inputs or outputs.

The programme developed to date reflects a 'worst case' in terms of delivery timeframe, assuming a traditional two stage procurement approach. Design and Build would most likely speed up the delivery phase of the project, but may take longer to get to a point where a contract could be let, as more work would be needed to advance the scheme beyond the initial concepts. CMBC will be required to make a decision on the procurement method during the preliminary design process (February / March 2016) to

maintain the project programme and ensure the required support services can be procured in a timely manner.

If a traditional two stage approach to procurement is adopted, the WYCA procurement model could be used to appoint a contractor for Phase 1b as this is not programmed to occur until 2017. However, if a Design and Build procurement route is chosen, it is unlikely that the WYCA procurement arrangements will be drawn up in time, requiring CMBC to find an alternative route to market.

The initial concept designs indicate land acquisition will be required mainly from statutory bodies and local business. It is currently expected that land acquisition will be sought by local negotiation with appointed specialists taking a lead on valuations, obtaining options on the land and providing legal advice and processing.

The approach to land acquisition is to negotiate with each individual land owner however if a negotiated settlement cannot be reached, the Council will consider using the Compulsory Purchase Order process to ensure certainty of programme. This will require full Council approval as Acquiring Authority. If early agreement is reached with the land owners CMBC would temporarily underwrite the cost of land purchase prior to Gateway 3 approvals, which is the approach being applied to the acquisition of land associated with the Phase 1a element of the scheme, with negotiations already at an advanced stage of development.

CMBC has already entered in to discussions with the land owner associated with the parcel of green field land between the A629 and Stainland Road, which provides the land for the new highway link. The acquisition of this land is considered the biggest risk to delivery of the scheme at this stage and therefore early engagement is imperative, as the business owner has outline development plans of his own to progress, albeit temporarily on hold pending formal outcome of Phase 1b's certainty. Of further consideration is future use of the remaining green field site which would be surplus to the schemes use; this retaining a viable development footprint albeit smaller than pre scheme sizing and in Councils ownership following purchase of the full plot; partial site acquisition is not viewed as a viable proposition.

Accommodation works procurement would be included within the main construction contract given relocation of third party retaining walls and other structures would form an enabling component to the highway widening and new bridge structure.

4.3 Risk allocation and Transfer

4.3.1 Revenue Risk

Operation and maintenance liabilities for the highway and any associated public realm works will fall to the CMBC. These latter costs have not been included in the cost estimate as they will become part of the maintenance and operations costs for the highway authority. They have been incorporated into the economic appraisal however, as part of the Benefit to Cost Ratio (BCR) calculation, to provide a robust whole life assessment of the proposed scheme.

4.3.2 Risk Management

In terms of scheme delivery, key risks have been identified in connection with:

- **Land Acquisition:** Given the extent of the scheme, there is a requirement for land acquisition outside the ownership of CMBC. This could significantly increase cost and delay, especially if Compulsory Purchase Orders (CPO) are required:
 - Yorkshire Electricity: Small element of the decommissioned substation site to the east of the A629 required facilitating highway widening.
 - Canal and Rivers Trust: Bridging Land required facilitating the construction on new highway links.
 - Elland Hall Farm: Small elements immediately adjacent to the highway required to facilitate highway widening.
 - New Bank Garden Centre Ltd: CMBC have already begun negotiations in relation to the land required to deliver the new highway link between the A629 and Stainland Road. This is as the acquisition of this parcel of land represents the biggest risk to scheme delivery.
- **Ground Conditions:** In order to maintain project programme, CMBC plan to continue with preliminary investigation works (ground conditions and slope stability in areas where new highway or structures are required) at their own financial risk, in advance of Gateway 1 approval. The New Bank green field site is known historically to have been used for deposition of canal dredgings.
- **Overhead Power lines:** National Grid has been engaged in relation to the presence of overhead power lines above and in the vicinity of the proposed new highway link and junction with Stainland Road. This process and discussion is ongoing to fully understand key risks and potential mitigation.
- **Flood Risk Mitigation:** The proposed link between the A629 and Stainland Road is located to the north of the River Calder and west of the Calder Hebble Navigation. Elements of the land which the link traverses are indicated as Flood Zone 2 and 3. Infrastructure proposed here will be designed and constructed to remain operational and safe for users in times of flood and will include the application of green infrastructure where appropriate.

4.3.3 Risk Register

Throughout the development stage of the scheme, risks have been identified, recorded and managed through the use of a risk register. A copy of the Risk Register is contained in Appendix N.

Where appropriate, risk owners have been allocated and tasked with eliminating risks, where possible, or identifying mitigation measures for residual risks. For example, the elements of the project with the greatest risk associated with them (set out above) are already being actively managed through comprehensive engagement with the relevant parties and through preparation works in advance commissioning further studies.

A Quantified Risk Assessment (QRA) will be completed as part of the Gateway 2 submission, but will be developed as part of the detailed design process taking account of required mitigation works. This requires the preliminary works set out in Section 5.3.1 to be completed.

4.4 Contract Length

An indicative scheme programme is provided in Appendix O for the Phase 1b element of the overall Phase 1 package. Phase 1a is currently being progressed on an advance programme due to it being an enabling component for Phase 1b and having already receiving Gateway 1 approval. The current project programme is also included in Appendix O:

- Gateway 1 – March 2015;
- Gateway 2 – June 2016;
- Gateway 3 – September 2016; and
- Construction – November 2016 to July 2017.

The current draft programme for Phase 1b indicates headline projects milestones as follows:

- Gateway 1 – November 2015 (Approval February 2016);
- Gateway 2 – November 2017;
- Gateway 3 – March 2018; and
- Construction – April 2018 to March 2020.

The current programmes for Phase 1a and Phase 1b include no allowance for the CPO process and are based on the assumption of land acquisition by negotiation given the positive discussions that have been held with existing land owners to date as part of the development of the Gateway 1 submissions. If a CPO process is required, there will be programme implications which would ultimately result in an extended project programme.

Given the interdependencies associated with the proposed scheme, and the interaction of Ground Investigation, Environmental, Preliminary and Detailed Design works required, a two year period has been outlined to reach a suitable position to deliver a compliant Gateway 2 submission, with all required elements in place. It is anticipated that a Gateway 3 submission will swiftly follow Gateway 2 approval, allowing time for final construction procurement.

Although the scheme lends itself to considerable offline working, a two year construction period has been outlined given the requirements for elements of the construction process to follow in series rather than allowing the programme to be shortened by tasks running in parallel. As the procurement method is confirmed and the detailed scheme design progresses, more clarity on the construction process will be available and at which time, the programme will be reviewed and updated to target as early a scheme delivery date as possible, given the initial target completion date of March 2019.

5 Management Case

5.1 Introduction

This chapter presents the Management Case for the scheme and describes how the scheme will be managed and delivered. The methodology used to define the process and procedures necessary to manage this project are based on the PRINCE2 methodology promoted by the Office of Government Commerce (OGC), as required under the West Yorkshire Single Appraisal Framework.

5.2 Evidence of similar projects

CMBC are experienced in delivering a diverse range of high profile civil engineering projects from canal refurbishments, land fill reclamations, business parks, the annual Local Transport Plan programme and the annual Highways Maintenance programme, to several national award winning public realm refurbishments during the last decade.

CMBC has also delivered similar schemes to this scheme in recent years under the LTP and in partnership with developers through Section 278 Agreements, as demonstrated below:

- **Halifax Town Centre Public Realm:** A £5million programme to introduce a 'zones and loops' solution for traffic circulation and high quality material public realm delivery to award winning standard. Inclusion in English Heritage best practice publications, DfT TA leaflet and plaudits from Heritage lottery fund.
 - Remodelling of town wide circulatory movement
 - 6 New signal junctions,
 - 3 new roundabouts
 - New car park / bus infrastructure
 - Urban realm upgrades throughout the towns core network ;
 - Extensive street lighting upgrades;
 - Extensive Traffic Regulation Orders / pay and display regime
 - Significant traffic management challenges;
 - Combination of off peak hour working/off highway working; and
 - Challenging/negative publicity from local media re potential disruption.
- **Sowerby Bridge Copley Valley Development Scheme:** A £3m business park spine road incorporating a new signal junction on A6026 and two refurbished bridge decks completed as Phase 1 in May 2012, with the construction of a new link road connecting Hollas Lane with Fall Lane completed and opened in July 2015 to unlock 7 hectares of brownfield land.
 - Construction of a new spine road 1km in length
 - 2 New signal junctions,
 - 2 new bridges spanning River Calder and Calder & Hebble navigation
 - Suds drainage / balancing pond

- Combination of off peak hour working/off highway working; and
- Challenging/negative publicity from local media re potential disruption.
- **Hebden Bridge Centre Public Realm:** A £1.5million town wide traffic circulation and kerbside review culminating in an award winning public realm town square design (British Council for Shopping Centres 2008 annual awards winner and runner up in Local Government News magazine street scene awards).
 - Remodelling of town wide circulatory movement
 - 3 New signal junctions, 2 pelicans
 - Urban realm upgrades;
 - Extensive street lighting upgrades;
 - Extensive Traffic Regulation Orders / pay and display regime
 - Significant traffic management challenges;
 - Combination of off peak hour working/off highway working; and
 - Challenging/negative publicity from local media re potential disruption.
- **Broad Street Plaza, Halifax:** A £1.5m remodelling of the principal roundabout and surrounding arterial network serving Halifax centre, to facilitate Broad Street Plaza a new £50m cinema/restaurant complex. Completed in July 2012, the scheme featured:
 - Remodelling of a major town centre roundabout, including additional circulatory lanes and signalisation;
 - New signal junction to serve a 500 space multi storey car park;
 - New emergency ambulance egress;
 - Highway retaining wall construction;
 - Highway service layby provision;
 - Urban realm upgrades;
 - Extensive street lighting upgrades;
 - Extensive Traffic Regulation Orders;
 - Significant traffic management challenges;
 - Combination of off peak hour working/off highway working; and
 - Challenging/negative publicity from local media re potential disruption.
- **Morrisons, Elland:** A £1.2m upgrade of the highway network serving a new superstore. Completed in June 2013, the scheme featured:
 - New signal junction with multi-lane approaches on the principal highway serving Elland;
 - New access road serving the store;
 - Demolition of existing building infrastructure;
 - Two pelican crossings/pedestrian realm upgrades;
 - Complementary soft landscaping.
- **Greenways, district wide:** A £800k investment working with Sustrans on Route 66, 68 and 69 delivered within the Borough as part of the national cycle network.
- **LTP regeneration, King Cross:** A £500k district centre upgrade incorporating a new signal junction, widened highway (A646) to accommodate a new bus lane, two zebra crossings, widened footways, extensive TRO and lighting upgrades. Significant challenges from local traders were resolved through local public consultation and a communications plan.

- **Sainsbury, Brighouse:** A £350k new signal junction upon the on A641 Brighouse ring road to serve a supermarket. The scheme involved challenging peak hour working on a major A road.

5.3 Programme & Project Dependencies

5.3.1 A629 Phase 1 (Southern Section)

Progress towards Gateway 2 status for Phase 1a has been continuing for eight months following Gateway 1 approval in March 2015.

Land acquisition approaches have been positively received by all nine private plot owners who indicate wiliness for a voluntary sale, Beachcoft solicitors have been appointed to undertake conveyancing and a parallel CPO in the background to ensure certainty of programme. Council Cabinet has approved the CPO and underwriting of land costs pending Gateway 3 approval.

Detailed Highway Design is being undertaken by in-house teams supported by consultant engagement for retaining structures (JBA) and Urban Traffic Control component (Leeds City Council).

Early contractor engagement has been broached with YORHUB with a view towards delivery of a sub phase in summer 2016 (potentially Free School Lane junction). A framework mini tender is planned post-Christmas in advance of Gateway 2 approval

A public exhibition day / posting of outline designs on the internet, plus subsequent media coverage, received positive feedback from the community during November 2015.

Assuming Gateway 1 approval for Phase 1b is successfully secured in March 2016; preliminary design would be progressed through to May 2016 in order to reduce design risks, with key tasks and risks based on:

- Reassessment of the scheme against the topographical survey and detailed utilities searches;
- Intrusive ground investigation and constraints reporting;
- Geometric design refinement and development in light of the above;
- Flood risk assessment, including identification of any remediation or attenuation works required;
- Detailed signals design to reflect geometric constraints identified, and refinement of the scheme as tested within the highways modelling;
- Preparation of scheme for public consultation:
 - Scheme drawings;
 - Land acquisition requirements; and
 - 3D visuals from highways modelling.
- Fulfil interim Principal Designer function (required under CDM 2015) up to the point where a detailed designer is appointed;

- Environmental impact assessment screening; and
- Screening advice to identify ecology survey requirements and interaction with programme considering the seasonal ecology calendar.

Following completion of the above, detailed design work will be progressed for the scheme over a period of 12 months from October 2016 up to October 2017. This will then enable delivery of Phase 1 by March 2020, following a construction period of 24 months (2 years).

The complex nature of the land required on and around the site of the proposed highway changes will require significant site investigation and the possibility of some remediation or other mitigation.

For this reason it is expected the initial searches required for aspects including Ecology, Archeology, Heritage, Flood Risk, Ground Conditions & Contamination and Statutory Undertakings will be 'front loaded' and undertaken in parallel with the Gateway 1 submission period, and at financial risk to CMBC, in order to maintain project momentum.

5.3.2 A629 Phase 2 Halifax Town Centre

A cumulative and recipient component of the Phase 1 deliverable is A629 Phase 2 focused upon Halifax town centre. Comprising an umbrella approach to Gateway 1, the £57million town wide strategic plan will be submitted in tandem by Calderdale for the November Gateway 1 review.

Figure 5-1 illustrates the outline of the scheme, which in scope is intended to:

- Both frame and enable development opportunities within the town
- Reduce through traffic levels on Square Road/Winding Road, hence enabling the enlargement of the core town centre area;
- Enhance the quality of arrival within Halifax;
- Create a better pedestrian environment within the town centre;
- Provide better bus-rail interchange and improve pedestrian and cycle access to the rail station;
- Improve the visual setting of the rail station within its environs, as well as connections to it from all directions;
- Allow better penetration of the town centre by public transport; and
- Facilitate easier way finding around the key town centre attractors.

Essentially, it includes five principal components:

- A new eastern route for vehicular traffic that allows the expansion of the town centre to the east;
- A downgrading of the A629 to the west of the town centre aimed at reducing existing severance;

- Enhanced bus facilities around the town centre, particularly bus-rail interchange;
- Accessibility and arrival improvements at the rail station; and
- Major improvements to the public realm across the town centre, focused at the key gateways to the north, west and east, and along Market Street.

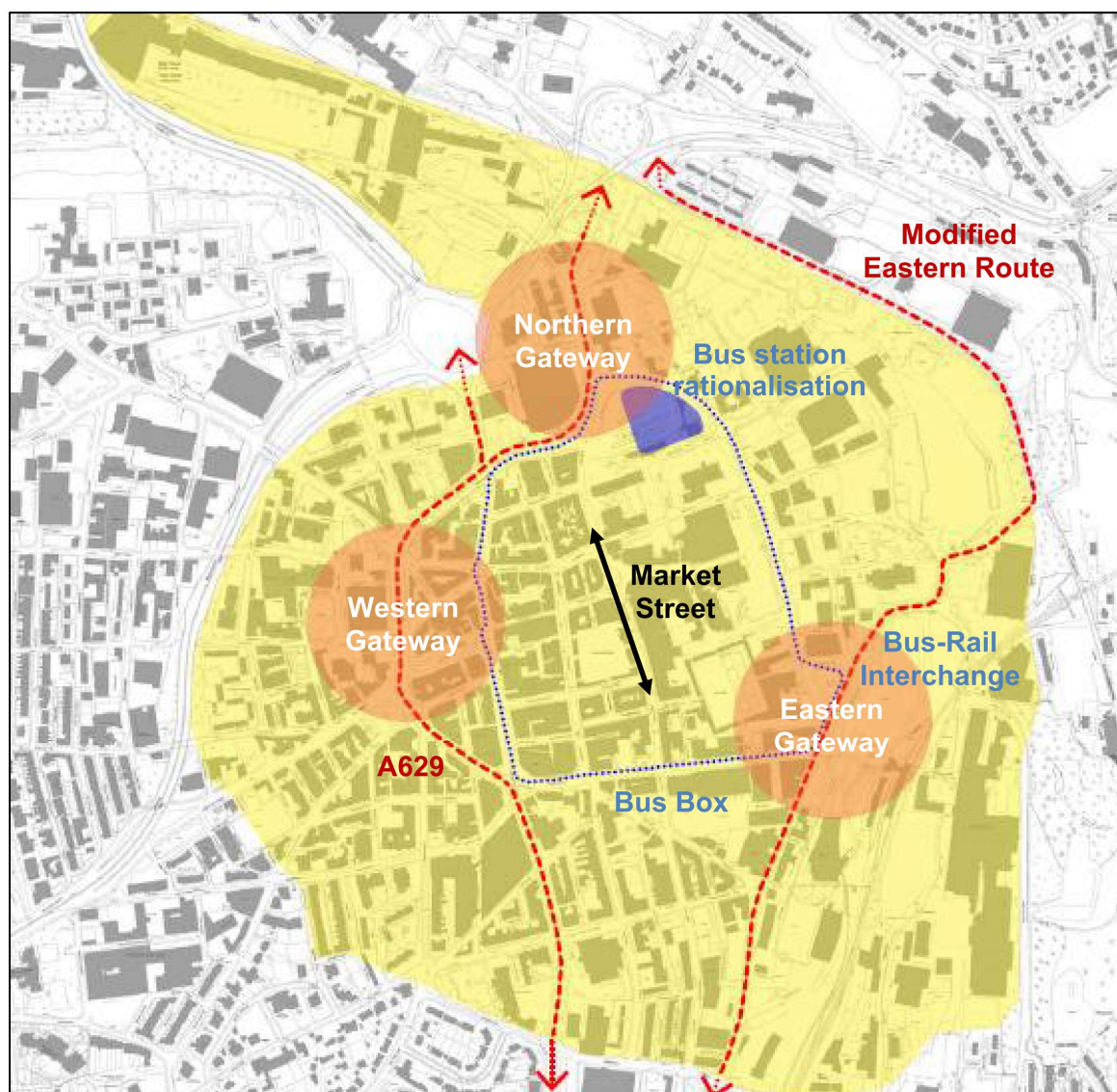


Figure 5-1 A629 Phase 2 Scheme outline Halifax Town Centre

The deliverables of this strategy will be realised under in 3 sub phases:

- Phase 2a – Eastern Gateway and Station Access Improvements [end of 2017];
- Phase 2b – Northern Gateway and Bus Interchange/Hubs [2018 – 2019]; and
- Phase 2c – Southern and Western Gateways [2019 - 2021].

The latter sub phase C links directly into Phase 1a crossroads of the A629 / Shaw Hill to form a continuous corridor upgrade into the heart of Halifax centre. Strategic modelling has encompassed a global approach to the corridor ensuring network capacity will be consistent across the adjoining phases.

5.3.3 A629 Phase 4 – Ainley Top (M62 Junction 24) and Wider Strategic Interventions

CMBC has secured mandate approval for Phase 4 to review the collective benefits that the combined A629 phased (1, 2 and 5) schemes will deliver, in order to complete a 'gap analysis' identifying what further interventions may be needed to achieve the total impacts forecast by the UDM for the corridor as a whole. A Gateway 1 submission for Phase 4 is anticipated to be brought forward in 2016.

Works completed to date on Phase 1 have sought to ensure passive provision for wider strategic interventions on the A629 corridor to be identified in Phase 4. The proposed highway improvements create flexibility in the network, particularly in the Phase 1b area, given the increased road space and capacity provided. The recommendation at this stage is that the existing bus lane provision in the Phase 1a area is to remain in place until such a time that the Phase 4 assessment identifies alternative uses of the highway space as part of the wider level assessment.

Measures proposed within Phases 1 and 2 will increase the appeal of general bus services using the corridor and town centre, in line with the scheme's objectives. The Phase 4 assessment will include a viability assessment of Park and Ride facilities being introduced at Ainley Top (as originally envisaged at pro forma stage) alongside other potential engineered or policy solutions (e.g. priority lanes), in order to identify the optimal mix of interventions to complement those schemes already in development. This further work will clarify the scope and location of measures to be delivered as part of Phase 4, the final phase of the A629 scheme to be delivered, with expected delivery in 2020 to 2021.

5.3.4 A629 Phase 5 – Ainley Top (M62 Junction 24) to Huddersfield

Kirklees Council are mandated to deliver Phase 5 of the A629 corridor strategy, focused on improvements along Halifax Road. An £11.7million strategy includes bus priority measures between the intersection of the A629 and Huddersfield Ring Road and the Cavalry Arms junction. The Cavalry Arms junction will be remodelled in a major upgrade to form an extra inbound lane. The approach to M62 Junction 24 Ainley Top roundabout will be served by two free flowing lanes. Phase 4 noted above will ensure integration of this major strategic roundabout into the respective districts A629 network upgrades.

Planned for Gateway submission in 2016, the delivery of the A629 Phases 5 by Kirklees Council will ultimately be necessary for benefits of the full A629 Halifax to Huddersfield improvements to be realised, in line with those forecast through the UDM assessment. However, the feasibility and benefits attributable to this Phase 1 scheme are not dependent on realisation of these later packages.

5.3.5 A641 Brighouse Corridor & M62 Junction 24a

CMBC, Kirklees Council and Bradford Council are also promoting a corridor improvement scheme under the WY+TF along the A641 between Bradford, Brighouse and Huddersfield. Work on the scheme is yet to be initiated, due to its planned delivery later in the WY+TF programme.

The Chancellor's Autumn Statement in December 2014 announced funding for upgrade of the M62 to a 'smart motorway' between Junctions 20 and 25. The potential development of a new motorway junction on the A641 corridor (Junction 24a) is currently being considered by Highways England working with KMBC. If a case for the scheme is identified, the scheme could be funded as a future major project in Highways England's Road Investment Strategy (RIS) and/or through the WY+TF.

Whilst realisation of a new motorway junction on a corridor parallel to the A629 could result in changes to corridor demand further south, it is not anticipated to affect traffic flow in the Phase 1 scheme area, given the northern divergence of the two corridors to serve different onward destinations.

5.4 Governance/ Organisational Structure

5.4.1 Governance

CMBC has the project management systems, skills and track record to be able to deliver this project successfully, and has robust financial monitoring systems and procurement credentials as demonstrated by years of delivering externally funded projects, including highway schemes.

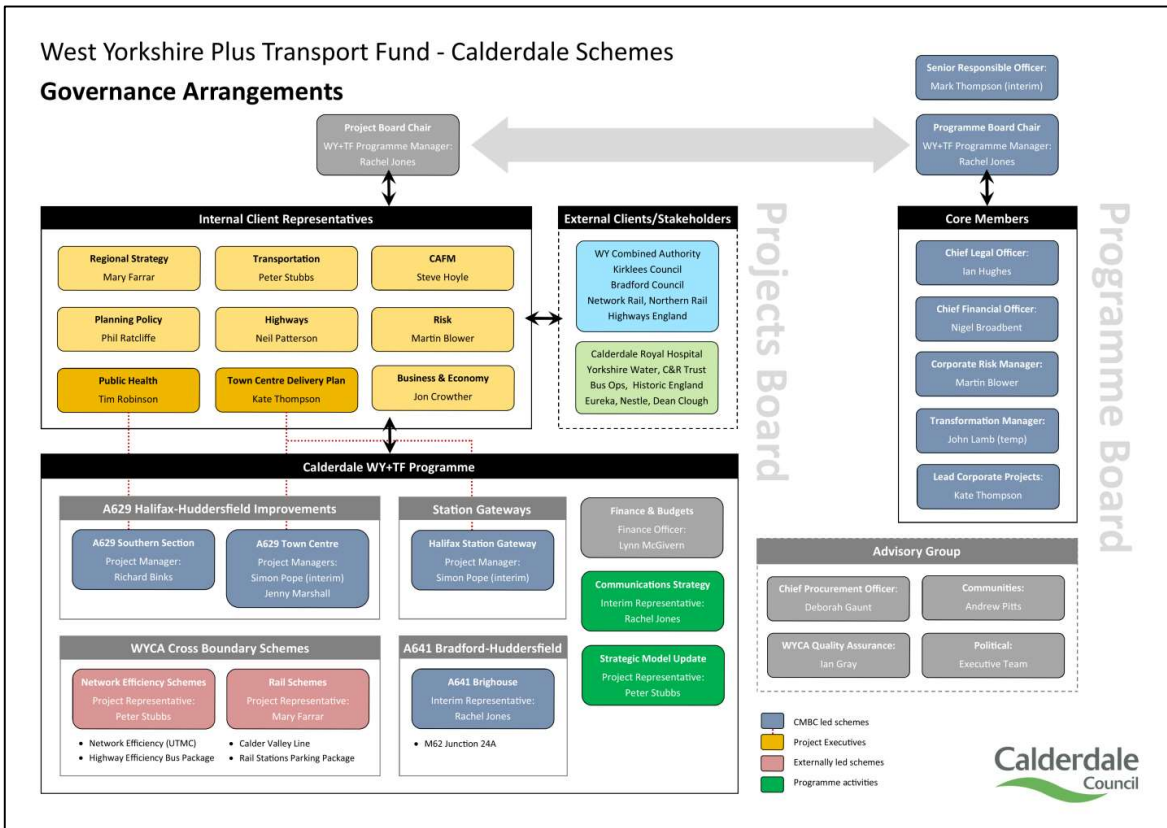


Figure 5-2 CMBC WY+TF Governance Structure

The governance structure is illustrated in Figure 5-2 above. This structure is designed to be flexible to respond to change and developments within the programme and wider regeneration within the district. In general terms the management of the project is split up into three tiers consisting of the WY+TF Board, the Programme Board and the Projects Board. The Phase 1 scheme and CMBC's wider WY+TF programme is led by the Corporate Projects team. This ensures the scheme's development and delivery is closely aligned with other projects being led by the Corporate Projects team. This effectively guarantees that the scheme's future development will be tailored to ensure realisation of parallel growth ambitions, as opposed to merely a standalone transport project.

The Programme Board comprises the Director of Economy & Environment as Senior Responsible Officer, the Lead for Corporate Projects, the Transformation Manager for Planning & Highways, the Corporate Risk Manager, Chief Legal Officer and Chief Finance Officer. Along with other officers from the Corporate Projects and Highways Teams, the board will continue to govern the programme and this scheme for a period of time until wider regeneration programmes develop. The Board is chaired by the WY+TF Programme Manager for Calderdale.

A Projects Board is in place, that overseas all the Calderdale schemes within the WY+TF. The board manages project development and delivery and gives direction to the individual project managers. The board includes internal client representatives from across a wide variety of disciplines and is chaired by the WY+TF Programme Manager for Calderdale. This provides mechanism to ensure reflection of parallel programmes and priorities is intrinsic to scheme development such as progress/delivery of the Local Plan, regeneration land assembly and public health projects.

A permanent team for the delivery of the project has been established with a Project Manager in place for the scheme. The Council has dedicated resource to deliver its major projects using PRINCE2 project management principles at both the programme and individual project level. One of the key principles governing the project is to manage by exception.

5.4.2 Communications and Stakeholder Management

A communication and stakeholder management strategy is being developed and is due for completion shortly. CMBC is developing an integrated communication plan, for local residents and interested parties, covering both the WY+TF programme and wider regeneration opportunities facilitated by the LEP: This includes:

- Carrying out a stakeholder analysis to identify the target audience and methodology for communication activities (internal/external/linked).
- Producing a resource plan that identifies resources required to undertake activity, identifying a mechanism for on-going maintenance of communication materials.
- Agreeing communications objectives, key messages and theme(s).
- Identifying how marketing materials will be flexible to take account of other branding that may be required, such as that from the West Yorkshire Combined Authority (WYCA) or Leeds City Region (LCR).

- Developing a highly targeted communications plan, including key milestones, timeline and budget. This plan should enable stakeholders easy access to information on upcoming developments and proactively communicate pertinent details, reducing the number of FOI requests which will be received by the Authority.
- Identifying the best methods for managing expectations locally, given that this is a long term approach until benefits may be realised.
- Procurement of marketing/communications/web development expertise (where necessary).
- Develop communications materials/methods (event(s) / website / printed media / social media etc.). Produce materials to convey the details of agreed, planned and aspirational work packages in a way that is simple and easy to understand.
- Any material should highlight Calderdale as a place for investment by businesses/developers.

Phase 1a is at a progressive stage of engagement both within the general public and stakeholder realm. Landowner negotiations have been positive with all nine plot owners currently supporting a voluntary acquisition process as opposed to indicating CPO necessity; a CPO is however being progressed in parallel to ensure certainty of programme though not envisaged being needed to be completed at this stage.

A public exhibition was held on Wednesday 28 October 2015 setting out the detail of the Phase 1a scheme and background information to the WY+TF. The event was well attended, with feedback generally supportive of the strategies and principles applied. The key points raised related to the provision of cycle infrastructure and the balance between the use of highway space for different modes. Phase 1a details are now posted on the CMBC website and a dedicated email address has been set up to receive enquiries about the scheme.

Phase 1b is not yet in the public domain. Publicity and communication is planned following a successful Gateway 1 approval. Engagement on the Phase 1b scheme will be in line with the communication and stakeholder management strategy outlined above.

Engagement with the principal landowner for Phase 1b has been ongoing, with an understanding reached with this developer to refrain from continuation of their own plans for the site in knowledge of the new highway link to come. Consultation with the other main stakeholder the Canal and Rivers Trust is currently pending.

5.5 Project Reporting

Well established project management tools are in place in CMBC, and these will be used to deliver this scheme. Monthly highlight reports are prepared by the permanent Project Manager who also conducts day to day management of the scheme, formal reporting to the Projects Board on a monthly basis, and monthly exception reporting to the Programme Board, using templates already adopted across the CMBC's Corporate Project Team. Progress across the wider CMBC WY+TF programme is fed back to WYCA through bi-monthly highlight reports and attendance at subsequent peer review sessions.

The WY+TF Project Brief defines the specific outputs that the scheme will need to deliver and the process to be employed in order to achieve them. The Programme Manager and Project Manager will also use any project reporting templates, as issued by the WYCA and CMBC, to report progress of this scheme going forward.

5.6 Benefits Realisation Plan, Monitoring and Evaluation

5.6.1 Monitoring and Evaluation

The scheme's progress is required to be monitored and evaluated in line with requirements set out in the DfT's 'Monitoring and Evaluation Framework for Local Authority Major Schemes' (September 2012). A detailed Monitoring and Evaluation Plan will be submitted at Gateway 2.

The purpose of monitoring is to understand if, how and why the intended outcomes and impacts of the scheme have been achieved or exceeded. To this end, all promoters are required to monitor progress against a set of standard measures that apply at different stages of delivery.

Suitable monitoring activities will be defined under each monitoring measure as a means of assessing contribution towards the project objectives. All 'before' data will be captured prior to the delivery of Phase 1a to ensure an appropriate baseline is available against which the realisation of benefits may be benchmarked. If data collection is not completed in advance of Phase 1a a true picture of the existing performance of the corridor will not be gained and the assessment of the Phase 1 scheme following completion of Phase 1b would not be against a true base point.

An evaluation of the wider A629 Halifax to Huddersfield Improvements (of which Phases 1a and 1b form a constituent part) is expected to be necessary. The Monitoring and Evaluation Plan will therefore undertake parallel fuller evaluation of the scheme to generate evidence on:

- Whether the scheme has been delivered effectively and efficiently,
- The causal effect of the scheme on anticipated outcomes and whether these have contributed to the intended impacts, and
- Whether the scheme has any unintended adverse or positive effects.

In this way, the fuller evaluation will build upon the evidence generated through monitoring of the standard and enhanced measures by triangulating this data with other bespoke evaluation sources, demonstrating the causal pathway between the scheme and the observed outcomes and impacts.

Completion of the fuller evaluation will involve reporting each of the following steps:

- **Process Evaluation:** Examining the processes by which the scheme was implemented, to understand how the scheme has influenced outcomes and impacts;
- **Impact Evaluation:** Assessing the outcomes and impacts generated by the scheme, in order to provide reliable evidence of the extent to which the scheme has caused the changes observed; and

- **Economic Evaluation:** Assessing whether the costs have been outweighed by the benefits, involving an ex-post appraisal using updated outturn values and appraisal assumptions based on observed evidence.

Documenting the evaluation findings will involve the production of a 'One Year After' Report (released 1-2 years post scheme implementation) and a Final Report (released approximately five years after scheme implementation), according to the timeframe within which, monitoring of particular measures and evaluation of causal effects needs to take place.

Since different phases of the wider A629 scheme will be realised at different times, an incremental approach to monitoring and evaluation will be necessary that reflects the scope and scale of benefits built-up on realisation of each component phase.

5.6.2 Benefits Realisation Plan

An initial Benefit Realisation Plan (BRP) has been produced to identify, track and compare the various benefits expected to be delivered. This details key activities that are required to manage successful realisation.

The scheme objectives have been used to develop the “desired outputs, outcomes and impacts” for the scheme. These desired outputs, outcomes and impacts are the actual benefits that are expected to be derived from the scheme and are directly linked to the original set of objectives:

- Desired outputs – tangible effects that are funded and result from the scheme;
- Desired outcomes – what happens as a result of the outputs; and
- Desired impacts – the final impacts brought about by the scheme in the short, medium and long term as a result of the outputs and outcomes.

The scheme objectives and desired outputs/outcomes are summarised in Table 5-1 and provide the starting point for the development of the BRP. The impacts will require fuller evaluation using a variety of metrics and causation factors. Given the scheme objectives identified, the BRP focuses upon stimulus to jobs/economic activity, the impact on journey times, and demands (by mode). A detailed Benefits Realisation Plan will be submitted at Gateway 2.

To determine whether the scheme benefits are being realised, the desired outputs, outcomes and impacts have been converted into measurable indicators of scheme benefits, as set out in Table 5-2. An initial view of the data required to measure the extent to which benefits are being realised is also shown in the table.

In terms of tracking the benefits of the scheme, it is recommended that all elements of the scheme are fully implemented prior to tracking the associated benefits. This is due to the likely traffic re-assignment/potential network delays that will occur during the construction of the later phases of scheme. It is recommended that the benefits are initially tracked one year after full scheme opening (with the exception of the accident and economic activity levels) and again five years post-opening.

It should also be recognised that the benefits realisation of the full A629 corridor package will need to be assessed collectively at some point. Jobs growth in Halifax town centre, for example, will in part be facilitated by improved access along the whole of the corridor, alongside improvements proposed as part of Phase 2. This suggests a programme of individual monitoring for each phase of the A629 corridor, as has been suggested, but also an allowance for fuller evaluation of the wider package in its entirety.

The overall BRP is owned by the Project Manager, with responsibility for overseeing particular benefits delegated as necessary. The owners will be responsible for tracking the benefits being realised and for reporting any exceptions to the Project Manager. This will allow early identification of any particular areas where benefits are not being realised as expected. The Project Manager will then appoint someone with sufficient expertise to oversee remedial actions to try to bring benefits back in line with expectations.

Table 5-1 Outline Scheme Objectives, Desired Outputs and Outcomes

Scheme Objectives	Desired Outputs	Desired Outcomes	Desired Impacts
Deliver optimal capacity on the A629 corridor (people and goods). Improve accessibility to Calderdale's key employment sites. Interventions to be supportive of housing growth. Enhance journey time reliability, particularly for public transport users. Minimise impact on future revenue budgets. Maintain and improve existing network operation for all road users. Enhance provision for sustainable modes. Reduce bi-directional journey times for all modes on A629 corridor. Improve air quality.	New highway link between the A629 and Stainland Road. New network of junctions and links to replace existing Calder & Hebble junction and remove existing pinch point. Improved pedestrian and cycle infrastructure on Wakefield Road and Stainland Road. Improved pedestrian and cycle infrastructure between Jubilee Road and Free School Lane. New retaining structure on Salterhebble Hill to facilitate widening to two lanes southbound. Junction capacity improvements at Dudwell Lane, Dryclough Lane and Free School lane. Scheme optioneering has minimised the impact on revenue budgets.	Accessibility to and from Halifax and Huddersfield. Key employment areas, such as Copley as well. Accessibility/severance between surrounding business and residential areas is improved. Increased cycle mode share to key attractors on the A629 corridor. Reduced levels of delay and queuing on the A629 through the Calder & Hebble junction for all modes. Reduced levels of 'rat-running' through West Vale area, Siddal and Exley. Increased vehicle throughput. Decrease in public transport journey time variability. Decrease in end to end corridor journey times. Improvement in air quality.	Increase in jobs. Increase in GVA. Increase in household completions. Positive Public Health Impact

Table 5-2 Benefit Assessment Indicators

Ref No.	Benefit (Desired Output/Outcome/Impact)	Benefit Indicator	Specific Data Requirements
Desired Output			
1	Infrastructure improvements to highway	% completion of scheme package	Completion records
Desired Outcomes			
2	Reduced 'rat-running' through West Vale	Reduction in vehicles travelling through West Vale who could otherwise use the A629	Origin-Destination traffic survey
3	Increased vehicle throughput	Increase in the number of vehicles using the A629 corridor	ATC data collection on A629, Stainland Road, Wakefield Road
4	Decrease in public transport journey time variability	Decrease in public transport journey time variability	Operator / WYCA journey time data
5	Decrease in end to end A629 corridor journey times	Decrease in end to end A629 corridor journey times	TrafficMaster
6	Improvement in air quality	Reduction in annual mean nitrogen dioxide (NO2) levels	TrafficMaster, environmental assessments
Desired Impacts			
7	Increase in jobs	Number of jobs created	Employment statistics and interviews with key investors / employers
8	Increase in GVA	Increase in GVA	GVA statistics
9	Increase in household completions	Increase in the number of household being built	Planning applications and data from developers
10	Positive Public Health Impact	Increase in use of sustainable modes. Health indicators to be agreed with CMBC Public Health team	Cycle counters, health indicators to be agreed with CMBC Public Health team

Appendix A – Super Output Areas

Appendix B – CSTM LMVR

Appendix C – CSTM Forecasting Report

Appendix D – A629 Issues & Objectives Matrix

Appendix E – Phase 1a Gateway 1 Submission

Appendix F – Phase 1b Scheme Drawings

Appendix G – Option Development & Sifting Report

Appendix H – Preferred Option Testing Report

Appendix I – Journey Time Comparison Graphs

Appendix J – TUBA Outputs

Appendix K – Cycle Benefits Assessment

Appendix L – Appraisal Summary Table

Appendix M – Land Owners Plan

Appendix N – Risk Register

Appendix O – Project Programme